

Installation and Deployment

HOPEX V2R1



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WINDOWS FRONT-END INSTALLATION GUIDE HOPEX V2R1

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1. SUMMARY

This document describes the procedures and technical configurations necessary for installing, upgrading and uninstalling programs of the Windows Front-End.

Note that Windows Front-End is also the kernel for HOPEX Web Front-End.
It applies to HOPEX V2R1.

It does not describe:

- System requirements and possible architectures (see architecture overview documentation).
- How to install corrective patch (see how to upgrade CP documentation).
- How to manage installations (see administrator manuals).
- How products are licensed (see license installation documentation).
- How to use features (see user manuals).

Before installing:

- You must have chosen a deployment (Standard deployment or Citrix/TSE deployment)
- You must have chosen a type of license (Must license, Elf license).

The types of installations described in the document are the following

Type of installation	Comment
Installation on standalone machine	Standalone installation for test purpose. In this case, it is assumed that storage is GBMS.
Installation on multiple machines	Real deployment on several machines. It is assumed that a tool to deploy .MSI/.MSP files is available and that storage is RDBMS.
Installation on Citrix /TSE Server	Real deployment on one or several Citrix/TSE servers. It is assumed that storage is RDBMS.

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2. INSTALLATION ON STAND-ALONE MACHINE

2.1. General Steps

Performing an installation on a stand-alone machine includes the following steps from the Windows Client:

- Installing the HOPEX programs (HOPEX Kernel).
- Installing a HOPEX Environment for test.
- Installing the HOPEX License.

In this document, it is assumed that the repository storage is GBMS. Otherwise:

- A HOPEX Environment should be available in a database server.
- If storage is SQL Server, SQL Server native client should be installed on the machine.

Pre-requisites:

Confirm that you have:

- Local administrator rights for the machine (for updating the system).
- 'Full control' of the installation folder.
- 4 GB free space in the installation folder.
- A system that is supported for this version of Windows Front-End
See document 'Windows Front-End Architecture Overview HOPEX V2R1 EN'.
- Visual C++ Redistributable for Visual Studio 2015 installed.
See also the section 'FAQs' of this document.
- A HOPEX local license. Consult your sales representative to obtain a license. You will get a license file and instructions to install it.

2.2. Installing on the Windows client

Procedure:

- Insert the HOPEX disk in the disk drive but do not install from the page started automatically (autorun).
- Select the program "`\\DISK1\\setup.exe`" and execute in '**Run as administrator**' mode
- Select the language of the user interface.
- Accept the license agreement.
- Choose whether the Windows Front-End is installed for all users or for the current user or for all system users (windows users).
- Check the folder in which you wish to install HOPEX, for example:
Folder '`C:\\Program Files (x86)\\MEGA\\HOPEX`' for a 64-bit system
This installation folder must not be the root of the drive, for example, it must not be `C:\\`
- In the 'Setup Type' window, select **Windows Standalone Setup**.
- Run the installation and wait for confirmation of completion.

Result:

- Programs are installed for the Windows Front-End.
- The system of the machine is updated (registry, libraries).
- Windows Service are installed
 - HopexRedisBackEnd
- Redis client programs are installed.
- The Program Features selected by default are installed. Note that no HOPEX environment is created by default.
- The local configuration file (Megasite.ini) contains the following section. It should not be removed.

```
[LAN]
clusterrootpath=
```

2.3. Post installation tests

After installation of HOPEX:

- Install the HOPEX license.
See section 'Checking the HOPEX License', later in this document.
- Install a test environment and a test data repository.
See section 'Installing a test environment', later in this document.

Then, perform the following tests:

Windows client	Scenario
Workstation01	Scenario #1 <ul style="list-style-type: none"> • Check license • Connection to Window Administration console Scenario #2 <ul style="list-style-type: none"> • Connection to Windows Front-End • Check dispatch Scenario #3 <ul style="list-style-type: none"> • Connection to Windows Front-End • Check creation of diagram

See Post installation scenarios section p. 11.

3. COMMON CONFIGURATION

This section describes configurations that will be necessary for standard deployment or Citrix/TSE deployment.

3.1. Checking the HOPEX License

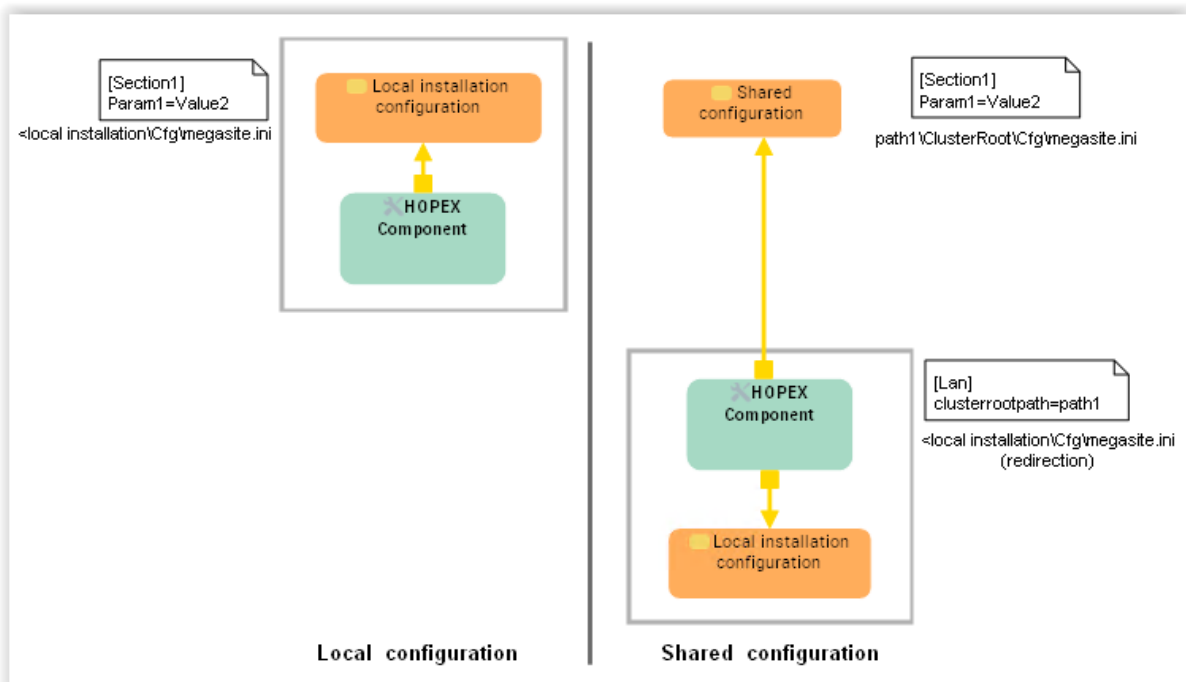
Consult your sales representative to obtain a license. You will get a license file and instructions to install it.

License type	Requirement
Must license (.must)	<ul style="list-style-type: none"> It should be installed in the UNC folder for which it has been programmed. Example: folder \\server001\Apps\Licenses containing the file License-000001.must. The must license folder must be accessible with full control to all Windows users that should share this configuration. If you want to configure smarter permissions, consult the FAQs section p. 25.
Elf license (.elf)	<ul style="list-style-type: none"> It should be installed in a shared folder. Example: folder \\server001\Apps\Licenses containing the file License-000002.elf The Elf license file must be accessible with at least read access to all Windows users that should share this configuration.

For more details about HOPEX license, see the article 'Must License Installation Guide HOPEX V2R1 EN'.

3.2. Creating a shared configuration folder

The configuration of the HOPEX installation can be local or shared:



When Windows Front-End is run by an end-user:

1. A configuration file (Megasite.ini) is read.
2. If it contains a redirection (clusterrootpath=YYY, ex clusterrootpath=\\mega\data), a different configuration files (Megasite.ini) is read in the shared folder.

Procedure:

- Create and share a folder that will contain configuration files (Example: \\mega\data\ClusterRoot\Cfg).
- Manually create a text file called 'megasite.ini'.

Notes:

- The folder must be accessible with **full control** to all Windows users that should share this configuration.
- The file megasite.ini must be copied in a subfolder (\ClusterRoot\Cfg) of the path set for clusterrootpath. Ex: \\mega\data\ClusterRoot\Cfg\megasite.ini
- If you want to configure smarter permissions, consult the FAQs section p. 25.
- The file megasite.ini should at least contain a section for the license, according to the type of license used. See below:

License type	Example
Must license (.must)	[Must license] Path = \\server001\Apps\Licenses
Elf license (.elf)	[MegaLicenseFile] FileLongName = \\server001\Apps\Licenses\License-000002.elf

If you do not have the technical skills or the authorization required for this step, contact your system administrator.

3.3. Copying the installation program on a network folder

You need to copy the HOPEX installation programs (often called 'installation master') on a network folder.

Example: \\Srv001\Master\HOPEX

This folder contains a subfolder \DISK1\HOPEX V2R1.msi.

Important notice:

Choose a folder that persists in time (do not delete it after installation). Indeed this path will be saved in the registry of the machines where HOPEX programs are installed. When such installations are upgraded (CP upgrade), this path can be tested and errors can occur if the master is no longer available.

3.4. Building an installation command line

Installing on several machines requires batching the execution of an installation command line.

The command line should be executed with the privilege 'Run as administrator'.

Execute the command line with the privilege Run as administrator:

With recent operating system it is required that the installation is performed not only by a user that belongs to the group of 'Administrators' but also that the installation program is executed with the privilege 'Run as administrator'.

It is important to verify that, in the procedure used, the .MSI/.MSP program is executed with the privilege 'Run as administrator'. Otherwise, the HOPEX Programs may not be fully installed or upgraded and various problems can occur especially with HOPEX Web Front-end.

Different procedures are available and only one is described below:

- Create a text file with the .Bat extension.
- Edit the .Bat file, add the command lines and save the file.
- Select the .Bat file and right-click > Run as administrator.

Full installation command line syntax for HOPEX V2R1.msi:

```
<path of msixec.exe> /package "<Folder of the HOPEX MSI file>\HOPEX V2R1.msi" /passive /levw "<path
of installation log>"
SELECTED_LANGUAGE="<language code>"
ADDLOCAL="<feature list>" REMOVE="<feature list>"
ALLUSERS="1"
INSTALLDIR="<installation path>"
CLUSTERDIR="<configuration folder>"
HOPEXDIR="<installation path of IIS HOPEX application>"
HOPEXMWAS="<installation path of IIS MWAS>"
MSSPDIR="<installation path of IIS SSP>"
IS_NET_API_LOGON_USERNAME_HOPEX="<HOPEX service account name>"
IS_NET_API_LOGON_PASSWORD_HOPEX="<HOPEX service account password>"
IS_NET_API_LOGON_USERNAME_API="<HOPEX API service account name>"
IS_NET_API_LOGON_PASSWORD_API="<HOPEX API service account password>"
WEBPORTAL_USERNAME="<name of administrator of the machine>"
WEBPORTAL_PASSWORD="<password of administrator of the machine>"
WITHSSL="<0 or 1>"
```

Element	Comment
/package "<Folder of the HOPEX MSI file>\HOPEX V2R1.msi"	Required. To specify the path of the .msi file. Ex: \\Srv001\Master\HOPEX\DISK1\HOPEX V2R1.msi.
/passive	Optional. To trigger not interactive mode
/levw "<path of installation log>"	Optional. To generate installation log Ex: /levw "C:\tmp\ScriptInstall.log"
SELECTED_LANGUAGE="<language code>"	Optional (English by default). To control installation language. Languages codes: 1031 (German language), 1033 (English language), 1036 (French language), 1040 (Italian language)
ADDLOCAL="<feature list>" REMOVE="<feature list>"	Recommended. To list the features to install: feature X, feature Y... See table 'Complete list of installation features' later in this document
INSTALLDIR="<installation path>"	Optional. To control target folder of HOPEX core programs. Ex: C:\Apps\MEGA\HOPEX
CLUSTERDIR="<root configuration folder>"	Optional (empty by default). To set a root configuration folder for the installation Ex: "\\mega\data"
HOPEXDIR="<installation path of IIS HOPEX application>"	Optional (by default C:\inetpub\wwwroot\HOPEX). To control target folder of IIS HOPEX application folder when installing Web Front-End. Ex: C:\Apps\MEGA\wwwroot\HOPEX
HOPEXMWAS="<installation path of IIS MWAS>"	Optional (by default C:\inetpub\wwwroot\HOPEXMWAS). To control target folder of IIS MWAS folder when installing Web Front-End. Ex: C:\Apps\MEGA\wwwroot\HOPEXMWAS
MSSPDIR="<installation path of IIS SSP>"	Optional (by default C:\inetpub\wwwroot\MegaSSP). To control target folder of IIS SSP folder when installing SSP. Ex: C:\Apps\MEGA\wwwroot\MegaSSP
IS_NET_API_LOGON_USERNAME_HOPEX="<HOPEX service account name>"	Required with HOPEX Web Front-End Ex: mydomain\myuserhopex
IS_NET_API_LOGON_PASSWORD_HOPEX="<HOPEX service account password>"	Required with HOPEX Web Front-End Ex: mypasswordhopex
IS_NET_API_LOGON_USERNAME_API="<HOPEX API service account name>"	Required only to deploy web services with HOPEX Web Front-End. Ex: mydomain\myuserhopexapi
IS_NET_API_LOGON_PASSWORD_API="<HOPEX API service account password>"	Required only to deploy web services with HOPEX Web Front-End. Ex: mypasswordhopexapi
WEBPORTAL_USERNAME="<login of administrator of the machine>"	Required to control access later. Choose the name of administrator of the machine Ex: mydomain\myadminuser
WEBPORTAL_PASSWORD="<password of administrator of the machine>"	Required to control access later. Choose the password of administrator of the machine Ex: mydomain\myadminpassword
WITHSSL="<0 or 1>"	0 to disable SSL at installation 1 to enable SSL at installation If no certificate is installed on the web server, disable installation with SSL. This can be configured after installation.

You can use such a command line to install HOPEX Windows Front-End and/or HOPEX Web Front-End. The appendix of this document contains:

- Examples of command line for Web Front-End.
- A complete description of installation features.

See also Microsoft documentation, for example:

[https://technet.microsoft.com/en-us/library/cc759262\(v=ws.10\).aspx](https://technet.microsoft.com/en-us/library/cc759262(v=ws.10).aspx)

3.5. Installing a test environment

A HOPEX Environment is required to run connection scenarios. To facilitate this step, it is created in the GBMS storage format. It can also be created in the RDBMS storage format. Of course, the HOPEX Environment used for production can be created in the RDBMS storage format.

For more details about RDBMS storage format, see the article 'RDBMS Repository Installation guide HOPEX V2R1 EN'.

Pre-requisites:

- 800 MB free space on a shared folder.
On the server disk, create a folder (example [\\svrname\data](#)) and share it with a few end-users (full control).
- Local HOPEX installation.

Procedure:

From the File Server:

- Run Administration.exe
Example: C:\Program Files (x86)\MEGA\HOPEX V2R1\Administration.exe
- In the tree, select the 'Environments' folder.
- Right-click > New.
- A window 'Environment installation (Create/Update)' is displayed.
 - Enter a value for 'Name:', (example: 'TestEnvironment').
 - For 'Location:', select the shared folder (example [\\svrname\data](#)).
 - For 'Repository storage support', keep 'Gbms'.
 - Click 'OK' and wait until installation is complete.
- In the tree, select the 'Environments' folder.
- Right-click > Open.
- In the window Identification, enter the identifier **System** (no password) and click 'OK'.
- In the tree, below the environment, select the 'Repositories' folder.
- Right-click > New.
- A 'Create repository' window is displayed.
 - Enter a value for 'Name:', (example: 'TestRepository').
 - For 'Repository storage support', keep 'Gbms'.
 - Click 'OK' and wait until installation is complete.
- Exit the Administration Console with Menu File > Exit.

3.6. Post installation scenarios

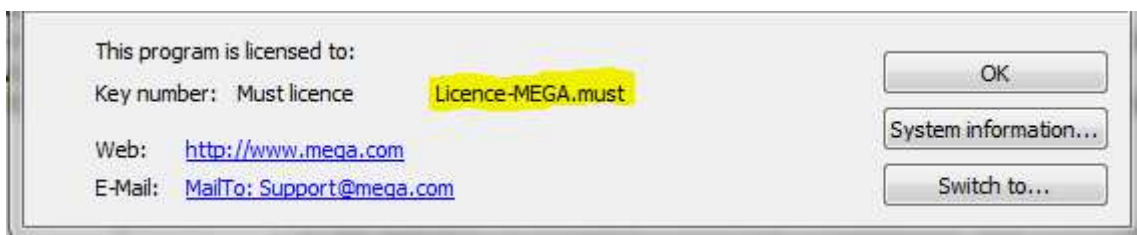
Once HOPEX Programs and HOPEX Licenses are installed, it is important to verify that connection to the Windows Front-End is technically possible.

A HOPEX Environment and a HOPEX Repository are required. If no environment or repository is available at this step, see the section 'Installing a test environment' in this document.

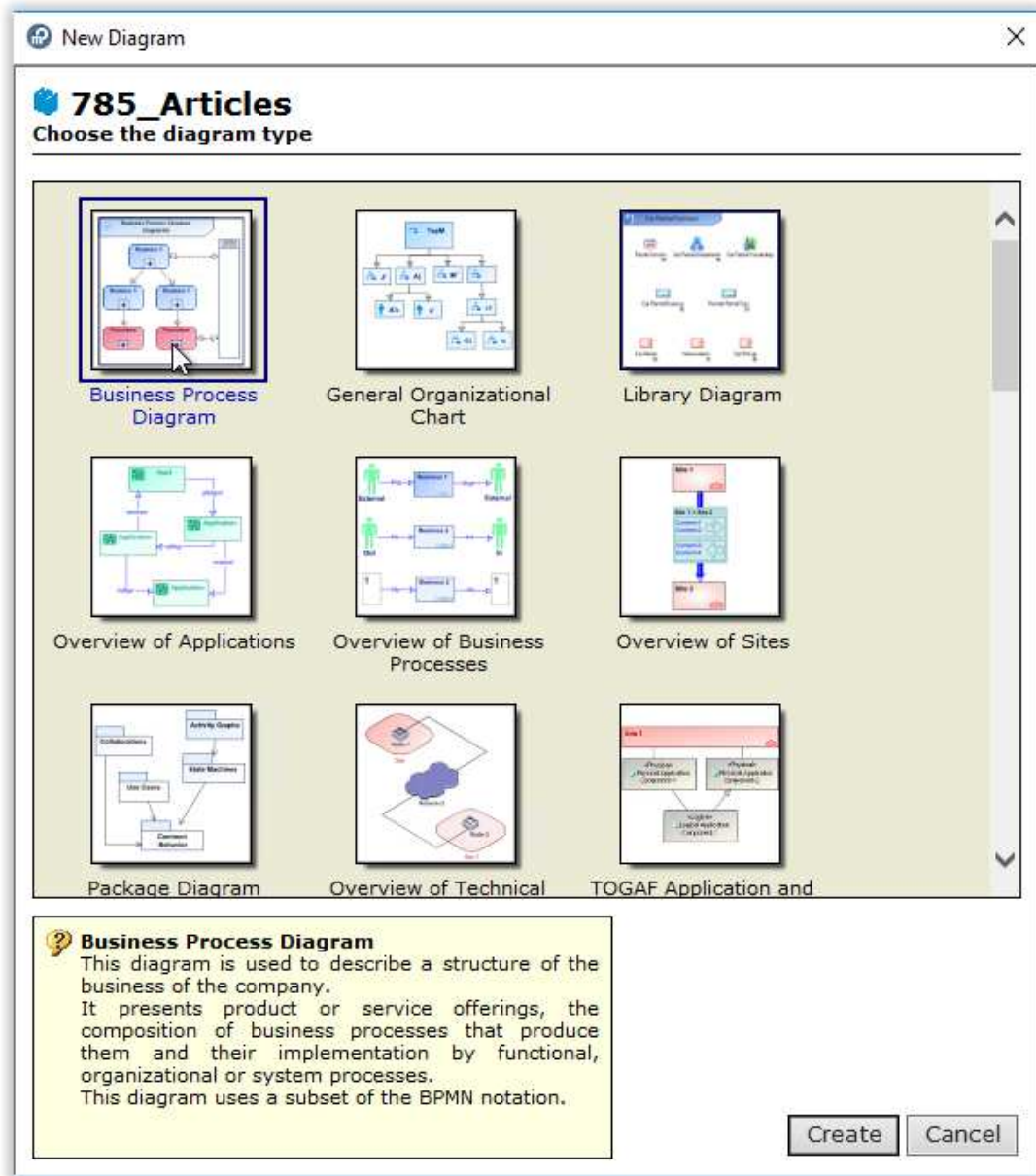
Scenario	Steps
Scenario #1 <ul style="list-style-type: none"> Check license Connection to Administration console 	<ul style="list-style-type: none"> Run Administration.exe. A window 'HOPEX - Administration' is displayed Click the menu help > About HOPEX A window 'About HOPEX' is displayed Check the type (ex: Must license) and name (ex: 'License HOPEX.must') of the license in the bottom of the page (1). <i>If you can run Administration console and display the name of the licence, test is a success. Otherwise, test is a failure.</i> Select the test environment Ex: xx\TestEnvironment. R click > Open In the window Identification, enter the identifier System (no password) and click 'OK'. <i>If you can display the folders 'Repositories', 'Customized Shapes' and 'User accounts', test is a success. Otherwise, test is a failure.</i> Click the menu File > Exit.

<p>Scenario #2</p> <ul style="list-style-type: none"> • Connection to Windows Front-End • Check dispatch 	<ul style="list-style-type: none"> • Run HOPEX.exe. • In the window 'Connection to HOPEX', enter the identifier Mega (no password) and click 'OK'. A window 'HOPEX' is displayed • Select a repository Ex TestRepository • Select the profile 'Enterprise Architect' and click 'OK'. The desktop is loaded <p><i>If the desktop is displayed, test is a success. Otherwise, test is a failure.</i></p> <ul style="list-style-type: none"> • Click the menu View > Navigation Window > Home A tab 'Home' is displayed • Select the library 'MEGA' (icon of open blue book) • Right-click New > Sub-library and confirm creation • Click the menu File > Exit and answer 'Yes' to the question 'Do you want to dispatch modifications?' <p><i>If the object is created and the dispatch is correct, test is a success. Otherwise, test is a failure.</i></p>
<p>Scenario #3</p> <ul style="list-style-type: none"> • Check creation of diagram 	<ul style="list-style-type: none"> • Run HOPEX.exe. • In the window 'Connection to HOPEX', enter the identifier Mega (no password) and click 'OK'. A window 'HOPEX' is displayed • Select a repository Ex TestRepository • Select the profile 'Enterprise Architect' and click 'OK'. The desktop is loaded • Click the menu View > Navigation Window > Home A tab 'Home' is displayed • Select the library 'MEGA' (icon of open blue book) • Right-click New > Sub-library and confirm creation • For this Library object, right-click New > Diagram. A wizard called 'New diagram' is displayed. <ul style="list-style-type: none"> ○ Check that it is possible to select 'Library diagram' and to click 'Create' (1). A diagram will be created. • Click the menu File > Exit and answer 'Yes' to the question 'Do you want to dispatch modifications?' <p><i>If the diagram is created, test is a success. Otherwise, test is a failure. In this case, change options at environment level, group 'Compatibility > Diagram' and set 'Diagram creation interface' to 'Menu (Compatibility mode)' (3) as a work-around. See also the Embedded Internet Explorer section p. 35.</i></p>

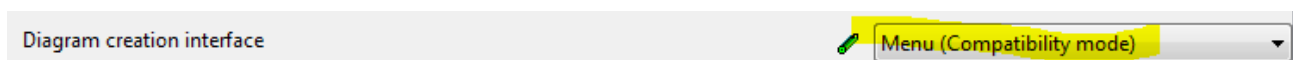
(1) Check the type and name of the license in the bottom of the page



(2) Check that it is possible to select 'Library diagram' and to click 'Create'.



(3) Change options at environment level, group 'Compatibility > Diagram' and set 'Diagram creation interface' to 'Menu (Compatibility mode)'.



4. INSTALLATION ON MULTIPLE MACHINES

4.1. General Steps

Performing an installation for standard deployment includes the following steps:

From each Windows Client:

- Installing SQL Server Native client if SQL Server storage is chosen.
No MEGA documentation is provided: use the standard documentation of the SQL Server native client.
- Installing the HOPEX programs (HOPEX Kernel) targeting a shared configuration in command line mode. This enables to pass the path of the shared configuration folder as a parameter so that local configuration file (megasite.ini) is updated.

From a file server:

- Checking the HOPEX license.
Refer to the section 'Common configuration' of this document.
- Creating a shared configuration folder.
Refer to the section 'Common configuration' of this document.
- Creating a shared configuration file.
Refer to the section 'Common configuration' of this document.
- Installing a HOPEX Environment for test.
Refer to the section 'Common configuration' of this document.

Pre-requisites:

Confirm that you have for each Windows client:

- Local administrator rights for the machine (for updating the system).
- 'Full control' of the installation folder.
- 4 GB free space in the installation folder.
- A system that is supported for this version of Windows Front-End
See document 'Windows Front-End Architecture Overview HOPEX V2R1 EN'.
- Visual C++ Redistributable for Visual Studio 2015 installed.
See also the section 'FAQs' of this document.
- A HOPEX license. Consult your sales representative to obtain a license. You will get a license file and instructions to install it.
- SQL Server Native client installed if SQL Server storage is used.

4.2. Installing on the Windows client

The installation consists in executing the installation command line for each windows client. Tools and solutions vary and there is no particular procedure. Anyway, the command line should be executed with the privilege 'Run as administrator'.

If you do not have the tools, technical skills or the authorization required for this step, contact your IT department.

Recommended command line for a Windows client:

```
C:\WINDOWS\system32\msiexec.exe
/package \\Srv001\Master\HOPEX\DISK1\HOPEX V2R1.msi
/passive
/levw "C:\tmp\ScriptInstall.log"
SELECTED_LANGUAGE="1033"
ADDLOCAL="ALL"
ALLUSERS="1"
REMOVE="HOPEX_SITE_SERVICE_PROVIDER,HOPEX,HOPEX_MWAS,HOPEX_API,HOPEX_API_MWAS,HOPEX
_UAS,HOPEX_CONSOLES_PORTAL"
INSTALLDIR="C:\Program Files (x86)\MEGA\HOPEX V2R1"
CLUSTERDIR="\\mega\data"
```

Note:

- The above command line is displayed though several lines for better understanding.
- Code '1033' is for English language but you can select another language code. See section 'Full installation command line syntax for HOPEX V2R1.msi' earlier in this document. "[\\mega\data\config](#)" is an example of share configuration folder. For more details, see section 'Creating a shared configuration folder' earlier in this document.

Result for each Windows client:

- Windows Front-End programs are installed.
- The system of the machine is updated (registry, libraries).
- Windows Service are installed
 - HopexRedisBackEnd
- Redis client programs are installed.
- The local configuration file (Megasite.ini) contains the reference of the shared configuration folder.

Example:

```
[LAN]
```

```
clusterrootpath=\\mega\data
```

4.3. Post installation tests

After installation of HOPEX:

- Install the HOPEX license.
See section 'Checking the HOPEX License', later in this document.
- Install a test environment and a test data repository.
See section 'Installing a test environment', later in this document.

Then, perform the following tests:

Windows client	Scenario
Workstation01	Scenario #1 <ul style="list-style-type: none"> • Check license • Connection to Window Administration console Scenario #2 <ul style="list-style-type: none"> • Connection to Windows Front-End • Check dispatch Scenario #3 <ul style="list-style-type: none"> • Connection to Windows Front-End • Check creation of diagram

See Post installation scenarios section p. 11.

5. INSTALLATION IN CITRIX/TSE DEPLOYMENT

5.1. General Steps

Performing an installation for Citrix/TSE deployment includes the following steps:

From the Client:

- Installing the Citrix/TSE client.
Refer to the Citrix/TSE documentation.

From the TSE server:

- Checking the HOPEX license.
Refer to the section 'Common configuration' of this document.
- Creating a shared configuration folder.
Refer to the section 'Common configuration' of this document.
- Creating a shared configuration file.
Refer to the section 'Common configuration' of this document.
- Installing a HOPEX Environment for test.
Refer to the section 'Common configuration' of this document.
- Installing SQL Server Native client if SQL Server storage is chosen.
No MEGA documentation is provided: use the standard documentation of the SQL Server native client.
- Installing HOPEX.
Installing the HOPEX programs (HOPEX Kernel) targeting a shared configuration in command line mode. Refer to the section 'Installation in standard deployment, Installing on the Windows client' of this document.

From the Citrix server:

- Checking the HOPEX license.
Refer to the section 'Common configuration' of this document.
- Creating a shared configuration folder.
Refer to the section 'Common configuration' of this document.
- Creating a shared configuration file.
Refer to the section 'Common configuration' of this document.
- Installing a HOPEX Environment for test.
Refer to the section 'Common configuration' of this document.
- Installing SQL Server Native client if SQL Server storage is chosen.
No MEGA documentation is provided: use the standard documentation of the SQL Server native client.
- Creating an installation package for the HOPEX programs.
- Deploying this installation package on the server farm.
- Publishing applications.

Pre-requisites:

Confirm that you have for each Citrix/TSE server:

- Local administrator rights for the machine (for updating the system).
- 'Full control' of the installation folder.
- 4 GB free space in the installation folder.
- A system that is supported for this version of Windows Front-End.
- A HOPEX license. Consult your sales representative to obtain a license. You will get a license file and instructions to install it.
- SQL Server Native client installed if SQL Server storage is used.

5.2. Creating an installation package

In Citrix, build a package with the installation command line.

The procedure varies with the version of Citrix.

If you do not have the tools, technical skills or the authorization required for this step, contact your IT department.

Recommended command line for Citrix/TSE server:

```
C:\WINDOWS\system32\msiexec.exe
/package \\Srv001\Master\HOPEX\DISK1\HOPEX V2R1.msi
/passive
/levw "C:\tmp\ScriptInstall.log"
SELECTED_LANGUAGE="1033"
ADDLOCAL="ALL"
ALLUSERS="1"
REMOVE="HOPEX_SITE_SERVICE_PROVIDER,HOPEX,HOPEX_MWAS,HOPEX_API,HOPEX_API_MWAS,HOPEX
_UAS,HOPEX_CONSOLES_PORTAL"
INSTALLDIR="C:\Program Files (x86)\MEGA\HOPEX V2R1"
CLUSTERDIR="\\mega\data"
```

Note:

- The above command line is displayed though several lines for better understanding.
- Code '1033' is for English language but you can select another language code. See section ' Full installation command line syntax for HOPEX V2R1.msi' earlier in this document. "\\mega\data\config" is an example of share configuration folder. For more details, see section 'Creating a shared configuration folder' earlier in this document.

5.3. Deploying a package on the server farm

The installation for HOPEX consists in deploying the installation package created before on the appropriate servers of the server farm.

The procedure varies with the version of Citrix.

If you do not have the tools, technical skills or the authorization required for this step, contact your IT department.

Result for each Citrix/TSE server:

- Windows Front-End programs are installed.
- The system of the machine is updated (registry, libraries).
- Windows Service are installed
 - HopexRedisBackEnd
- Redis client programs are installed.
- The local configuration file (Megasite.ini) contains the reference of the shared configuration folder.

Example:

[LAN]

clusterrootpath=\\mega\data

5.4. Publishing the application

The following are recommendations for publishing the Windows Front-End in Citrix:

Element	Comment
Application to publish	<ul style="list-style-type: none"> • Publish HOPEX.exe for each end-user expected to run Windows Front-End. • Publish Administration.exe for each end-user expected to run the Administration Console. • Publish licensing.exe for each end-user expected to configure MEGA Must licenses
Type of application	Publish as ' Application ' rather than 'Server desktop' or 'Content' Select application type ' Accessed from a server '. Do not select 'Streamed if possible, otherwise accessed from a server' nor 'Streamed to client'. These modes have not been qualified by MEGA
Control of instances per user	Check the parameter ' Allow only one instance of application for each user '
Audio	Do not check ' Enable legacy audio '
Screen resolution	For the parameter ' Session windows size ', select '1024 x 768' minimum
Colors	For the parameter ' Maximum color quality ', select 'Better appearance (32-bit)' or 'Better speed (16-bit)'. Do not select '256-color (8-bit)'
Command line	Do not use the '/K' command line parameter for HOPEX.exe. Use the parameter 'command line' in MEGA profile properties

5.5. Post installation tests

After installation of HOPEX:

- Install the HOPEX license.
See section 'Checking the HOPEX License', later in this document.
- Install a test environment and a test data repository.
See section 'Installing a test environment', later in this document.

Then, perform the following tests connection tests on all Citrix/TSE servers logged with non-administrator windows users:

Citrix/TSE server	Logged as	Scenario
Server01	User01 on domain01 allowed to login on Server01	Scenario #1 <ul style="list-style-type: none"> • Check license • Connection to Windows Administration console Scenario #2 <ul style="list-style-type: none"> • Connection to Windows Front-End • Check dispatch
Server02	User02 on domain02 allowed to login on Server02	Scenario #1 <ul style="list-style-type: none"> • Check license • Connection to Windows Administration console Scenario #2 <ul style="list-style-type: none"> • Connection to Windows Front-End • Check dispatch Scenario #3 <ul style="list-style-type: none"> • Connection to Windows Front-End • Check creation of diagram
...

See Post installation scenarios section p. 11.

6. UPGRADING HOPEX PROGRAMS

Note that upgrade command lines do not allow to change the major version.

Ex: it does not allow to upgrade from HOPEX V1R3 to HOPEX V2R1.

Upgrade command line enable to batch a CP upgrade within the same major version.

Ex: upgrade from HOPEX V2R1 CP1.0 to HOPEX V2R1 CP2.0.

As usual, it is possible to upgrade HOPEX by executing manually an upgrade program (.msp file).

Pre-requisites:

- Stop SSP service (Windows Service 'HOPEX Site Service Provider' and 'HOPEX Service Watchdog')
- Stop IIS web site
- Check that no HOPEX process (mgw*.exe) is running

Upgrading several machines requires to batch the execution of an upgrade command line.

6.1. Perform a backup of key configuration files

The upgrade of HOPEX program will not upgrade data.

It is recommended to backup key configuration files to prevent a possible initialization during upgrade.

Shared configuration folder	File	Location	Comment
Yes	Megasite.ini	As customized <clusterrootpath>\ClusterRoot\Cfg	See variable ClusterRoot of file Megaenv.ini. Ex [LAN] clusterrootpath=\\mega\data
No	Megasite.ini	Cfg folder of HOPEX installation.	By default: C:\Program Files (x86)\MEGA\HOPEX V2R1\Cfg

6.2. Upgrade command line

The upgrade consists in executing the installation command line for each machine. In Citrix, build a package with the installation command line. Tools and solution vary and there is no particular procedure. Anyway, the command line should be executed with the privilege 'Run as administrator'.

If you do not have the tools, technical skills or the authorization required for this step, contact your IT department.

The installation consists in executing the installation command line for each windows client.

Upgrade command line syntax for HOPEX V2R1 Cpx.msp:

<path of msixec.exe> /update <path of the HOPEX MSP file> /passive

Example:

C:\WINDOWS\system32\msiexec.exe /update "[\\Srv001\CP\HOPEX\HOPEX V2R1 Patch 1.msp](#)" /passive
/levw "C:\tmp\ScriptInstall.log"

Result for each server:

- HOPEX programs are upgraded (according to Program Features previously installed).
- The system of the machine is updated (registry, libraries).

7. REMOVING HOPEX PROGRAMS

7.1. General recommendations

With task manager, check that no HOPEX process (mgw*.exe) is running on the machine.

If the HOPEX installation is also used by HOPEX Web Front-End, it is recommended to set the Windows services 'HOPEX Site Service Provider' and 'HOPEX Service Watchdog' to 'Disabled' and to stop the IIS Web site.

Pre-requisites:

- Stop SSP service (Windows Service 'HOPEX Site Service Provider' and 'HOPEX Service Watchdog')
- Stop IIS web site
- Check that no HOPEX process (mgw*.exe) is running

As usual, it is possible to uninstall HOPEX manually through the Control Panel of the machine.

- Select 'Programs and Features'
- Select the program 'HOPEX V2R1'
- Confirm uninstallation.

Uninstalling on several machines requires to batch the execution of an uninstallation command line.

7.2. Uninstallation command line

The uninstallation consists in executing the installation command line for each machine. In Citrix, build a package with the installation command line. Tools and solution vary and there is no particular procedure. Anyway, the command line should be executed with the privilege 'Run as administrator'.

If you do not have the tools, technical skills or the authorization required for this step, contact your IT department.

Uninstallation command line syntax for HOPEX V2R1.msi:

<path of msixec.exe> /x <path of the HOPEX MSI file> /passive

Example:

```
C:\WINDOWS\system32\msiexec.exe /x "\\Srv001\Master\HOPEX\DISK1\HOPEX V2R1.msi" /passive /levw
"C:\tmp\ScriptUninstall.log"
```

Result for each machine:

- HOPEX programs are uninstalled (according to Program Features previously installed).
- The system of the machine is updated (registry, libraries).

7.3. Uninstalling SQL Server Native client

No MEGA documentation is provided: use the standard documentation of the SQL Server native client.

8. FAQs

8.1.1. Why is it necessary to install a Visual C++ Redistributable package?

This package is required for a good behavior of both Web client and Windows client of HOPEX. It contains runtimes that enable to execute C++ component of the HOPEX kernel (mainly .dll files). Microsoft now recommends to install these runtimes through a separate installer package.

8.1.2. How to get the package Visual C++ Redistributable for Visual Studio 2015?

You can download it from Microsoft web site.

Search 'Visual C++ Redistributable for Visual Studio 2015' (offline installer, 32-bit version). The expected file is 'vc_redist.x86.exe'.

Ex: <https://www.microsoft.com/en-us/download/details.aspx?id=48145>

If HOPEX is installed, you can also find this package in the following folder:

<HOPEX installation>\Install\vc_dedist

Ex: C:\Program Files (x86)\MEGA\HOPEX V2R1\Install\vc_dedist

It is recommended to run vc_redist.x86.exe as an Administrator.

8.1.3. Why is it necessary to tinstall a Visual C++ Redistributable package?

The offline installer can be found at this address:

If you want to download it from that location, make sure to download the 32 bits' version, file "vc_redist.x86.exe".

Moreover, once the HOPEX application is installed, you will be able to find it in the folder "<installation folder>\Install\vc_dedist".

8.1.4. How to track an installation error?

If an installation error persists after a second try and no reason can be found, contact MEGA Technical support. An installshield log can be requested.

To generate such a log, you can use a **/levw** command line parameter.

Example:

```
msiexec /package "\\Srv001\Master\HOPEX\DISK1\HOPEX V2R1.msi" /passive /levw
"C:\tmp\ScriptInstall.log"
```

Understanding the logfile generated by this command requires an expertise.

8.1.5. How to disable SMB 2.0?

SMB 2.0 can be disabled on the client side or on the server side.

If the file server is dedicated to HOPEX, it is recommended to disable SMB 2.0 on the server side. See the following web page:

<http://community.mega.com/t5/custom/page/page-id/mega-kb-solution?sid=501D00000012dnrIAA>

8.1.6. How can I create a HOPEX Environment in RDBMS Storage (Oracle, SQL Server)?

For more details about RDBMS storage format, see the article 'RDBMS Repository Installation guide HOPEX V2R1 EN'.

8.1.7. After upgrade of a HOPEX installation from version X to version Y, when a user Z runs HOPEX, the version is version X (and not version Y)!

This is a known issue with Citrix deployment (XenApp). The version of the programs is cached by Citrix. As long as a user has a session that is disconnected, he cannot see the new version.

Ask users to exit with logoff. In Citrix administration console, disconnect inactive users for the application corresponding to HOPEX.

9. APPENDIX

9.1. Recommended file permissions for the HOPEX installation

In this section, it is assumed that only the administrator can:

- Perform administration actions (create environment, create repository...).
- Deploy customized resources (custom .jar files, custom files in Mega_usr).
- Deploy licences.
- Install Solution Packs.
- Uncompress documentation in Javadoc format.

9.2. Reading table

You may configure advanced file permissions:

Right / Windows permission	Read & execute	Modify	Delete denied
Read	X		
Update no delete	X	X	X
Update and delete	X	X	

9.2.1. Permissions for the license folder (Must license)

File	Location	Administrator rights	User rights
*.must	Parent license folder containing a .must license file (ex: License-Y999.must) Example: \\server001\Apps\Licenses	Update and delete	Update no delete
.	License subfolder (hidden, created dynamically when license is used) Example: \\server001\Apps\Licenses\License-Y999	Update and delete	Update and delete ¹

Event smarter permission can be defined. See the article 'Must License Installation Guide HOPEX V2R1 EN'.

9.2.2. Permissions for the license folder (ELF license)

File	Location	Administrator rights	User rights
*.elf	Parent license folder containing the .elf license file (ex: L1345.elf). Example: \\server001\Apps\Licenses	Update and delete	Read

¹ By default, user files and token files are set as 'Not visible'.

9.2.3. Permissions for the shared configuration folder

File	Location	Administrator rights	User rights
.	Shared configuration folder containing the megasite.ini file. Example: =\\mega\data\config	Update and delete	Update no delete

9.2.4. Permissions for HOPEX installation folders (%programfiles(x86)%)

By default, core programs are installed on %programfiles(x86)%\MEGA\V2R1.

File	Location	Administrator rights	User rights
.	<Installation folder> and subfolders (Documentation, DotNet\Assemblies, Install, java, Mega_Std, System, Utilities). Main programs	Update and delete	Read
.	<Installation folder>\Cfg	Update and delete	Read (1)
.	<Installation folder>\DotNet\Assemblies_usr	Update and delete	Read (1)
.	<Installation folder>\java\lib_usr	Update and delete	Read (1)
.	<Installation folder>\Mega_Usr	Update and delete	Read (1)
.	<Installation folder>\Utilities\Solution Pack	Update and delete	Read (1)

(1) To facilitate the work of developer on HOPEX, it is advised to configure 'Update and delete' for this folder.

9.2.5. Permissions for HOPEX installation folders (%programfiles%)

By default, Redis component is installed on %programfiles%\MEGA\V2R1.

File	Location	Administrator rights	User rights
.	<Installation folder> and subfolders	Update and delete	Read

9.2.6. Permissions for HOPEX Environment folders

Note that most folders are created dynamically during use of HOPEX.

File	Location	Administrator rights	User rights
.	<Environment folder> Environment main folder.	Update and delete	Read
.	<Environment folder>\Db Root repository folders.	Update and delete	Read
.	<Environment folder>\Db\<Repository> Repository folder.	Update and delete	Update no delete

File	Location	Administrator rights	User rights
	<ul style="list-style-type: none"> If the repository is stored in the GBMS storage format (default), each HOPEX Repository consists of 4 files (.EMA, .EMB, .EMS, EMV). If the repository is stored in Oracle, each HOPEX Repository consists of 2 files (. EMV, .EMO) and files on the database server. If the repository is stored in SQL Server, each HOPEX Repository consists of 2 files (. EMV, .EMQ) and files on the database server. 		
.	<Environment folder>\Db\<Repository>\<Approve> Default folder for reports (MS Word) detached from HOPEX. This folder can be configured (optional).	Update and delete	Update and delete
.	<Environment folder>\Db\<Repository>\<Document> Default folder reports (MS Word). This folder can be configured (optional).	Update and delete	Update and delete
.	<Environment folder>\Db\<Repository>\<Repository>.Lock Folder of data repository locks for GBMS storage. One file (.EMK) per lock placed. These files can be created and deleted during use of HOPEX	Update and delete	Update and delete
.	<Environment folder>\Db\<Repository>\<Repository>.ix Folder of full search indexes. These files can be created and deleted during use of HOPEX	Update and delete	Update
.	<Environment folder>\Db\<Repository>\<Repository>.Log Folder of data repository logfile. One file (.MGL) per administration session or per private workspace dispatched. These files can be created and deleted during use of HOPEX.	Update and delete	Update and delete
.	<Environment folder>\Db\<Repository>\<Repository>.Transactions Folder of private workspace for data repositories (for GBMS storage only) and repository backup logfile (for all types of storage). If the repository is stored in the GBMS format (default), each private workspace consists in two files (.EMB and .EMS). These files are created on opening a private workspace and deleted at each dispatch. One file (.MGL) per administration session or per private workspace dispatched. These files can be created and deleted during use of HOPEX.	Update and delete	Update and delete
.	<Environment folder>\Db\<Repository>\<USER> and sub-folders Personal folders of the users.	Update and delete	Update and delete
.	<Environment folder>\Db\<Repository>\<WORK> and sub-folders Working folder for administration of repository.	Update and delete	Update and delete
.	<Environment folder>\<Intranet> Default root folder for static HTML page generation. This folder can be configured (optional).	Update and delete	Update and delete
.	<Environment folder>\<Mega_user> Folder containing customized resources (.MGS, .DOT files)	Update and delete	Read

File	Location	Administrator rights	User rights
.	<Environment folder>\SysDb Folder of system repository. It consists of 4 files (SystemDb.ema, SystemDb.emb, SystemDb.ems, SystemDb.emv)	Update and delete	Update no delete
.	<Environment folder>\SysDb\SystemDb.Log Folder of system repository logfile. One file (.MGL) per administration session or per private workspace dispatched. These files can be created and deleted during use of HOPEX.	Update and delete	Update and delete
.	<Environment folder>\SysDb\SystemDb.Lock Folder of system repository locks for GBMS storage. One file (.EMK) per lock placed. These files can be created and deleted during use of HOPEX.	Update and delete	Update and delete
.	<Environment folder>\SysDb\SystemDb.Transactions Folder of private workspaces for system repository (for GBMS storage only) and repository backup logfile (for all types of storage). If the repository is stored in the GBMS format (default), each private workspace consists in two files (.EMB and .EMS). These files are created on opening a private workspace and deleted at each dispatch.	Update and delete	Update and delete
.	<Environment folder>\SysDb\USER and sub-folders Folder of user reports (<user code>.TXT)	Update and delete	Update and delete
.	<Environment folder>\SysDb\WORK and sub-folders Working folder for administration of system repository.	Update and delete	Update and delete

9.3. Example of command lines for HOPEX Web Front-End

Recommended command line for Web Application Server (web standalone installation):

```
C:\WINDOWS\system32\msiexec.exe
/package "\\Srv001\Master\HOPEX\DISK1\HOPEX V2R1.msi"
/passive
/levw "C:\tmp\ScriptInstall.log"
SELECTED_LANGUAGE="1033"
ADDLOCAL="ALL"
ALLUSERS="1"
INSTALLDIR="C:\Program Files (x86)\MEGA\HOPEX V2R1"
IS_NET_API_LOGON_USERNAME_HOPEX="<mydomain>\<myuser>"
IS_NET_API_LOGON_PASSWORD_HOPEX="<mypassword>"
IS_NET_API_LOGON_USERNAME_API="<mydomain>\<myuser>"
IS_NET_API_LOGON_PASSWORD_API="<mypassword>"
WEBPORTAL_USERNAME="<mydomain>\<myadminuser>"
WEBPORTAL_PASSWORD="<myadminpassword>"
WITHSSL="0"
```

Note:

- The above command line is displayed though several lines for better understanding.

Result:

- HOPEX core programs are installed
- The system of the machine is updated (registry, libraries).
- Windows Service are installed
 - HOPEX Site Service Provider
 - HOPEX Service Watchdog
 - HopexRedisBackEnd
- Redis client programs are installed.
- Different IIS applications are installed on the target web server
 - Hopex
 - Hopex2
 - HOPEXAdministration
 - HOPEXAPI
 - HOPEXPIMWAS
 - HOPEXLicenceManager
 - HOPEXMonitor
 - HOPEXMWAS
 - HOPEXSupervision
 - MegaSSP
 - UAS
 - WindowsAuthenticationService

Recommended command line for SSP Server:

```
C:\WINDOWS\system32\msiexec.exe
/package "\\Srv001\Master\HOPEX\DISK1\HOPEX V2R1.msi"
/passive
/levw "C:\tmp\ScriptInstall.log"
SELECTED_LANGUAGE="1033"
ADDLOCAL="ALL"
REMOVE="HOPEX,HOPEX_MWAS,HOPEX_API,HOPEX_API_MWAS,HOPEX_UAS,HOPEX_CONSOLES_PORTAL"
"
ALLUSERS="1"
INSTALLDIR="C:\Program Files (x86)\MEGA\HOPEX V2R1"
IS_NET_API_LOGON_USERNAME_HOPEX="<mydomain>\<myuser>"
IS_NET_API_LOGON_PASSWORD_HOPEX="<mypassword>"
IS_NET_API_LOGON_USERNAME_API="<mydomain>\<myuser>"
IS_NET_API_LOGON_PASSWORD_API="<mypassword>"
WEBPORTAL_USERNAME="<mydomain>\<myadminuser>"
WEBPORTAL_PASSWORD="<myadminpassword>"
WITHSSL="0"
CLUSTERDIR="<configuration root path (clusterrootpath)>"
```

Note:

- The above command line is displayed though several lines for better understanding.

Result for SSP server:

- HOPEX core programs are installed
- The system of the machine is updated (registry, libraries).
- Windows Service are installed
 - HOPEX Site Service Provider
 - HOPEX Service Watchdog
 - HopexRedisBackEnd
- Redis client programs are installed.
- The system of the machine is updated (registry, libraries).
- Windows Service 'HOPEX Site Service Provider' is installed
- Different IIS applications are installed on the target web server
 - MegaSSP
- The local configuration file (Megasite.ini) contains the reference of the shared configuration folder.
Example:
[LAN]
clusterrootpath=\\mega\data

Recommended command line HOPEX Web Application Server nodes:

```
C:\WINDOWS\system32\msiexec.exe
/package "\\Srv001\Master\HOPEX\DISK1\HOPEX V2R1.msi"
/passive
/levw "C:\tmp\ScriptInstall.log"
SELECTED_LANGUAGE="1033"
ADDLOCAL="ALL"
REMOVE=" HOPEX_SITE_SERVICE_PROVIDER"
ALLUSERS="1"
INSTALLDIR="C:\Program Files (x86)\MEGA\HOPEX V2R1"
IS_NET_API_LOGON_USERNAME_HOPEX="<mydomain>\<myuser>"
IS_NET_API_LOGON_PASSWORD_HOPEX="<mypassword>"
IS_NET_API_LOGON_USERNAME_API="<mydomain>\<myuser>"
IS_NET_API_LOGON_PASSWORD_API="<mypassword>"
WEBPORTAL_USERNAME="<mydomain>\<myadminuser>"
WEBPORTAL_PASSWORD="<myadminpassword>"
WITHSSL="0"
CLUSTERDIR="<configuration root path (clusterrootpath)>"
```

Note:

- The above command line is displayed though several lines for better understanding.

Result for HOPEX Web Application Server nodes:

- HOPEX core programs are installed
- The system of the machine is updated (registry, libraries).
- Windows Service are installed
 - HOPEX Service Watchdog
 - HopexRedisBackEnd
- Redis client programs are installed.
- Different IIS applications are installed on the target web server
 - Hopex
 - Hopex2
 - HOPEXAdministration
 - HOPEXAPI
 - HOPEXPIMWAS
 - HOPEXLicenceManager
 - HOPEXMonitor
 - HOPEXMWAS
 - HOPEXSupervision
 - UAS
 - WindowsAuthenticationService
- The local configuration file (Megasite.ini) contains the reference of the shared configuration folder.
Example:
[LAN]
clusterrootpath=\\mega\data

9.4. List of program features displayed in the setup wizard

Program feature	Comment	Installation feature (internal)
HOPEX BackEnd		BackEnd
MEGA Web Access for Hopex API	Installs IIS application 'HOPEXAPIMWAS' on IIS	HOPEX_API_MWAS
MEGA Web Access for Hopex	Installs IIS application 'HOPEXMWAS' on IIS	HOPEX_MWAS
HOPEX Site Service Provider	Installs SSP component/service on IIS	HOPEX_SITE_SERVICE_PROVIDER
HOPEX FrondEnd	Installs IIS application 'HOPEX' and 'HOPEX2' on IIS	FrontEnd
HOPEX (IIS)	Installs IIS application 'HOPEX' and 'HOPEX2' in IIS	HOPEX
HOPEX API	Installs IIS application 'HOPEXAPI' on IIS	HOPEX_API
Hopex Unified authentication service	Installs IIS applications 'UAS' and 'WindowsAuthenticationService' on IIS	HOPEX_UAS
Hopex Console Portal	Installs IIS application for HOPEX Web Consoles on IIS	HOPEX_CONSOLES_PORTAL
Hopex Administration	Installs IIS application 'HOPEXAdministration' on IIS	HOPEX_WADMIN
Hopex Web Supervision	Installs IIS application 'HOPEXSupervision' on IIS	HOPEX_WSUP
HOPEX License Manager	Installs IIS application 'HOPEXLicenceManager' on IIS	HOPEX_WLIC
HOPEX Web Monitor Manager	Installs IIS application 'HOPEXMonitor' on IIS	HOPEX_WMON
MEGA software	Installs core programs (by default in %programfiles(x86)%\MEGA\HOPEX V2R1)	MEGA
Redis Client executable	Installes redis component (by default in %programfiles\MEGA\HOPEX V2R1)	Redis_SBS
Administration Program	Installs a launcher Administration.exe in the root folder of core programs	Administration.exe
MUST License Management Program	Installs a launcher licensing.exe in the root folder of core programs	Licensing.exe
Utilities	Installs utilities in a subfolder '\Utilities' of the root folder of core programs	See table below
MEGA Documentation	Installs documentation in PDF format in a subfolder '\Documentation' of the root folder of core programs	Documentation
Debugging files	Installs additional files for debugging purpose in a subfolder '\System' of the root folder of core programs	MEGA.DebugSymbol

9.5. Embedded Internet Explorer

Certain features of Windows Front-End (start page, diagram creation wizard in graphic mode) use Internet Explorer in embedded mode. This use of Internet Explorer can be impacted by system settings.

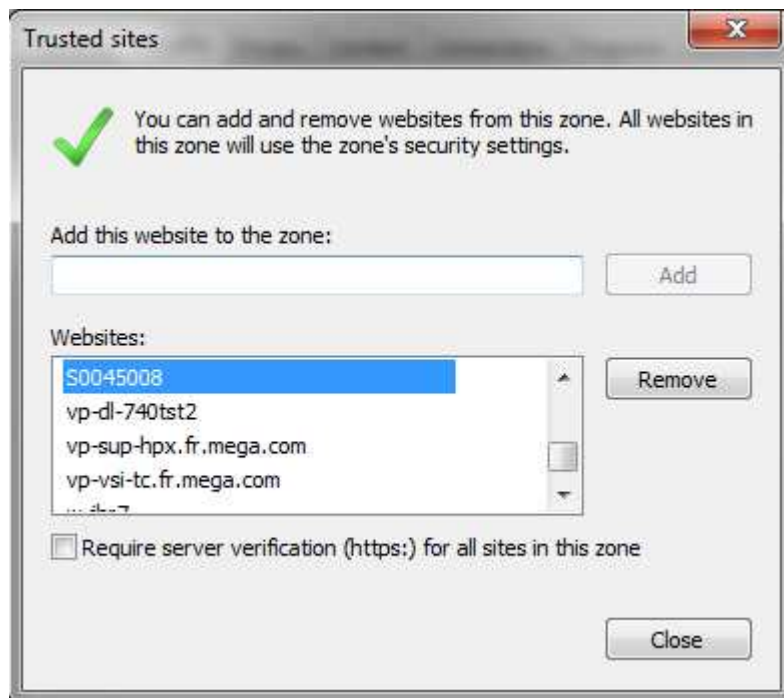
If features are not running as expected (ex: creation of diagram), it is recommended to configure trusted sites in Internet Explorer **as follows**:

Pre-requisite:

Identify the network name of the machine that hosts the HOPEX Environment, ex S0045008.

Procedure:

1. Run Internet Explorer.
2. From the **Tools** menu, select **Internet Options**.
3. In **Security** tab, select 'Trusted sites' and click **Sites**. The 'Trusted sites' window is displayed.
4. Uncheck 'Require server verification (https:) for all sites in this zone'.
5. Enter the network name of the machine identified before (ex S0045008), and add it to the trusted sites.



Notes:

- Even if you use a different HTML Browser, this configuration is relevant. **It affects the behavior** of Internet Explorer in embedded mode **that is independent from the HTML browser used**.
- If this configuration is not allowed (security policies), ask the local system administrator to perform it.

For Citrix, this configuration is required for all users of HOPEX. ask the local system administrator to perform it using Windows GPO (Group Policy Object).

9.6. Complete list of installation features

Installation feature (internal)	Comment	Target folder
Administration.exe	Installs Administration.exe	INSTALLDIR
Data.Extractor	Installs MEGA Data Extractor utility	INSTALLDIR\Utilities\MEGA Data Extractor
Documentation	Installs documentation	INSTALLDIR\Documentation
EnvComparator	Installs MEGA Customisation Analyser utility	INSTALLDIR\Utilities\MEGA Customisation Analyser
Install	Installs the folders 'Advance Reporting', 'Compatibility Tools', 'Doors', 'Languages'	INSTALLDIR\Install
Install.DBMS	Install RDBMS related resources	INSTALLDIR\Install\RDBMS client
Install.Licenses	Installs the folder 'Licenses'	INSTALLDIR\Install\Licenses
Install._GR	Installs the _GR files, Upgrade files, preinstalled SystemDb (GBMS), predefined system business documents	INSTALLDIR\Install
Licensing.exe	Install Licensing.exe	INSTALLDIR
MEGA	Installs HOPEX.exe, binary files and resources (folders 'java', 'Mega_std', 'System' and '\Utilities\Solution Pack')	INSTALLDIR
MEGA.DebugSymbol	Install PDB files (optional)	INSTALLDIR\System
Optional.File	Installs optional .mol files	INSTALLDIR\Mega_Std
Optional.Moka_Reference	Installs MOKA related resources	INSTALLDIR\Mega_Std\Moka Reference
RDBMS_Diagnostic	Installs RDBMS Diagnostic tool	INSTALLDIR\Utilities\RDBMS Diagnostic
System.FlexGrid	Redistributable file system Microsoft FlexGrid	%systemroot%
System.GDIplus	Redistributable file system Microsoft GDI +	%systemroot%
System.MSXML	Redistributable file MS XML3	%systemroot%
System.Redist	Redistributable file system	%systemroot%
System.Scripting56	Redistributable file system Windows Scripting Host 5.6	%systemroot%
System.VB6	Redistributable file system VB6 Runtime	%systemroot%
System.VC8	Redistributable file system VC8	%systemroot%
System.VC10	Redistributable file system VC10	%systemroot%
System.VC15	Redistributable file system VC15	%systemroot%
System.WData	Redistributable file system WebData std library	%systemroot%
Test.Utilities	Installs utilities: HOPEX Server Supervisor utility, RDBMS Diagnostics...	INSTALLDIR\Utilities

Installation feature (internal)	Comment	Target folder
Utilities	Installs utilities and resources: MEGA Mail Test utility, transport order (Solman)	INSTALLDIR\Utilities
HOPEX	Installs IIS application 'HOPEX' and 'HOPEX2' in IIS	IISROOT\wwwroot\HOPEX
HOPEX_MWAS	Installs IIS application 'HOPEXMWAS' in IIS Installs service 'HOPEX Service Watchdog'	IISROOT\wwwroot\HOPEXMWAS IISROOT \wwwroot\MegaMSW <registry>
HOPEX_SITE_SERVICE_PROVIDER	Installs IIS application 'MegaSSP' in IIS Installs services 'HOPEX Site Service Provider and 'HOPEX Service Watchdog'	IISROOT\wwwroot\MegaSSP <registry>
HOPEX_API	Installs 'HOPEX API	IISROOT\wwwroot\HOPEXAPI
HOPEX_API_MWAS	Install 'MEGA web Access for HOPEX API'	IISROOT\wwwroot\HOPEXAPIMWAS
HOPEX_WEB_ACCESS	Groups features HOPEX_API_MWAS et HOPEX_MWAS and sub-features	
HOPEX_UAS	Installs IIS applications 'UAS' and 'WindowsAuthenticationService' on IIS	IISROOT\wwwroot\UAS IISROOT\wwwroot\ WindowsAuthenticationService
HOPEX_CONSOLES_PORTAL	Installs IIS application for HOPEX Web Consoles on IIS	IISROOT\wwwroot and subfolders
HOPEX_WADMIN	Installs IIS application 'HOPEXAdministration ' on IIS	IISROOT\wwwroot\HOPEXAdministration
HOPEX_WSUP	Installs IIS application 'HOPEXSupervision' on IIS	IISROOT\wwwroot\HOPEXSupervision
HOPEX_WLIC	Installs IIS application 'HOPEXLicenceManager' on IIS	IISROOT\wwwroot\HOPEXLicenceManager
HOPEX_WMON	Installs IIS application 'HOPEXMonitor' on IIS	IISROOT\wwwroot\HOPEXMonitor
Redis_SBS	Installs Redis component	%programfiles%\MEGA\V2R1
FrontEnd	Groups features HOPEX_MWAS, HOPEX_API_MWAS, HOPEX_SITE_SERVICE_PROVIDER and sub-features	IISROOT\wwwroot and subfolders
BackEnd	Group features for HOPEX, HOPEX_API,HOPEX_UAS,HOPEX_CONSOLE_PORTAL and all their sub-features	IISROOT\wwwroot and subfolders

Web Front-End Single-Server Installation Guide HOPEX V2R1 EN

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This document describes all the steps required to install MEGA HOPEX Web Front-end on Windows Server 2012 R2 or above.

PREREQUISITES

Operating System

MEGA HOPEX Web Front-End can be installed on the following systems:

- Windows Server 2008 R2 (not recommended because of the coming end of Support by Microsoft, but supported)
- Windows Server 2012
- Windows Server 2012 R2
- Windows Server 2016

To install MEGA HOPEX Web Front-End, you must open a Windows session with a domain user that has administrator rights on the server machine.

This document describes installation steps for **Windows Server 2012 R2**. Some steps might need to be adapted when using Windows Server 2008 R2.

.Net

.Net 4.6.2 is required.

It is already installed by default with Windows Server 2016.

For more information on installing it on previous versions, please follow the following article:

<https://www.microsoft.com/en-us/download/details.aspx?id=53345>

Visual C++ Redistributable for Visual Studio 2015

This package is required for a good behavior of both the web client, and the Windows client of the application.

The associated libraries were previously embedded with our own, but Microsoft changed its approach, and recommends now to install this redistributable through their official installer.

The offline installer can be found at this address:

<https://www.microsoft.com/en-us/download/details.aspx?id=48145>

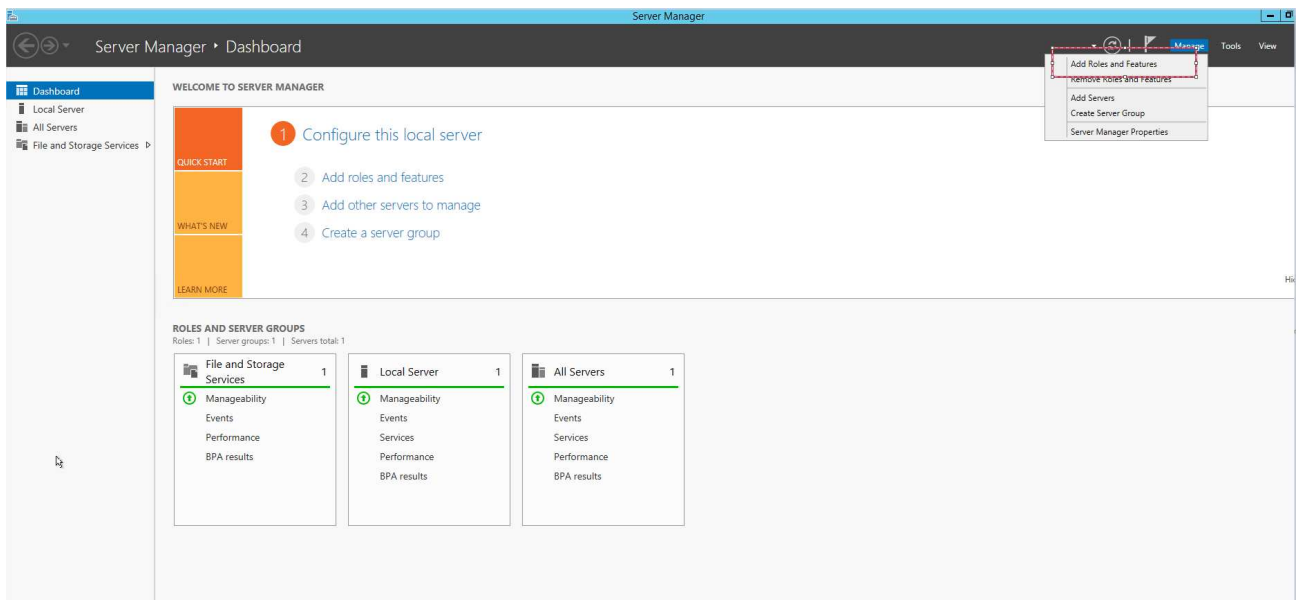
If you want to download it from that location, make sure to download the 32 bits' version, file "vc_redist.x86.exe".

Moreover, once the HOPEX application is installed, you will be able to find it in the folder "<installation folder>\Install\vc_dedist".

Required roles

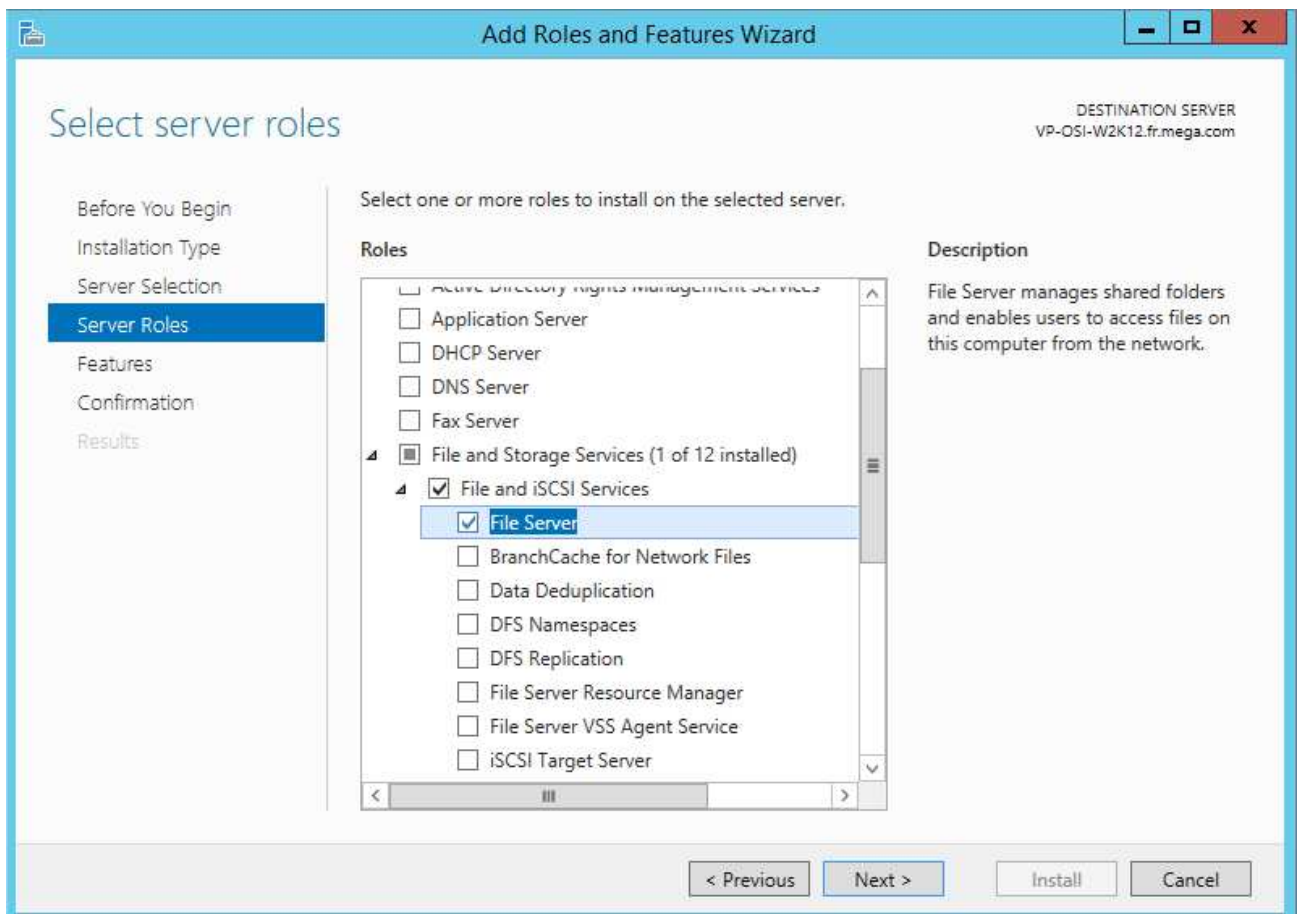
If the roles are already in place, at least check that all sub features are active.

1. Through the "Server Manager", click "Manage" and select "Add Roles and Features":

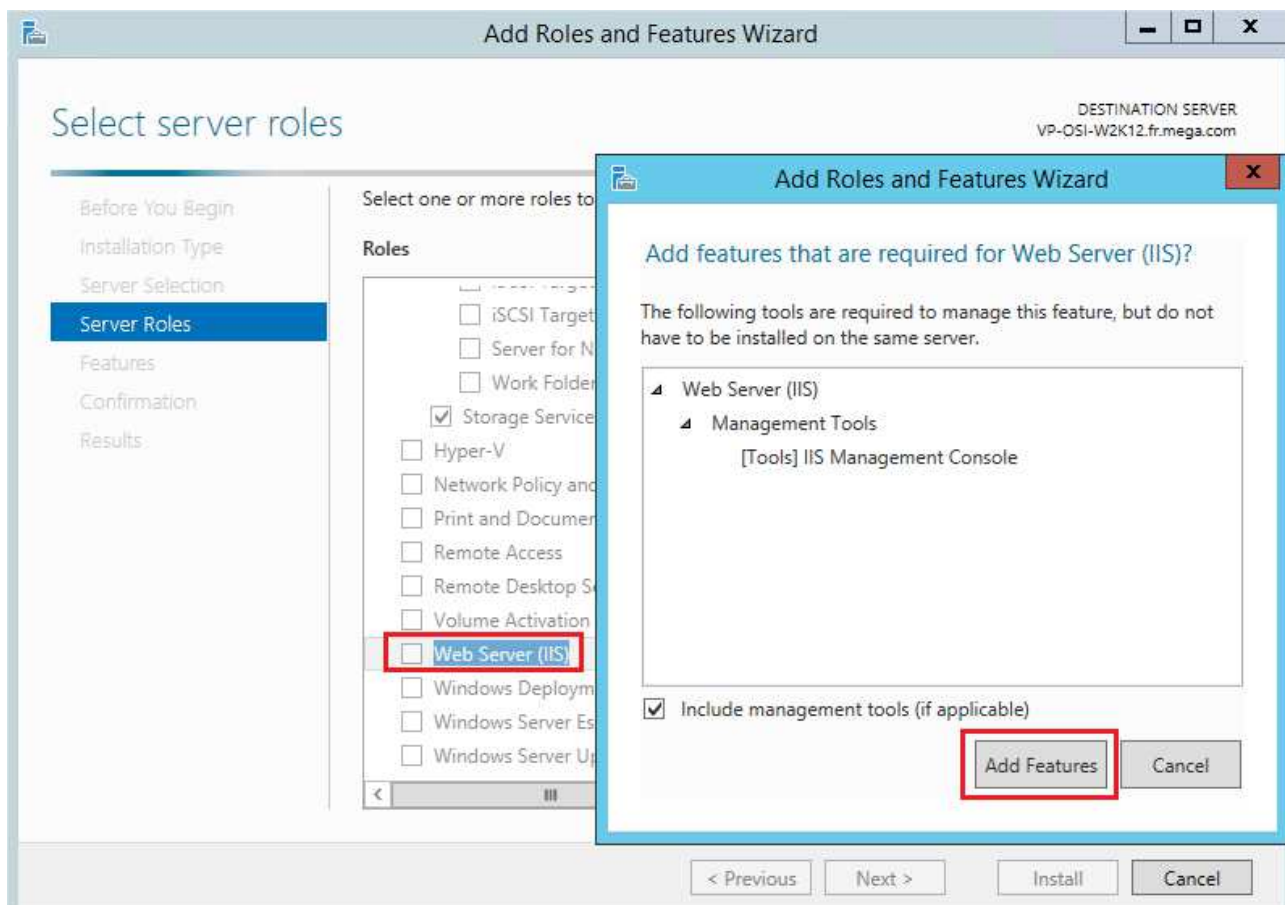


2. In the Roles, activate both:

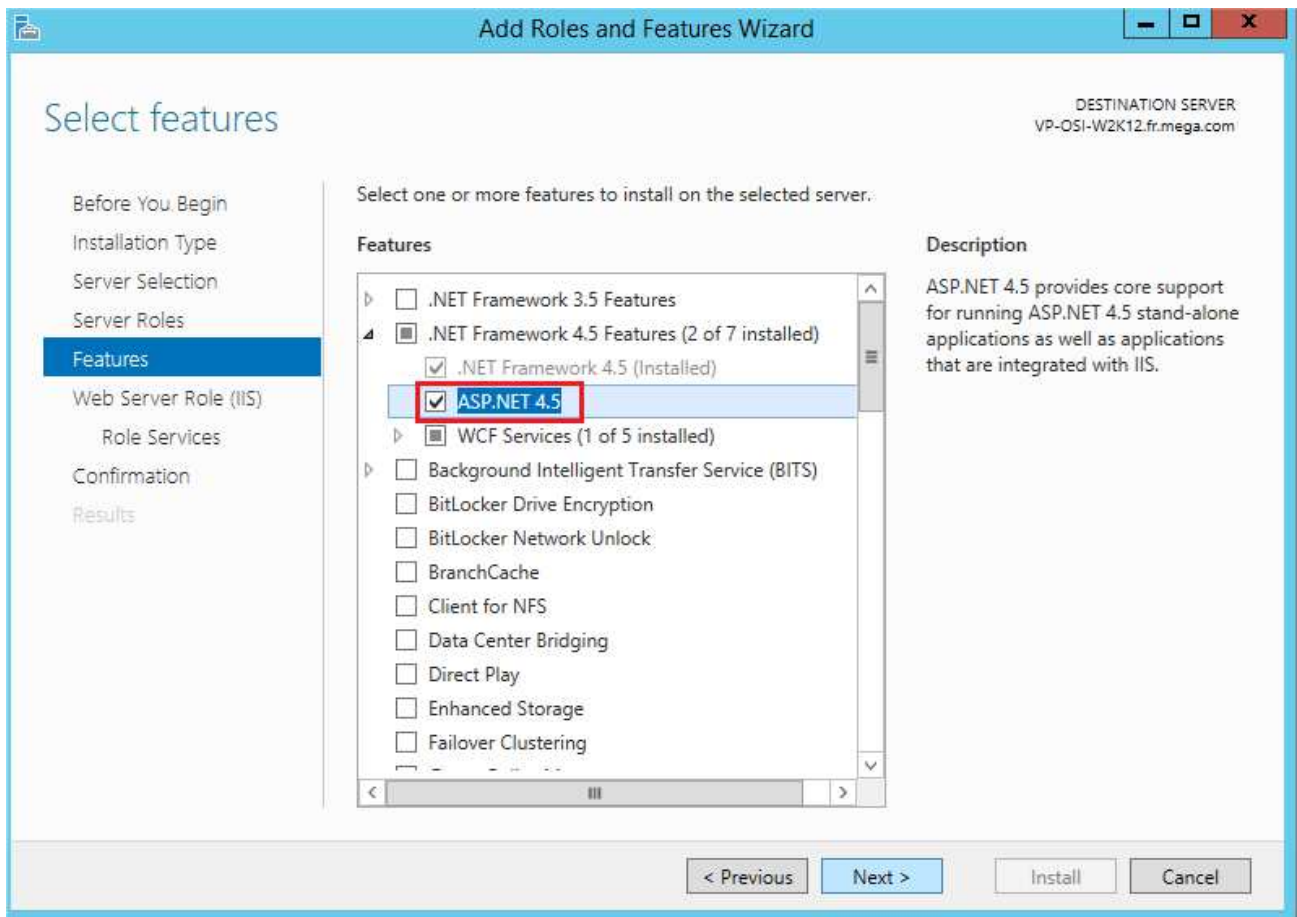
- « File Server » :



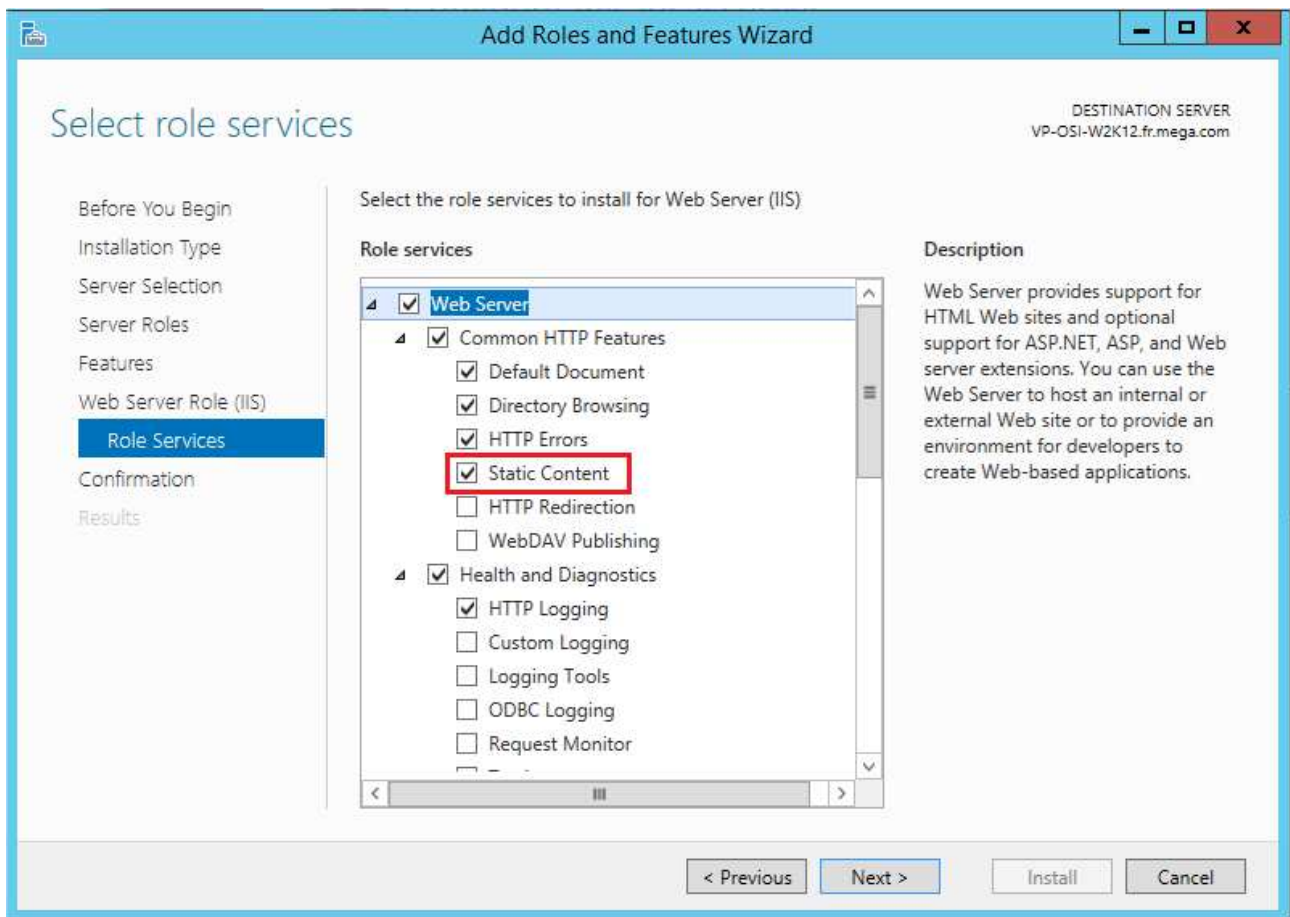
- « Web Server (IIS) » and its related features :



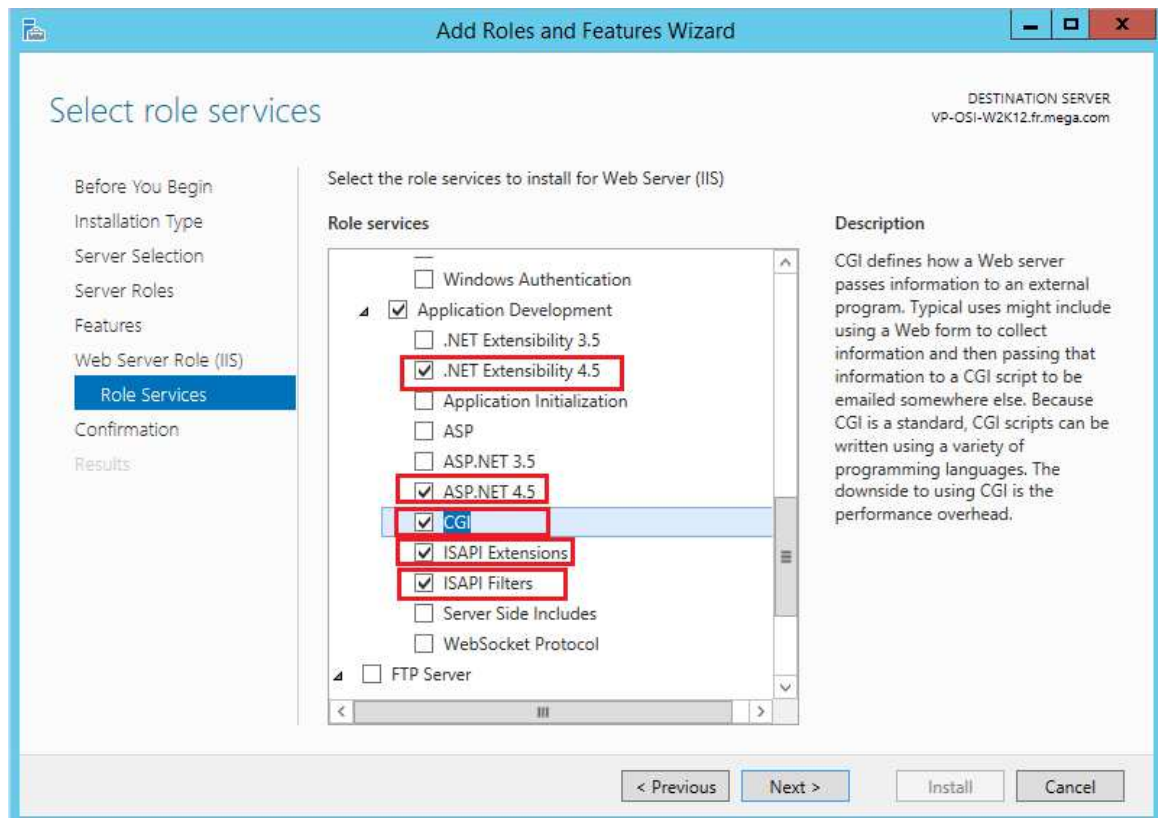
3. In the "Features", make sure to activate the "ASP.NET 4.5". Normally, if you installed 4.6.2 prior to this activation of features, it shouldn't be needed:



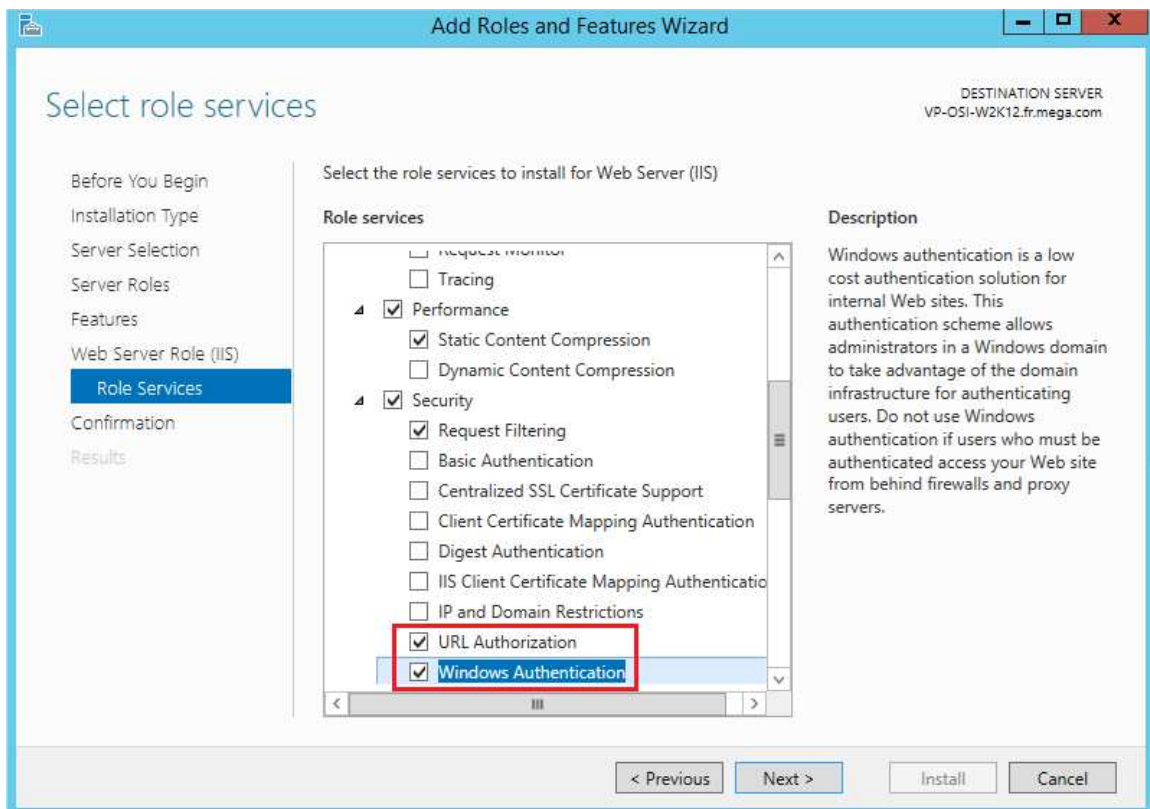
4. In the "Role Services" of IIS, make sure that "Static Content" is checked:



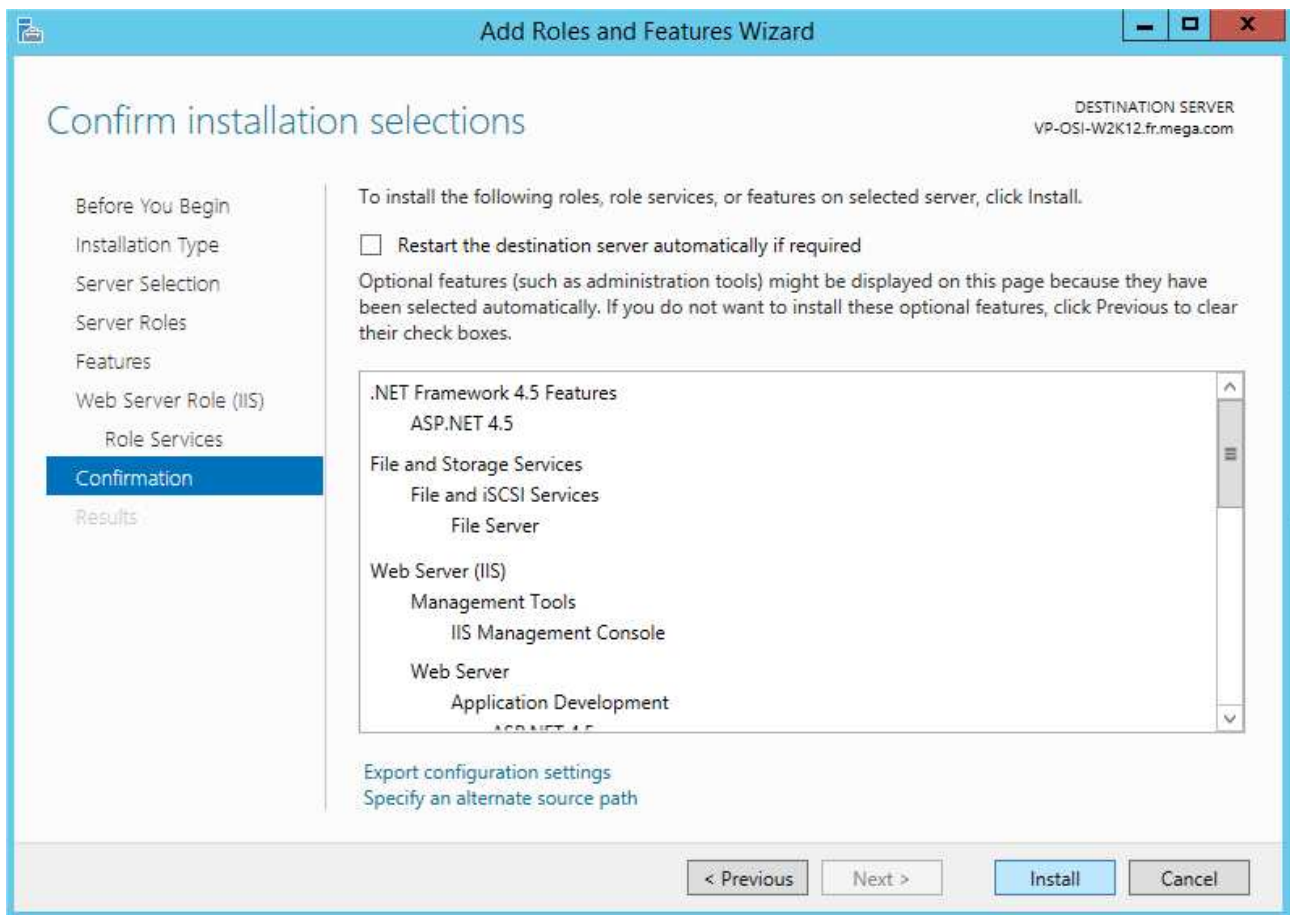
5. In addition, for the "Web Server (IIS)" role, the following "Role Services" and their dependencies must be installed:
- ASP.NET 4.5 (and related features)
 - CGI



6. To manage specific rights on the website (such as restricting access to the admin page), you can also:
 - a. activate "URL Authorization" and "Windows Authentication":



7. Install:



Desktop heap configuration

The Desktop Heap is an internal memory of Windows. It is heavily used by the web application. It is thus **mandatory** to update this value.

Thus, when running several users simultaneously on the same server, the Windows session of the impersonation user might start running out of desktop heap. This will create execution errors.

This is especially true because the impersonation user uses a non-interactive session, and the default value set for the non-interactive desktop heap for in this case is very low.

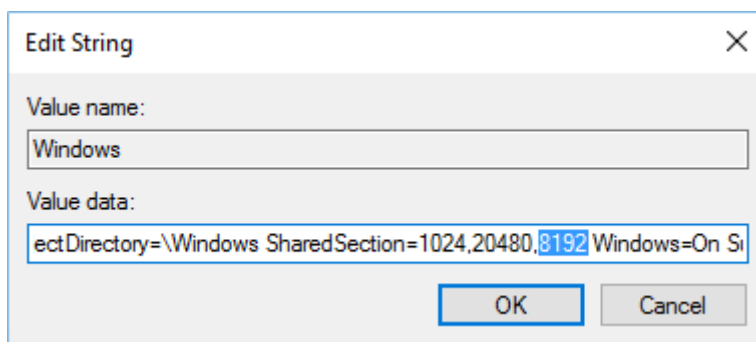
With the latest version of the application, we check that the desktop heap is set to at least 8 MB. If it isn't, anyone that will access the website will receive a warning message.

This modification needs to be made in the Windows Registry. Look for the "Windows" value in *HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\Session Manager\SubSystems*. There's a long string for this value that will look similar to this: *%SystemRoot%\system32\csrss.exe ObjectDirectory=Windows SharedSection=1024,3072,512 Windows ...*

It is the Shared Section part that might need to be modified. The three values are, in order: the shared heap, the interactive desktop heap, and the **non-interactive desktop heap**. They are expressed in KB. Default values vary significantly between Windows versions. You will need to modify the non-interactive desktop heap.

Be careful of not using excessive values, as this could stop you from logging into your server. It is therefore recommended to change this value using small increments.

The minimum value to put is therefore: **8192**.



Value name:
Windows

Value data:
ectDirectory=\\Windows SharedSection=1024,20480,8192 Windows=On Si

OK Cancel

It works for small/medium deployments. For configuration when a large amount of concurrent users is expected on the Web Front-End server, please get in touch with your Mega contact that will ask for the assistance of appropriate people.

Configuration of SSL / TLS

To ensure data protection, it is highly recommended to use SSL/TLS.

Therefore, the installer allows to install the web application on a website where HTTPS is already deployed.

If you want to activate this feature, it is then mandatory, as a prerequisite, to configure your IIS platform to activate the SSL/TLS.

You will need to have a certificate. You can bind the HTTPS protocol to any wanted port, the installer will ask you on which website you want to install Hopex, and on which port.

Please note that if you want to do this, you will need to choose the "Custom Setup" type of install (see section "MEGA HOPEX Setup" for details). In a standalone web deployment, we deploy *without* SSL/TLS.

You can find on the following link some documentation of IIS:

<http://technet.microsoft.com/en-us/library/cc771438%28v=ws.10%29.aspx>

We also provide a technical article that explains how to secure the Hopex platform that contains some guidelines about the actions of SSL/TLS, as well as an example of configuration. Please refer to the article "Web Front-End - Securing the platform.doc".

!!Warning!! Do not choose to use the SSL/TLS when installing Hopex unless you have made the deployment on your web server, with a proper certificate on the appropriate port.

Windows User(s) for MEGA HOPEX

When installing MEGA HOPEX, a user is required to manage process authentication. It is recommended not to execute the Web Application processes with an administrator user. You will therefore need a second domain user.

This user will be used as an impersonate user in the web application. It is specifically linked to the feature called "Mega Web Access for Hopex". All the actions carried out in MEGA HOPEX will be done under the identity of this windows user.

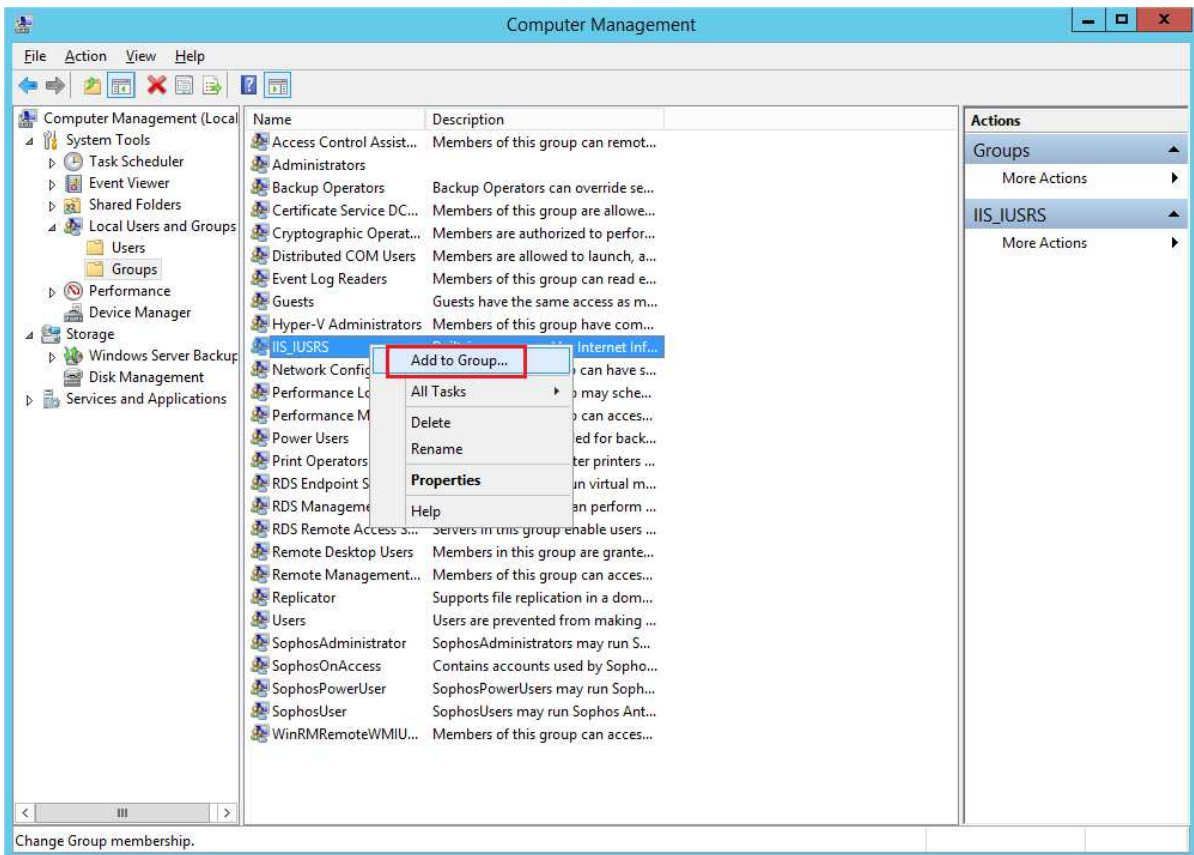
This is only the user that will run some application pools for the web front-end part of the application.x²

Moreover, if you need to use web services, and thus, you activate the feature called "HOPEX API", you will need a second Windows user. It **cannot** be the same as the first one, or it will create side-effects such as navigation issues and errors for users.

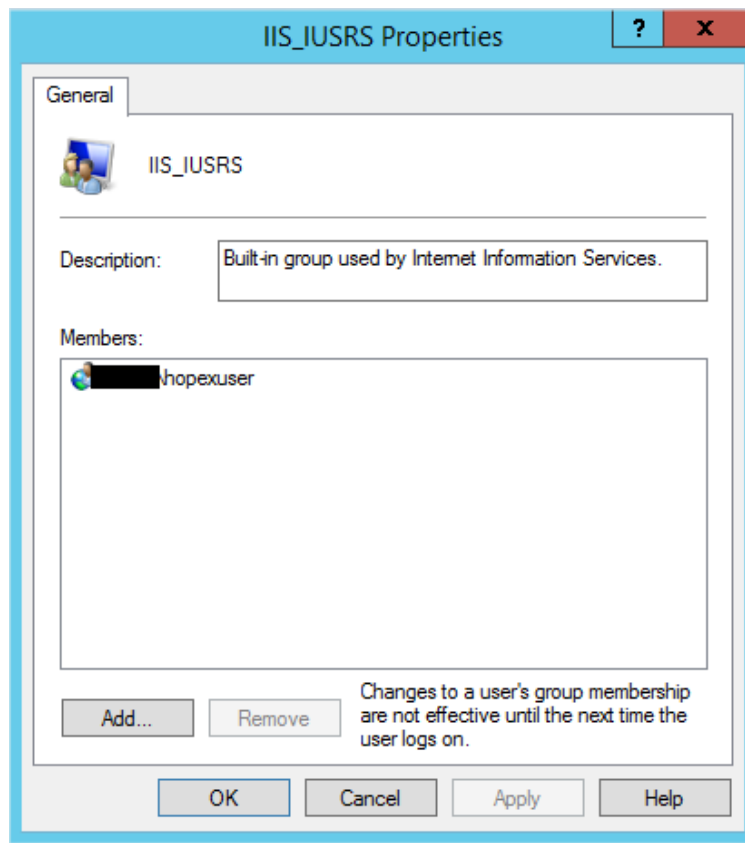
Define Group permissions

This user must belong to specific windows groups:

- He must belong to the "IIS_IUSRS" group of the server. To add the user to this group, use the "Computer Management" dialog box in the "Tools" of the "Server Manager". Browse to the "Groups" node. Right-click "IIS_IUSRS" and select "Add to Group..."



Example with a domain user called "...\\hopexuser":

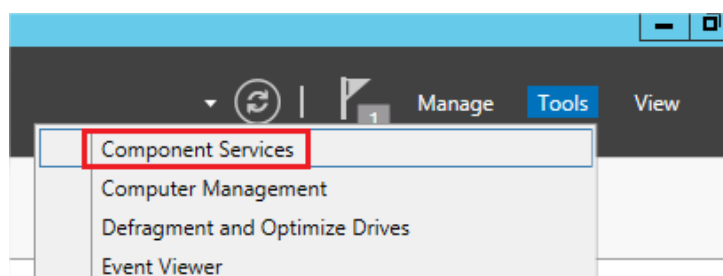


Define MUST Licence Access

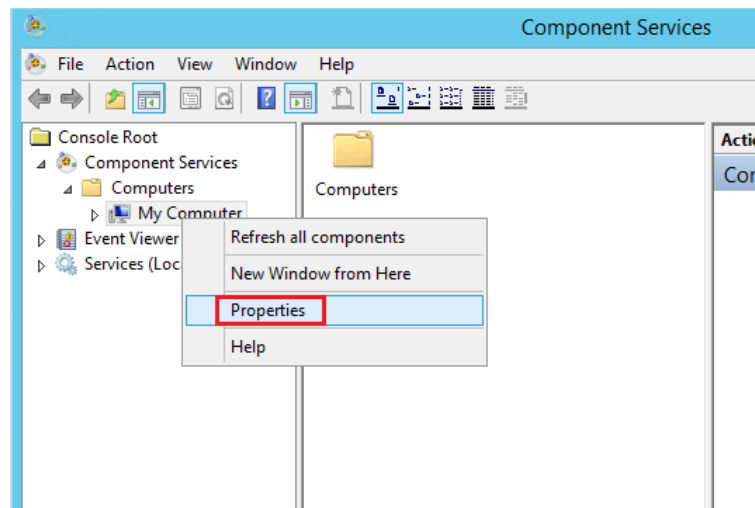
He must be registered in the MUST license tool, have the rights to read and write data in the MUST license folder and to share data. For more details, see the "Must License Installation Guide" technical article located in the Documentation folder of your MEGA installation.

Define COM Access rights

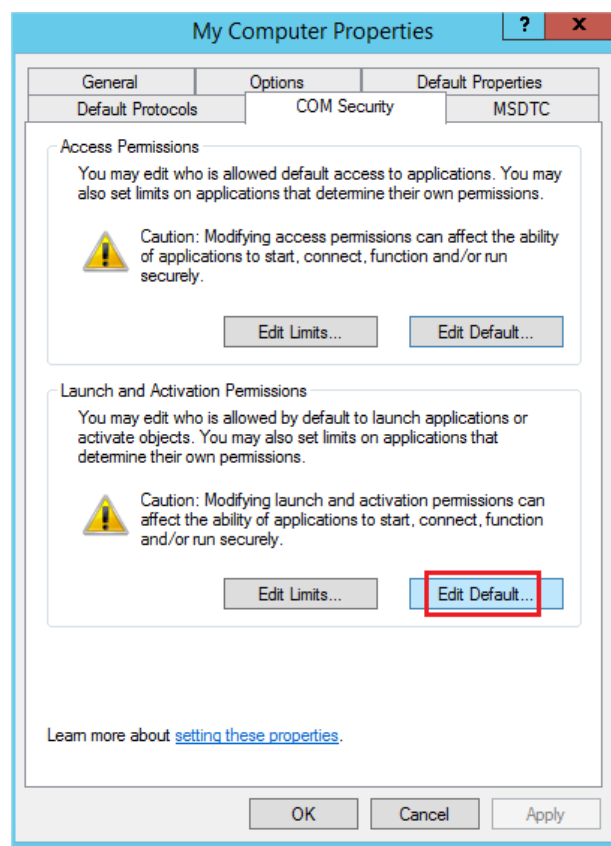
He must be able to launch COM applications by default. To assign this right, proceed from the "Component Services" dialog box through the "Tools" section of the "Server Manager":



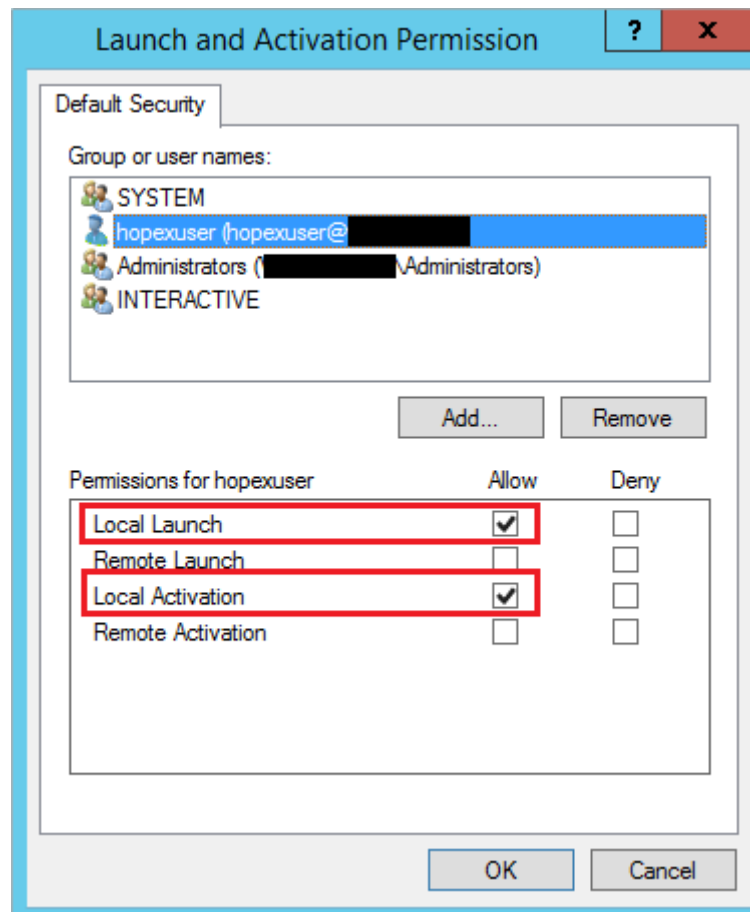
1. Expand the "Component Services" node, then Computers.
2. Right-click "My Computer" and select "Properties".



3. Select the "COM Security" tab and click "Edit Default..." on "Launch and Activation Permissions" group.



4. Add the Windows user, in this example "...\\hopexuser", and give him "Local Launch" and "Local Activation" rights.



MEGA HOPEX SETUP

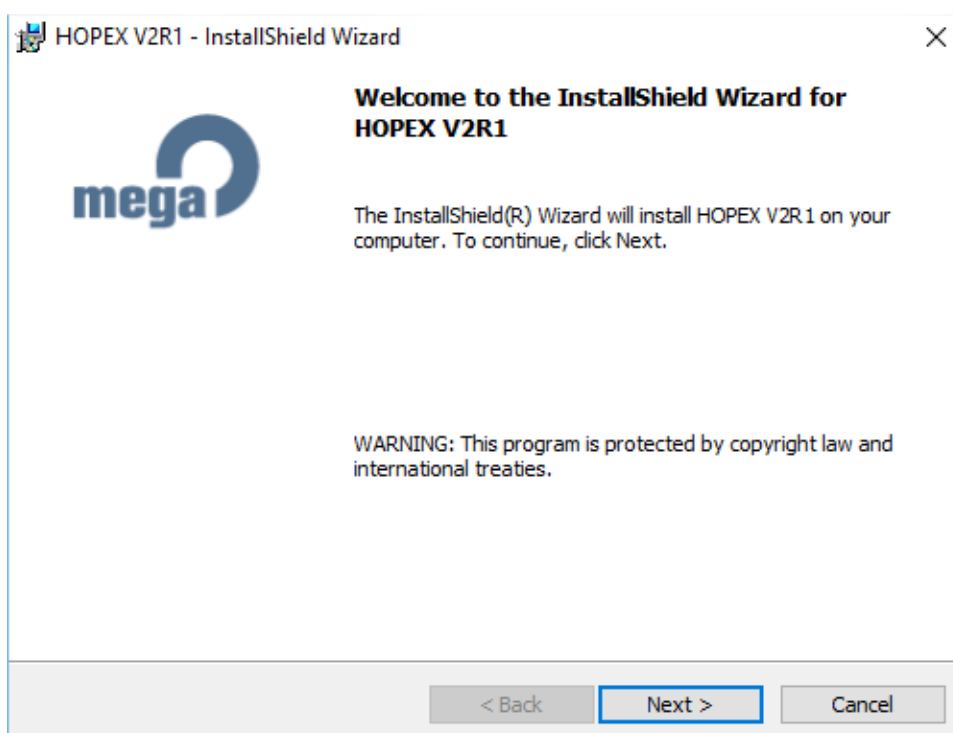
Choosing your setup type

HOPEX offers two ways to install the Web Front-End:

- **Standalone Setup:** automatically installs the Web Front-End and its dependencies (SSP,...) on a single standalone server without SSL/TLS.
- **Advanced Setup:** allows more complex installation scenarios. Use it for any multi-server installation (scale out or scale up), or if you require SSL/TLS.

Web Front-End Standalone Setup

1. Double-click **Setup** to launch the **Setup** program.
2. If prompted, answer "Yes" to "Do you want to allow the following program to make changes to this computer?"
3. Go through each of the following screens:



HOPEX V2R1 - InstallShield Wizard

License Agreement

Please read the following license agreement carefully.

**SOFTWARE AGREEMENT FOR END USER MEGA PRODUCTS
REDISTRIBUTION FORBIDDEN**

CAUTION : READ ATTENTIVELY BEFORE USING THIS SOFTWARE
 This agreement concerns the use of certain MEGA products. It is a legal agreement between the Customer (physical or moral person) and MEGA International, for the use of MEGA Products, named hereafter Products. When installing, copying or using the Products, you recognize the formal character of the provisions of this software agreement.
IF YOU DO NOT AGREE WITH THESE PROVISIONS, PLEASE DO NOT INSTALL THE PRODUCTS

☒ I accept the terms in the license agreement
 ☐ I do not accept the terms in the license agreement

Print

InstallShield

< Back Next > Cancel

HOPEX V2R1 - InstallShield Wizard

Customer Information

Please enter your information.

User Name:

Organization:

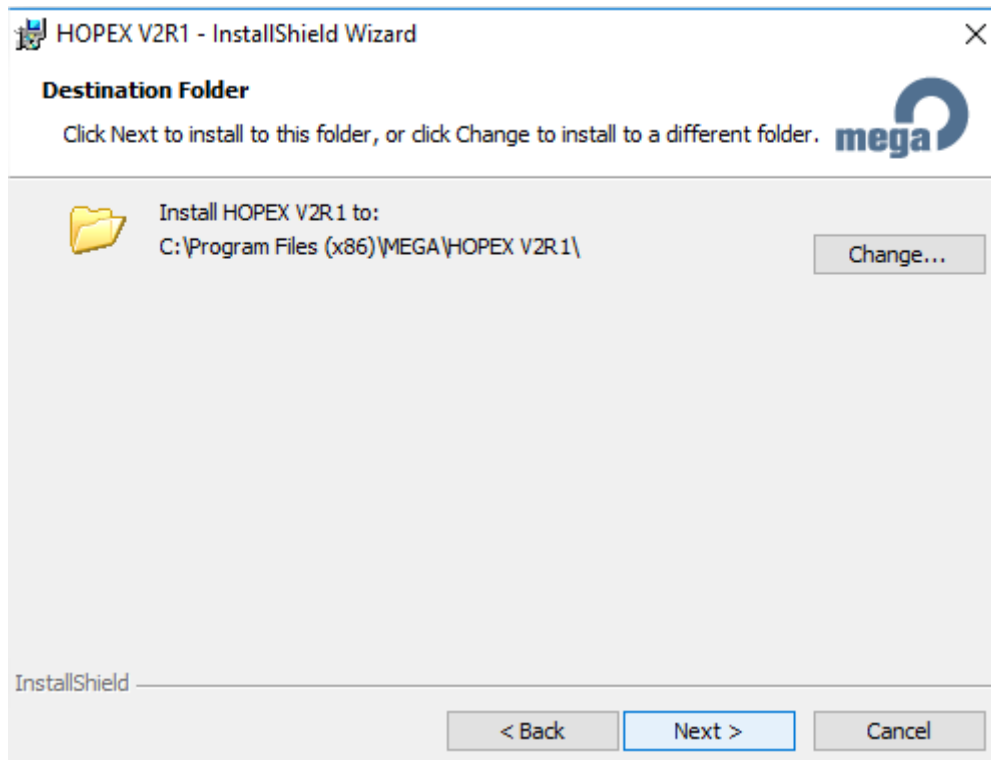
Install this application for:

☒ All system users
☐ Only for me (IT Technology)

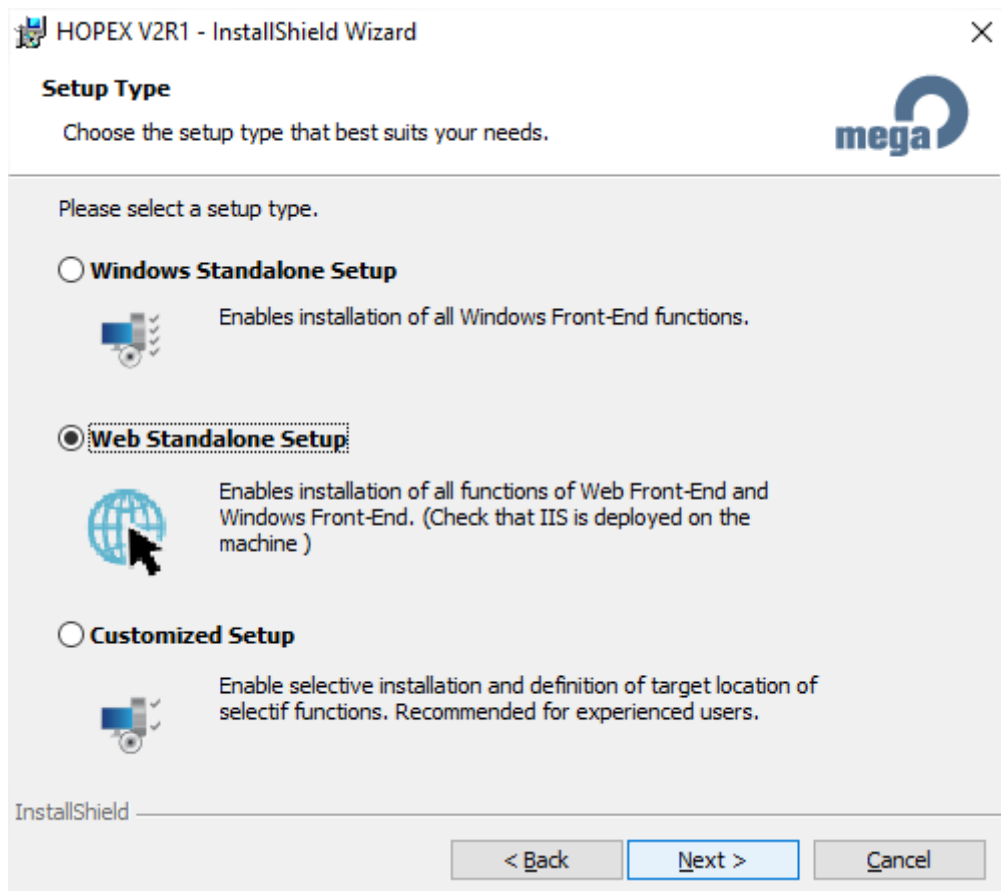
InstallShield

< Back Next > Cancel

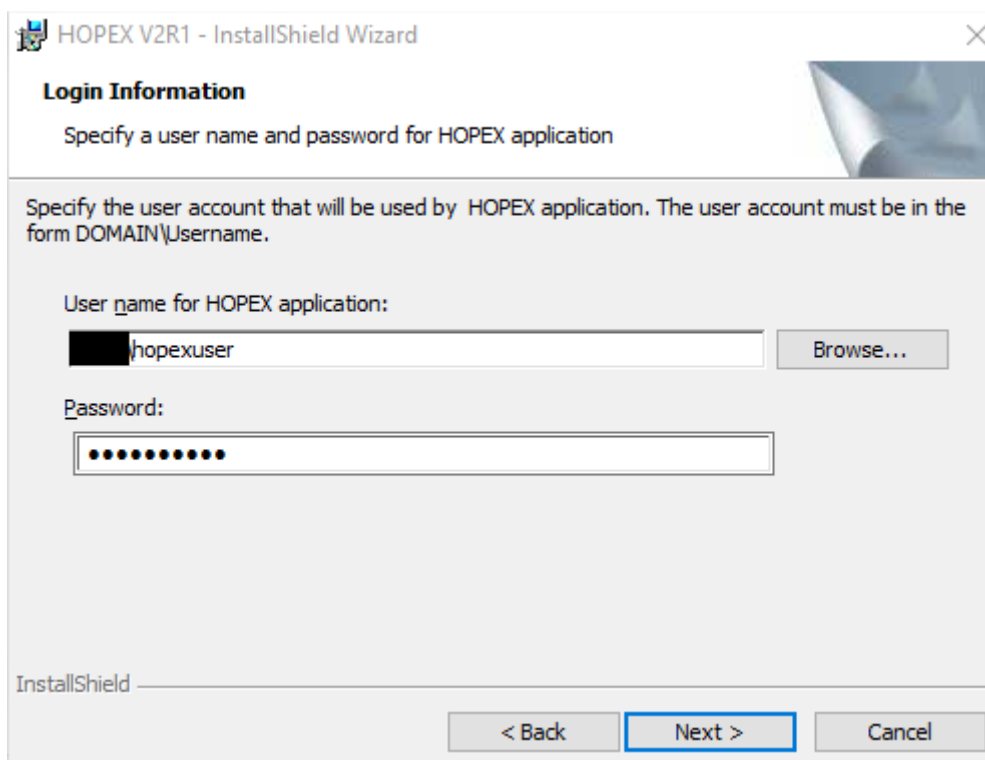
4. If needed, click **Change** to modify the installation folder for the Mega Software, else keep the default one.



5. Select **Web Standalone Setup**.

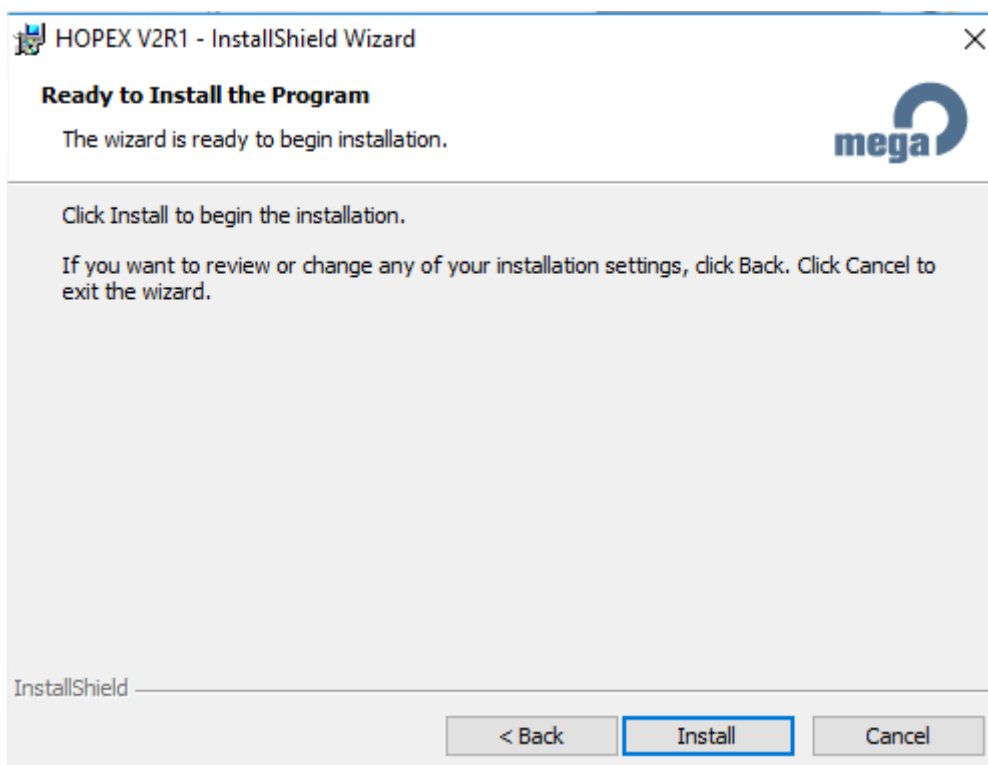


6. Enter the username and password of the **Windows User for Mega Hopex** you have chosen in the previous section of this document. It will be used for impersonation of the Web application:

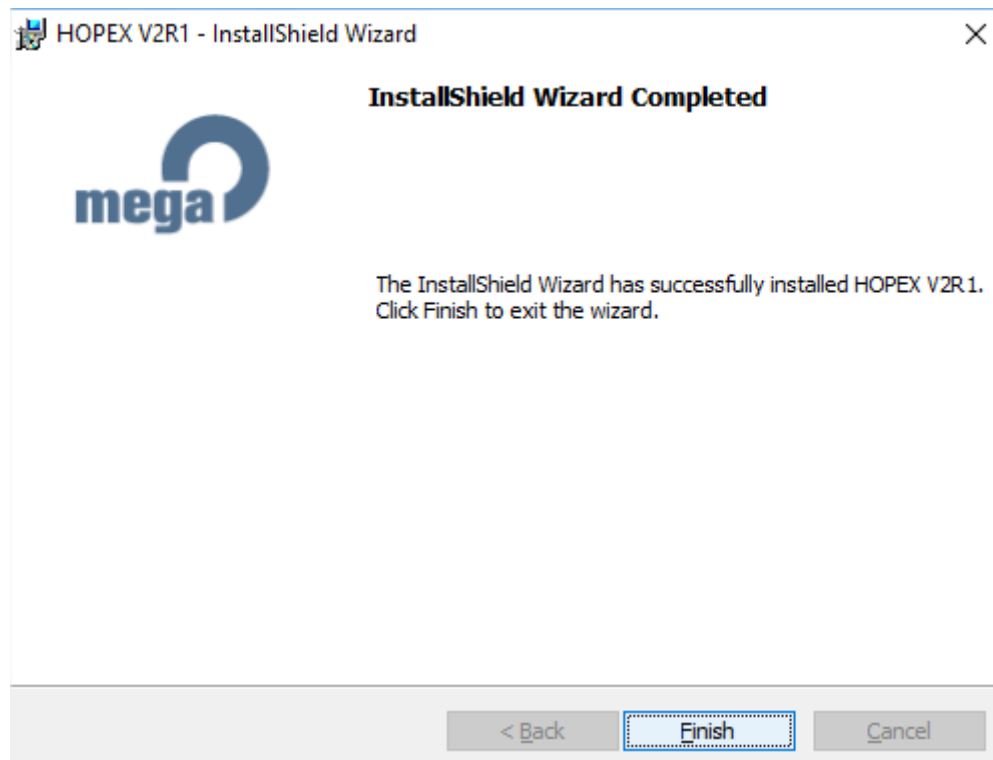


The screenshot shows the 'HOPEX V2R1 - InstallShield Wizard' window. The title bar includes a close button. The main heading is 'Login Information'. Below it, the text says 'Specify a user name and password for HOPEX application'. A larger instruction states: 'Specify the user account that will be used by HOPEX application. The user account must be in the form DOMAIN\Username.' There are two input fields: 'User name for HOPEX application:' with the text 'hopexuser' and a 'Browse...' button to its right; and 'Password:' with a masked password field represented by dots. At the bottom, there are three buttons: '< Back', 'Next >' (which is highlighted with a blue border), and 'Cancel'. The 'InstallShield' logo is visible in the bottom left corner.

7. You are now ready to launch the installation by clicking **Install** :



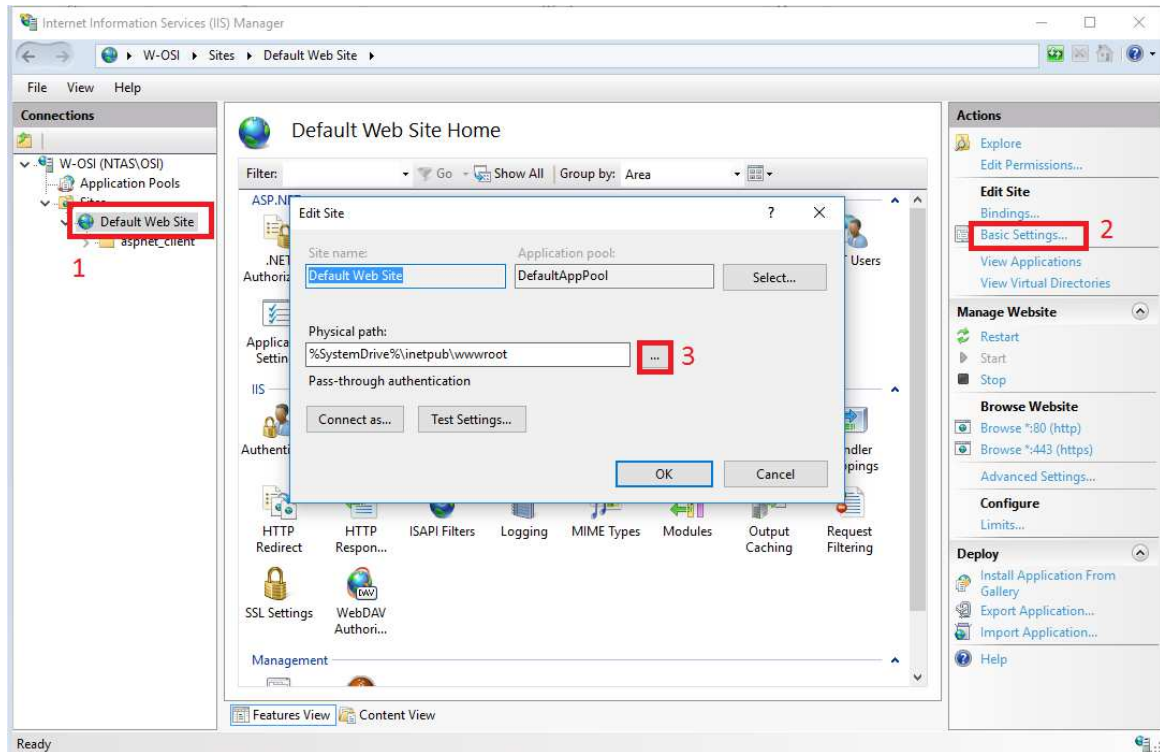
The screenshot shows the 'HOPEX V2R1 - InstallShield Wizard' window at the 'Ready to Install the Program' step. The title bar includes a close button. The main heading is 'Ready to Install the Program'. Below it, the text says 'The wizard is ready to begin installation.' and the 'mega' logo is displayed on the right. A larger instruction states: 'Click Install to begin the installation. If you want to review or change any of your installation settings, click Back. Click Cancel to exit the wizard.' At the bottom, there are three buttons: '< Back', 'Install' (which is highlighted with a blue border), and 'Cancel'. The 'InstallShield' logo is visible in the bottom left corner.



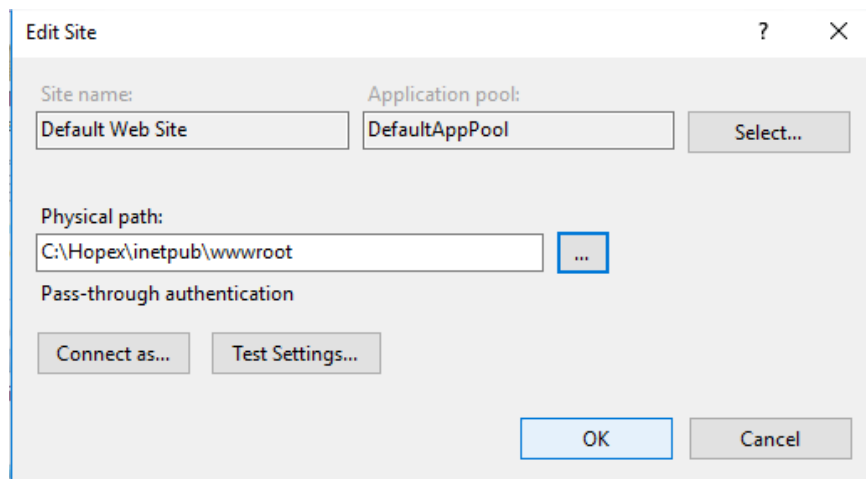
Advanced Setup

Advanced Setup is similar to the standalone setup, except for the initial choice screens and extra parameter choices.

Remark: if you plan to install the web components in a different location than “C:\inetpub\wwwroot”, you need to first configure the root directory of the website where you will install it. Here, an example for the “Default Web Site”:



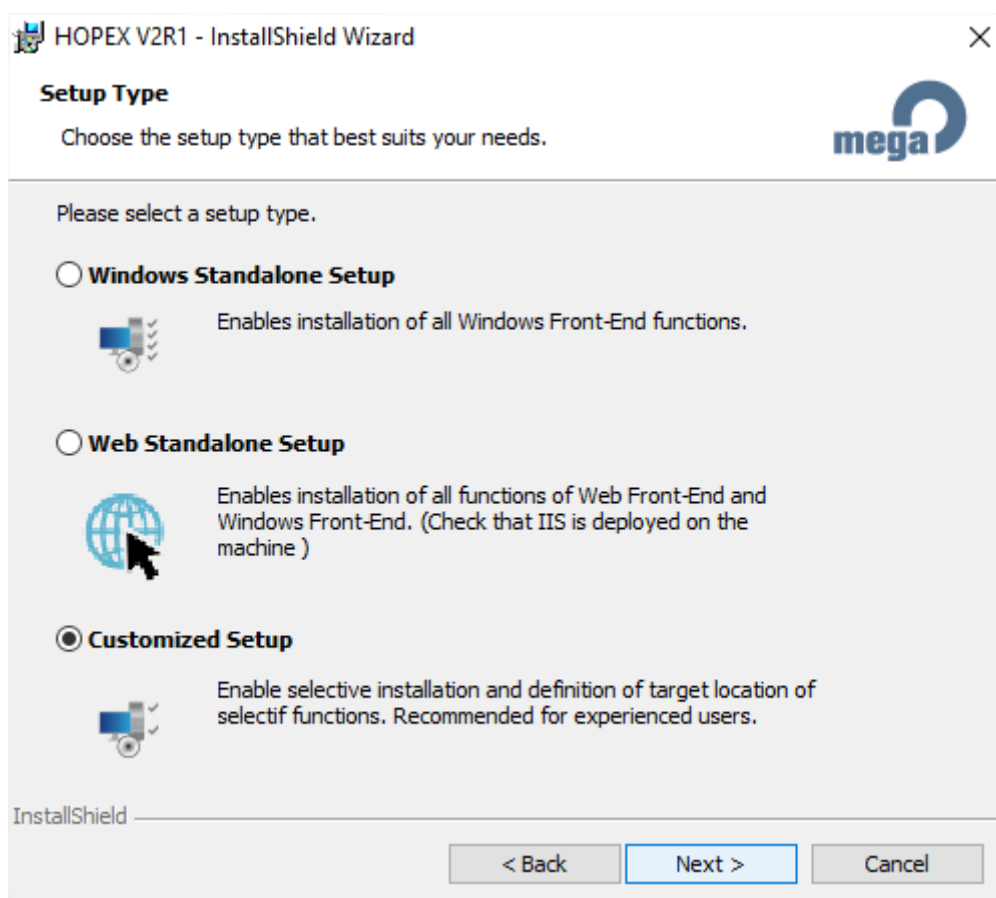
Browse to the folder where you want to install, and validate:



Do not forget that you will need to grant the same permissions for the same users on that folder, following the steps of “Define “Windows User for MEGA HOPEX” files Access Rights” in a later section of this document.

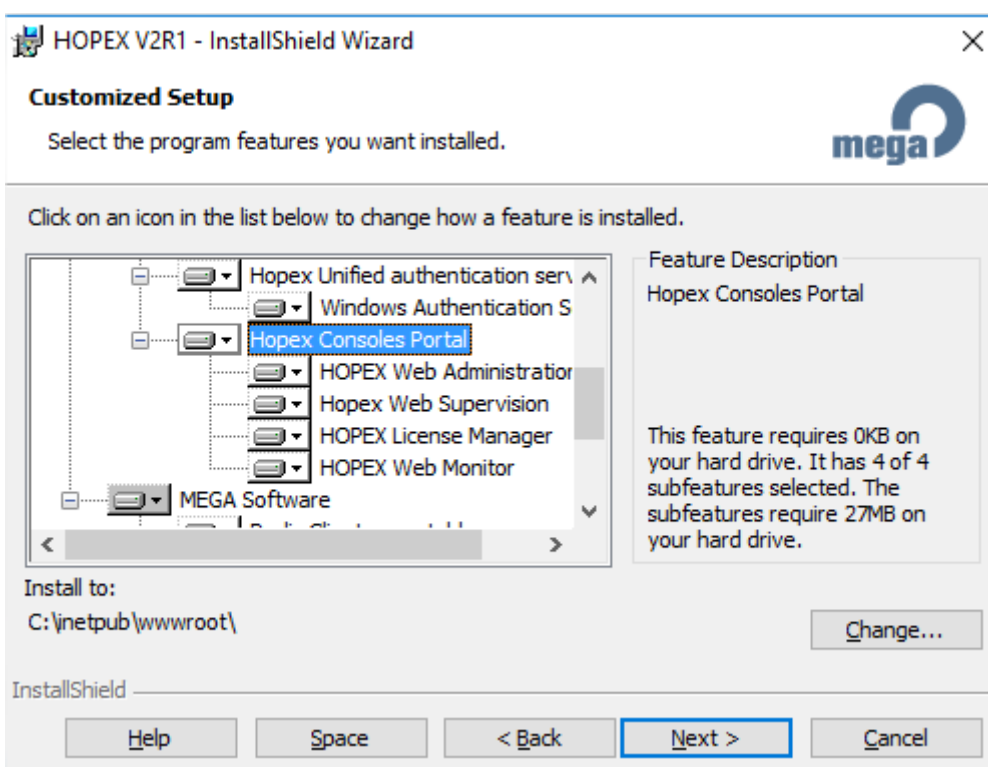
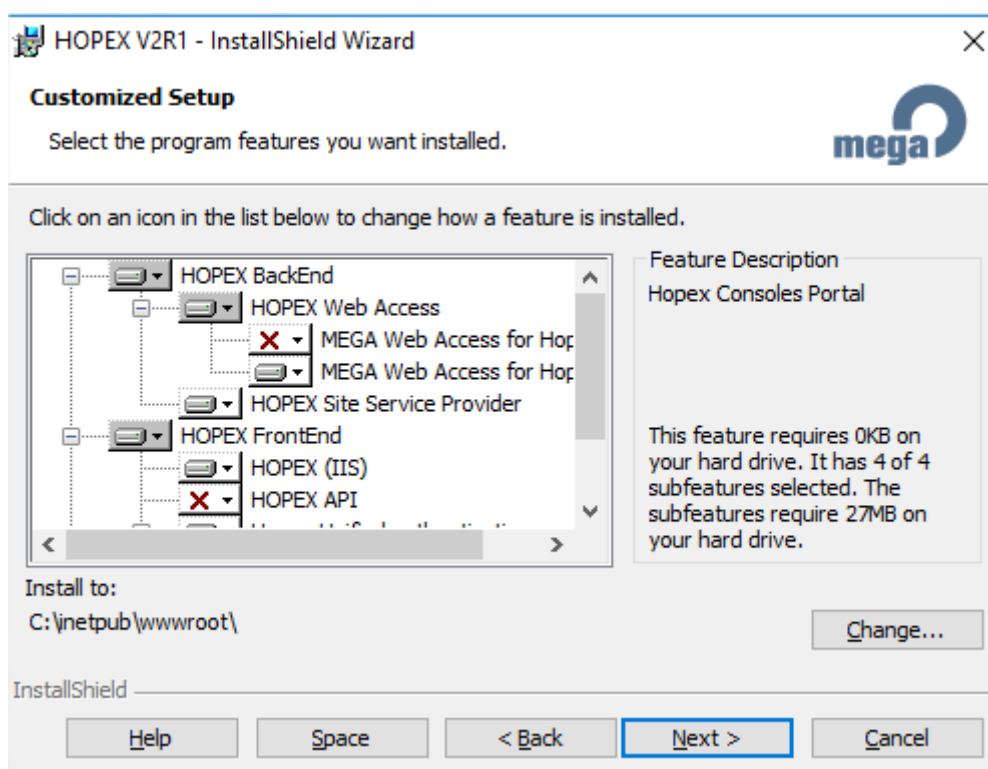
Choice Screen

1. Choose **Customized Setup**:



2. Choose the features that you want to install. Depending on how many servers you have, and the type of deployment you choose (see the "Web Front-end Architecture Overview" document), you need at least :
 - HOPEX FrontEnd and its subfeature
 - HOPEX BackEnd, wih at least:
 - "Hopex Web Access" -> "Mega Web Access for Hopex"
 - Hopex Site Service Provider
 - The "Mega Software" suite, already activated by default

In this example we install all those features on a single server:

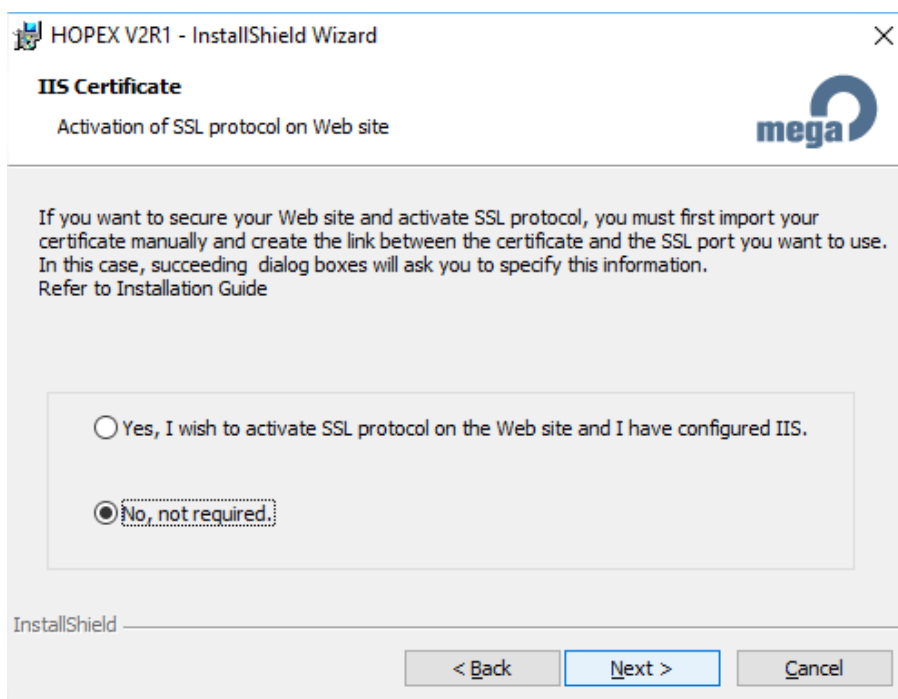


Note that by selecting each item, you can click **Change** to modify the installation location of the files that are linked to a specific feature.

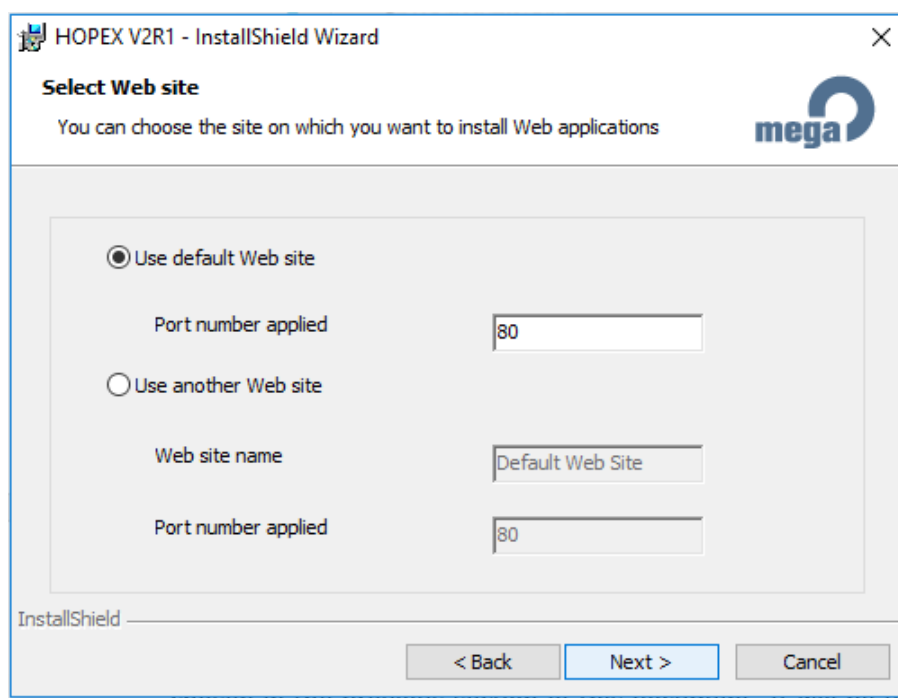
- The "HOPEX API" feature, above, is needed when you have to add web services on the platform. It requires another Windows user, different from the one used by the "Mega Web Access for Hopex" feature. You will also need to activate the "Mega Web Access for Hopex API" in the "HOPEX BackEnd" section.

4. Choose to activate use of SSL/TLS or not. SSL/TLS is highly recommended; however, it requires some prior configuration of IIS (see Prerequisites section). **Moreover, do not choose "Yes" unless the certificate is deployed in IIS. Otherwise, the installation will roll back.**

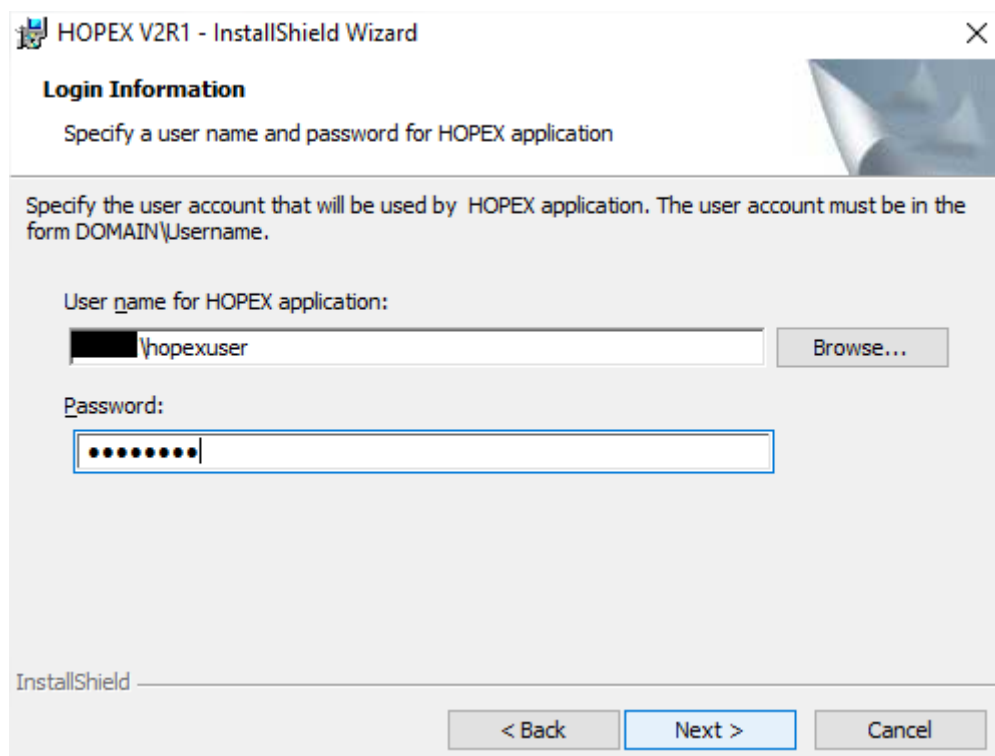
In this example, we do not have HTTPS activated on our website:



5. Choose the IIS web-site where you want to install the Hopex Web Front-End. **Please note** that the installer will check that there is a website running on the chosen port, and will install in the first site using that port that is available. So make sure to properly manage your websites and their ports before choosing one for the Hopex deployment. If you choose a port that is bound to no site, and that isn't listening during the installation, the setup will roll back :



6. Enter the username and password of the **Windows User for Mega Hopex** you have chosen in the previous section of this document. It will be used for impersonation of the Web application:

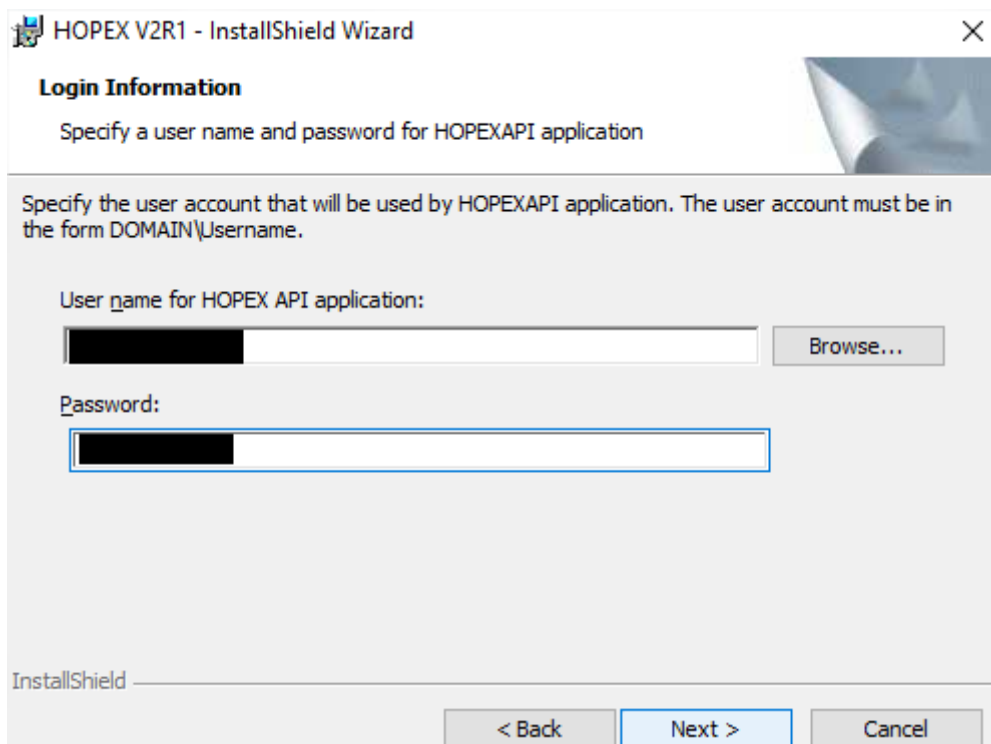


The screenshot shows a Windows installation wizard window titled "HOPEX V2R1 - InstallShield Wizard". The window has a close button (X) in the top right corner. The main heading is "Login Information", followed by the instruction "Specify a user name and password for HOPEX application". Below this, a note states: "Specify the user account that will be used by HOPEX application. The user account must be in the form DOMAIN\Username." There are two input fields: "User name for HOPEX application:" with the text "\hopexuser" and a "Browse..." button to its right; and "Password:" with a masked password field (dots). At the bottom, the "InstallShield" logo is on the left, and three buttons "< Back", "Next >", and "Cancel" are on the right.

Advanced Parameters

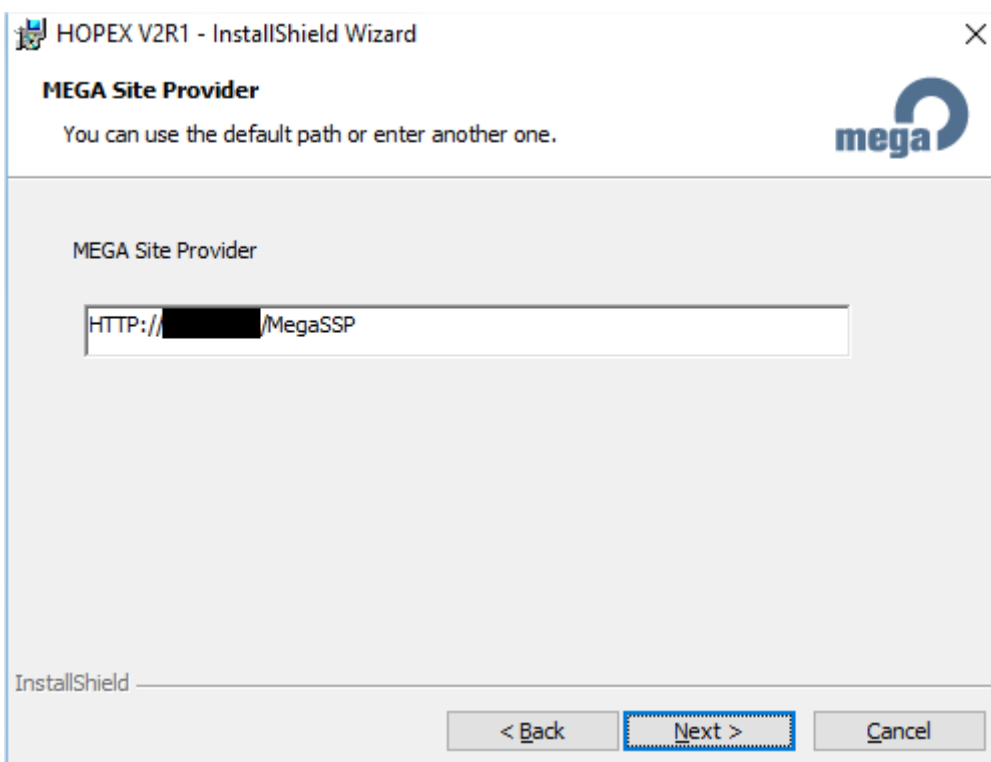
Parameters depend of the components you have chosen to install. Here is the list of parameters that are not proposed in the standalone setup.

HOPEX API user



The screenshot shows the 'HOPEX V2R1 - InstallShield Wizard' window. The title bar includes a close button (X). The window has a header section with the title and a close button. Below the header, the section is titled 'Login Information' with a subtitle 'Specify a user name and password for HOPEXAPI application'. The main area contains instructions: 'Specify the user account that will be used by HOPEXAPI application. The user account must be in the form DOMAIN\Username.' Below this, there are two input fields: 'User name for HOPEX API application:' and 'Password:'. The 'User name' field has a 'Browse...' button next to it. At the bottom, there are three buttons: '< Back', 'Next >', and 'Cancel'. The 'Next >' button is highlighted.

Mega Site Provider (SSP) URL



The screenshot shows the 'HOPEX V2R1 - InstallShield Wizard' window. The title bar includes a close button (X). The window has a header section with the title and a close button. Below the header, the section is titled 'MEGA Site Provider' with a subtitle 'You can use the default path or enter another one.' and the MEGA logo. The main area contains the text 'MEGA Site Provider' and a text input field containing 'HTTP://[redacted]/MegaSSP'. At the bottom, there are three buttons: '< Back', 'Next >', and 'Cancel'. The 'Next >' button is highlighted.

Security Token

It should be **identical on all Hopex installs** (Web, Windows, SSP,..) that work together in a scale up or scale out scenario

HOPEX V2R1 - InstallShield Wizard

Security Token
Security Token for MEGA services access

Security key generated by default

05u5skuAnroo9s8

InstallShield

< Back **Next >** Cancel

Control Portal access limit

You provide the credentials of the user that can access the new Web Consoles Portal, if activated. If more than one user needs to access it, you will need to make additional IIS configuration:

HOPEX V2R1 - InstallShield Wizard

Console Portal access limit
Specify a user name and user password

You have chosen to install HOPEX Console Portal. You can specify a user who will have access to this component.

User name
[Redacted] Browse...

Password:
[Redacted]

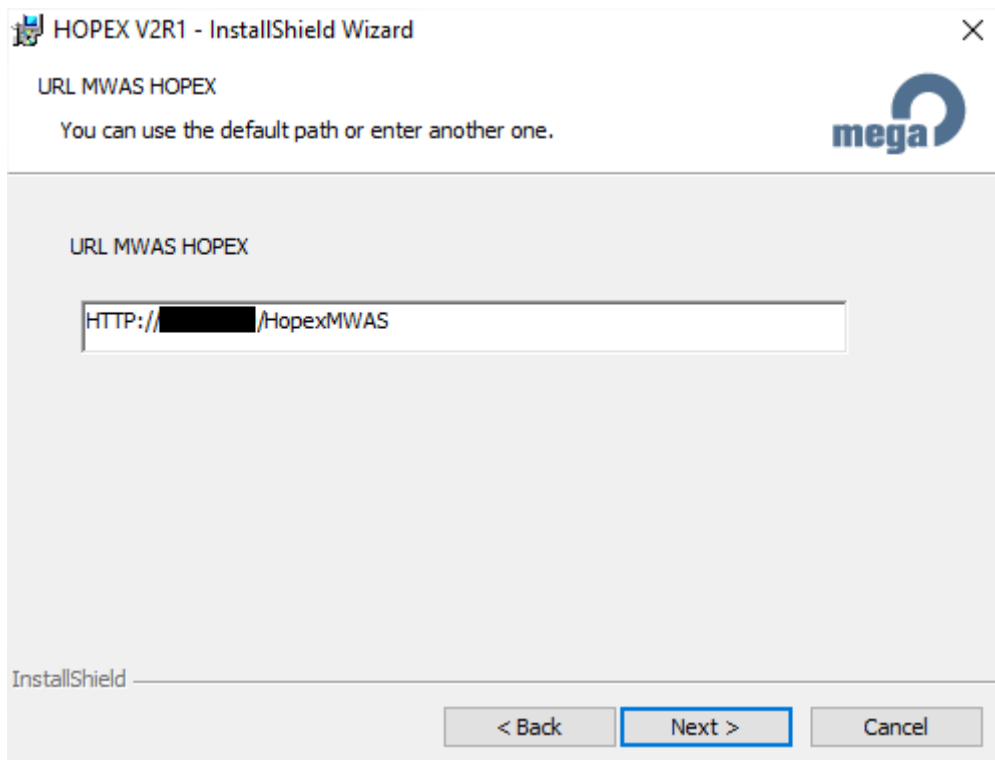
InstallShield

< Back **Next >** Cancel

URL of HOPEX MWAS Web Site

Defined on a web server to indicate the application server

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HOPEX V2R1 - InstallShield Wizard

URL MWAS HOPEX

You can use the default path or enter another one.

URL MWAS HOPEX

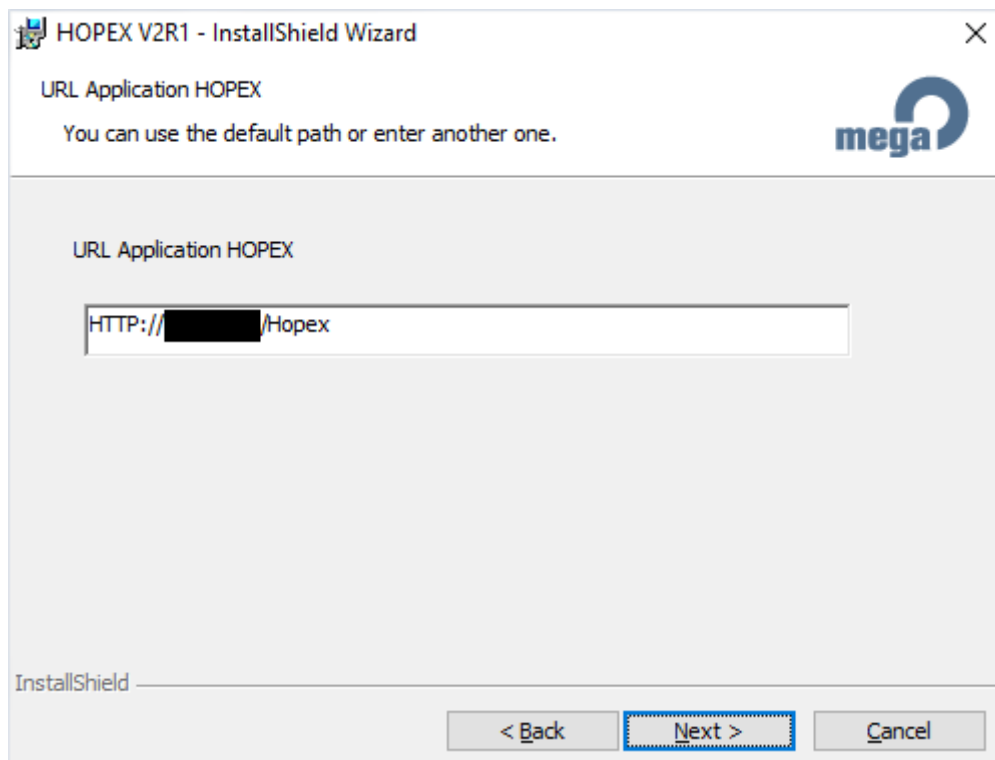
HTTP://[REDACTED]/HopexMWAS

InstallShield

< Back Next > Cancel

URL of HOPEX Web Site

Defined on a MWAS server to indicate the web server



HOPEX V2R1 - InstallShield Wizard

URL Application HOPEX

You can use the default path or enter another one.

URL Application HOPEX

HTTP://[REDACTED]/Hopex

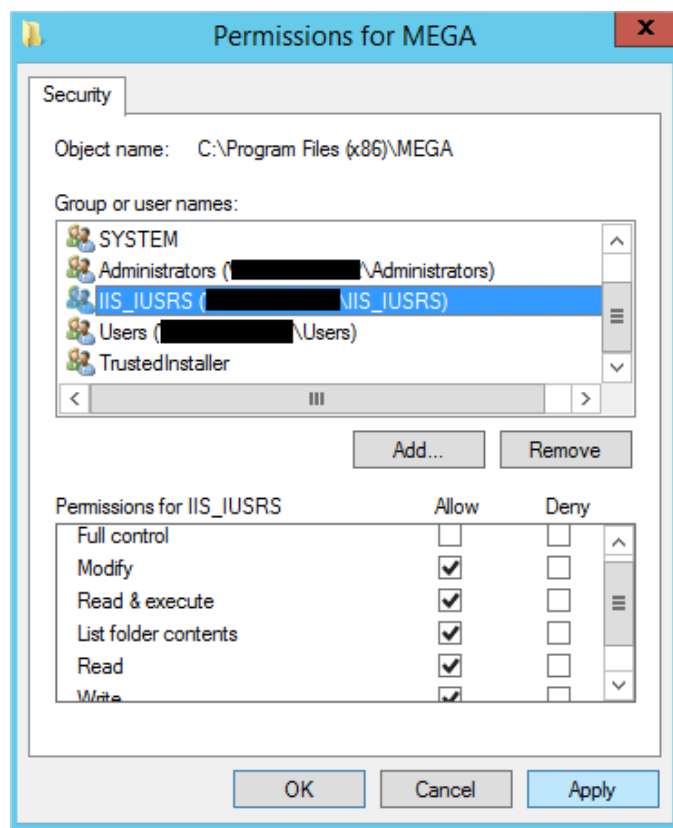
InstallShield

< Back Next > Cancel

COMPLETING INSTALLATION

Define "Windows User for MEGA HOPEX" files Access Rights

- Go to the **installation folder of MEGA HOPEX** (By default, "C:\Program Files (x86)\MEGA\HOPEX V2R1" on 64 bits systems) and give read/write access rights to the **IIS_IUSRS** group, that contains your Windows User that does the impersonation. This way, if you change that user, you won't have to change that security, but just update the above group:



- Repeat this operation for:
 - The **installation folder of MEGA HOPEX Web Front-End** (by default at C:\Inetpub\wwwroot\hopex)
 - The **environments folders** to be reached through MEGA. By default, environments are created in sub-directories of C:\Users\Public\Documents.
 - The **Temporary folder** used for Web Access. Usually, it is at C:\Windows\Temp.

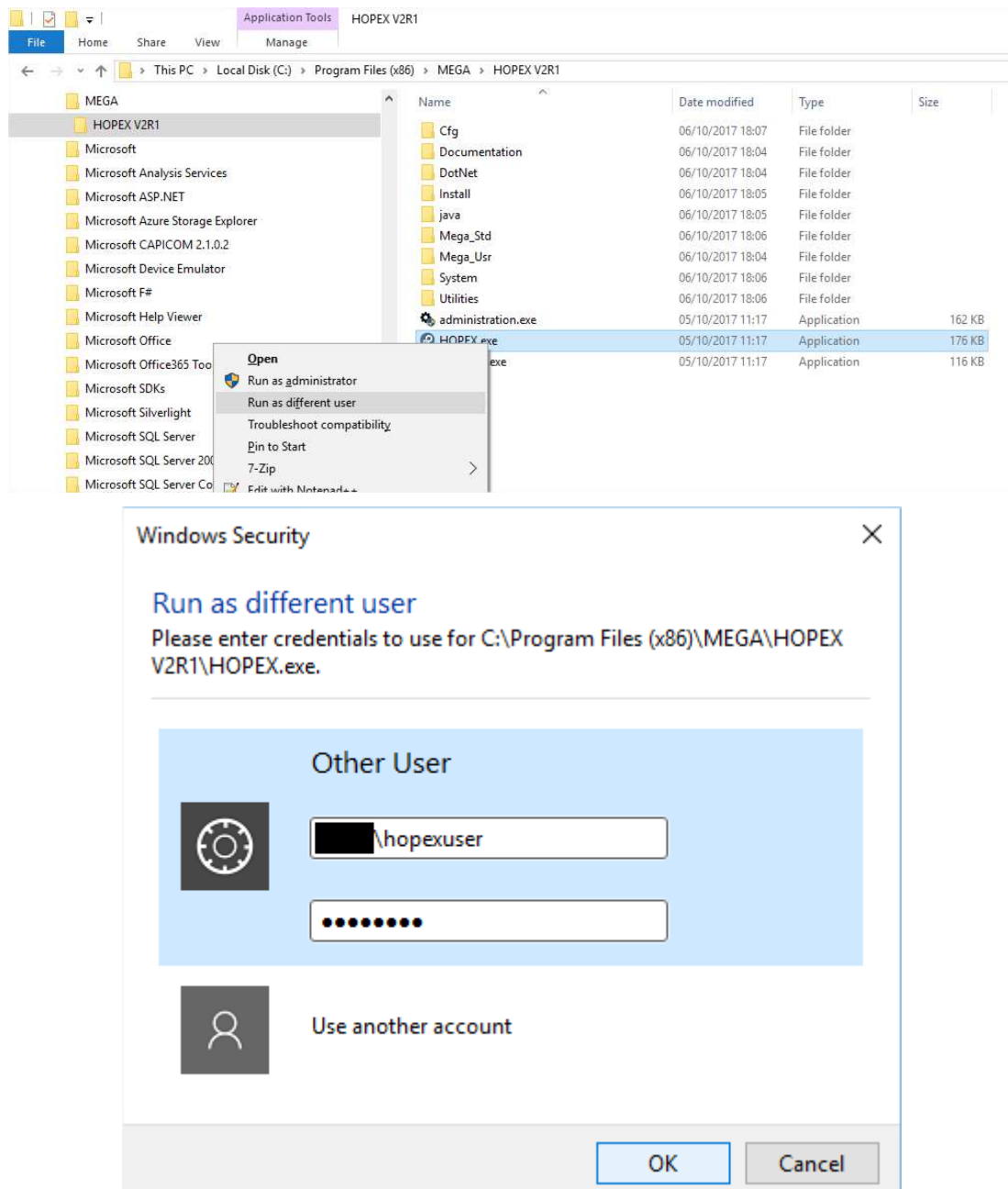
Make sure your user is correctly configured for the MUST license (for more details see the "Must License Installation Guide" technical article located in the Documentation\Articles folder of your installation).

As a first test, run HOPEX application as the "windows user for MEGA HOPEX".

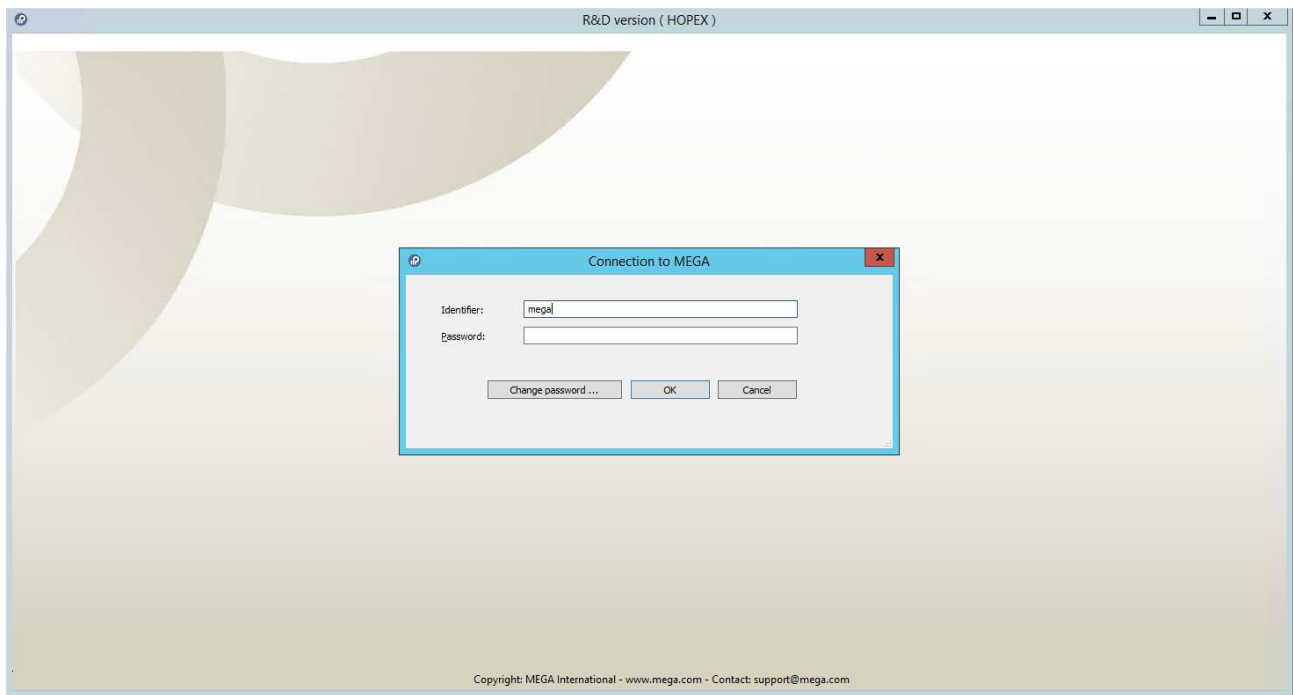
Prerequisite: having a Mega environment referenced on your platform. Either one of the GBMS environments that you can activate through the installer. Or an RDBMS environment that you created in a separate step.

To do so, go into the Mega installation folder.

Hold down the "Shift" button, right-click Hopex.exe and select "Run as different user":



You must be able to launch MEGA.



Tune IIS

A default option of IIS makes the worker process of the HOPEX/HOPEX2 recycle every 29 hours. This is what Microsoft chose to make sure that the w3wp.exe process, that manages websites and/or web applications within websites, to be stable.

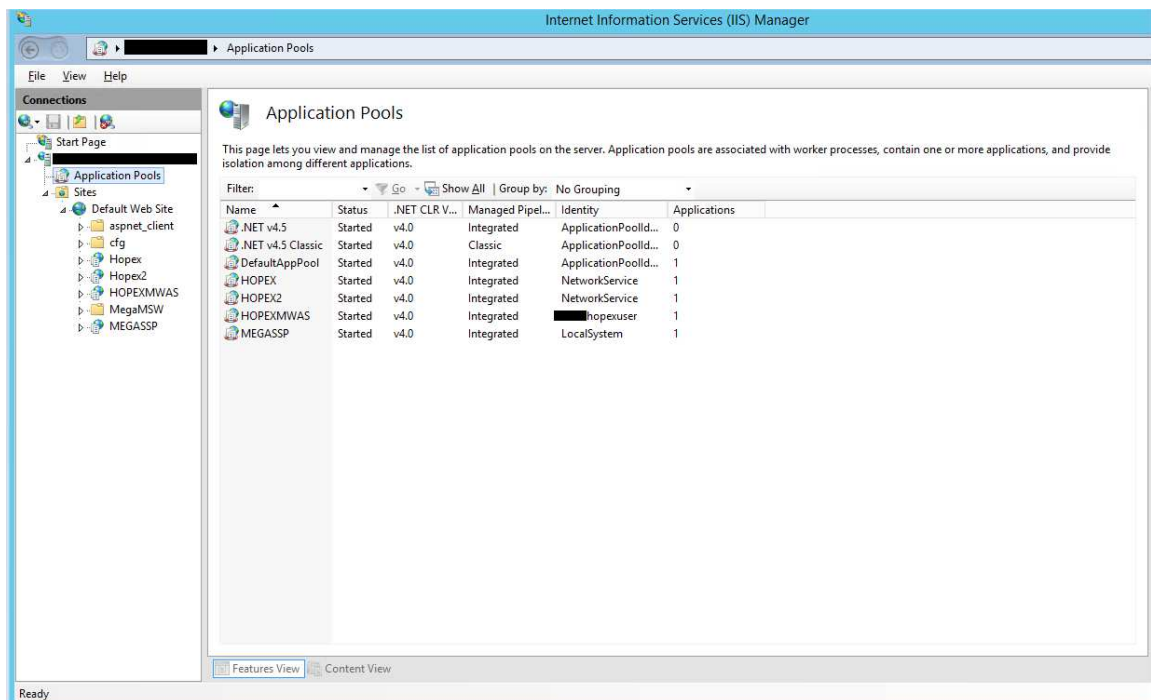
However, the fact that this process restarts, makes the browsing of connected users to fail, as they lose their browsing context.

To avoid that, the installer disables completely this recycling, and use the default idle timeout, that says that after 20 minutes of complete inactivity, the worker process will stop (it will automatically start next time someone tries to access the website).

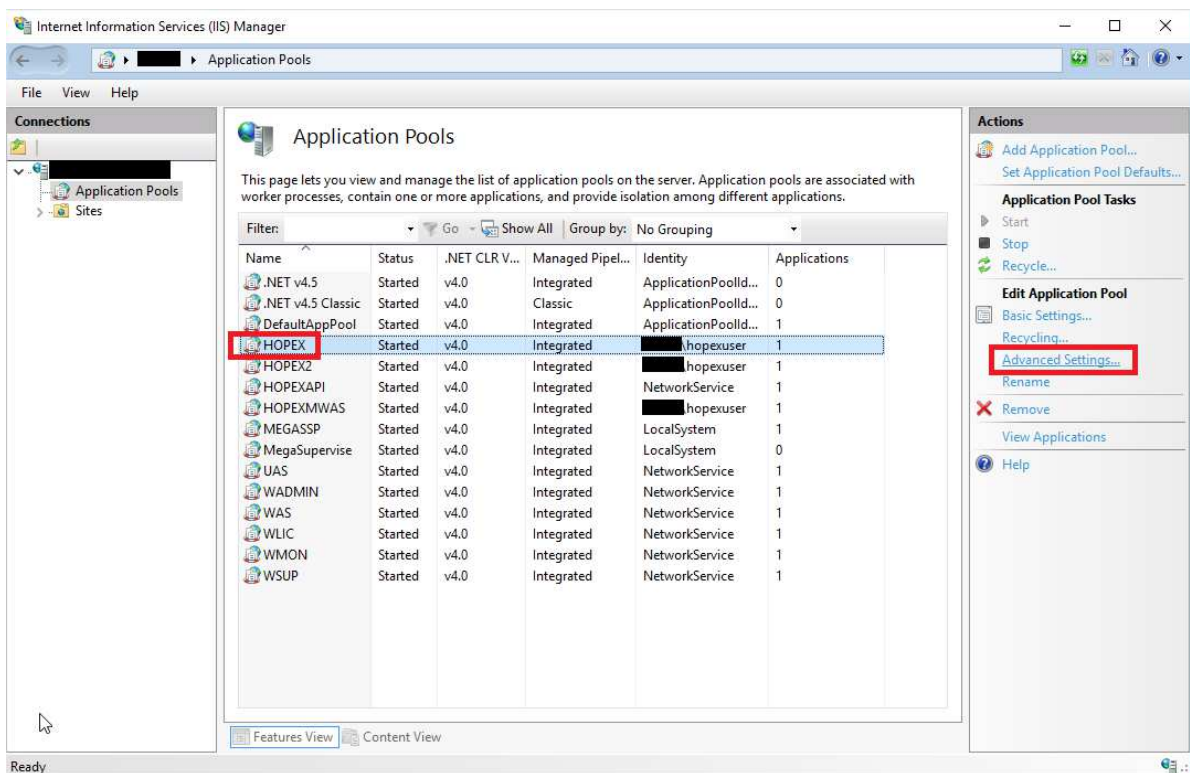
We recommend to manually add a restart at a fixed hour, when you know that no one will actually be connected on the website, to be sure it restarts at least once a day.

To do this.

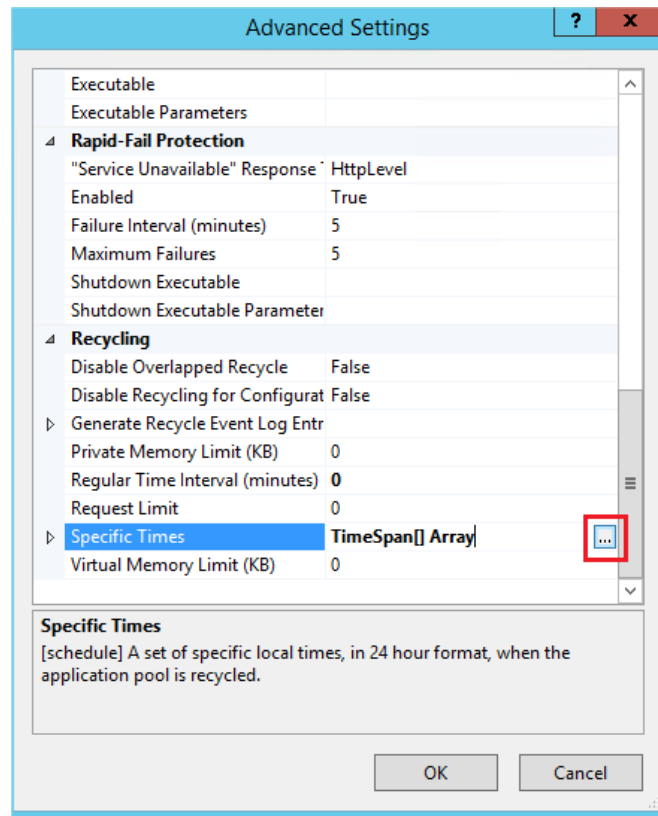
1. Open the "Internet Information Services (IIS) Manager", and go to **Application Pools**:



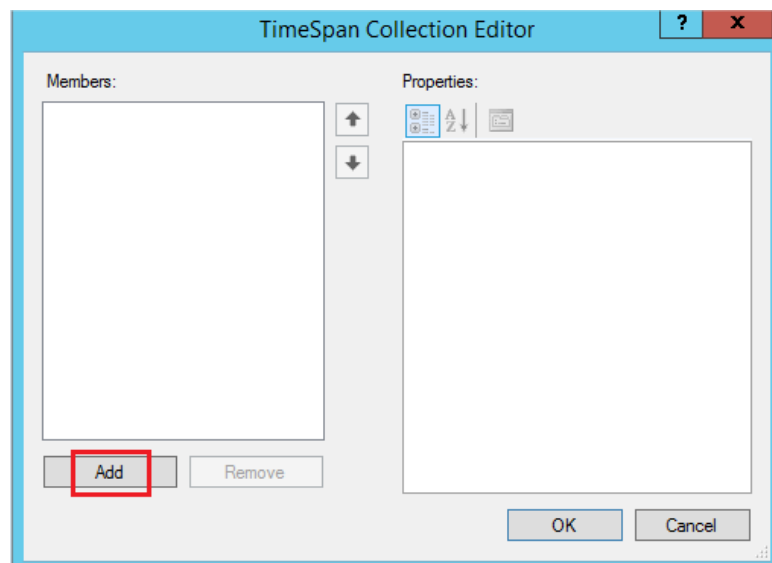
2. Select "HOPEX".
3. Click on the "Advanced Settings" option in the contextual menu:



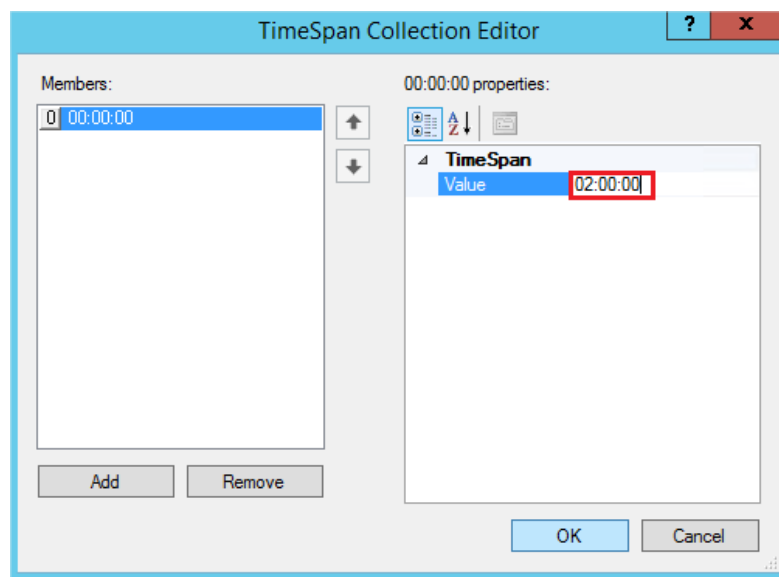
4. In the **Recycling** section, select the line Specific Times, and click on the "...” button:



5. Click on **Add**:



- Put the wanted restart time (in this example it's at 2am everyday), and click on "OK" to validate :

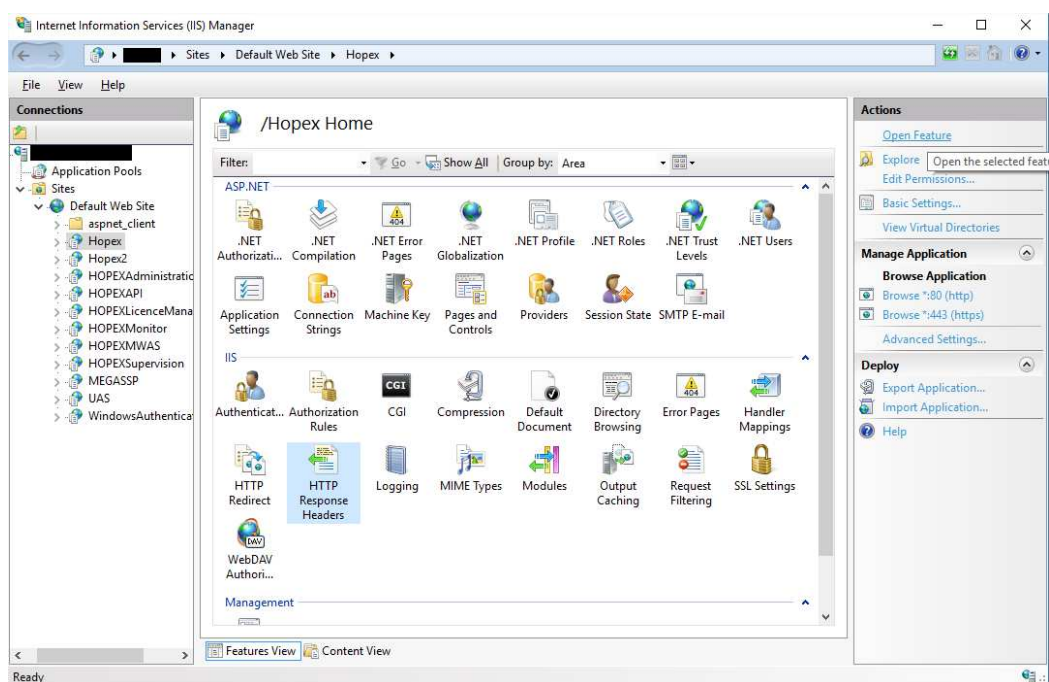


- Close the **Advanced Settings**. Reproduce this procedure for the **HOPEX2** application pool if you deployed HOPEX.

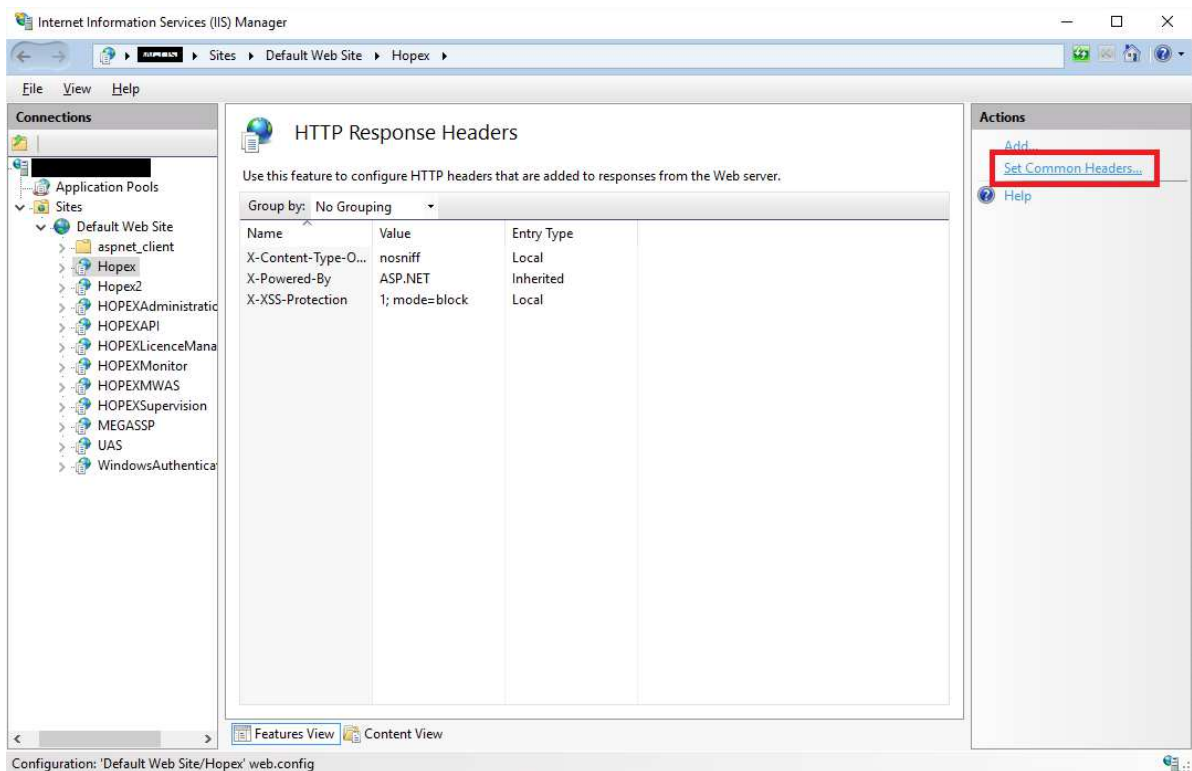
A restart of IIS will be needed to make this configuration active.

Configure Web Content expiration

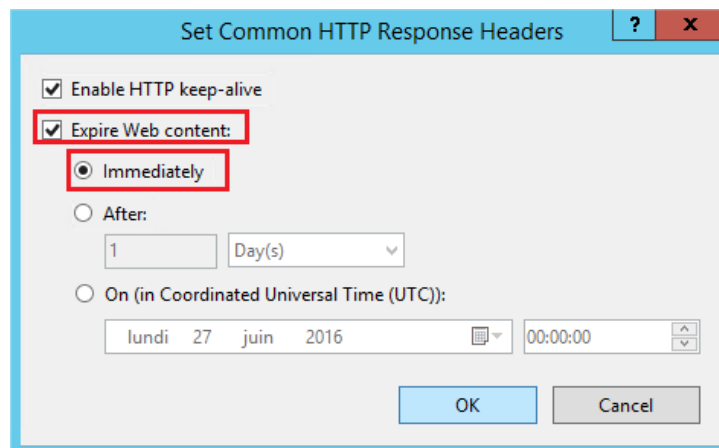
- In the "Internet Information Services (IIS) Manager", expand **Web Sites**, then **Default Web Site**.
- Select "HOPEX"
- Double-click the **HTTP Response Headers** functionality to open the feature:



4. Click **Set Common Headers** on the right panel:



5. Set it to expire immediately :

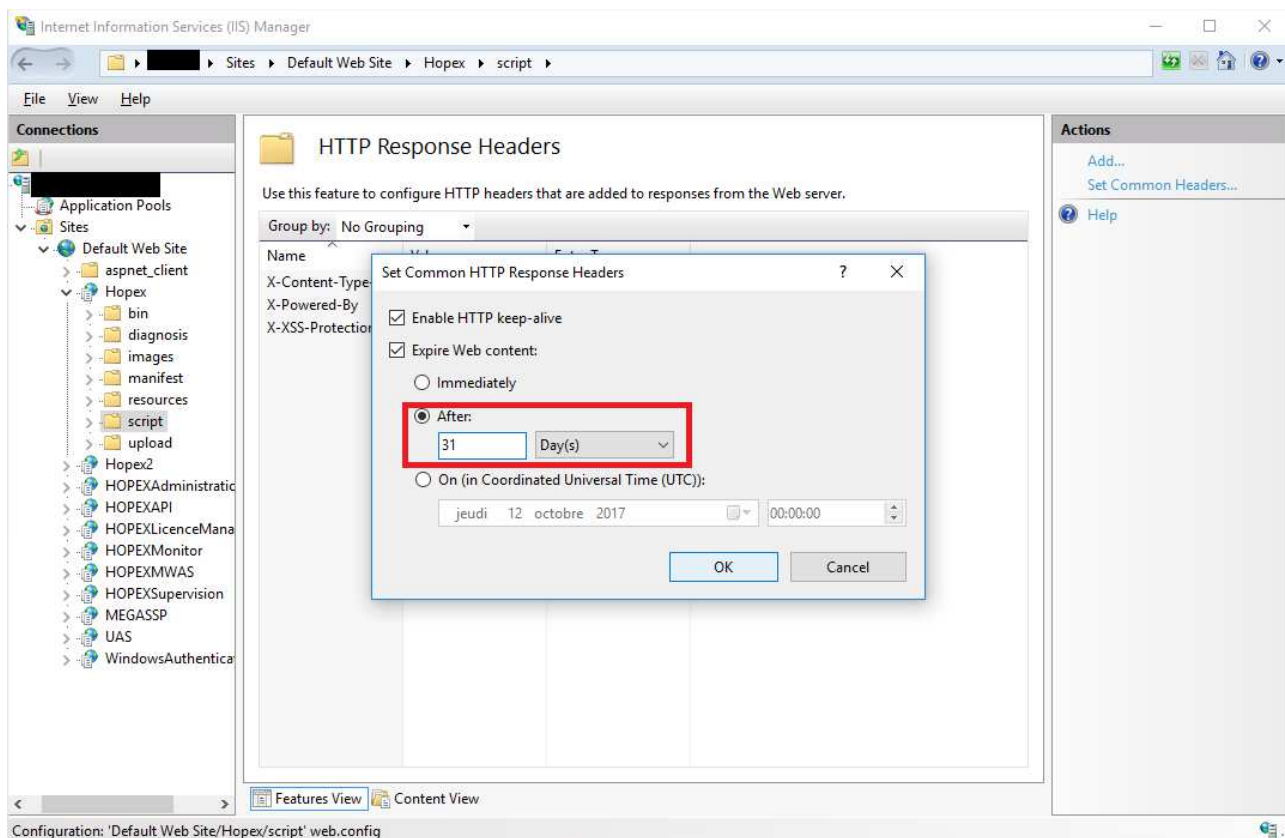


6. In the "Internet Information Services (IIS) Manager", expand **HOPEX**

7. Select the **script** folder and choose "HTTP Response Headers" again.

8. Click **Set Common Headers** on the right panel.

9. Enable content expiration after 31 days.



10. Repeat this step on the **images** folder.

WHAT'S NEXT?

You have successfully installed MEGA HOPEX Web Front-end.

You should now personalize your setup.

The two main steps are:

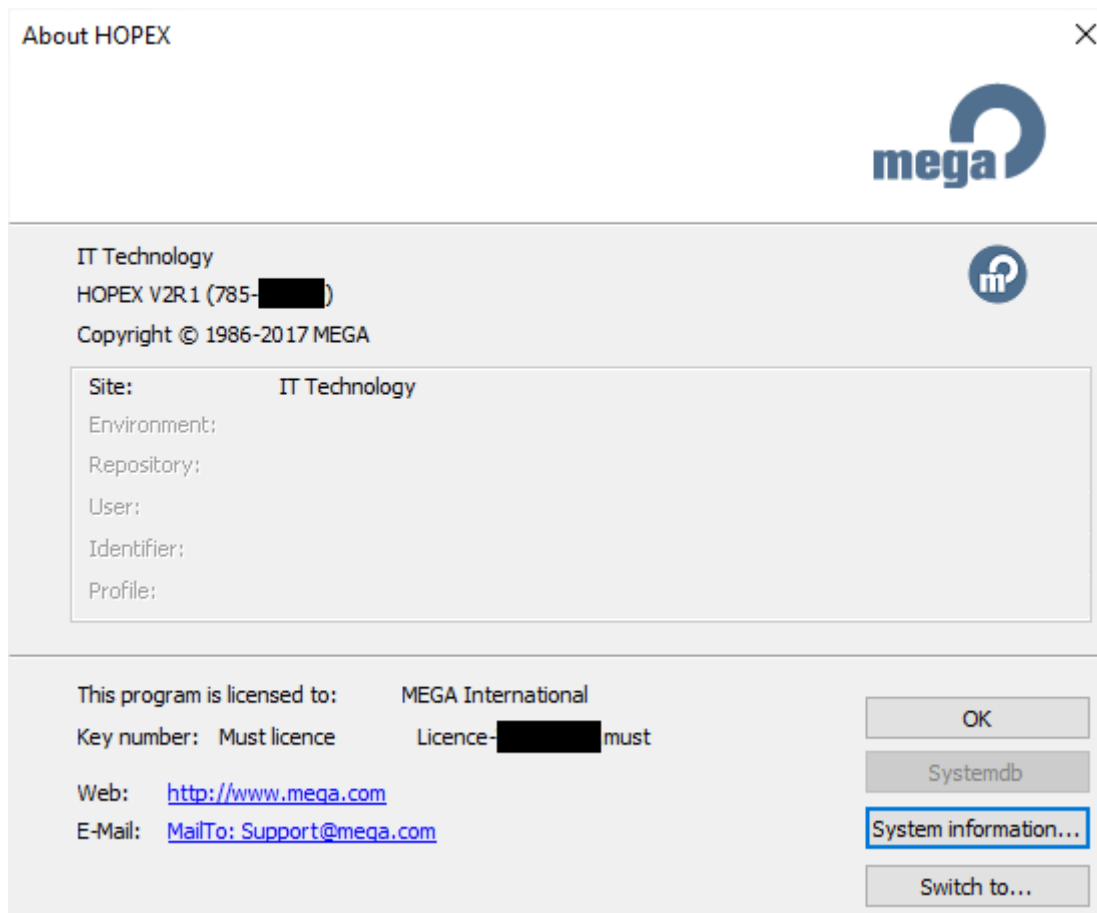
- Setting up an RDBMS environment
- Configuring authentication

Refer to Mega administration documentation.

TESTING THE INSTALLATION

A pre-requisite for the test is to install an environment.

On the server, run MEGA Administration Console (Administration.exe). Click the menu "Help" > "About MEGA" and check the license used. It must be the MUST license name generated for this installation.

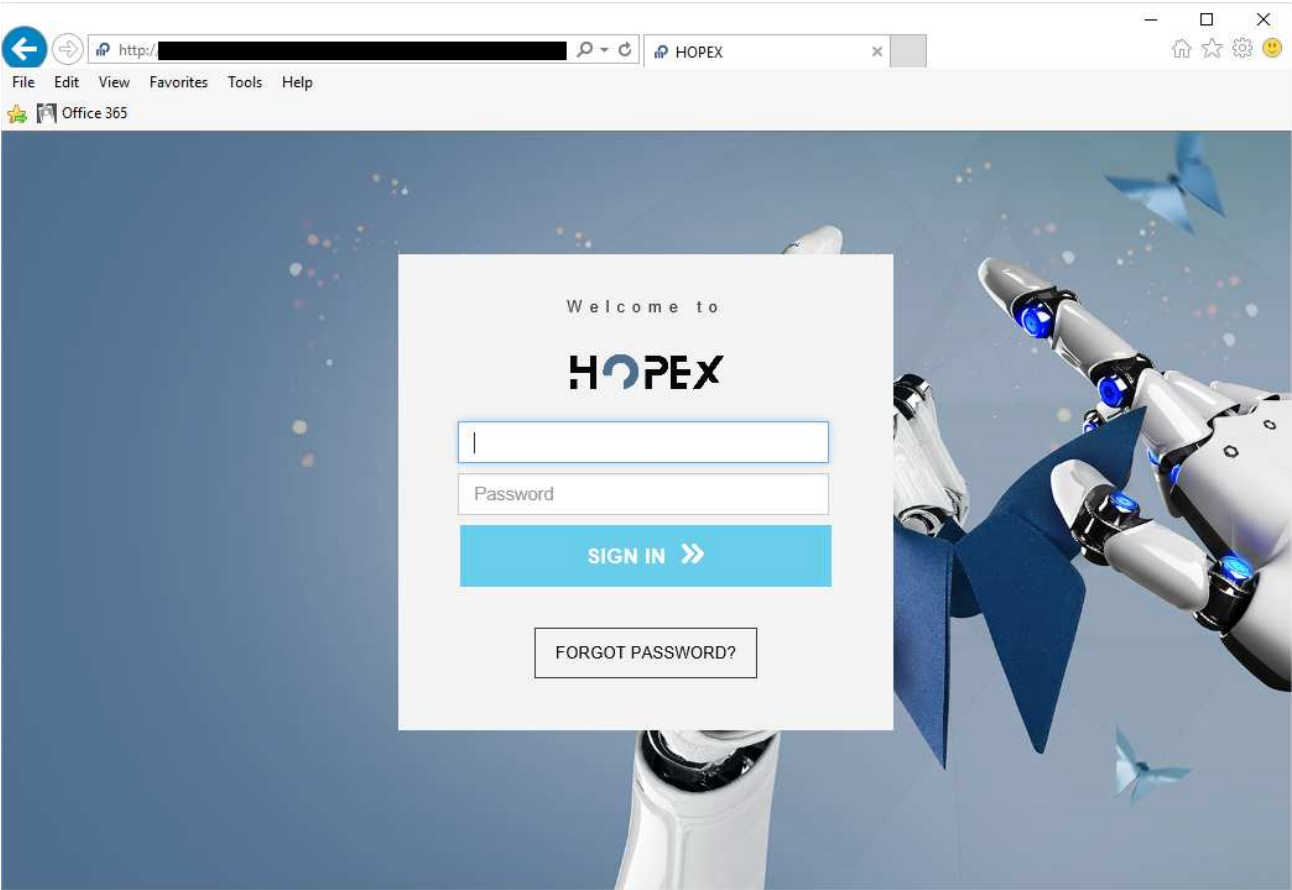


If the Administration Console does not start or if the license is not the one expected, you need to review the license configuration before going further.

Testing MEGA HOPEX Web Front-End

Prerequisite: having a Mega environment referenced on your platform, either with SQL Server or Oracle.

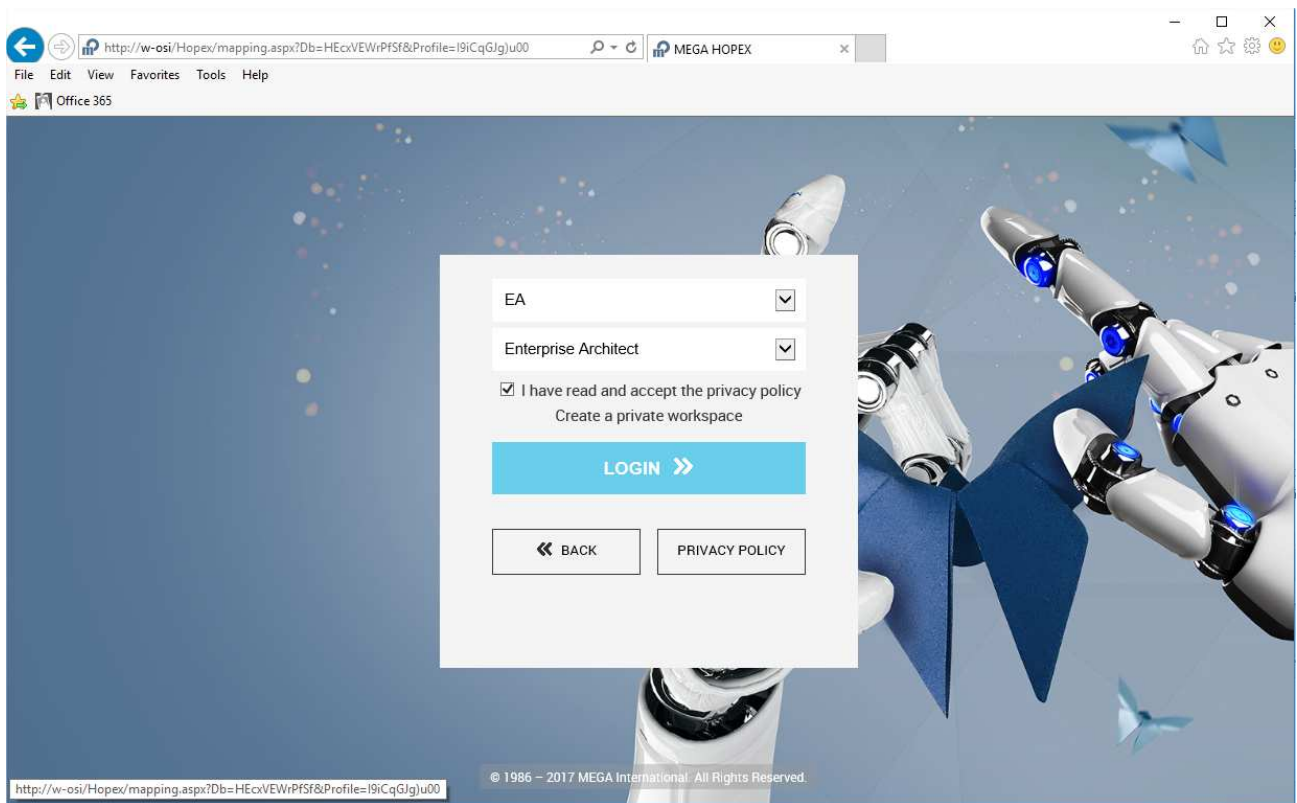
On the server, open a supported browser and browse to [Error! Hyperlink reference not valid.](#). The login page should appear.



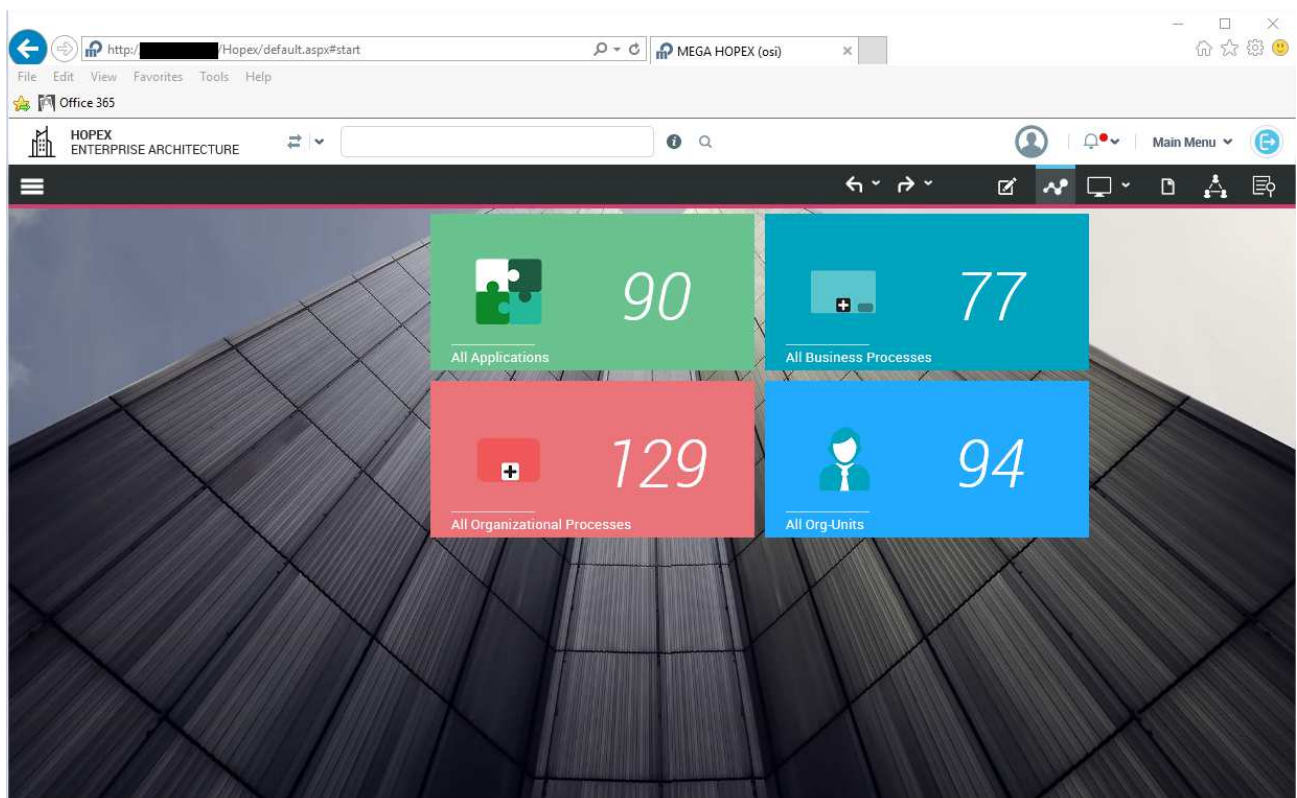
Now, use another client machine with any supported browser and browse to <http://<servername>/hopex/>. The login page should appear.

Log in to the environment with the Login “mega” and an empty password.

Then select:



The web workspace should be displayed:



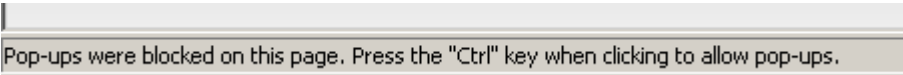
Depending on available licenses, the displayed content may vary.

More required configuration

Word, Excel and PDF exports

Please, make sure your browser authorizes to download files.

IE may display the following message in the status bar preventing from opening the PDF file:



Reports (MS Word)

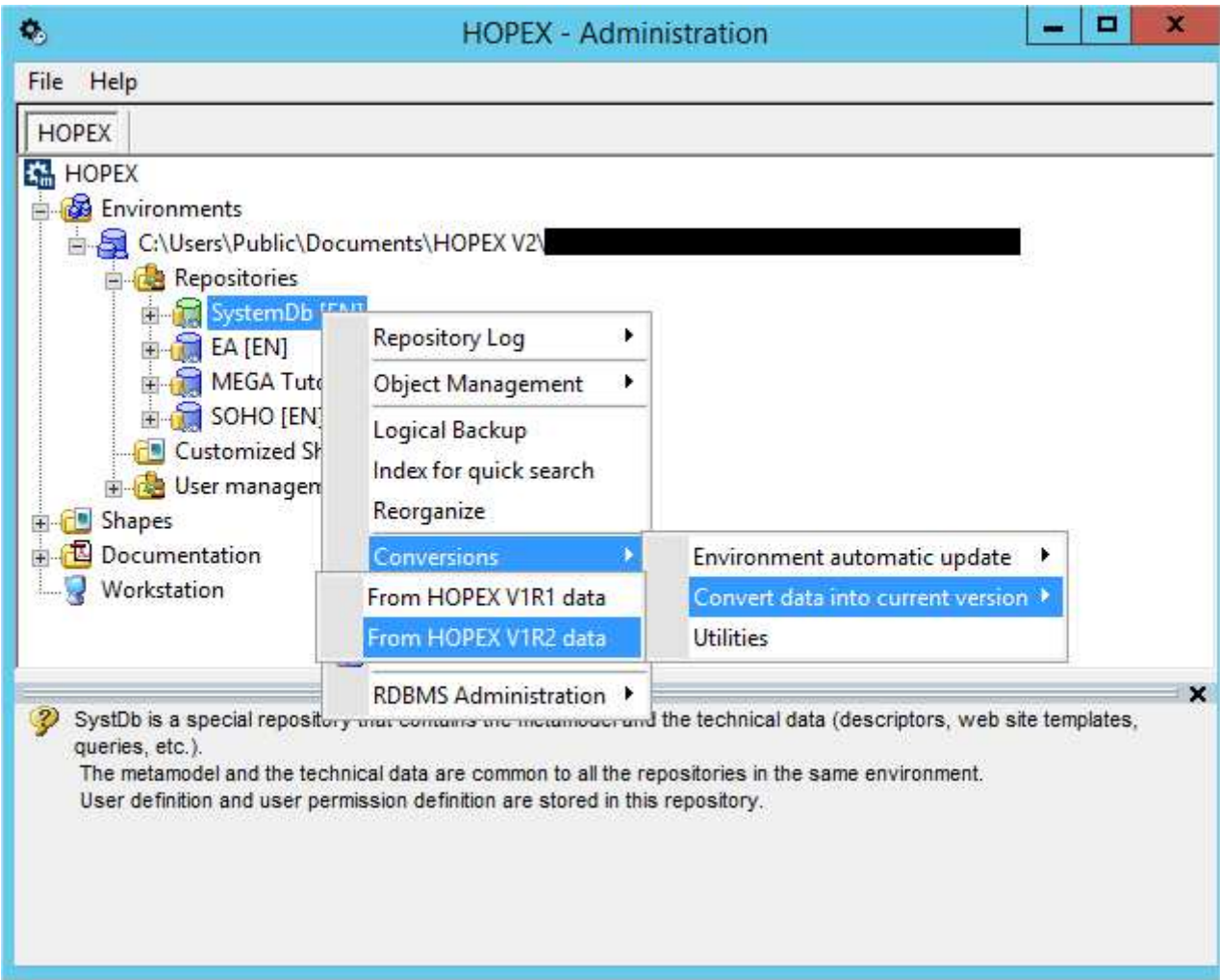
In Hopex V2 R1, generated documents of new environments are automatically converted to the RTF format.

However, the format of Reports documents was MS Word.

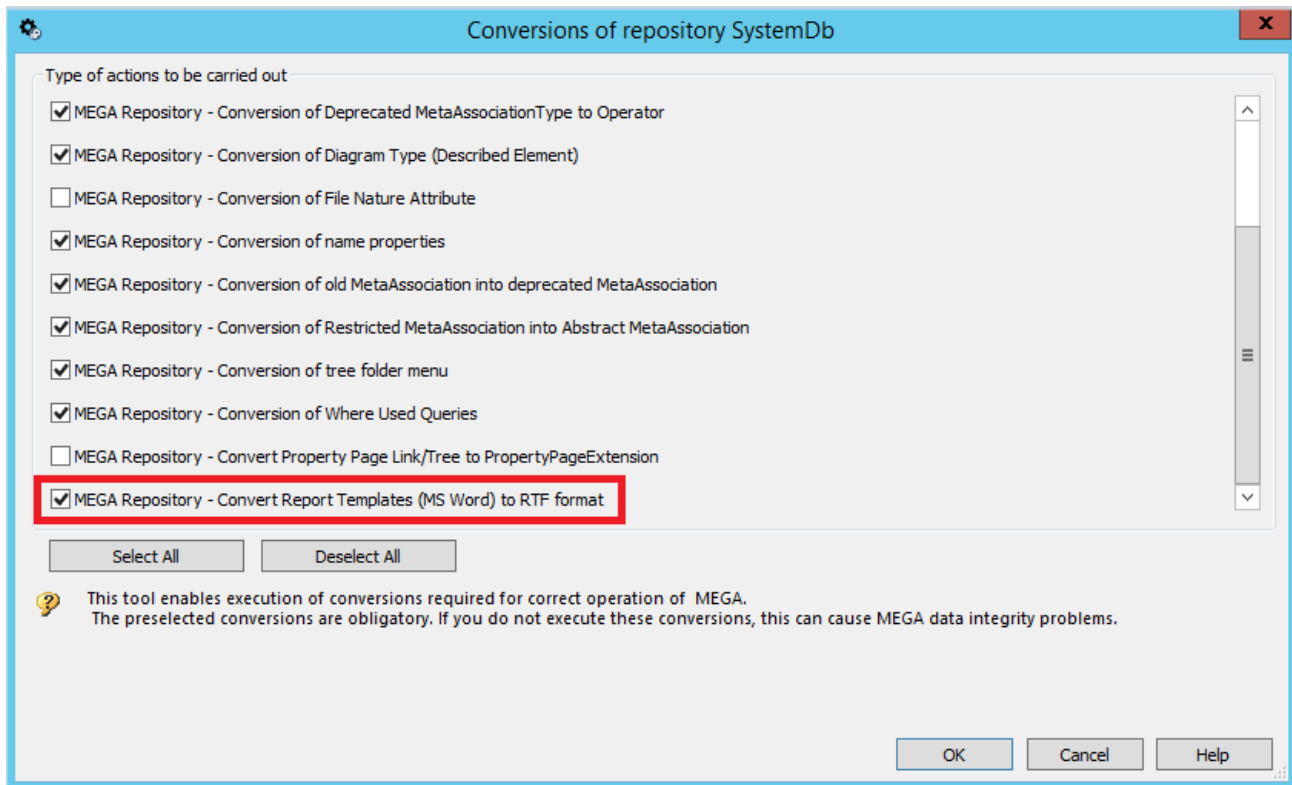
So if you are performing a migration from a source that still has this MS Word format, you must follow the below steps, in order to use documents on the Web Front-End.

You must exit any web session by dispatching or discarding your private workspace.

Then, from **a computer where Microsoft Word is installed**, go to the Administration Tool, open the environment you wish to convert with the user 'System', navigate to the systemDB and right-click "Conversions > Convert data into current version > From HOPEX V1R~~x~~ data", 'x' obviously being the version of your environment in the process of being migrated:

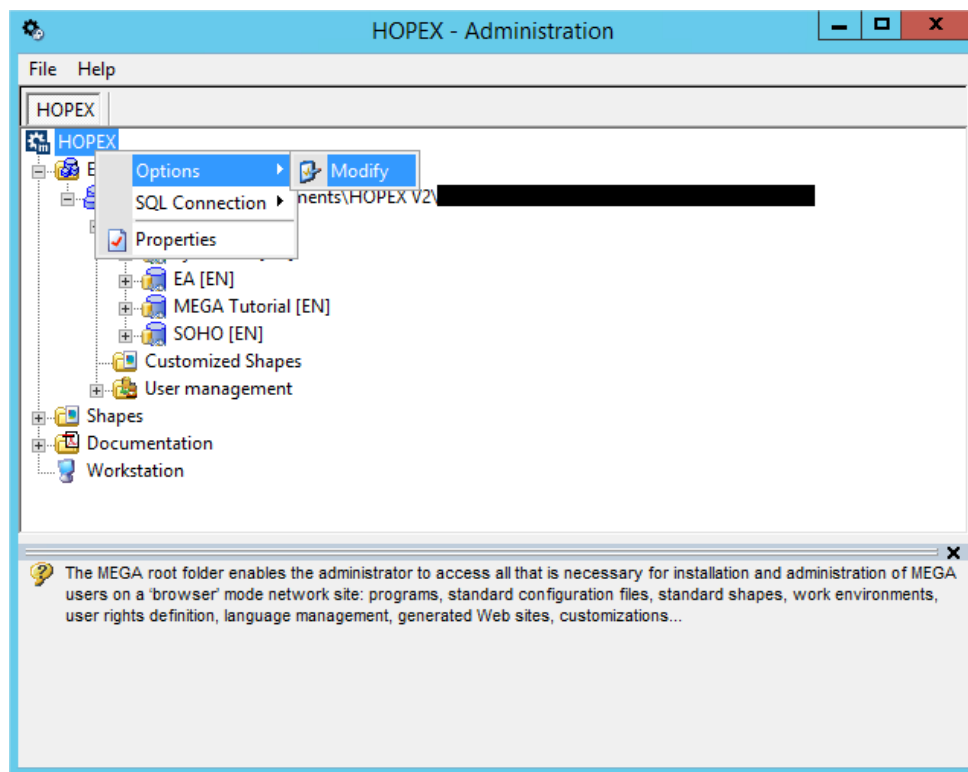


This is the last possible conversion called "MEGA Repository - Convert Report Templates (MS Word) to RTF Format", that is checked by default:



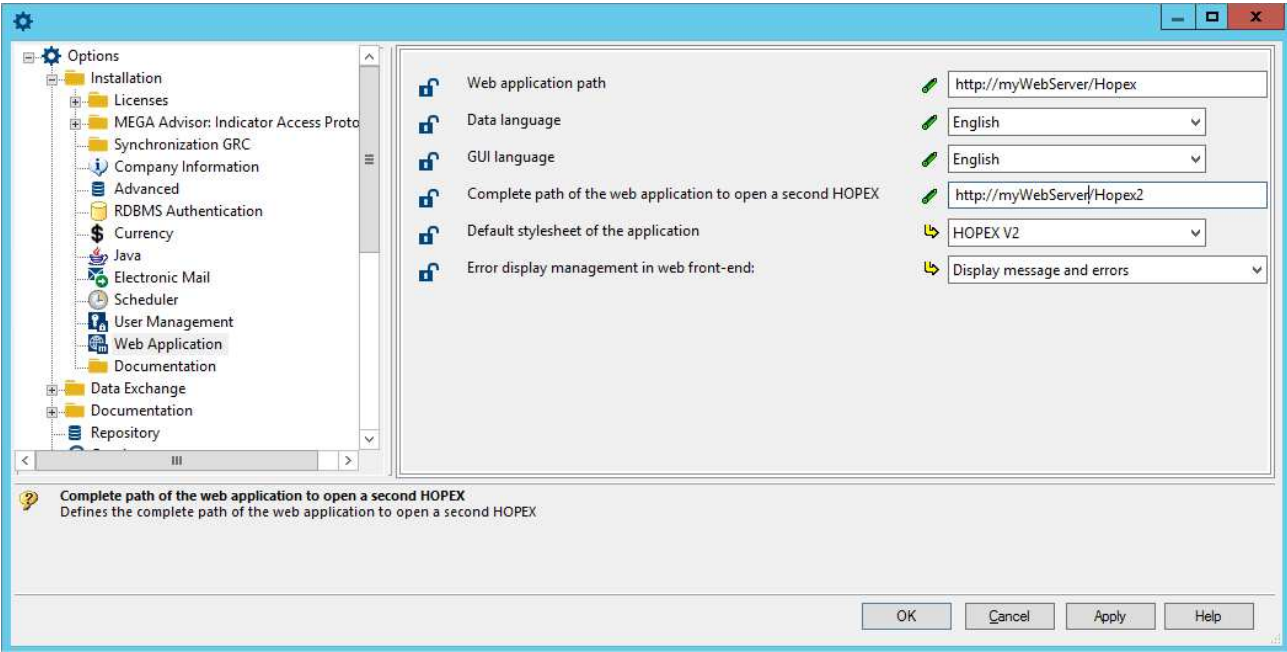
Required options configuration

You must fill-in a number of site options using Administration.exe, at the root level:

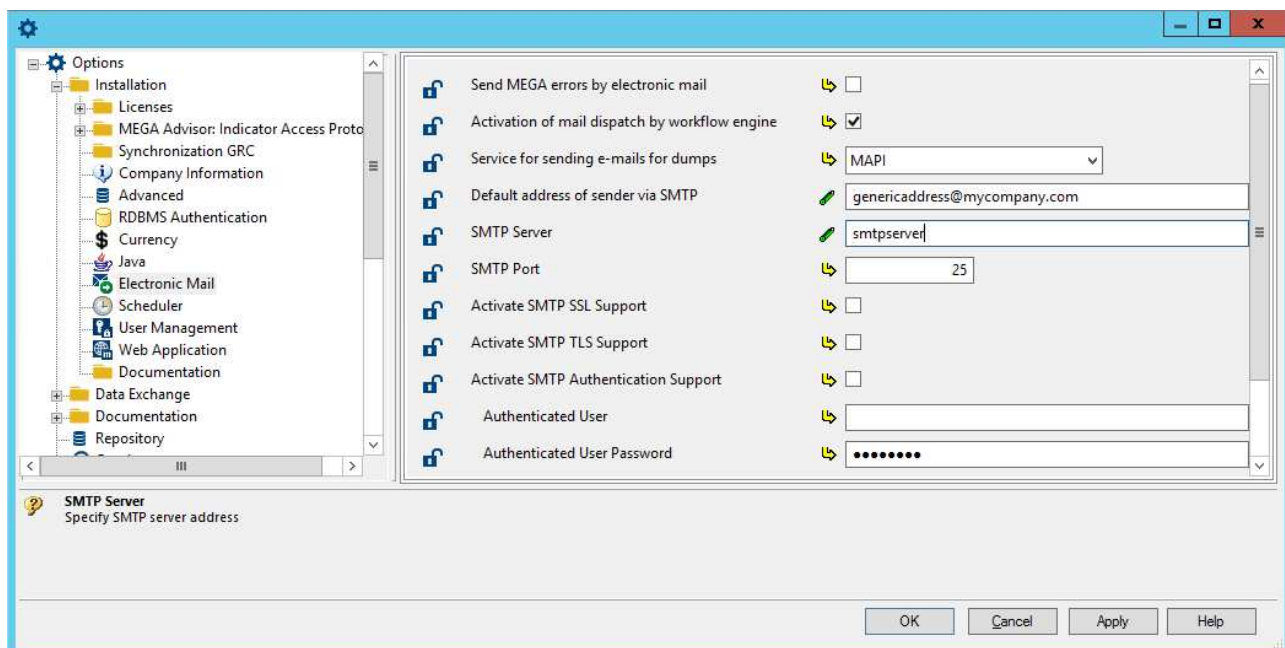


The following options are required for MEGA HOPEX Web front-end to operate:

- In the Installation > Web Application folder:
 - “Web Application path” (e.g. <http://myWebServer/HOPEX/>) and “Complete path of the web application to open a second HOPEX”, are already filled-in by the setup. However, you may have to change it if a DNS alias is put in place after the setup, or if your web servers are behind a Load Balancer or a reverse-proxy that has a different address than the server name itself:

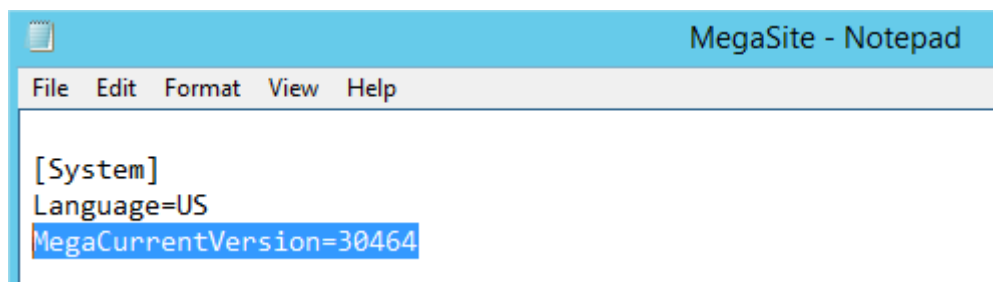


- In the Installation > Electronic mail folder:
 - Default address of sender via SMTP
 - SMTP Server
 - Any SMTP configuration (port, SSL, authentication, etc.) required by your infrastructure



In V2R1, please note that your MegaSite.ini will contain the version number. So if you upgraded a V1R2 version to a V2R1 version, and wanted to keep your settings, make sure that you have those information in the [System] section of your MegaSite file :

MegaCurrentVersion=30208



Allowing the use of verbose logs and activation

To allow Mega to perform deep analysis of the logs, it can be asked to activate the verbose mode.

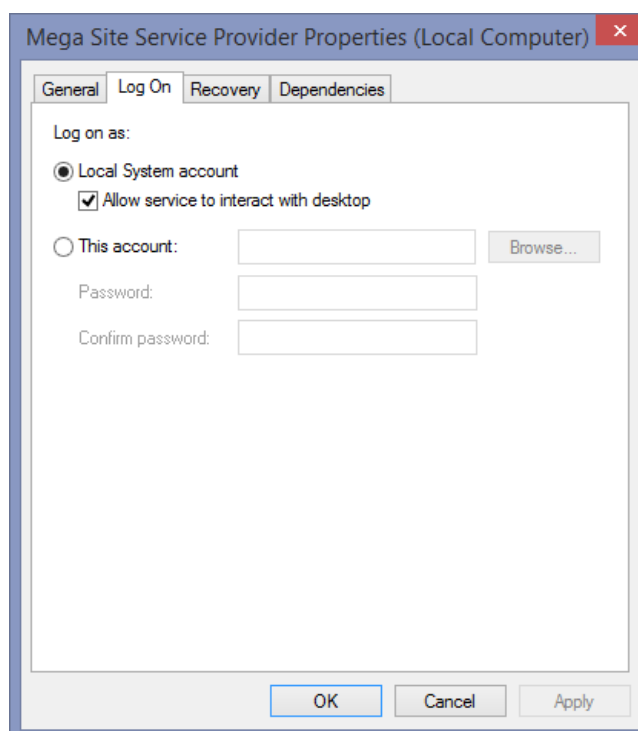
The verbose mode activation includes two steps:

- Registry update
- Mega Server Supervisor: « verbose mode » activation
 - ➔ To deactivate this configuration, see Disabling the verbose mode p. 48.

Registry update

To update the registry before activating the verbose mode:

1. Allow the impersonate account (see "Windows User for MEGA HOPEX" section) to have read/write access to a key (see Windows User(s) for MEGA HOPEX p. 11).
2. Make sure that the account that runs the "Mega Site Service Provider" Windows service has the same access level.
 - a. Check which account is running the service:



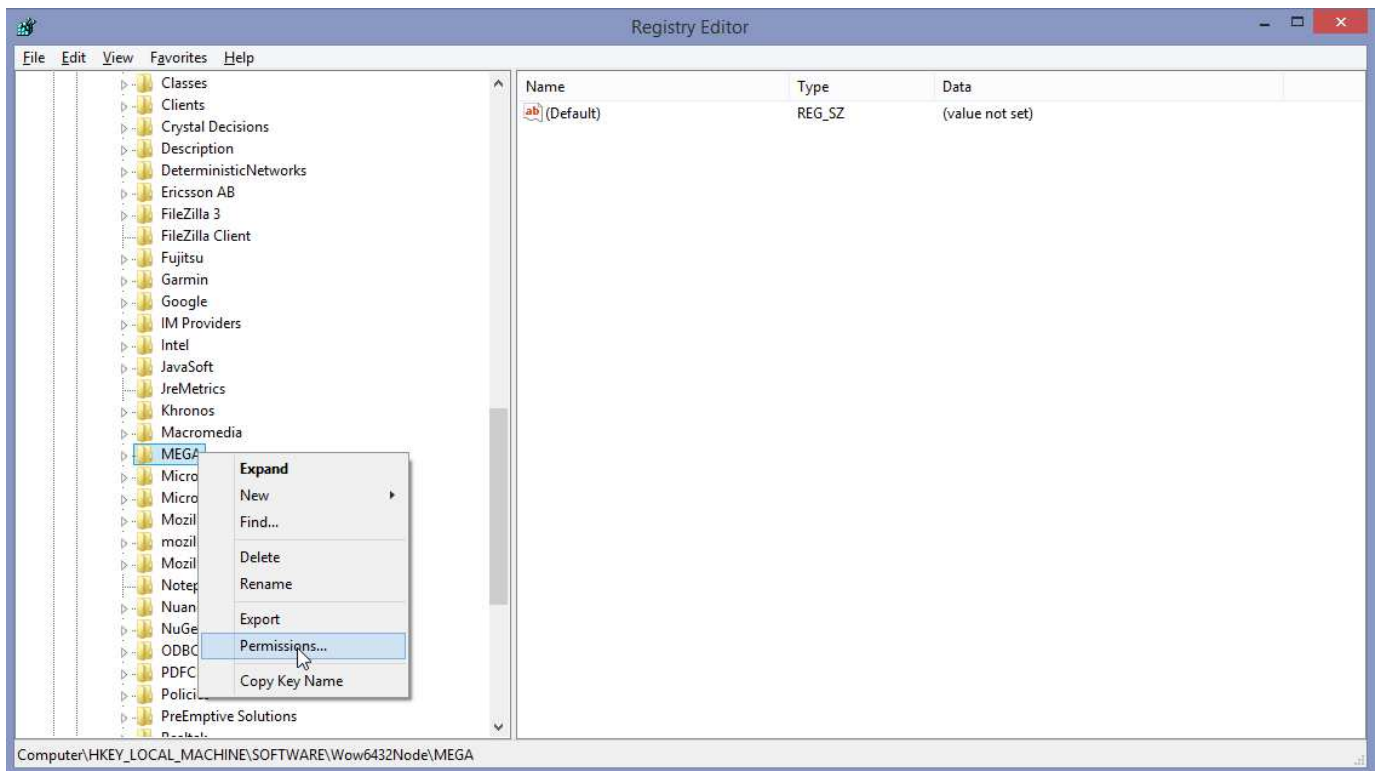
If it is « Local System », you do not need to update the registry for that service, only for the impersonate user.

Otherwise, if you run the service with a local account or domain account different than the impersonate account, we advise you to add this account in the IIS_IUSRS local group.

- b. Launch the "regedit.exe" executable to open the registry.
- c. The registry key on which you need to change the permissions is:

HKEY_LOCAL_MACHINE\SOFTWARE\Wow6432Node\MEGA

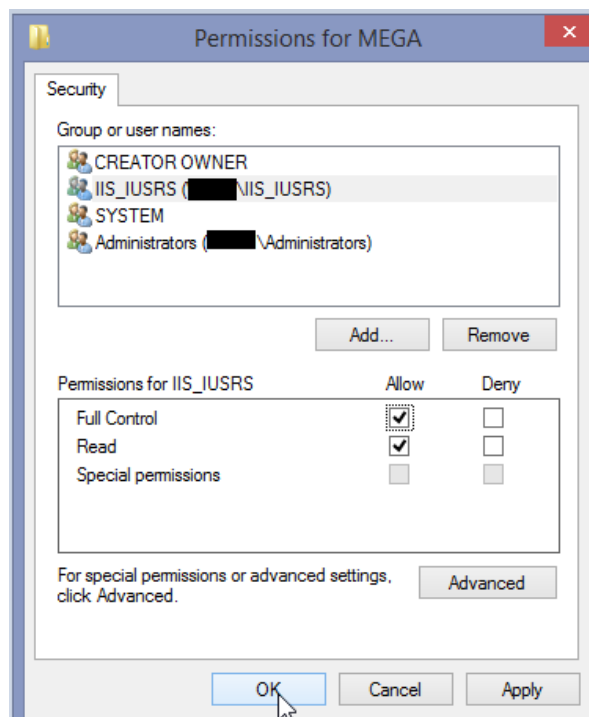
*Right-click the key and select **Permissions**.*



- d. On this key, add the "IIS_IUSRS" local group.

The impersonate account is normally included in the "IIS_IUSRS" local group, and as stated before, that can contain the account that runs the "Mega Site Service Provider".

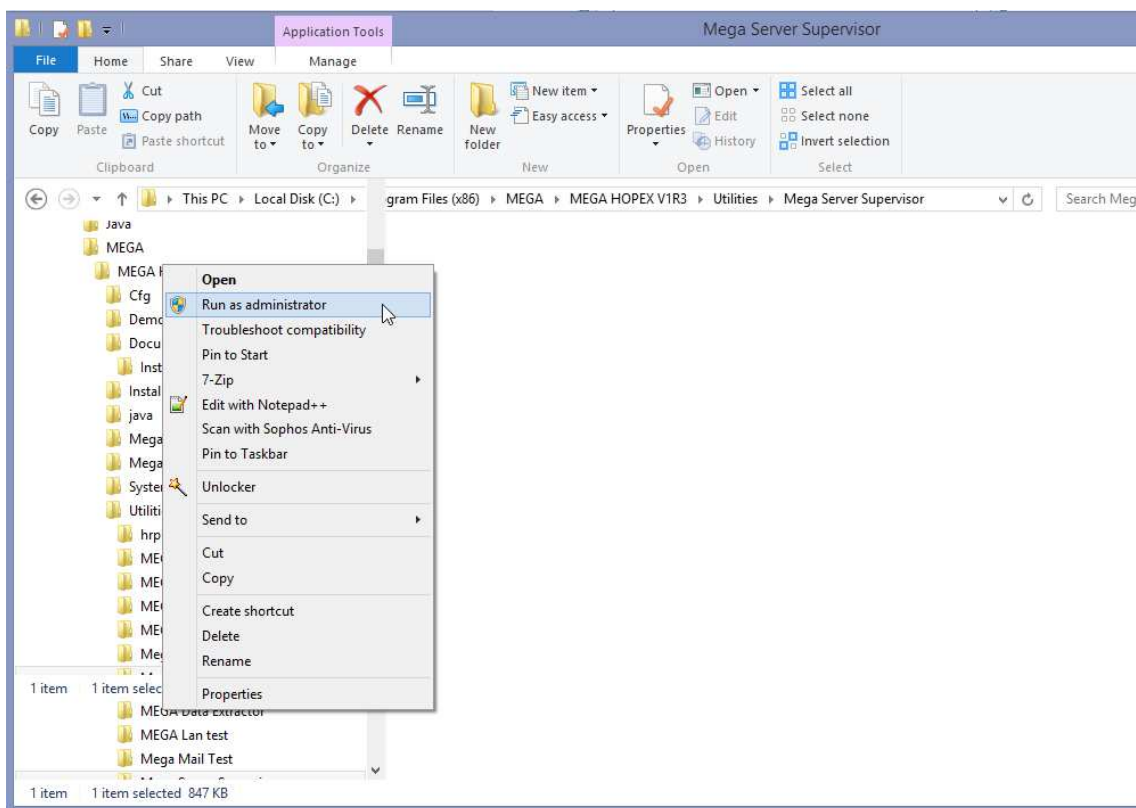
- e. Allow: "Full Control" and "Read".



- f. Apply and close the registry.

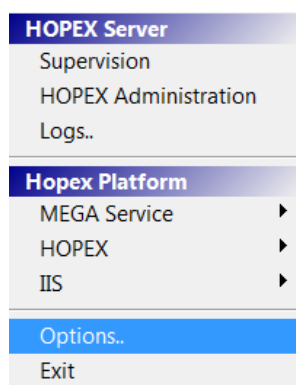
Mega Server Supervisor: « verbose mode » activation

1. In the MEGA installation folder, expand the **Utilities > Mega Server Supervisor** folder of Mega binaries.
2. Right-click « MEGA Server Supervisor.exe » tool and select **Run as administrator**.

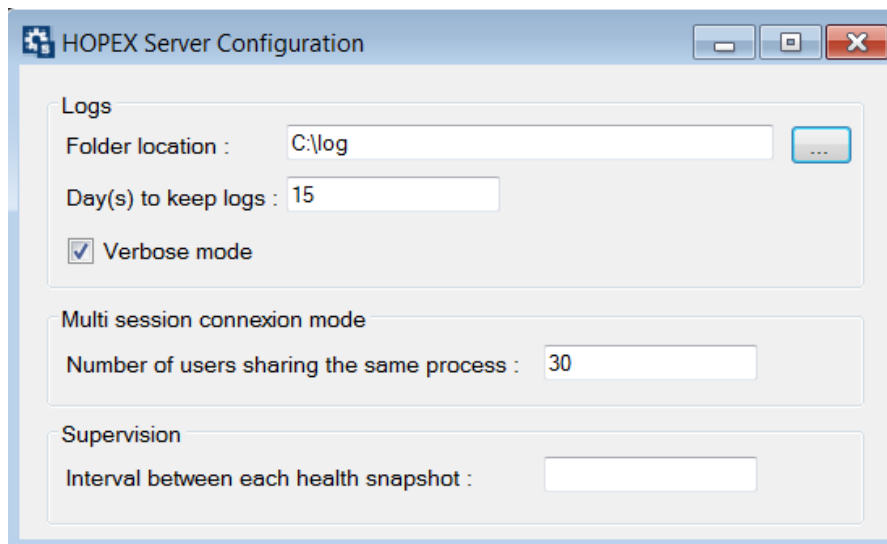



The **MEGA Server Supervisor** icon  appears in the system tray of your workstation.

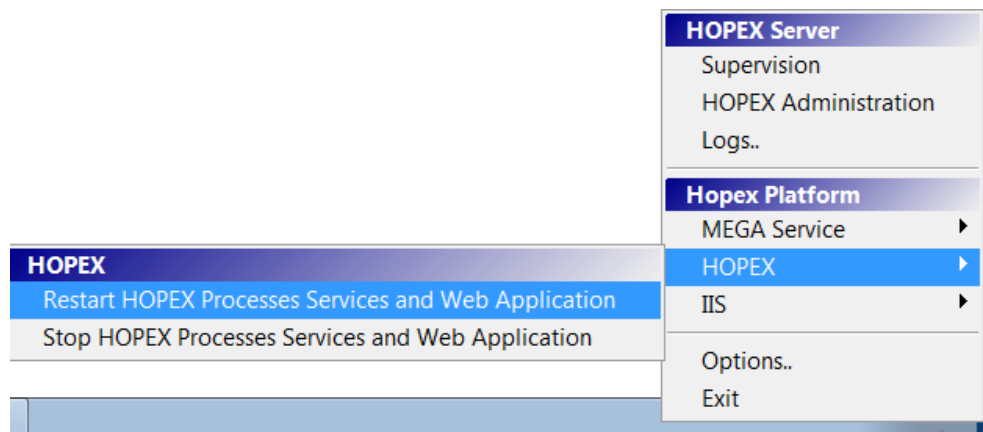
3. Right-click the icon and select **Options**.



4. Select **Verbose Mode**.



5. Close the configuration window to apply.
6. If your application was started, you need to restart it. You can use the Mega Server Supervisor to do so: right-click the **MEGA Server Supervisor** icon  and select **HOPEX > Restart HOPEX Processes Services and Web Application**.



Disabling the verbose mode

To deactivate the verbose mode:

1. Follow the Mega Server Supervisor: « verbose mode » activation procedure p. 47 and clear **Verbose mode**.
2. Restart the application to take the modification into account.


URL Rewrite

This is a component that was added with the Update 2 of Hopex V2R1. A component that is added to the usual IIS features.

If you make a new install with the Update 2 master, you shouldn't concern yourself.

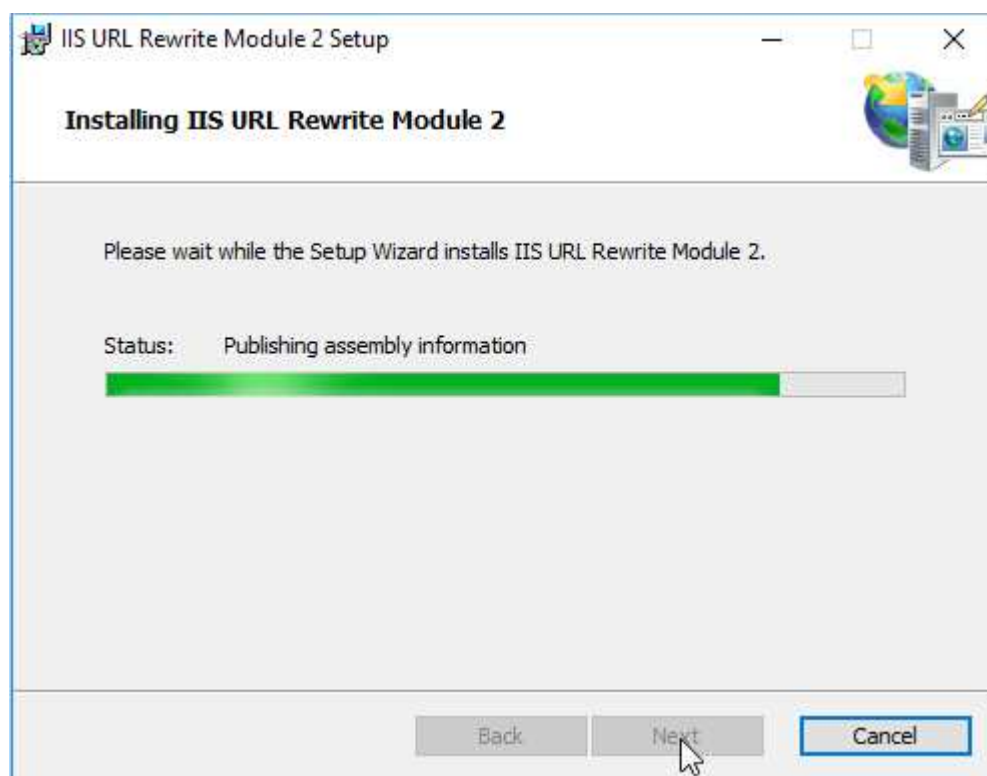
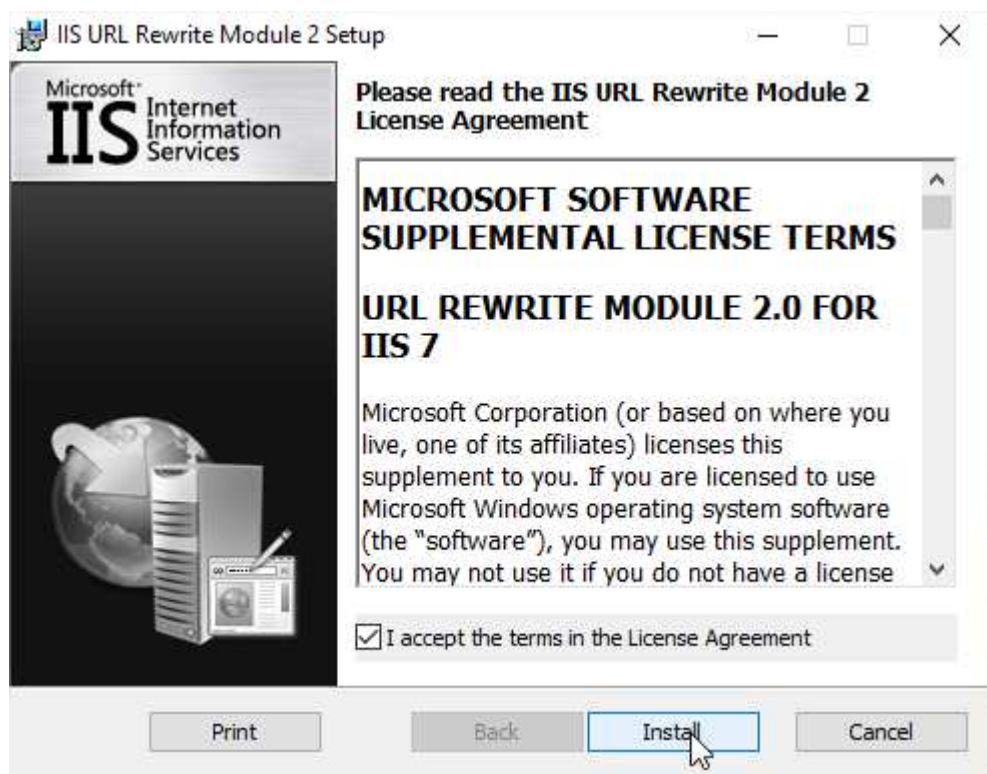
However, if you had a previous install of Hopex V2R1, and you used this document to make you installation, instead of the very specific release note linked to patching to Update 2, then you need to install that feature.

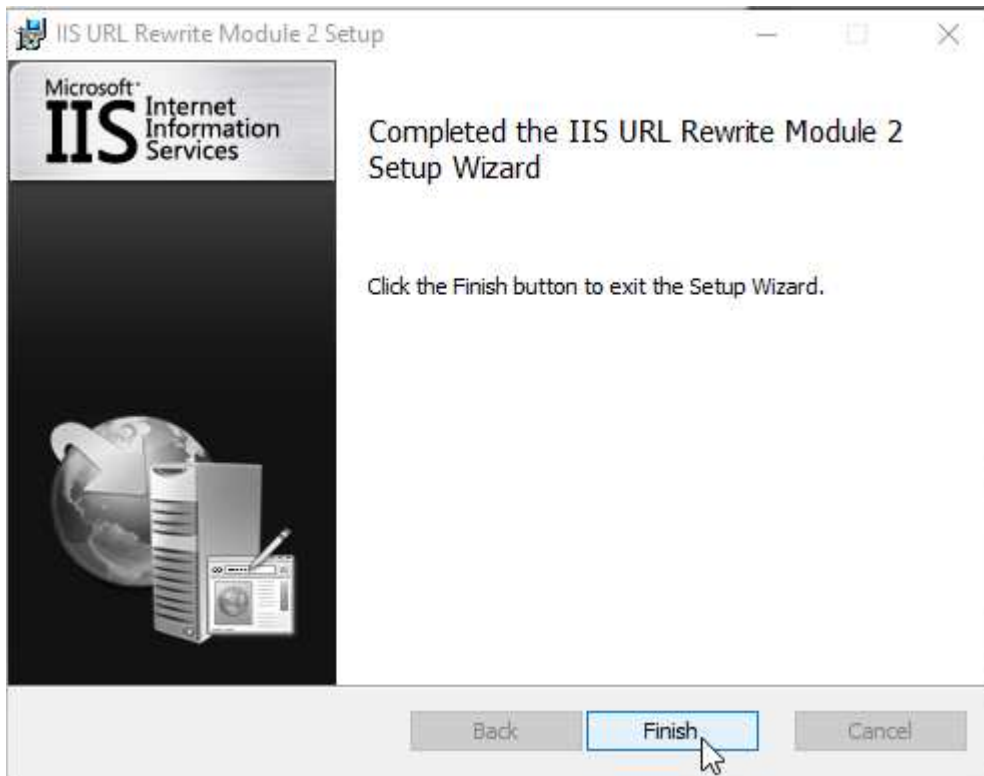
You can find the installer link at this address:

Web Front-End Single-Server Installation Guide HOPEX V2R1 EN	page 48/59	C0 - PUBLIC	
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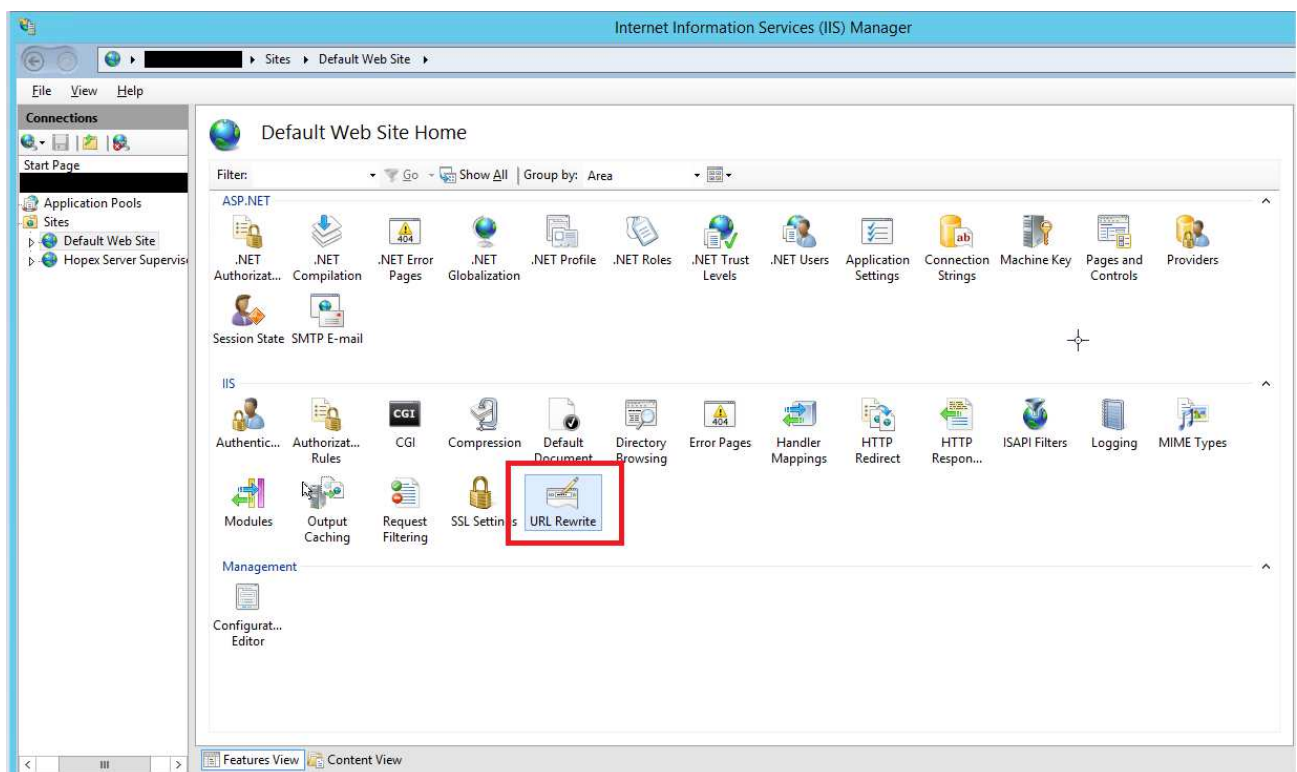
<https://www.microsoft.com/en-us/download/details.aspx?id=47337>

Click on "Install" and let the component get deployed:





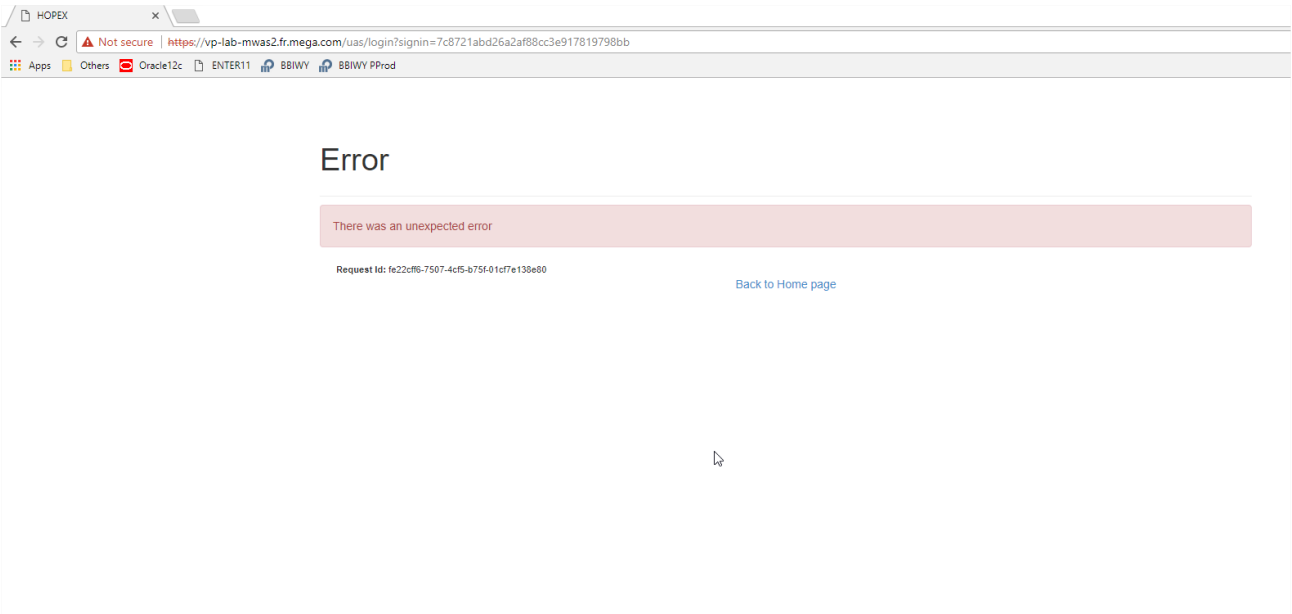
A **reboot** is required to be able to see the feature in IIS:



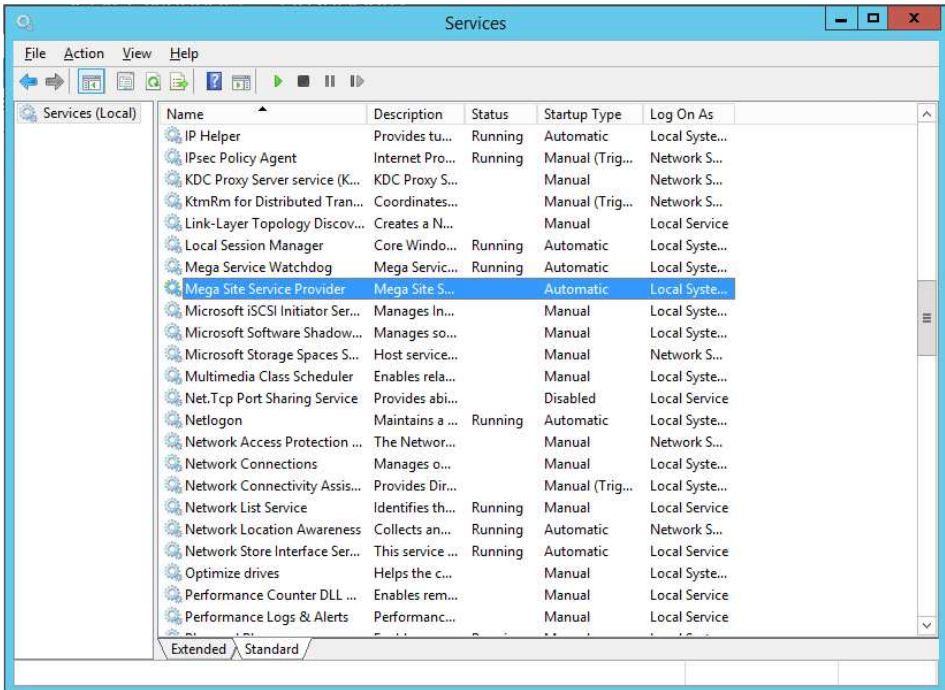
TROUBLESHOOTING

Check that the Site Service Provider is running

If you have the following message, and environments are accessible using Administration.Exe and Mega.exe:



You should first check that the “HOPEX Site Service Provider”, and the “HOPEX Service Watchdog”, are running using the Services administration tool:

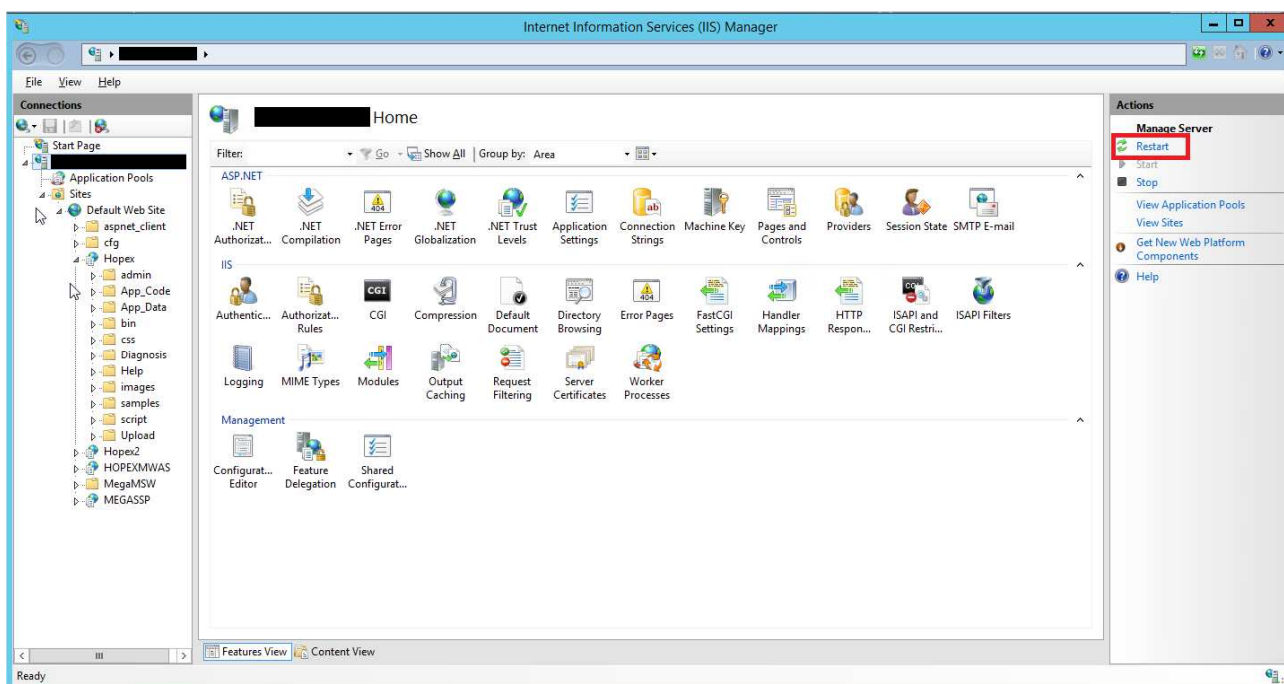


If those are not running, check that its startup is « Automatic » and Start the services.
If it is running, restart the service.
Then restart IIS (see below).

Restarting Internet Information Services

If errors occur, the first step is to try to restart the Web Server.

In the "Internet Information Services (IIS) Manager", select the server name and click "Restart" in the Actions panel



Referencing a New Environment

So that a new environment is fully accessible in MEGA HOPEX, do not forget to give the "Windows user for MEGA HOPEX" full access rights to the environment folder.

If you have a multi-server deployment, you should reference it and check the rights on every server (except for pure web servers).

Disabling Data Execution Prevention

In rare cases, it might be necessary to disable "Data Execution Prevention (DEP)" for MEGA programs.

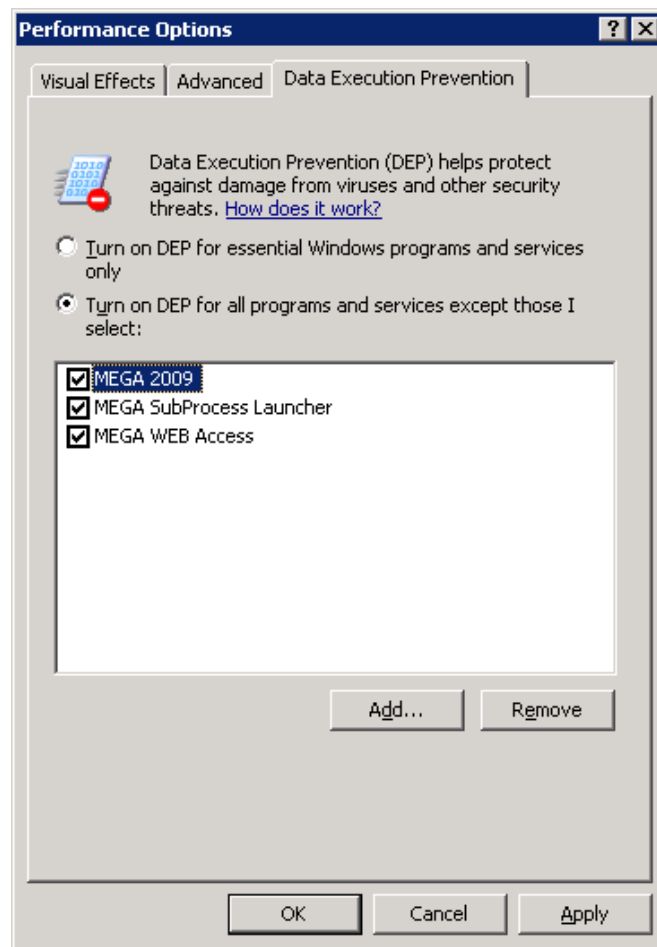
If you are able to run the Administration.exe and/or the Hopex.exe rich clients from the web server, then the following procedure is unnecessary.

To access the DEP settings:

In the "Start" menu, right-click "Computer" and select "Properties". In the next screen, click "Advanced System Settings". Go to the "Advanced" tab, click "Settings" in the "Performance" group and select the "Data Execution Prevention" tab.

You can either turn on DEP only for essential Windows programs and services, or add exceptions for the following Mega programs (default installation locations):

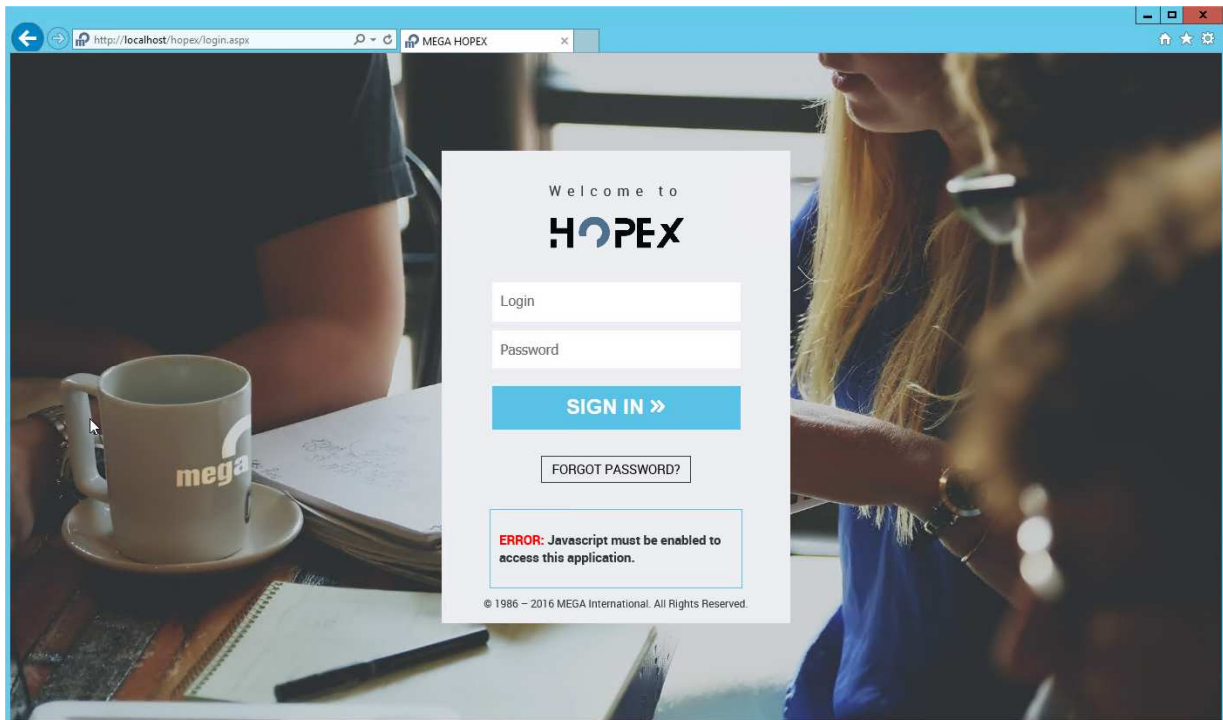
- C:\Program Files (x86)\MEGA\HOPEX V2R1\System\mgwspro.exe
- C:\Program Files (x86)\MEGA\HOPEX V2R1\System\mgwmapp.exe
- C:\Program Files (x86)\MEGA\HOPEX V2R1\System\mgwmwas.exe



Loosening Internet Explorer Security Settings

Although default browser security settings on client machines are sufficient for using the MEGA Web Application, some computers, especially servers, might have stricter security policies. For

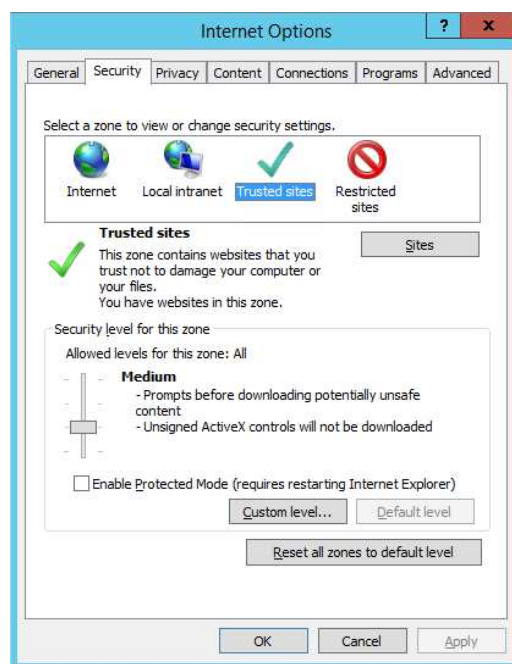
instance, they might prevent the execution of JavaScript, on which the MEGA Web Application relies.



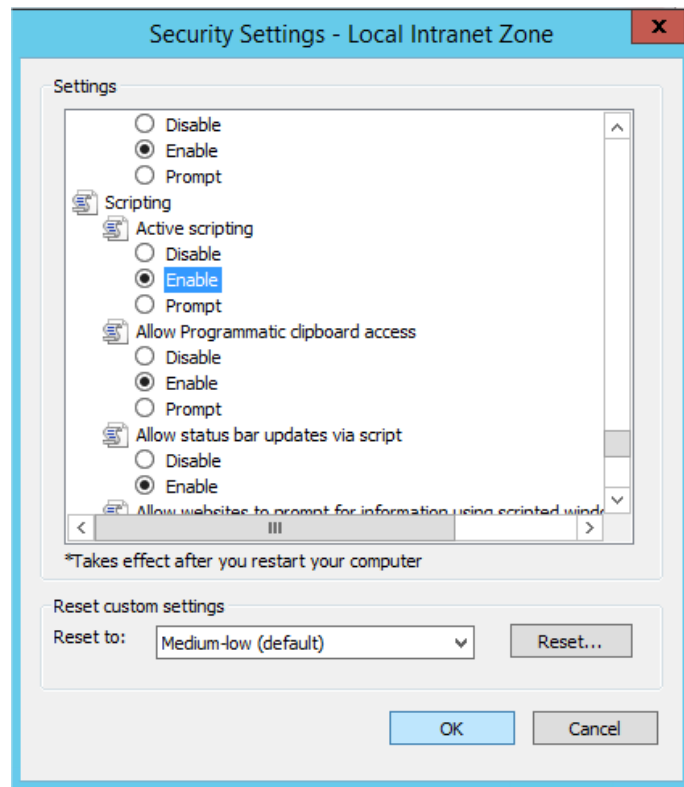
To fix this issue, follow the steps below:

Step 1: Enable Active Scripting on the trusted sites zone

1. Go to the "Tools\Internet Options..." menu
2. Select the "Security" tab
3. Click on "Trusted Sites" then "Custom Level"

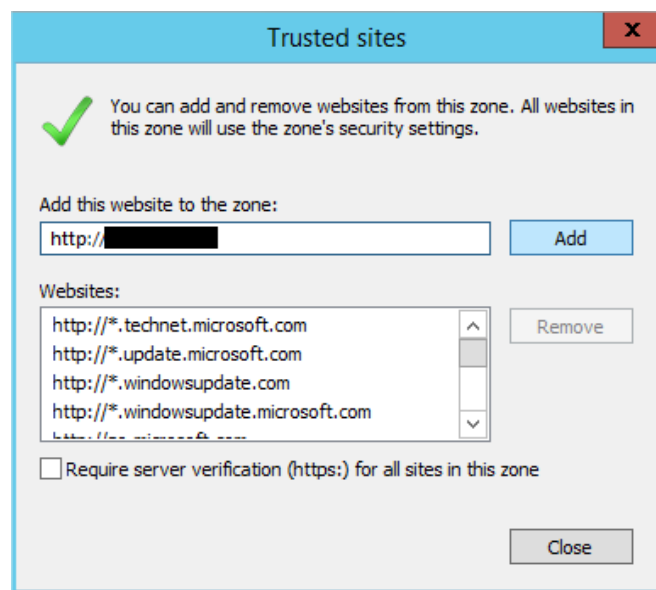


4. Enable "Active Scripting"



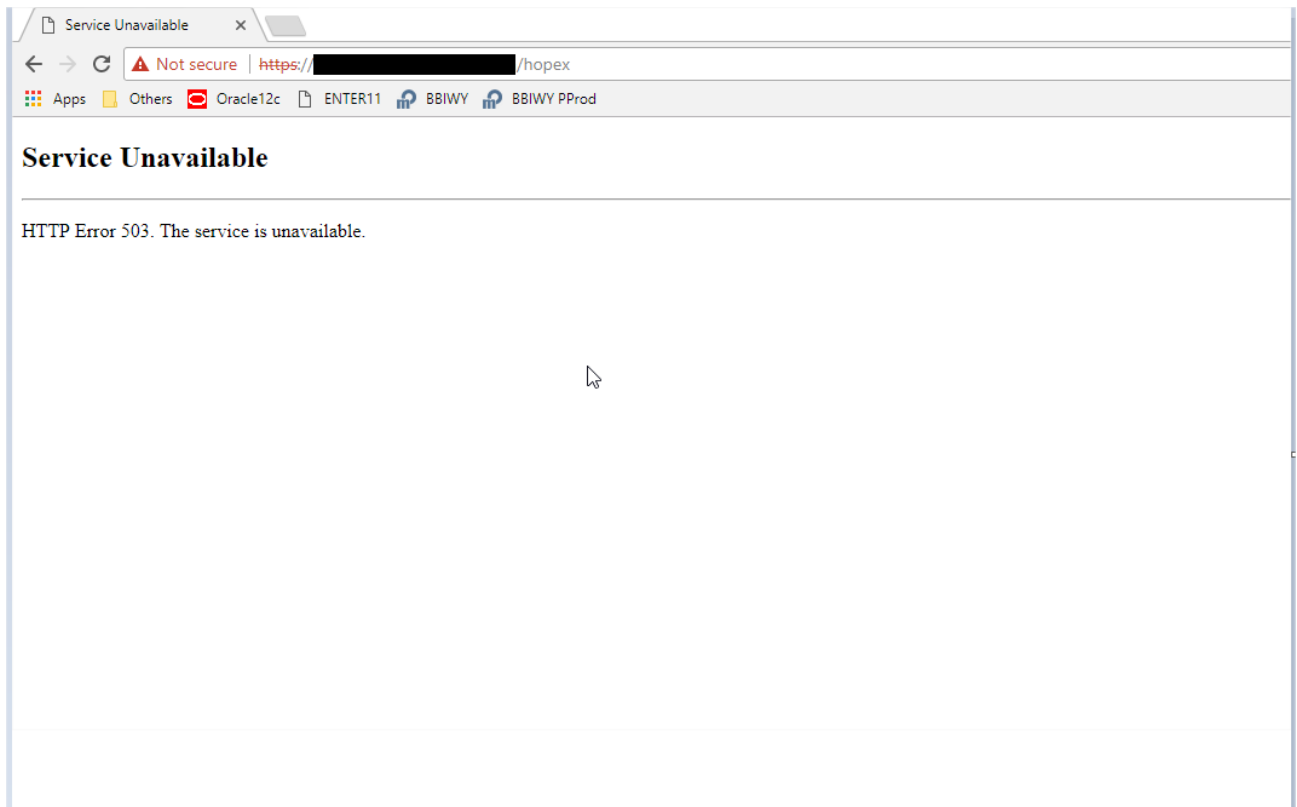
Step 2: Add MEGA Web Application to the trusted Web sites list

1. Go to the "Tools\Internet Options..." menu
2. Select the "Security" tab
3. Click "Trusted sites" then "Sites"
4. Enter the Address of your Web site, click "Add"
5. Validate



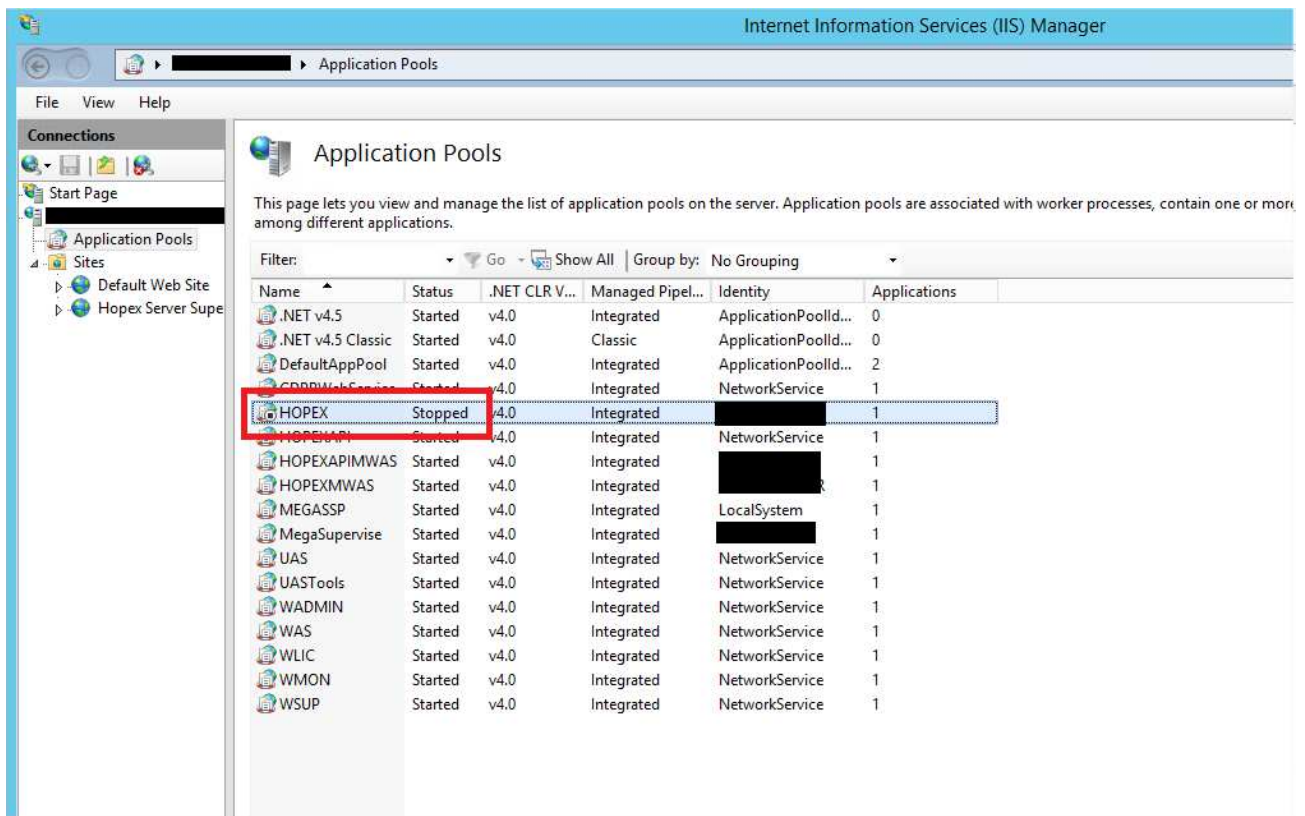
Manage http 503 error

If, when trying to access the /hopex of your web application, you end up on this kind of error page:



If this is the case, you may want to check IIS Manager, and more precisely the status of the application pool called "HOPEX".

As you can see, it is in "Stopped" status:

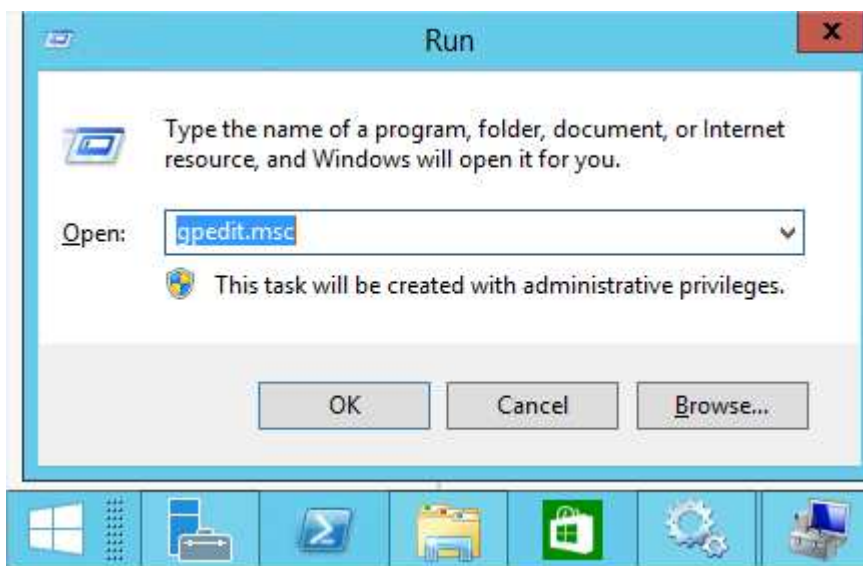


You can try to start it again, and refresh your browser. If you continue to have this error message, you can go back to IIS Manager, refresh the view of the application pools, and see if it is stopped again.

If it is still the case, you most likely have a policy issue on that account.

To check the local policies, execute the following command from the "Run" menu of your application server:

gpedit.msc



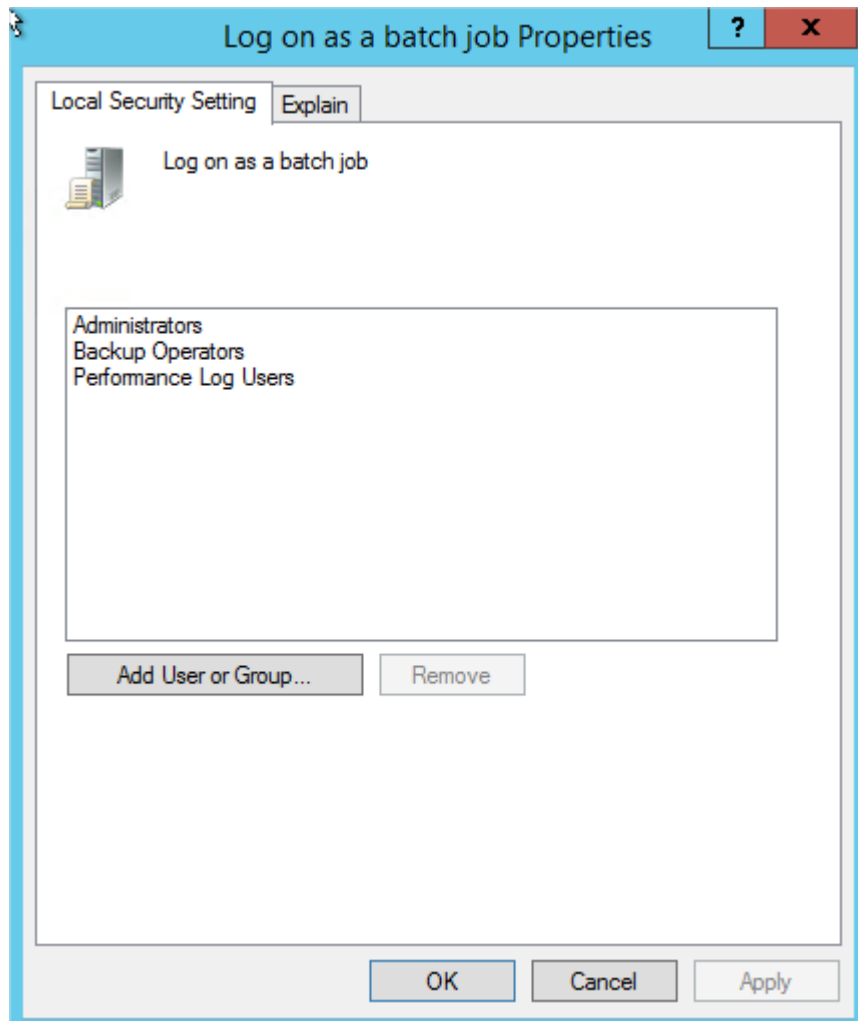
In that tool, browse to "Computer Configuration -> Windows Settings -> Security Settings -> Local Policies -> User Rights Management", and locate the rules :

- Log on as a batch job

- Impersonate a user after authentication

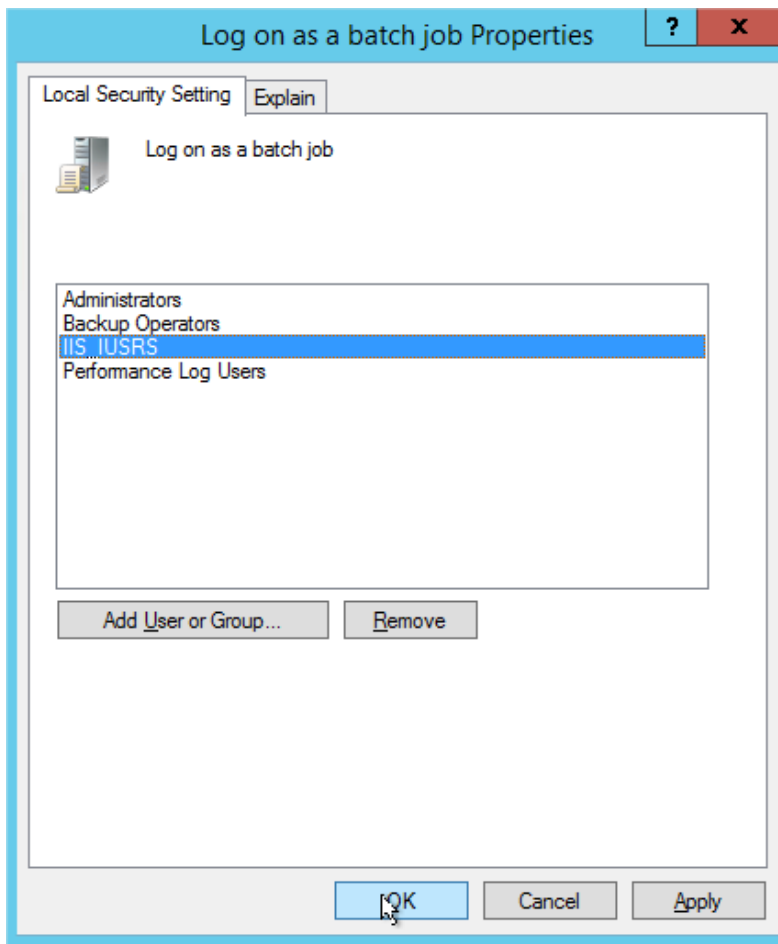
If you open the Properties of those rules, you need to check if the groups containing the Windows user you set up during the installation are part of the list of granted resources.

Here, we see that the IIS_IUSRS local group is missing:

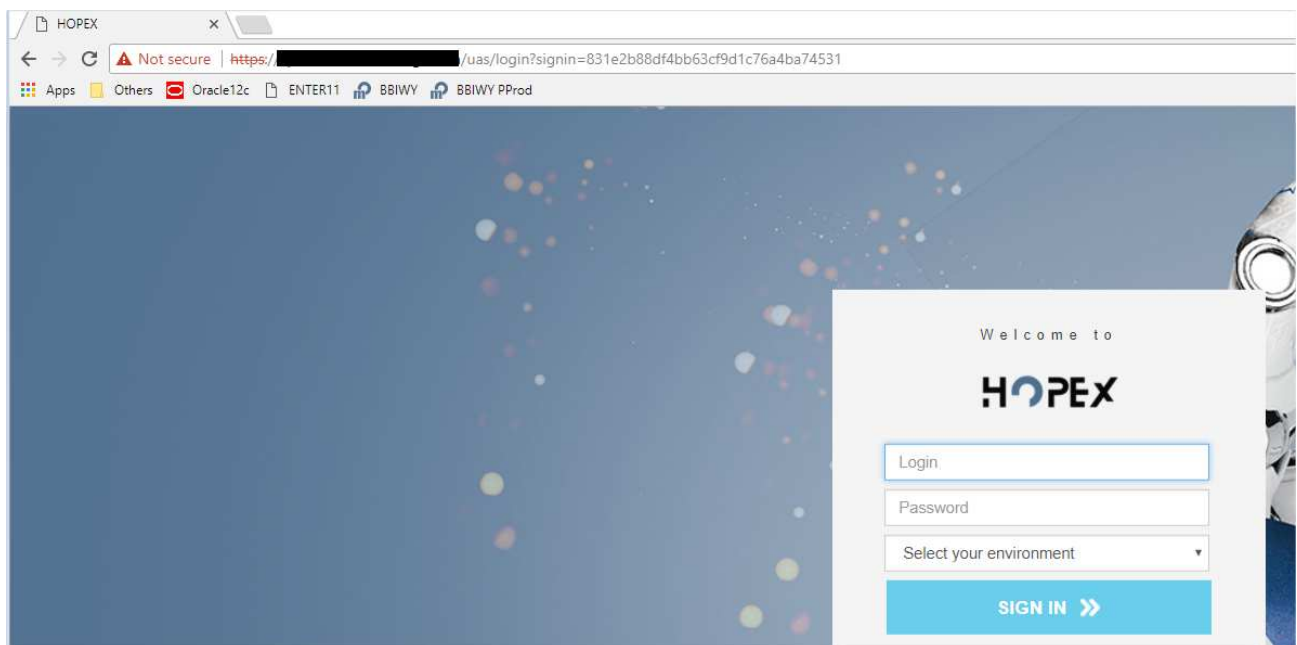


It most likely means that, at a higher level, group policies (or GPOs) are set to remove that group, which is normally granted that right.

If you can modify it yourself, click on "Add User or Group...", and add the "IIS_IUSRS" local group:



Do it for both policies. And restart the application, and IIS. Make sure that the "HOPEX" application pool is started. And test again. If this update was successful, you will see the login page:



If editing those policies is not permitted (grayed out in the interface), you need to explain this to the people in charge of setting up GPOs for the servers, so that they make this modification.

Web Front-End Architecture Overview HOPEX V2R1

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SUMMARY

This document applies to HOPEX V2R1 Update 2 and higher update.

It does not describe:

- How to perform installations (see installation documentation).
- How to manage installations (see administrator manuals).
- How products are licensed (see license installation documentation).
- How to use features (see user manuals).

The figures provided in this document are recommendations that may not apply to all contexts. In committing phases, a specific study with MEGA product management support is compulsory.

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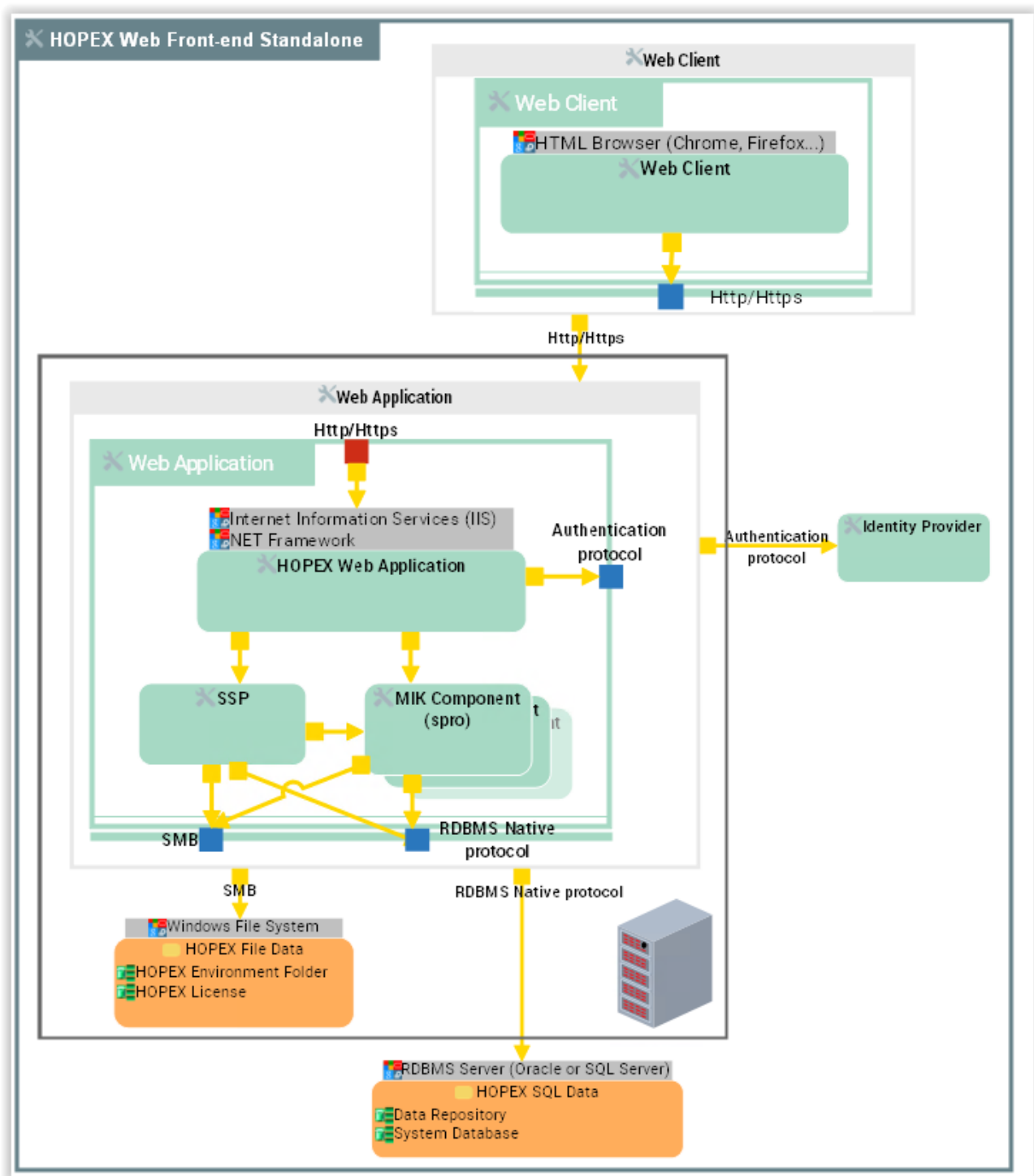
1. DEPLOYMENT TYPES

The HOPEX Web Front-End can be deployed in different typical ways:

Deployment type	Recommended for	Comment
Standalone	Small deployment	2 tiers architecture All in one server. Very easy to install.
Horizontal scaling	Large deployment	Multi-tiers architecture Also called 'Scale up'
Vertical scaling	Large deployment	Multi tiers architecture Also called 'Scale out'

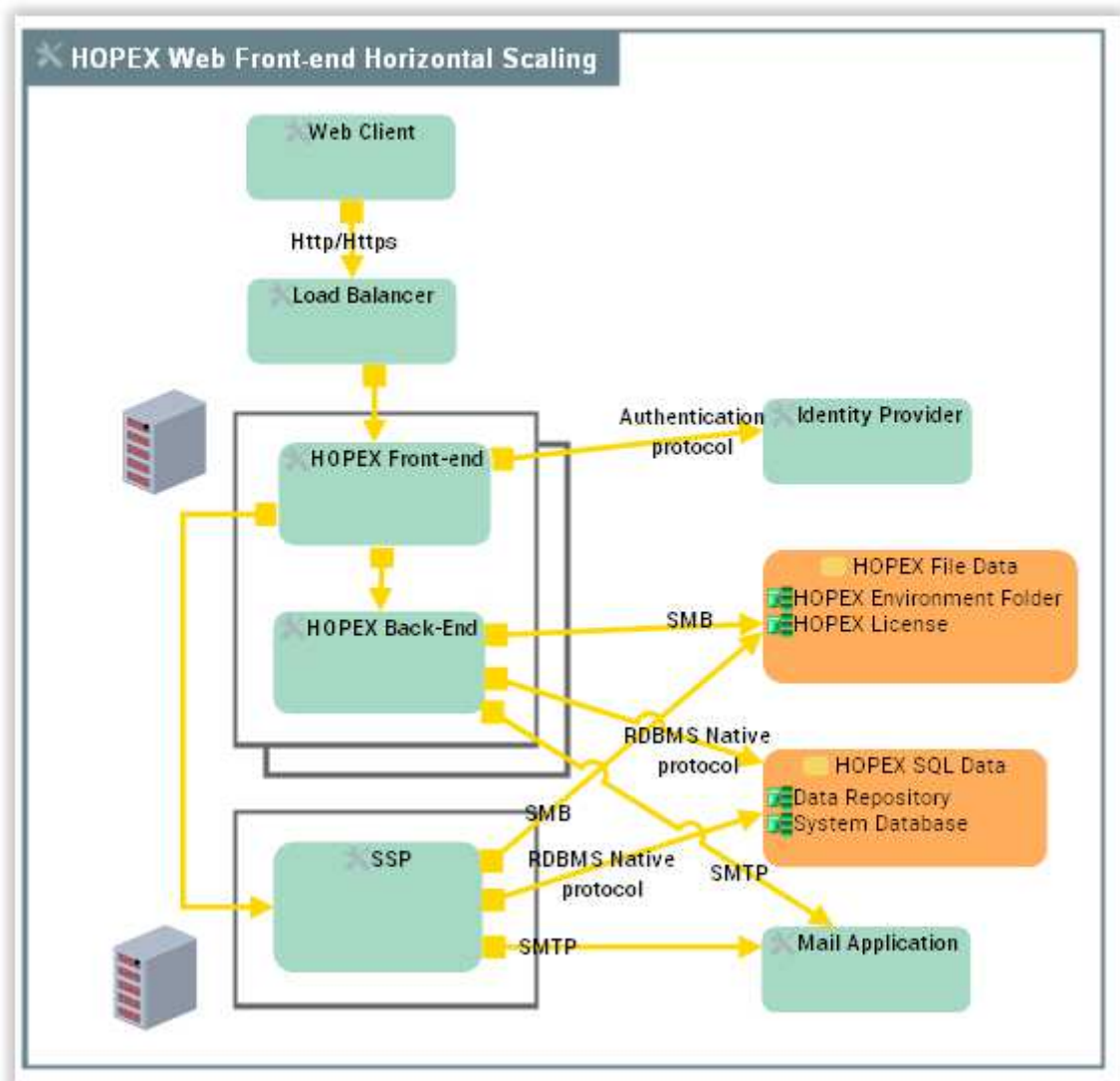
Other deployments – For specific requirements, other deployments are possible. For further information, contact your sales representative.

1.1. Standalone Deployment



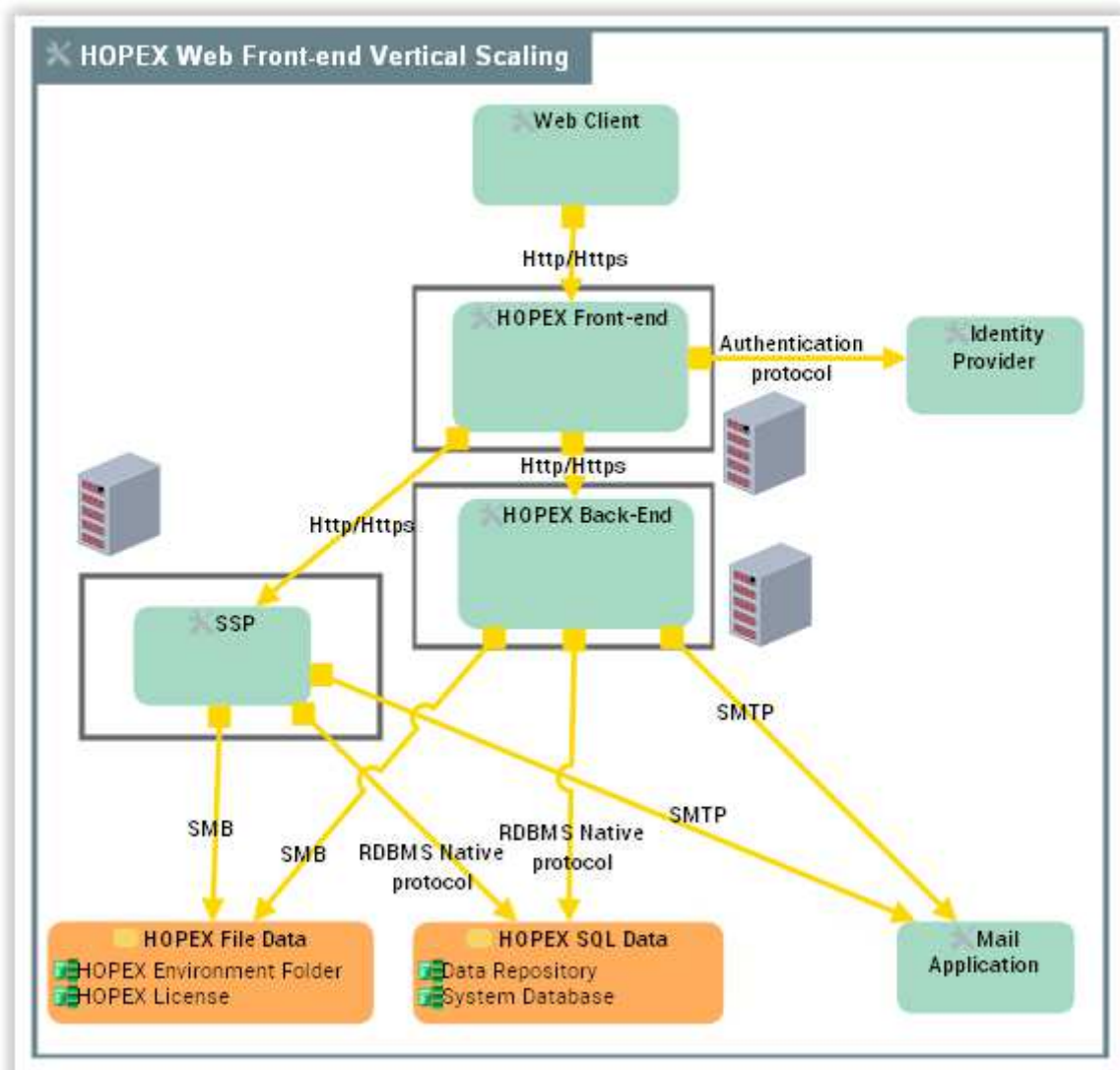
To facilitate readability, different elements have not been displayed (authentication server, mail server, SQL Server Native client required for SQL Server storage).

1.2. Horizontal scaling Deployment



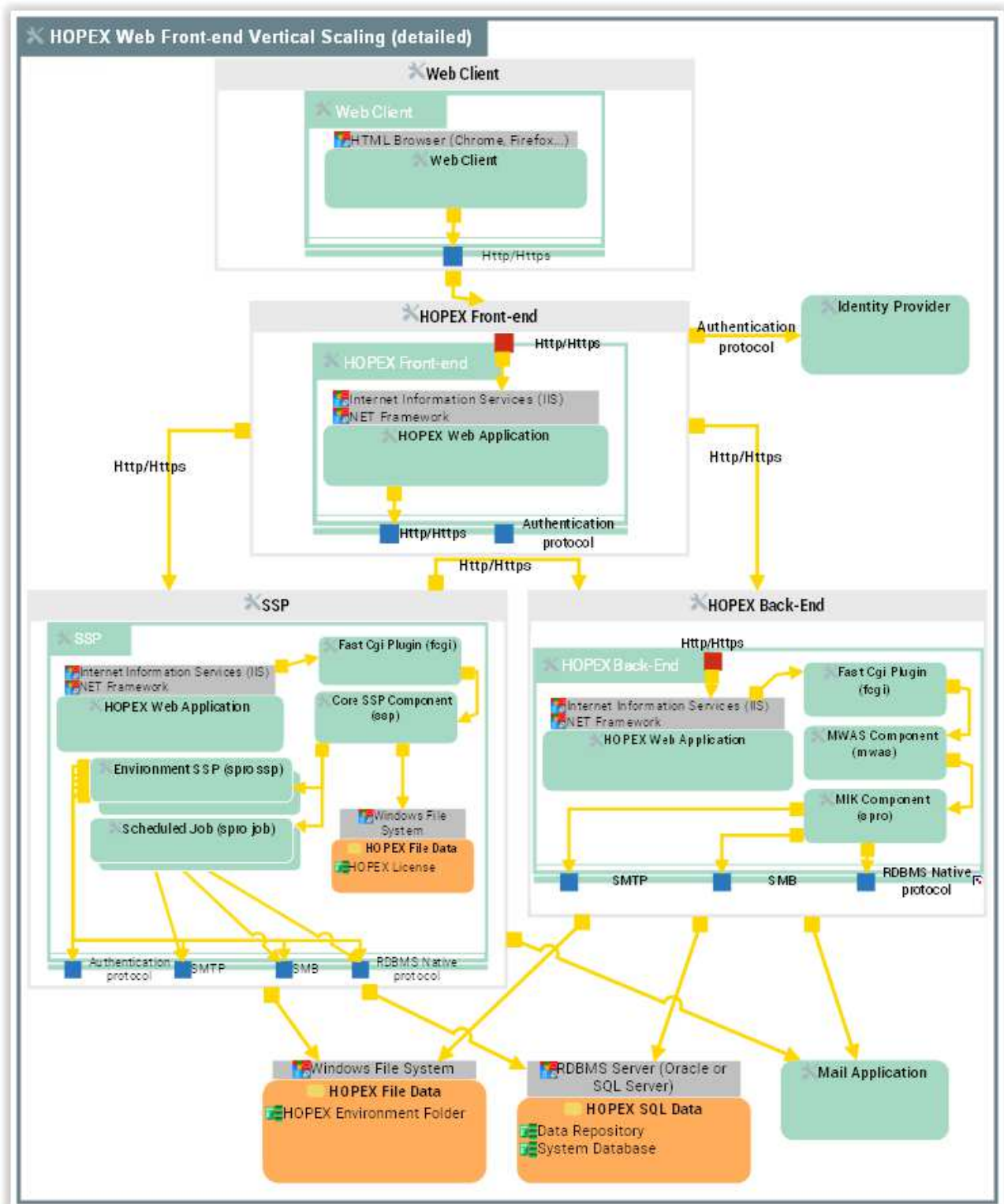
To facilitate readability, different elements have not been displayed (authentication server, document server, mail server, SQL Server Native client for SQL Server storage).

1.3. Vertical scaling Deployment



To facilitate readability, different elements have not been displayed (authentication server, mail server, SQL Server Native client for SQL Server storage).

1.4. Vertical scaling Deployment (detailed view)



To facilitate readability, SQL Server Native client (SQL Server storage) is not displayed.

2. COMMON DEPLOYMENT REQUIREMENTS

2.1. Web Client

HTML Browser 32/64 bit	MS Edge (1) Mozilla Firefox ESR (1) Google Chrome (1) Apple Safari (1)
Configuration	Screen resolution 1280x800 16 M colours JavaScript enabled Cookies enabled HTML 5 enabled Download of files enabled Popup blocker disabled Web storage enabled
Additional Software	PDF reader RTF/DOC/DOCX reader XLS/XLSX reader

(1) Supported with minor restrictions. See FAQs section p. 26.

2.2. Application Server

Operating system	Windows Server 2012 Windows Server 2012 R2 Windows Server 2016 Microsoft Azure deployment (1) For other systems a specific study is necessary Visual C++ Redistributable for Visual Studio 2015 (2)
Hardware	Processor Multi core RAM 6 GB minimum. 2 GB for the system 2 GB for data cache in memory Per environment SSP 400 MB Per equivalent concurrent modeller user 600 MB intensive use 300 MB low use Disk space 4 GB recommended for HOPEX Kernel 200 MB recommended for IIS applications 500 MB recommended for logs
Additional Software	SQL Server Native client 11.0 (SQL Server 2012, SQL Server 2014, SQL Server 2016) If data is stored in SQL Server

Web Server	MS Internet Information Services 8.0 MS Internet Information Services 8.5 MS Internet Information Services 10.0
Script layer	ASP .NET .NET Framework 4.6.2 or higher

- (1) With specific parameters. See Appendix
(2) Required for each Window machine running HOPEX kernel (workstation or server).

Note that these are general indications. You should contact MEGA to discuss a more suitable sizing, especially if more than 5 users are expected.

2.3. File Server

Operating system	Windows Server 2012 Windows Server 2012 R2 Windows Server 2016 Microsoft Azure deployment (1) For other file systems a specific study in necessary
Hardware	Processor Multi core RAM 1 GB minimum. 1 GB for the system Disk space 5 GB recommended per HOPEX Environment (environment folder) 10 MB for HOPEX License

- (1) With specific parameters.

2.4. Database Server

Server System	see RDBMS requirements
RDBMS	Oracle Database Server 12C (12.1, 12.2), SQL Server 2014 SQL Server 2016
Disk space	Data: 2 GB minimum per system database 3 GB minimum per data repository Refer to the separate article 'RDBMS Repository Installation guide HOPEX V2R1'.
Hardware	RAM: a specific study is required. Refer to the separate article 'RDBMS Repository Installation guide HOPEX V2R1'. CPU: see hardware requirements of the RDBMS.

3. COMMUNICATION

3.1. Between Web Client and Web server (Web Application Server)

Protocol	HTTP by default
Port	80 by default
Network bandwidth	Per equivalent modeller user 60 Kbit/s average bandwidth 512 Kbit/s peak bandwidth
Network latency	100 Ms maximum (A)

(A) For a ping of 5 KB (It is recommended to use the hrping utility). Refer to the separate article 'RDBMS Repository Installation guide HOPEX V2R1'.

Note that a proxy configuration can be required: see section 'Security' of this document.

3.2. Between Environment SSP or MIK and Database server (Oracle, SQL Server)

Protocol	Oracle: Oracle Native Protocol SQL Server: SQL Server Protocol
Port	Oracle: Example TCP 1521 (B) SQL Server: Example UDP/TCP 1433 (B)
Network bandwidth	1 Gbit/s minimum full duplex (C)
Network latency	1 Ms maximum (A)

(A) For a ping of 5 KB (It is recommended to use the hrping utility). Refer to the separate article 'RDBMS Repository Installation guide HOPEX V2R1'.

(B) Default port, check the appropriate port with the database administrator.

(C) For 30 concurrent users.

3.3. Between Environment SSP or MIK and mail server

Protocol	SMTP
Port	25 by default, configurable
Network bandwidth	1 Gbit/s minimum full duplex (C)
Network latency	1 Ms maximum (A)

3.4. Between Environment SSP or MIK and file server (file access, license access)

Protocol	SMB/CIFS
Port	UDP/TCP 138 UDP/TCP 137 UDP/TCP 139 UDP/TCP 445
Network bandwidth	1 Gbit/s full duplex

3.5. Between Environment SSP and LDAP Server

Protocol	LDAP
Port	TCP 389 by default (B)
Direction	Bidirectional

(B) Default port, check the appropriate port with the LDAP server administrator.

4. INSIDE

4.1. Administration tools

Several administration tools can be used:

Administration tool	Component	Tasks
Web Administration Desktop	Desktop of HOPEX Web Front-End	Functional administration (user, permissions, workspaces, LDAP configuration, import/export...)
Web Supervision console	.NET application	Monitoring of running processes and events...
Web Monitoring console	.NET application	Monitoring of connected user, management of logs, installation checks...
Web Licensing console	.NET application	Monitoring of license use, assignment of users to the license...
Windows Administration Console	Win32 (Administration.exe)	Data storage management (environment, repositories, stored procedures) Functional administration (user, permissions, workspaces, LDAP configuration, import/export...)
Monitoring Console	.net web page (XX.aspx)	Supervision of HOPEX (IIS) application
IIS manager	Win64 (InetMgr.exe)	Management of IIS server
Must license manager	Win32 (Licensing.exe)	Management of Must license
Windows Front-End	Win32 (HOPEX.exe)	Fix unexpected configuration issue
HOPEX Server Supervisor	Win32 (Hopex Server Supervisor.exe)	System supervision of the server

Reference:

See online documentation, HOPEX Administration ... Administrator Guide

4.2. Anti-virus Configuration

To maintain good performances, it is recommended to exclude certain file extension from antivirus scanning (on access scanning)

Machine	Location/File	Comment
Each machine running HOPEX	%programdata%\MEGA and subfolder Ex: C:\ProgramData\MEGA File extension: *.MGC	Folders of the Compiled data cache and RDBMS local cache
Each machine running HOPEX	Location: check with the HOPEX administrator Ex: C:\Program Files (x86)\MEGA\MEGA HOPEX V2R1 File extension: *.*	Folders of HOPEX core programs
Each machine running HOPEX IIS application	Location: see HOPEX administrator Ex: C:\inetpub\wwwroot\HOPEX File extension: *.*	Folders of HOPEX IIS application

4.3. Authentication

Basic authentication (variant MEGA) is available immediately after installation.

Other authentication models need to be configured in HOPEX or integrated with HOPEX after installation.

From HOPEX V2R1, an authentication framework called 'UAS (Unified Authentication Service)' is used. It enables to:

- Secure authentication requests.
- Use standard identity providers.
- Develop custom identity provider.

Several authentication models can be implemented:

Authentication models	Description	Comment
OpenID authentication	Authentication process is managed within HOPEX Platform. Users are declared in an external directory. Standard providers are available for the following identity providers: Microsoft, Salesforce, Google	This model is recommended for standard deployments where OpenID is used. No integration is required for the 3 identity providers addressed, only configuration and testing. For other identity providers, a specific integration is required.
SAML2 authentication	Authentication process is managed within HOPEX Platform. Users are declared in an external directory. A standard provider is available, implemented using AD FS (Active Directory Federation Services).	This model is recommended for standard deployments where SAML2 is used. No integration is required, only configuration and testing.
Windows Authentication	Authentication process is managed within HOPEX Platform. Users are declared in an external directory. A standard provider is available, implemented using WIF (Windows Identity Foundation)	This model is recommended for standard deployments where Windows Authentication is used. No integration is required, only configuration and testing.
Basic authentication	Authentication process is managed within HOPEX Platform. Users are declared explicitly in the HOPEX Environment and possibly mapped individually with an external directory. 3 variants: MEGA, LDAP, Windows	This model is recommended for basic deployments. No integration is required, only configuration.
Fully custom authentication	Authentication process is external to the HOPEX platform (UAS is skipped). All types of IT corporate directory can be addressed (customized identity provider)	This model is not recommended. It can be used for advanced deployments with specific requirement. It requires a specific integration.

Password values storage, encryption and update vary with the configuration chosen.

Authentication models	Storage	Encryption
OpenID authentication	According to identity provider specifications	According to identity provider specifications
SAML2 authentication	Active Directory	According to directory specifications
Windows Authentication	Active Directory	According to directory specifications
Basic authentication (MEGA)	System repository	Encrypted, hashed
Basic authentication (Windows)	Active Directory	According to directory specifications
Basic authentication (LDAP)	LDAP directory	
Fully custom authentication	According to implementation	According to implementation

Reference:

- Online documentation, HOPEX Administration ... Authentication in HOPEX
- Article 'HOPEX Unified Authentication Service Installation guide'

4.4. Cluster, scalability and load balancing

This document contains metrics for a small deployment. Sizing is a complex matter that is closely linked to infrastructure and can be impacted by security policy. As a consequence, medium or large deployments need specific studies:

- Initial sizing according to load hypothesis.
- Load tests in the final infrastructure to check that sizing is appropriate.

For large deployments, scalability and load balancing is required.

Service	Principle
Scalability	Install on a cluster/farm server. A configuration file is used to share configuration between nodes.
Load balancing	Install on a cluster/farm server. Use a load balancer mechanism to balance load between nodes. A specific integration is required.
High availability	Install on a cluster/farm server. Use server SSP nodes (multiple SSP servers) Use a load balancer mechanism to balance load between nodes. A specific study is recommended.

To implement load balancing, various solutions are available on the market. In all cases the solution must be qualified and supported by customers and/or third parties.

4.5. Data access

Access to data is mainly controlled using profiles (repository access, data permissions, and GUI permissions).

Other features are available:

- Writing access management: control of updates on existing objects.
- Reading access management: control of visibility regarding existing objects.
- Data access rules: computed control of visibility regarding existing objects.

Reference:

See online documentation.

- HOPEX Administration ... Managing Data Reading Access
- HOPEX Administration ... Managing Data Writing Access

4.6. Data storage

Each HOPEX Environment consists of one system repository and one/several data repositories.

By default, data is stored in a database server (SQL Server, Oracle). This is called RDBMS storage. RDBMS storage is mandatory Web Front-End.

Storage	Mapping	Comment
SQL Server	A data repository is an SQL Server database. A system repository is an SQL Server database. (1)	Create one SQL server user for the environment with specific privileges. Only SQL server authentication is supported. Install and schedule stored procedures by data repository or system repository. No dedicated instance is required. SQL Server native client. Default port can be used.
Oracle	A data repository is a user/schema. A system repository is a user/schema.	Create one Oracle user by data repository or system repository with specific privileges. Install and schedule stored procedures by data repository or system repository. No dedicated instance is required. No client-side installation (Oracle instant client). Default port can be used. Create one tablespace for each environment (recommendation).

(1) This the standard recommendation. It is also possible to store a data repository in a schema of a SQL Database.

Reference:

- Article 'RDBMS Repository Installation guide HOPEX V2R1'
- See online documentation, Products.

4.7. Document management

A document management system is available through a solution or a pack. **RDBMS storage is required.**

Object	Location	Storage
Business Document	Data repository	Database server
System Business Document	System database	Database server

If document management is enabled, web users can add, update and consult documents.

Reference:

- See online documentation, Common Features ... Using Business Documents

4.8. Error and trace logfiles

No log is generated on the client side. All errors are displayed using popup windows or via the HTML browser. An option enables to control the display of errors to end users (GUI). For advanced diagnostic, a verbose mode can be enabled to generate more detailed logfiles.

Different files can be created on server side:

File	Comment	Default location (example)
sspsprvsYYYYMMDD.txt	Supervision log (3)	%programdata%\MEGA\HOPEX V2R1\ClusterRoot\Supervision Ex: C:\ProgramData\MEGA\HOPEX V2R1\ClusterRoot\Supervision
SSPLOGYYYYMMDD.txt	Core SSP log (3)	%programdata%\MEGA\Logs Ex: C:\ProgramData\MEGA\Logs
ssperrYYYYMMDD.txt	Environment SSP log (3)	%programdata%\MEGA\Logs Ex: C:\ProgramData\MEGA\Logs
MWASLOGYYYYMMDD.txt	MWAS component log (5)	%programdata%\MEGA\Logs Ex: C:\ProgramData\MEGA\Logs
megaerrYYYYMMDD.txt	MIK component log (1)	%programdata%\MEGA\Logs Ex: C:\ProgramData\MEGA\Logs
uas-YYYY-MM-DD.log	UAS component log (4)	%programdata%\MEGA\Logs \UAS Ex: C:\ProgramData\MEGA\Logs\UAS
SWDLOGYYYYMMDD.txt	Service Watchdog log (2)	%programdata%\MEGA\Logs Ex: C:\ProgramData\MEGA\Logs
event-YYYY-MM-DD.log	Event logs	%programdata%\MEGA\Events C:\ProgramData\MEGA\Events
dtpxYYYYMMDD.txt	DTPX component log (4)	<iis root>\HOPEX\App_Data\DTPX Ex C:\inetpub\wwwroot\HOPEX\App_Data\DTPX
redis_server_log.txt	Redis component log (2)	%programdata%\MEGA\HOPEX V2R1\Logs Ex: C:\ProgramData\MEGA\HOPEX V2R1\Logs

Where

- DD is a number indicating the day in the month.
- MM is a number indicating the month in the year.
- YYYY is a number indicating the year.

(1) Location can be configured

(2) Generated for each server where HOPEX components are installed

(3) Generated for the server running SSP

(4) Generated for the server running HOPEX Front-end

(5) Generated for the server running HOPEX Back-end

4.9. Full search and indexing

Solutions of HOPEX platform can use full search. A parameter at data repository and/or system repository level enables to activate indexing.

There are 2 levels of indexing:

- Full indexing: the data repository/system repository is scanned, and index files are created in a subfolder of the data repository/system repository.
- Incremental indexing: the log (internal) of the data repository/system repository is scanned and index files are updated in a subfolder of the data repository/system repository.

Full search and indexing are available with RDBMS storage only.

Reference:

See online documentation

- HOPEX Administration ... Enabling and Customizing Repository Indexing
- Common Features ... Presentation of search tools

4.10. Licensing

Products and solutions of HOPEX platform are protected by Must licenses. Must licenses can be shared between multiple users.

Must licensing is not server-based (there is no Windows process for a license server). At runtime with HOPEX Web Front-end, a set of files are generated dynamically by service account.

However, a domain user (Active directory) is required for:

- Each service account running the HOPEX (IIS) application.
- Each user running the Administration Console (system administrator, functional administrator).
- Each user running the Windows Front-end (developer, functional administrator, user associated to a scheduled task).

To obtain a license, contact your sales representative. A UNC will be requested and a .must license file (locked on this UNC) will be sent with installation instructions.

Reference:

Article 'Must License Installation Guide HOPEX V2R1'.

4.11. Mail system

A mail server needs to be configured so that mail notifications can be used within workflows.

SMTP parameters (server, port, proxy...) can be configured for the installation using the Administration console.

4.12. Multi-language

Web Front-End enables to work with multiple languages.

Nature	List	Installation	Comment
GUI Language	Core languages (1)	Core languages are installed by default. With additional languages, it can be requested to install a language pack on the Application Server.	Controls the display of the user interface (menus, pages...) Different end users can have different GUI languages.
Data language	More than 30 languages available	Core languages are installed by default. Additional languages are installed at environment level	Enables data entry in several languages for objects. A end user can switch between several data languages within his session

(1) Core languages are English, French, Italian, Spanish and German.

4.13. Physical backup

In case you face a real disaster recovery scenario, presence of a valid and restorable backup is very important.

Element	Recommendations
Frequency	Every 24 hours (1) (2)
Retention	In the last 30 days keep daily backup In the last 12 months keep a monthly backup
Other files to backup	By default folder of each HOPEX Environment

(1) For HOPEX Environment used by an active project

(2) In particular before a major update concerning data. E.g.: system repository customization, data reprocessing, CP/RP upgrade of MEGA data

Specific recommendations

Storage	Mode
SQL Server	Cold/warm backup recommended
Oracle	Cold/warm backup recommended

4.14. Redo logs and activity tracking

Service	Activation	Comment
Embedded log (repository log)	Enabled by default	Enables to generate a log of updates (redo log), activity tracking. Also used by specific features (full search, alert management...) This log can be partially/completely initialized and disabled using Windows Administration Console.
External log (backup logfile)	Enabled by default	Enables to generate additional command files logging the updates of a user (backup log) that can be useful to recover quickly data after an incident. This log can be disabled using Windows Administration Console.

Reference:

See online documentation

- HOPEX Administration ... Managing Repositories.
- HOPEX Administration ... Managing logfiles.
- HOPEX Administration ... Optimizing Repository Access Performance.

4.15. Regular administration tasks

A few tasks need to be run and can often be automated:

Task	Server involved	Comment
Conservation of repository performance	Database server	Stored procedure to be installed and scheduled for each data repository and system repository. Can be automated. SQL server only.
Deletion of historical data	Database server	Stored procedure to be installed and scheduled for each data repository and system repository. Can be automated.
Deletion of private workspace temporary data	Database server	Stored procedure to be installed and scheduled for each data repository and system repository. Can be automated.
Environment compilation	Application server	To build system cache. System updates are impossible during compilation. Need to stop HOPEX Services and HOPEX related processes
Full indexing	Server running SSP	Manual.
Incremental indexing	Server running SSP	Automated using HOPEX Scheduler.
Information about fragmentation and statistics	Database server	Generates a technical report regarding physical indexing (statistics gathering)
Maintenance Plan	Database server	Need to stop SSP when running maintenance plan (SQL server)
Maintenance plan (SQL Server storage)	Database server	Required with several tasks. Can be automated. Refer to the article 'RDBMS Repository Installation Guide HOPEX V1R2 EN
Physical backup of data (RDBMS)	Database server	Required. Daily backup recommended. Can be automated.
Restart HOPEX Web site	Web server	For HOPEX program upgrade (CP upgrade) Can be required in case of problem
Restart IIS server	Web application server	Can be required in case of problem For IIS programs upgrade

Task	Server involved	Comment
Restart server	Application server	Can be required in case of problem
Restart SSP service (1)	SSP server	For HOPEX program upgrade (CP upgrade) For certain changes (license, list of environments, and list of repositories...) Can also be required in case of problem

(1) Windows service 'Mega Site Service Provider'.

4.16. Reporting

There are three categories of reports:

Category	Native format	conversion format	Comment
Report	HTML	RTF, XLS, XLSX, PDF	Window or web Front-End Generated from a Report template According to the Report template considered, certain conversion formats may not be available.
Report (MS Word)	RTF	-	Window or web Front-End Generated from a list or from a Report template (MS Word).
Instant report	HTML	-	Web Front-end only Generated from a list or from a Report DataSet. A report DataSet is a table of data generated from a Report DataSet Definition

To open a report from the web client, a reader corresponding to the format should be installed.

Example: MS Excel to read .XLS documents, Adobe reader to read .PDF documents, Open Office/MS Word to read .RTF documents.

(1) Web Front-End does not enable to design Report templates (MS Word): templates must be developed on Windows Front-End with MS Word 32-bit and delivered using a specific procedure.

Execution mode	Compatible Web Front-End	Comment
.RTF mode	Yes	Set by default Look and feel can be slightly different as style application is not enforced. RTF macros are not supported. MS Word (such as table of content) are not refreshed. Reports can be convert to DOCx
.DOC mode	No	Can be configured by default

Reference:

See online documentation

- HOPEX Power Studio ... Report DataSet Definition
- HOPEX Power Studio ... Report Studio
- HOPEX Power Studio ... Customizing Reports (MS Word)

4.17. Security

All ports used in the HOPEX platform are either configurable or set elsewhere. No specific port is required or hard-coded. To configure firewall ports, see the 'Communications' section earlier in this document.

MEGA strongly recommends configuring HTTPS to improve the security of flows between the Web Client and the Web Server. This requires a specific configuration of IIS and HOPEX.

If a local enterprise proxy is used, it should be configured by adding an excluding rule on the proxy. The rule refers to the IP address of the HOPEX web server involved.

File permissions should enable access to:

- Error and trace logfiles (see section 'Error and trace logfiles' in this document).
- License folder.
- Environment folder.

Reference:

Article 'Web Front-End - Securing the platform'.

4.18. Services and running processes

Several Windows services are created by the installation:

Service	Executable	Startup type	User (1)	Server
HOPEX Site Service Provider	mgwssp.exe	Automatic	Local system	SSP server
HOPEX Service Watchdog	mgswd.exe	Automatic	Local system	Each server used to deploy Web Front-end
HopexRedisBackEnd	redis-server.exe	Automatic	Local system	Each server used to deploy Web Front-end

At runtime, several processes can be created.

Process	User	Comment	Number
mgwssp	Local system (1)	Core SSP	One/several per installation. Runs on SSP server. Started by windows service
mgwmapp			
mgwspro	Local system (1)	Environment SSP (MIK)	One per HOPEX Environment. Runs on SSP server
mgwspro	Local system	Scheduled job	According to scheduler configuration
mgwmwas	Service account	MWAS (HOPEX)	One per web application server
mgwmapp			
mgwspro	Service account	Web session (MIK)	One per end user (single session), one per group of user (multi session)
mgswd.exe	Service account	Service Watchdog	One per server application server. Started by windows service
mgwmapp	Current user	Administration Console	One per running instance of Administration Console. Started manually.
HOPEX Server Supervisor	Current user	HOPEX Server Supervisor utility	One per running instance of the utility. Started manually.

(1) Can be configured

4.19. Supervision

The HOPEX platform enables system monitoring.

Supervision logfiles are updated by the server running the SSP when various events occur.

This information can be consulted via

- Web Supervision console
- HOPEX Server Supervisor (Windows utility)

A WMI probe can also enable to supervise HOPEX from standard tools supporting WMI (a specific integration is required).

Reference:

See online documentation, HOPEX Administration ... Managing Events

4.20. System caches

Several caches are created on the Windows client. *For Citrix/TSE deployment, the Citrix/TSE server is considered as the Windows client.*

Cache type	Location	Average disk space	Comment
RDBMS local cache	Default location: %programdata%\MEGA\<version code>\Cache\RDBMS data Ex: C:\ProgramData\MEGA\HOPEX V2R1\Cache\RDBMS data	1-20 GB (1)	One folder per HOPEX environment. Cache of data saved in database server. Can be disabled. Updated dynamically at runtime.
Compiled data cache	Default location: %programdata%\MEGA\<version code>\Cache\Compiled data Ex: C:\ProgramData\MEGA\HOPEX V2R1\Cache\Compiled data	10-30 MB (1)	One folder per HOPEX environment. Cache of systemdb configuration. Cannot be disabled. Updated by environment compilation.
Cache of MetaPicture	Default location: %programdata%\MEGA\<version code>\Cache\Compiled data Ex: C:\ProgramData\MEGA\HOPEX V2R1\Cache\Compiled data	1-5 MB	Cache of images. Cannot be disabled. Updated dynamically at runtime.
Cache of resources	Default location: <iis root>\wwwroot\HOPEX\ App_Data\MWAS\res Ex: C:\inetpub\wwwroot\HOPEX\ App_Data\MWAS\res	1-10 MB (1)	Cache of resources for MWAS. Cannot be disabled. Updated dynamically at runtime.

(1) For one HOPEX environment

4.21. Technical documentation

Category	Audience	Format	Language code
Installation and deployment guides	System administrator, functional administrator	PDF	EN
Online documentation	End user, functional administrator	web site	EN, FR, IT*, DE*
Technical articles	Developer, functional administrator	PDF	EN
Javadoc	Developer	HTML pages	EN

Installation and deployment guides and user manuals are installed in the subfolder \Documentation of HOPEX programs folder

Example: C:\Program Files (x86)\MEGA\HOPEX V2R1\Documentation

Language codes:

EN : English

IT: Italian

FR: French

DE: German

* can be available a few months after the initial release

5. FAQs

5.1.1. What about HTML browsers other than Edge, IE, Chrome, Firefox and Safari?

MEGA has decided to focus on Chrome, IE, Firefox and Safari. This does not mean that solutions do not run on HTML browsers. It means only that these HTML browsers are not supported.

5.1.2. Is SQL Server 2017 supported?

SQL Server 2017 is not qualified yet. It is candidate for support in a future update or version.

5.1.3. What is web storage for HTML browsers?

This is a capability of HTML browsers to store data (localStorage mode)

This capability is supported by recent browsers (IE11, Edge, Firefox, Chrome)

5.1.4. What is supported for Azure?

Here are the options qualified by MEGA so far:

- Premium storage (SSD disk)
- VM DSv2
- SQL on local VM (private cloud, IaaS, SQL Server Web Edition)

5.1.5. What is Mozilla Firefox ESR?

As Firefox versions change very rapidly, MEGA has decided to focus on ESR versions.

Extended Support Release (ESR) based on an official release of Firefox for desktop is used by organizations that need extended support for mass deployments.

See also <http://www.mozilla.org/en-US/firefox/organizations/faq/>

5.1.6. What is the list of minor restrictions for Edge / IE / Chrome / Firefox / Safari?

There are non-conformities to standards such as HTML browser zoom.

The list is documented in the document 'Known issues version HOPEX V2R1 CPX'.

5.1.7. Is IE 9.0 still supported?

With HOPEX V2R1, Internet Explorer 9.0 is not supported.

5.1.8. Is Internet Explorer 10 still supported?

From HOPEX V2R1, Internet Explorer 10.x is supported as web client but not recommended (end of mainstream support). See <https://support.microsoft.com/en-en/lifecycle>

5.1.9. Is Internet Explorer 11 still supported?

From HOPEX V2R1 update 01, Internet Explorer 11.x is supported as web client but not recommended (end of mainstream support). See <https://support.microsoft.com/en-en/lifecycle>

5.1.10. Is Windows Server 2008 R2 still supported?

With HOPEX V2R1, Windows Server 2008 R2 SP2 is supported as application server and file server but not recommended as support end date has passed

See <https://support.microsoft.com/en-en/lifecycle>

5.1.11. Is Oracle Database Server 11 still supported?

With HOPEX V2R1, Oracle Database Server 11 is supported as database server but not recommended as support end date has passed.

5.1.12. Are SQL Server 2008/2008 R2/SQL Server 2012 still supported?

With HOPEX V2R1, SQL Server 2008/2008 R2/SQL Server 2012 are supported as database server but not recommended as support end date has passed.

See <https://support.microsoft.com/en-en/lifecycle>.

5.1.13. Are there requirements or recommendations regarding security policies (GPOs)?

It is assumed that standard policies (installed by default with the system) are available. In particular, the policy 'Impersonate a client after authentication' can be necessary for the HOPEX service account and IIS related users, based on your deployment. If certain policies are not available, a specific study is required.

5.1.14. How to configure HTTPS?

This can be done through the installation program. See the article 'Web Front-End Installation Guide MEGA HOPEX V2R1'. Note that a certificate should be configured before installing HOPEX: see your IIS administrator.

5.1.15. It is possible to use a Must licence that is not located on the SSP Application Server?

This is possible. An additional configuration is required.

5.1.16. Can the HOPEX web Front-End run on a web server other than IIS?

HOPEX V2R1 is designed for IIS only.

5.1.17. Can HOPEX solutions and products run on a mobile platform?

Most HOPEX products and solutions are designed for a web client running on a desktop or laptop computer with screen resolution 1280x800. They have not been designed for pads or smart phones.

Viewer users can use tablets running Android or iOS. Viewer users can consult data usually through a simplified desktop.

Note that technologies used by the HOPEX platform enabled to develop web application that can run on mobile platforms. Tuning of web desktops is required.

5.1.18. What are the web technologies used by HOPEX Platform?

For HOPEX Web Front-end, the HOPEX platform uses HTML5 and various JavaScript related technologies mainly:

- Ajax.
- Extjs (6.5.x).
- Dojo.

On the server side, nothing is required except the .NET Framework. All necessary execution layers are installed by default. HOPEX V2R1 uses an embedded JRE (version 8).

A more detailed list can be sent upon request.

5.1.19. What about other database servers?

MEGA has decided to focus on widespread and recent versions of Oracle and SQL Server.

5.1.20. What is the HOPEX2 folder?

This is a clone of the HOPEX (IIS) web application. It is used in specific scenario when users need to work simultaneously in two different contexts (RFC...).

5.1.21. Are there supervision tools?

The HOPEX installation generates supervision logfiles. The standard utility HOPEX Server Supervisor provides a supervision interface. It is also possible to setup a WMI probe to communicate with supervision tools (Nagios...). For this, a specific integration is required.

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Windows Front-End Architecture Overview HOPEX V2R1

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1. SUMMARY

This document describes the system requirements and deployment types for the installation of the Windows Front-End.

This document only applies to HOPEX V2R1 Update 3.

It does not describe:

- How to perform installations (see installation documentation).
- How to manage installations (see administrator manuals).
- How products are licensed (see license installation documentation).
- How to use features (see user manuals).

The figures provided in this document are recommendations that may not apply to all contexts. In committing phases, a specific study with MEGA product management support is compulsory.

2. TYPICAL DEPLOYMENTS

The Windows Front-End can be deployed in different typical deployment:

- Standard deployment
- Citrix/TSE deployment

It is of course also possible to install Windows Front-End on a standalone machine (Stand-alone deployment).

Deployment type	Recommended for	Comment
Standard deployment	Small or medium deployment with good network performances (LAN, VPN)	No TSE/Citrix license required. 2-tiers architecture: <ul style="list-style-type: none"> • Windows clients (presentation and business logic). There are as many clients as end user workstations. • Database server (data). A shared configuration folder is used.
Citrix/TSE deployment	Large deployment, reduced bandwidth	3-tiers architecture: <ul style="list-style-type: none"> • Client (presentation). • Application server (business logic). • Database server (data). A shared configuration folder is used. A server farm enables scalability, load balancing, centralized administration and deployment

Bandwidth / user *	2 - 50 concurrent users	More than 50 concurrent users **
> 5 Mbit/s	Standard deployment Citrix/TSE deployment	Citrix/TSE deployment
< 2 Mbit/s	Citrix/TSE deployment	

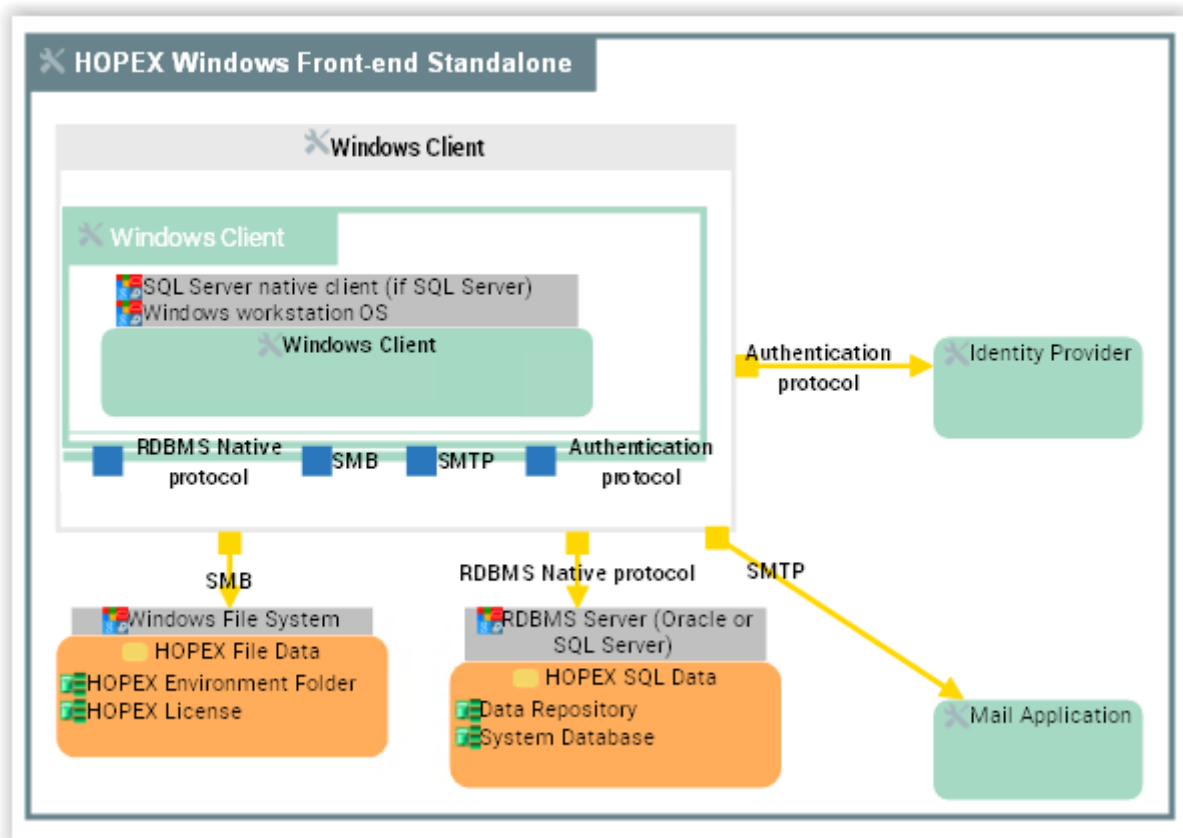
Other deployment models – For specific requirements, other deployment models are possible. For further information, contact your sales representative.

* Bandwidth considered is the bandwidth available between Windows client and database server (RDBMS storage) or file server (GBMS storage).

** Above 50 concurrent users, we recommend a specific study to confirm that the deployment type and the administration procedures are appropriate for project activity and the technical architecture used.

2.1. Standard Deployment

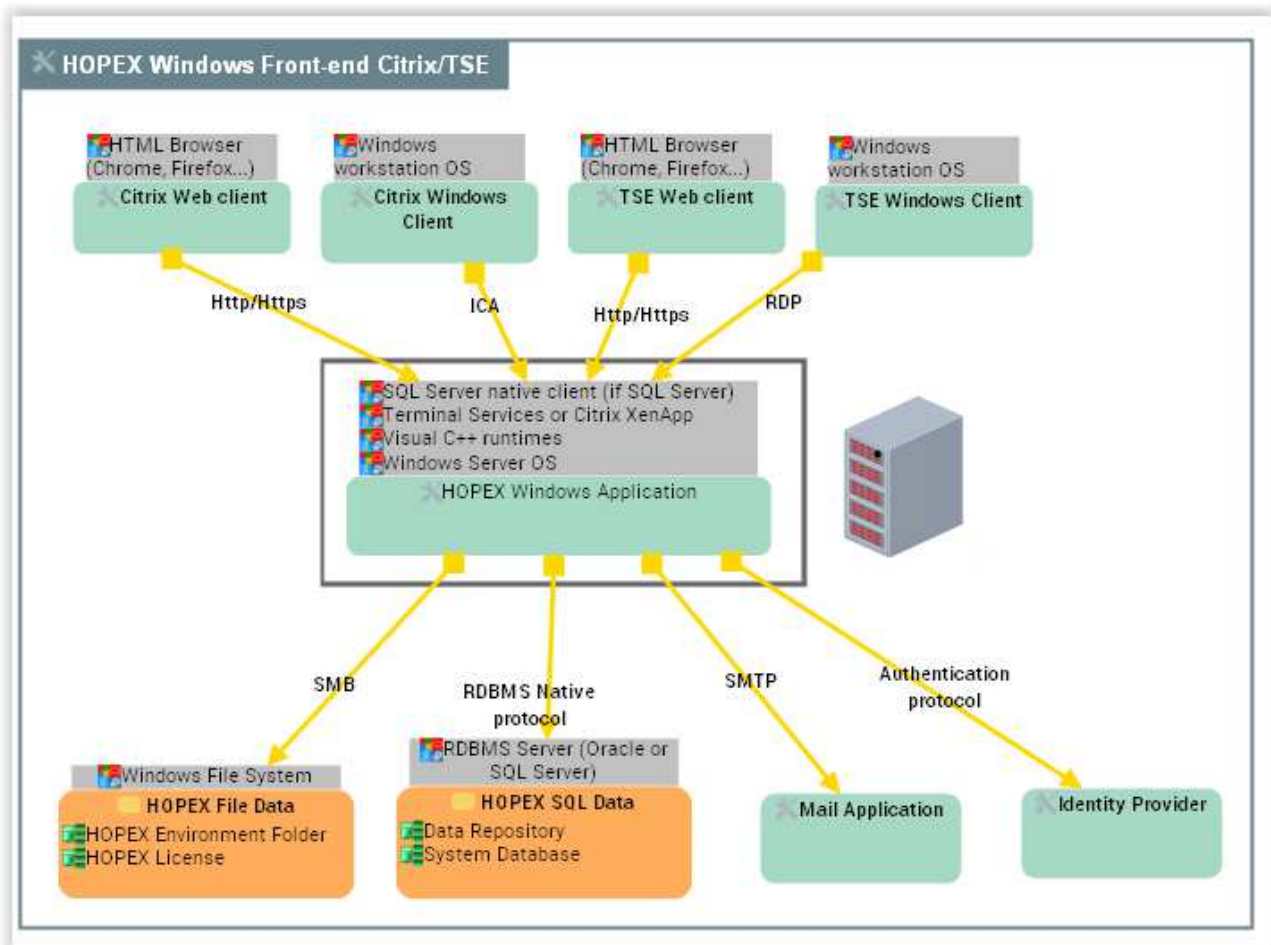
There is one MIK (running instance of HOPEX Kernel) per workstation running Windows Front-End.



In this example, it is assumed that the repository storage is RDBMS (Oracle, SQL Server). SQL Server Native client is required only with SQL Server storage.

2.2. Citrix/TSE Deployment

There is one MIK per TSE/Citrix session running Windows Front-end.



In this example, it is assumed that the repository storage is RDBMS (Oracle, SQL Server) and there is only one Citrix/TSE server. To facilitate readability, the SQL Server Native client required for SQL Server storage is not displayed on the Application Server.

3. DEPLOYMENT REQUIREMENTS

3.1. Windows Client

Client System	Windows 10.0 (64-bit) Visual C++ Redistributable for Visual Studio 2015 (1)
Additional Software	PDF reader: Adobe reader 10.0 or higher recommended RTF/DOC/DOCX reader XLS/XLSX reader SQL Server Native client 11.0 (SQL Server 2012, SQL Server 2014, SQL Server 2016) If data is stored in SQL Server
Hardware	Processor multi-core RAM 4 GB minimum 6 GB or higher recommended 2 GB for data cache in memory Resolution and colors 16 M colors Screen resolution 800 x 600 minimum 1024 x 768 or better recommended Disk space 4 GB for HOPEX Kernel 50 MB recommended for logs

(1) Required for each Window machine running HOPEX kernel (workstation or server).

3.2. File Server

Server System	<p>Windows Server 2012 SP2</p> <p>Windows Server 2012 R2</p> <p>Windows Server 2016</p> <p>For other file systems a specific study is necessary</p>
Hardware	<p>Processor See hardware requirements of the system.</p> <p>RAM See hardware requirements of the system, 1 GB recommended.</p> <p>Disk space 5 GB recommended per HOPEX Environment (environment folder).</p> <p>Select superior quality components for disks and disk controller cards.</p>

3.3. Citrix Client/Remote Desktop Client

Client System	<p>Citrix Client The list varies with the version of the Citrix server Examples: Windows 32/64-bit client, Linux client, UNIX client, Mac client</p> <p>Citrix Web Client The list varies with the version of the Citrix server Examples: Edge, Mozilla Firefox, Safari</p> <p>Remote Desktop Connection Client The list varies with the version of the TSE server Examples: Windows 32/64-bit client, Mac client</p> <p>Remote Desktop Web Connection Client Edge</p>
Hardware	No specific requirement for HOPEX.

3.4. Application Server (Citrix Server/Terminal Server)

Server System	See also requirements for Citrix Presentation Server or Citrix XenApp
Application Server Layer	TSE on Windows Server 2012 TSE on Windows Server 2012 R2 Citrix XenApp 7.x For 2012 R2 Citrix XenApp 7.x For 2016 Visual C++ Redistributable for Visual Studio 2015 (1)
Additional Software	PDF reader Adobe Reader 10.0 or higher recommended SQL Server Native client 11.0 (SQL Server 2012) If data is stored in SQL Server
Hardware	Processor 1 cores minimum per group of 15 users 3-4 cores recommended per group of 15 users RAM 6 GB minimum 1 GB minimum for the Terminal Server system and for the Citrix system 2 GB for data cache in memory Per concurrent modeller user 600 MB intensive use 300 MB low use Resolution 65000 colors minimum. Disk space 4 GB for HOPEX Kernel 500 MB recommended for logs

(1) Required for each Window machine running HOPEX kernel (workstation or server).

(2) When running HOPEX Windows Front-End, IE is used in embedded mode. It is installed with the system.

3.5. Database server

Server System	see RDBMS requirements
RDBMS	Oracle Database Server 12C (Release 1, Release 2) SQL Server 2014 SQL Server 2016
Disk space	Data: 2 GB minimum per system database 2 GB minimum per data repository Refer to the separate article 'RDBMS Repository Installation guide HOPEX V2R1'.
Hardware	RAM: a specific study is required. Refer to the separate article 'RDBMS Repository Installation guide HOPEX V2R1'. CPU: see hardware requirements of the RDBMS.

4. COMMUNICATION

4.1. Between MIK and File Server (file access, license access)

Protocol	SMB/CIFS SMB 2.0 is not supported (1)
Port	UDP/TCP 138 UDP/TCP 137 UDP/TCP 139 UDP/TCP 445
Network bandwidth	Standard deployment 10 Mbit/s minimum full duplex Citrix/Terminal server deployment 1 Gbit/s or higher recommended
Network latency	1-5 Ms maximum*

(1) For GBMS storage.

4.2. Between Citrix client and Citrix Server

Protocol	Independent Computing Architecture Protocol (ICA Protocol)
Port	Example: UPD/TCP 1604 (2)
Network bandwidth	100 Kbit/s or higher full duplex
Network latency	100 Ms maximum*

(2) Default port, check the appropriate port with the Citrix administrator.

4.3. Between Citrix web client and Citrix Server

Protocol	HTTP
Port	UPD/TCP 80 (HTTP)
Network bandwidth	100 Kbit/s or higher full duplex
Network latency	100 Ms maximum*

4.4. Between Remote Desktop Client and Remote Desktop Services

Protocol	Remote Desktop Protocol (RDP)
Port	UDP/TCP 3389 (MS WBT Server)
Network bandwidth	100 Kbit/s or higher full duplex
Network latency	100 Ms maximum*

4.5. Between Remote Desktop Web Client and Remote Desktop Services

Protocol	HTTP
Port	UPD/TCP 80 (HTTP)
Network bandwidth	100 Kbit/s or higher full duplex
Network latency	100 Ms maximum*

* For a ping of 5 KB (It is recommended to use the hrping utility. Refer to the separate article 'RDBMS Repository Installation guide HOPEX V2R1').

4.6. Between MIK and Database server (Oracle, SQL Server)

Protocol	Oracle: Oracle Native Protocol SQL Server: SQL Server Protocol
Port	Oracle: Example TCP 1521 (2) SQL Server: Example UDP/TCP 1433 (2)
Network bandwidth	1 Gbit/s minimum full duplex
Network latency	1-5 Ms maximum*

(2) Default port, check the appropriate port with the database administrator.

4.7. Between MIK and mail server

Protocol	SMTP
Port	25 by default, configurable

4.8. Between MIK and Document server (file access)

Protocol	SMB/CIFS
Port	UDP/TCP 138 UDP/TCP 137 UDP/TCP 139 UDP/TCP 445

4.9. Between MIK and LDAP Server

Protocol	LDAP
Port	TCP 389 by default (2)

(2) Default port, check the appropriate port with the LDAP server administrator.

5. INSIDE

5.1. Administration tools

Several administration tools can be used:

Administration tool	Component	Tasks
Windows Administration Console	Win32 (Administration.exe)	Data storage management (environment, repositories, stored procedures) Functional administration (user, permissions, workspaces, LDAP configuration, import/export...)
Must license manager	Win32 (Licensing.exe)	Management of Must license
Windows Front-End	Win32 (HOPEX.exe)	Fix unexpected configuration issue
XenApp AppCenter Console	See Citrix documentation	Management of Citrix session Monitoring of HOPEX processes
HOPEX Server Supervisor	Win32 (Hopex Server Supervisor.exe)	System supervision of the server

Reference:

- See online documentation, HOPEX Administration : Administrator Guide

5.2. Anti-virus Configuration

To maintain good performances, it is recommended to exclude certain file extension from antivirus scanning (on access scanning)

Machine	Location/File	Comment
Each machine running HOPEX	%programdata%\MEGA and subfolder Ex: C:\ProgramData\MEGA File extension: *.MGC	Folders of the Compiled data cache and RDBMS local cache
Each machine running HOPEX	Location: check with the HOPEX administrator Ex: C:\Program Files (x86)\MEGA\MEGA HOPEX V2R1 File extension: *.*	Folders of HOPEX core programs

5.3. Authentication

Windows Front-End uses standard authentication.

Authentication model	Description	Comment
Basic authentication	Authentication process is managed within HOPEX Platform. Users are declared explicitly in the HOPEX Environment and possibly mapped individually with an external directory. 3 variants: MEGA, LDAP, Windows	This model is recommended for basic deployments. No integration is required, only configuration.

Password values storage, encryption and update vary with the configuration chosen.

Authentication models	Storage	Encryption
Basic authentication (MEGA)	System repository	Encrypted, hashed
Basic authentication (Windows)	Active Directory	According to directory specifications
Basic authentication (LDAP)	LDAP directory	

Reference:

- See online documentation, HOPEX Administration : Administrator Guide : Managing Users : Authentication in HOPEX

5.4. Cluster, scalability and load balancing

For large deployments, scalability and load balancing is required.

Service	Principle
Scalability	This service is provided by Citrix/TSE server deployment. A configuration file is used to share configuration between nodes.
Load balancing	This service is provided by Citrix/TSE server deployment. A shared configuration file is used to share configuration between nodes.

5.5. Data access

Access to data is mainly controlled using profiles (repository access, data permissions, and GUI permissions).

Other features are available:

- Writing access management: control of updates on existing objects.
- Reading access management: control of visibility regarding existing objects.
- Data access rules: computed control of visibility or update regarding existing objects.

Reference:

See online documentation.

- HOPEX Administration : Administrator Guide : Managing Data Reading Access
- HOPEX Administration : Administrator Guide : Managing Data Writing Access

5.6. Data storage

Each HOPEX Environment consists in one system database and in one/several data repositories. By default data is stored in a database server (SQL Server, Oracle). This is called RDBMS storage. GBMS storage format (MEGA proprietary) is available for compatibility.

Storage	Mapping	Comment
SQL Server	A data repository is an SQL Server database A system database is an SQL Server database (1)	Create one SQL server user for the environment with specific privileges Only SQL server authentication is supported Install and schedule stored procedures per data repository or system database. No dedicated instance is required SQL Server native client (SQL Server 2012). A specific license token (Repository Storage (SQL Server)) is required for each end user. Default port can be used.
Oracle	A data repository is a user/schema A system database is a user/schema	Create one Oracle user per data repository or system database with specific privileges. Install and schedule stored procedures per data repository or system database. No dedicated instance is required. A specific license token (Repository Storage (ORACLE)) is required for each end user. No client-side installation (Oracle instant client) Default port can be used. Create one tablespace for each environment (recommendation).
GBMS	A data repository is a set of files. A system database is a set of files.	A specific license token (Lan) is required for each end user. No client-side installation. File-based. Protocol SMB 2.0 is not supported and must be disabled. GBMS storage is not supported for data repository or system database with size higher than 4 GB.

(1) This the standard recommendation. It is also possible to store a data repository in a schema of a SQL Database.

Note that RDBMS storage can be mandatory for certain products and the bundles including such products. It is also a requirement for Web Front-end.

Reference:

- Article 'RDBMS Repository Installation guide HOPEX V2R1'
See online documentation, Products.

5.7. Document management

A document management system is available through a solution or a pack. **RDBMS storage is required.**

Object	Location	Storage
Business Document	Data repository	Database server
System Business Document	System database	Database server

If document management is enabled, web users can add, update and consult documents.

Reference:

- See online documentation, Common Features : Managing Documentation : Using Business Documents

5.8. Error and trace logfiles

Different files can be created on the Windows client side (2):

File	Comment	Default location (example)
megaerrYYYYMMDD.txt	Error log of MIK (1)	%programdata%\MEGA\Logs Ex: C:\ProgramData\MEGA\Logs
MEGASETTINGS.INI	User settings	%userprofile%\AppData\Roaming\MEGA\HOPEX V2R1 Ex: C:\Users\my user\AppData\Roaming\MEGA\HOPEX V2R1
MEGAWKS.INI	Workstation settings	%programdata%\MEGA\HOPEX V2R1\Cfg Ex: C:\ProgramData\MEGA\HOPEX V2R1\Cfg
sspsprvsYYYYMMDD.txt	Supervision log	%programdata%\MEGA\HOPEX V2R1\ClusterRoot\Supervision Ex: C:\ProgramData\MEGA\HOPEX V2R1\ClusterRoot\Supervision
redis_server_log.txt	Redis component log	%programdata%\MEGA\HOPEX V2R1\Logs Ex: C:\ProgramData\MEGA\HOPEX V2R1\Logs

(1) location can be configured

(2) For Citrix/TSE deployment, the Citrix/TSE server is considered as the Windows client.

(3) Where XX is the login name. Ex: MegaSettings-U1.ini for login U1

When using Windows Front-End, each end user must have 'modify' access to :

- The files and folders described above.
- A temporary folder (%tmp%, ex: C:\Users\myuser\AppData\Local\Temp).

For Citrix/TSE deployment, if a cluster of server is used, a configuration is available so that errors logs of MIK are saved in a central location and not on each server of the cluster.

5.9. Licensing

Products and solutions of HOPEX platform are protected by Must licenses. Must licenses can be shared between multiple users.

Must licensing is not server-based (there is no Windows process for a license server). At runtime with HOPEX Web Front-end, a set of files are generated dynamically by service account.

However, a domain user (Active directory) is required for:

- Each service account running the HOPEX (IIS) application.
- Each user running the Administration Console (system administrator, functional administrator).
- Each user running the Windows Front-end (developer, functional administrator, user associated to a scheduled task).

To obtain a license, contact your sales representative. A UNC will be requested and a .must license file (locked on this UNC) will be sent with installation instructions.

Reference:

- Article 'Must License Installation Guide HOPEX V2R1'.

5.10. Mail system

A mail server needs to be configured so that mail notifications can be used within workflows.

SMTP parameters (server, port, proxy...) can be configured for the installation using the Administration console.

5.11. Multi-language

Windows Front-End enables to work with multiple languages.

Nature	List	Installation	Comment
GUI Language	Core languages (1)	Core languages are installed by default. With additional languages, it can be requested to install a language pack on the Application Server.	Controls the display of the user interface (menus, pages...) Different end users can have different GUI languages.
Data language	More than 30 languages available	Core languages are installed by default. Additional languages are installed at environment level	Enables data entry in several languages for objects. A end user can switch between several data languages within his session

(1) Core languages are English, French, Italian, Spanish and German.

To ensure a correct display under Windows with specific languages, it can be requested to set the system parameter 'Languages for non-Unicode programs' for each Windows machine:

- Standard deployment: each windows client.
- Citrix/TSE deployment: each Citrix/TSE server.

5.12. Physical backup

In case you face a real disaster recovery scenario, presence of a valid and restorable backup is very important.

Element	Recommendations
Frequency	Every 24 hours (1) (2)
Retention	In the last 30 days keep daily backup In the last 12 months keep a monthly backup
Other files to backup	By default folder of each HOPEX Environment

(1) For HOPEX Environment used by an active project

(2) In particular before major update concerning data. E.g.: system database customization, data reprocessing, CP/RP upgrade of HOPEX data

5.13. Specific recommendations

Storage	Mode
SQL Server	Cold/warm backup recommended (3)
Oracle	Cold/warm recommended (3)
GBMS	Cold/warm recommended (3)(4)

(3) No HOPEX end-user should be connected while backup is performed

(4) We have found that with some file systems, differential/incremental backup did not save HOPEX repository files correctly. We cannot guarantee hot backup mode either.

5.14. Redo logs and activity tracking

Service	Activation	Comment
Embedded log (repository log)	Enabled by default	Enables to generate a log of updates (redo log), activity tracking. Also used by specific features (full search, alter management...) This log can be partially/completely initialized and disabled using Windows Administration Console.
External log (backup logfile)	Enabled by default	Enables to generate additional command files logging the updates of a user (backup log) that can be useful to recover quickly data after an incident. This log can be disabled using Windows Administration Console.

Reference:

See online documentation

- HOPEX Administration ... Managing Repositories.
- HOPEX Administration ... Managing logfiles.
- HOPEX Administration ... Optimizing Repository Access Performance.

5.15. Regular administration tasks

A few tasks need to be run and can be automated (a specific integration is required):

Task	Machine involved	Comment
Conservation of repository performance	Database server	Stored procedure to be installed and scheduled for each data repository and system database. Can be automated. SQL server only.
Deletion of historical data	Database server	Stored procedure to be installed and scheduled for each data repository and system database. Can be automated. Pointless with GBMS
Deletion of transaction temporary data	Database server	Stored procedure to be installed and scheduled for each data repository and system database. Can be automated. Pointless with GBMS
Environment compilation	Application server	To build system cache. System updates are impossible during compilation. Need to stop HOPEX related processes
Information about fragmentation and statistics	Database server	Generates a technical report regarding physical indexing (statistics gathering)
Maintenance plan (SQL Server storage)	Database server	Required with several tasks. Can be automated. Refer to the article 'RDBMS Repository Installation Guide HOPEX V1R2 EN
Physical backup of data (GBMS)	File server	Required. Daily backup recommended. Can be automated.
Physical backup of data (RDBMS)	Database server	Required. Daily backup recommended. Can be automated.
Repository reorganization (GBMS)	Application server Database server	Required with GBMS. Can be automated. Pointless with RDBMS
Restart server	Citrix/TSE Application server	Can be required in case of problem

5.16. Reporting

There are two main categories of reports:

Category	Native format	conversion format	Comment
Report	HTML	RTF, XLS, XLSX, PDF	Generated from a Report template According to the Report template considered, certain conversion format may not be available.
Report (MS Word)	RTF	-	Generated from a Report template (MS Word).

To open a report from the windowd client, a reader corresponding to the format should be installed.

Example: MS Excel to read .XLS documents, Adobe reader to read .PDF documents, Open Office/MS Word to read .RTF documents.

To design Report templates (MS Word), Windows Front-End and MS Word are required. The Office 2010/2013/2016 versions 32 bit versions should be used (64 bit versions are not supported).

Execution mode	Compatible Web Front-End	Comment
.RTF mode	Yes	Set by default Look and feel can be slightly different as style application is not enforced. RTF macros are not supported. MS Word (such as table of content) are not refreshed
.DOC mode	No	Can be configured by default

Reference:

See online documentation

- HOPEX Power Studio ... Report Studio
- HOPEX Power Studio ... Customizing Reports (MS Word)

5.17. Security

All ports used in the HOPEX platform are either configurable or set elsewhere. No specific port is required or hard-coded. To configure firewall ports, see the 'Communications' section earlier in this document.

If a local enterprise proxy is used, it should be configured by adding an excluding rule on the proxy. The rule refers to the IP address of the HOPEX web server involved.

File permissions should enable access to:

- Error and trace logfiles (see section 'Error and trace logfiles' in this document).
- License folder.
- Environment folder.

Reference:

Article 'Web Front-End - Securing the platform'.

5.18. Services and running processes

One Windows service is installed on the machine:

Service	Executable	Startup type	User	Server
HopexRedisBackEnd	redis-server.exe	Automatic	Local system	Each server used to deploy Web Front-end

Several processes can run on the machine:

Process	User	Comment
mgwmapp	Current user	One per end-user session (per running instance of HOPEX.exe)
mgwmapp	Current user	One per running instance of Windows Administration Console (Administration.exe)
redis-server	Local system	One per machine.

If SSP is installed (custom setup), a service is installed and additional process will run.

5.19. Supervision

The HOPEX platform enables system monitoring.

Supervision logfiles are updated by the server running the SSP when various events occur.

This information can be consulted via HOPEX Server Supervisor (Windows utility).

A WMI probe can also enable to supervise HOPEX from standard tools supporting WMI (a specific integration is required).

Reference:

See online documentation, HOPEX Administration ... Managing Events

5.20. System caches

Several caches are created on the Windows client. *For Citrix/TSE deployment, the Citrix/TSE server is considered as the Windows client.*

Cache type	Location	Average disk space	Comment
RDBMS local cache	Default location: %programdata%\MEGA\<version code>\Cache\RDBMS data Ex: C:\ProgramData\MEGA\HOPEX V2R1\Cache\RDBMS data	1-20 GB (1)	One folder per HOPEX environment. Cache of data saved in database server. Can be disabled. Updated dynamically at runtime.
Compiled data cache	Default location: %programdata%\MEGA\<version code>\Cache\Compiled data Ex: C:\ProgramData\MEGA\HOPEX V2R1\Cache\Compiled data	10-30 MB (1)	One folder per HOPEX environment. Cache of systemdb configuration. Cannot be disabled. Updated by environment compilation.
Cache of MetaPicture	Default location: %programdata%\MEGA\<version code>\Cache\Compiled data Ex: C:\ProgramData\MEGA\HOPEX V2R1\Cache\Compiled data	1-5 MB	Cache of images. Cannot be disabled. Updated dynamically at runtime.

(1) For one HOPEX environment

5.21. Technical documentation

Category	Audience	Format	Language code
Installation and deployment guides	System administrator, functional administrator	PDF	EN
Online documentation	End user, functional administrator	web site	EN, FR, IT*, DE*
Technical articles	Developer, functional administrator	PDF	EN
Javadoc	Developer	HTML pages	EN

Installation and deployment guides and user manuals are installed in the subfolder \Documentation of HOPEX programs folder

Example: C:\Program Files (x86)\MEGA\HOPEX V2R1\Documentation

Language codes:

EN : English

IT: Italian

FR: French

DE: German

* can be available a few months after the initial release

6. FAQs

6.1.1. Is Windows 7.0 SP1 (64-bit) still supported?

With HOPEX V2R1, Windows 7.0 is supported but not recommended (end of mainstream support). See <https://support.microsoft.com/en-en/lifecycle>

6.1.2. Is Windows 8.0 (64-bit) still supported?

With HOPEX V2R1 update 01, Windows 8.0 is supported but not recommended (end of mainstream support). See <https://support.microsoft.com/en-en/lifecycle>

6.1.3. Is Windows 8.1 (64-bit) still supported?

With HOPEX V2R1 update 01, Windows 8.1 is supported but not recommended (end of mainstream support). See <https://support.microsoft.com/en-en/lifecycle>

6.1.4. Is Windows Server 2008 (64-bit) still supported?

Windows Server 2008 is no longer supported as support end date has passed. See <https://support.microsoft.com/en-en/lifecycle>

6.1.5. Is Windows Server 2008 R2 still supported?

With HOPEX V2R1, Windows Server 2008 R2 is supported as file server and application server but not recommended (end of mainstream support). See <https://support.microsoft.com/en-en/lifecycle>

6.1.6. Is Internet Explorer 10 still supported?

From HOPEX V2R1, Internet Explorer 10.x is supported as web client but not recommended (end of mainstream support). See <https://support.microsoft.com/en-en/lifecycle>

6.1.7. Is Internet Explorer 11 still supported?

From HOPEX V2R1 update 01, Internet Explorer 11.x is supported as web client but not recommended (end of mainstream support). See <https://support.microsoft.com/en-en/lifecycle>

6.1.8. Is Citrix XenApp 6.x (6.0, 6.5) still supported?

With HOPEX V2R1, Citrix XenApp 6.x is supported as application server but not recommended as support end date has passed.

6.1.9. Is Oracle Database Server 11 still supported?

With HOPEX V2R1, Oracle Database Server 11 is supported as database server and file server but not recommended as support end date has passed.

6.1.10. Is SQL Server 2008/2008 R2 still supported?

With HOPEX V2R1, SQL Server 2008/2008 R2 is supported as database server and file server but not recommended as support end date has passed.

6.1.11. Is remote execution still possible?

Yes. It is still technically possible to install Windows Front-End on a file server and run it remotely. However, this deployment is not supported nor recommended. Note that:

- Registration on each client machine can be required.
- This type of execution requires an excellent network (bandwidth).

6.1.12. Is .NET Framework required to install Windows Front-end?

No additional version of .NET Framework is required that the one installed with the system.

However NET Framework 4.6.1 or higher is required for HOPEX Web Front-End, SSP and to run certain utilities.

6.1.13. Why is SMB 2.0 not supported for GBMS storage?

GBMS storage is deprecated and not supported with Web Front-End. MEGA has decided to focus on RDBMS storage. HOPEX V2R1 supports only SMB 1.0. It will be required to disable SMB 2.0 for file server access. See the article 'Windows Front-End Installation Guide HOPEX V2R1'.

6.1.14. Can HOPEX Windows front-end run on Microsoft App-V?

This version is not qualified. MEGA recommends to user Citrix XenApp or VmWare.

6.1.15. Is GBMS storage recommended?

GBMS storage is deprecated and not supported with Web Front-End. MEGA has decided to focus on RDBMS storage. GBMS is kept for compatibility and is supported with certain products. Note that certain features are NOT available with GBMS storage.

GBMS storage is not supported if the size of a repository in GBMS storage format exceeds 4 GB. In such situations, it is required to switch to RDBMS storage (Oracle, SQL Server).

7. GLOSSARY

Term	Definition
.NET, NET Framework	Software framework developed by Microsoft that runs primarily on Microsoft Windows. It includes a large library and provides language interoperability (each language can use code written in other languages) across several programming languages
Active Directory	Directory system for Microsoft environments. It provides centralized services to identify and authenticate to a network of MS Windows machines.
Administration Console, Windows Administration Console	Administration console of the HOPEX platform that performs core administration tasks including: <ul style="list-style-type: none"> • Managing HOPEX environments. • Managing HOPEX repositories. • Managing HOPEX users. • Managing HOPEX profiles. Win32 component (Administration.exe)
Application server	Server playing the application server role.
Authentication	Authentication defines whether the user exists and if it can connect to the software (for example a web site).
Availability	A measure of a computer system's ability to maintain services despite hardware or software failures. A highly available system delivers services to clients a high percentage of the time.

Term	Definition
Bandwidth	Rate of data transfer. Usually measured in KBit/s or GBit/s.
Cluster	A group of independent computer systems, referred to as nodes, working together as a unified computing resource
Concurrent license	License where products or bundles are programmed in concurrent mode. Example: 5 concurrent accesses users for 10 possible users
Database Server	A database server is a machine providing database services to other machines. In this document the database server is a machine running relational database management systems. A database server can host one or several instances. Example: <ul style="list-style-type: none"> • Server 'iba.company.com' • Server '192.888.777.666' • Server 'SQL02'
DBA (DB Administrator)	Person that ensures an operational and effective functioning of a database server.
Dedicated license	License assigned to a particular user. It cannot be shared.
Directory, Directory services	Software application for organizing information about a computer network's users and resources.
DMS (Document Management System), Document Management	System used to track and store electronic documents
Document Repository	Group of documents within a document server.
Documentation Server	Server hosting a Document Management System.
Domain User	User in Active Directory (Microsoft product).
End-user	Person that uses a product.
Environment folder, HOPEX Environment folder	Folder of a HOPEX Environment. It has several subfolders such as 'Db' and 'SysDb'. It contains configuration and output files. With GBMS storage, it also contains core data files of HOPEX repositories.
Environment, HOPEX Environment	A HOPEX Environment is a working area, storing data of a user group. Within a HOPEX Environment, a set of data repositories share within a system repository a metamodel definition, users and profiles. An environment is thus made of a single system repository and of one or multiple data repositories. Workspace for a group of HOPEX users. A HOPEX Environment references a system repository and one or several data repositories. It has its own metamodel. It corresponds to a folder on the disk.
Failover	Technique of switching to a redundant or standby server, system, hardware component or network upon the failure or abnormal termination of the previously active application, server, system, hardware component, or network
File Server	Server used to share files. Hardware must include superior quality components for disk and disk controller card. Configuration must favor file access performances in read and write mode.
Functional Administrator, HOPEX Administrator	Person responsible for operational functioning of a HOPEX installation (manage users, workareas, logs...)
High availability	High availability refers to a system or component that is continuously operational for a desirably long length of time. Availability can be measured relative to "100% operational" or "never failing."

Term	Definition
HOPEX (IIS)	HOPEX .NET application. It communicates with HOPEX Kernel to access to a repository and provides the services of HOPEX Web Front-End.
HOPEX Component	A component is a piece of the HOPEX platform delivering a defined service. It may be (or not) activated or used by products or solutions. A component cannot be isolated from the overall platform. Ex: Authentication engine, Permission engine, Versatile Desktop engine, Workflow engine...
HOPEX Directory	System repository seen as a directory services (for user definition)
HOPEX Disk	CD/DVD containing the installation program of HOPEX software. The content of this disk can be copied to a network folder and installed from the network.
HOPEX Kernel	Core of the HOPEX Platform. Back-end set of programs used seamlessly by end users through all Front-Ends. It is a generic component instantiated in every MIK.
HOPEX Programs folder, HOPEX Programs folder, HOPEX Kernel folder	Folder of a HOPEX Kernel installation on a machine. It can be identified by the two subfolders 'Cfg' and 'System'.
HOPEX Web Front-end	Access to HOPEX platform through a web client. HOPEX Web Front-End may be used to access solutions (ex: Internal Audit) or products (ex: MEGA IT Architecture) in a HTML Browser.
HOPEX, HOPEX Platform	HOPEX is an acronym for Holistic OPERational Excellence. It is the technical platform underlying HOPEX Solutions and Products. Its components provide graphical user interface, data management, roles and profiles management, reporting, collaborative functions, and functional tools. It evolves through versions, for example: HOPEX V1R1, HOPEX V1R2, HOPEX V1R3, HOPEX V2...
Impersonate user	See service account
Latency	Measure of time delay experienced for a network component, usually measured in milliseconds (ms).
LDAP Server	Server supporting the LDAP protocol and providing directory services. With HOPEX platform, it is used to authenticate web user.
License, HOPEX license	License used to run HOPEX Software (Product, Module). There are different technologies available. The most common one is the HOPEX Must license.
Load	Amount of work being done by a node. In Network Load Balancing, load is measured as a raw number of connections.
Load Balancing	Technique for scaling performance by distributing requests across multiple nodes.
Mail Server	Server hosting a mail system. With HOPEX platform, SMTP server is used to send mails.
Megasite.ini	HOPEX Kernel configuration file. It is created at installation.
Megawks.ini	Windows Front-End configuration file used to set machine related settings. The file is not created at installation.
MIK (MEGA Instantiated Kernel)	Running instance of a HOPEX Kernel. Multiple running instances of HOPEX Kernel allow a large number of users to be connected simultaneously. Each Windows Front-End runs its own MIK. For HOPEX Web Front End, a MIK may manage a single user or several users, depending on the product or solution used.
Monitoring Console, HOPEX Monitoring Console	Web page that enables monitoring tasks: <ul style="list-style-type: none"> Managing web user connections. Managing caches. Used for HOPEX Web Front-end

Term	Definition
Must license	Type of HOPEX license. It is file based and relies on Active Directory. Each Must license is locked on a UNC.
Must license folder	Folder containing one or several .Must license files. This folder can be referenced by one or several HOPEX installation(s).
Must license utility	HOPEX utility (licensing.exe) used to monitor and configure Must license.
Oracle Instant Client	Oracle Instant client is an Oracle technology. It is a client side for an Oracle database server. It avoids deploying an oracle client on client workstations. For HOPEX Windows Front-End, it is installed with HOPEX Programs: no installation is required on the Windows client.
Person Group, Group	Group account used with Web Front-end. A person group determines various permissions (profile, reading access, writing access...). The list of users (Person (System)) that belong to the group can be defined explicitly or dynamically. When a user logs in on behalf of a person group, it gets the associated permissions.
Product, HOPEX Product	A product is a functional unit identified and saleable. As opposed to a solution, a product is not role-oriented, and does not provide collaborative functions. Users of products have to define their own usage mode of tools provided in products. Product portfolio covers mainly all the Enterprise Architecture offering existing in versions prior to HOPEX. Examples of products: HOPEX Business Data, HOPEX Database Builder, HOPEX IT Architecture...
Profile assignment	Mapping between a user (Person (System)) and a profile or between a person group and a profile. This enables login to Windows Front-End or Web Front-end.
Profile, HOPEX Profile	Consistent definition of GUI and permissions for a business role. It makes it easier to manage HOPEX user (options, permissions, license, web desktop...) Each HOPEX Solution provides different profiles. HOPEX products use a generic profile (Enterprise Architect).
Program features	Installation component selected during the installation of software (setup). Examples for HOPEX setup: <ul style="list-style-type: none"> • HOPEX (IIS) • MEGA Software <ul style="list-style-type: none"> ○ Administration Program ○ Utilities ○ Documentation...
RDBMS Server	Relational Database server. With HOPEX platform, core data is saved in database instance of SQL Server or Oracle.
Remote Desktop (client, services, protocol)	Remote Desktop is a Microsoft technology that allows a use to access applications and data on a remote computer over a network. It is based on Remote Desktop Protocol (RDP). The client side is called Remote Desktop Client (formerly called Terminal Services Client). The server side is called Remote Desktop Services (formerly called Terminal Services).
Repository, HOPEX Repository, data repository	A HOPEX Repository is a database hosting HOPEX data compliant with a metamodel definition. It contains objects with attributes, and associations between objects. Storage format (GBMS, Oracle, and SQL Server) is defined when creating the repository.

Term	Definition
	A HOPEX Repository belongs to a HOPEX Environment.
Role, Business Role	A business role is the function of a person in the business meaning Ex: Audit director, Auditor, Application portfolio manager...With HOPEX platform, it is implemented by a profile.
Scalability	Scalability is the ability of a system to continue to function well when it is changed in size or volume.
Server farm	Collection of server machines usually maintained by an enterprise to accomplish server needs far beyond the capabilities of one machine. Synonym: server cluster
Service account	Active directory user dedicated to execution of a given application. Sometimes called 'Impersonate user' A service account should be used for HOPEX Web Front end (ex: hopex01@mydomain.com)
Shared configuration (Megasite.ini)	Configuration file shared between several installations. The group of installations is called a cluster.
Shared license	License where products or bundles are programmed in shared mode. Example: 5 concurrent accesses users for 10 possible users
SMB (Server Message Block Protocol)	Protocol used by a client machine to request file and print services to a MS Windows file server. Previously called CIFS protocol.
SMTP Server	Mail server supporting the SMTP protocol
Solution	A HOPEX solution tools up different business roles to execute a function across an enterprise through collaborative tasks. A solution is a self-sufficient offer. Example: Internal Audit, ITPM, ERM, Internal Control...
SQL Server Native Client	SQL Server Native Client is a Microsoft technology. It is a client side for an SQL Server database server. It should be installed in the Windows client using a Microsoft setup program.
Storage Format, HOPEX Storage Format	Typology of storage formats for a data repository or a system repository: <ul style="list-style-type: none"> • Oracle (RDBMS, Oracle). • SQL Server (RDBMS, SQL Server). • GBMS (MEGA DBMS, proprietary format kept for compatibility).
System Administrator	Person that ensures an operational and effective functioning of a computer system or network
System database, system repository, systemdb	A system database contains data shared between all data repositories within an environment. It contains at least: <ul style="list-style-type: none"> • A HOPEX directory (definition of users/roles/profiles). • A set of templates of deliverables. • A metamodel definition.
UNC (Universal Naming Convention)	A UNC address is a shared folder that has a unique address on the network
User, HOPEX User	User account in a HOPEX Environment. The user can be declared in HOPEX or declared in a directory service and replicated in HOPEX. In all cases, users are saved in the system repository. Technically, it is the association of a Person (System) with a Login.
Windows Front-End	Windows Front-End is a Microsoft Windows based program accessing the HOPEX platform. Windows Front-End is compatible with Citrix/Terminal Server environments. Currently designed for Microsoft Windows 32/64 platforms.
Windows user	A user configured in the active directory. This is completely independent of HOPEX. This configuration is required to enter the company network.

Term	Definition
	Example: User U0001 is configured for domain D01
WMI (Windows Monitoring Instrumentation)	Interface proposed by Microsoft Servers. It enables providers to pull events to supervision utilities and applications (ex: Windows Performance Monitor, Nagios...)
Scheduler	HOPEX component running on SSP environment. It enables to schedule execution of various jobs. It is used by various features (full search indexing, alert management, LDAP user synchronization...)
Supervision	Set of tools and techniques that enable to monitor computer system. In particular, running applications can be monitored through events.

RDBMS Repository Installation Guide

HOPEX V2R1

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Summary

This technical article describes the procedures and best practices for deploying the HOPEX application on a relational database server (Oracle, SQL Server).

This deployment applies to **HOPEX V2R1**.

Generalities

Supported Versions of RDBMS

MEGA has qualified some versions of RDBMS for HOPEX V2R1. Those versions can be found in the following documents (depending on your type of deployment):

- Web Front-End Architecture Overview HOPEX V2R1 EN
- Windows Front-End Architecture Overview HOPEX V2R1 EN

Unsupported HOPEX Features in RDBMS Storage

When a HOPEX repository is stored on an RDBMS, HOPEX does not support the following features:

- MySQL RDBMS
- Offline mode
- Repository protection
- Mixed environments
 - MEGA proprietary format (GBMS storage format) repository and repositories stored on an RDBMS. For example, a GBMS environment (SystemDb) and one or more repositories stored on Oracle or SQL Server. The opposite is also not supported (Oracle or SQL Server environment with GBMS repositories within).
 - It is allowed to have an environment on Oracle (which SystemDb is Stored on an Oracle instance) and repositories on SQL Server.
 - The opposite is also supported (SQL Server SystemDb and with Oracle repositories).

Expected Advantages

The advantages expected from an RDBMS deployment are:

- Compliance with company-wide IT standards.
- Guarantee of scalability and security.
- Quicker dispatch time. In particular with “big” HOPEX private workspaces (HOPEX private workspaces with many creations/deletions/updates).

With this type of architecture, HOPEX supports global deployment on the same repository. In particular, it enables bypassing some limits related to the GBMS storage format.

- Maximum limit of 510 concurrent private workspaces per environment. No limit is identified in the HOPEX application for Oracle/SQL Server storage format.
- Maximum limit of 24 GB of data per HOPEX repository. No limit is identified in the HOPEX application for Oracle/SQL Server storage format.

With the RDBMS storage format, the HOPEX environment contains unshared files. All the data accessed during the execution of the HOPEX application is stored in the RDBMS. The RDBMS guarantees scalability and security.

Licensing

The “HOPEX repository storage (Oracle)” or “HOPEX repository storage (SQL Server)” product is required on the license to gain access to the RDBMS storage feature. The license can be dedicated to the workstation or shared by a group of users. All users connecting to HOPEX must have access to this license as well as to other products (HOPEX IT Architecture...).

Infrastructure Requirements

RDBMS Client

An RDBMS Client is necessary on each workstation that uses HOPEX with data stored on an RDBMS.

- **Oracle**

No additional installation is required. Oracle instant client is embedded in the HOPEX programs. (<http://www.oracle.com/technetwork/database/features/instant-client/index-100365.html>)

- **SQL Server**

Installation of Microsoft SQL Server 2012 Native Client is required. This client is compatible with the 2008, 2012, 2014, and 2016 versions of SQL Server. See corresponding Microsoft articles for more details:

<http://msdn.microsoft.com/en-en/library/cc280356.aspx>

The SQL Server 2012 Native Client installation program is available in a subfolder of the HOPEX installation, for:

- 64bits Windows operating systems:

Under < HOPEX installation>\Install\RDBMS client\Sqlserver\x64\sqlncli.msi

- 32bits Windows operating systems:

Under <HOPEX installation>\Install\RDBMS client\Sqlserver\x86\sqlncli.msi

Network Capability to Database Server

On a client computer running HOPEX, it is recommended to ping the RDBMS server with a filled buffer to have an evaluation of the infrastructure. To do this, download the **hrPING** freeware tool available at <https://www.cfos.de/en/ping/ping.htm>. To use this tool, you must first accept the terms of the licence. Use it with the following command in a command window from a computer that will be running HOPEX:

```
hrping.exe -W -l 5000 -n 50 -y <RDBMS Server name or IP>
```

Example for this command output:

```
Statistics for <RDBMS Server name or IP>:  
Packets: sent=50, rcvd=49, error=0, lost=1 (2% loss) in 24.500562 sec  
RTTs of replies in ms: min/avg/max/dev: 0.338 / 0.535 / 0.637 / 0.048  
Bandwidth in kb/sec: sent=10.260, rcvd=10.055
```

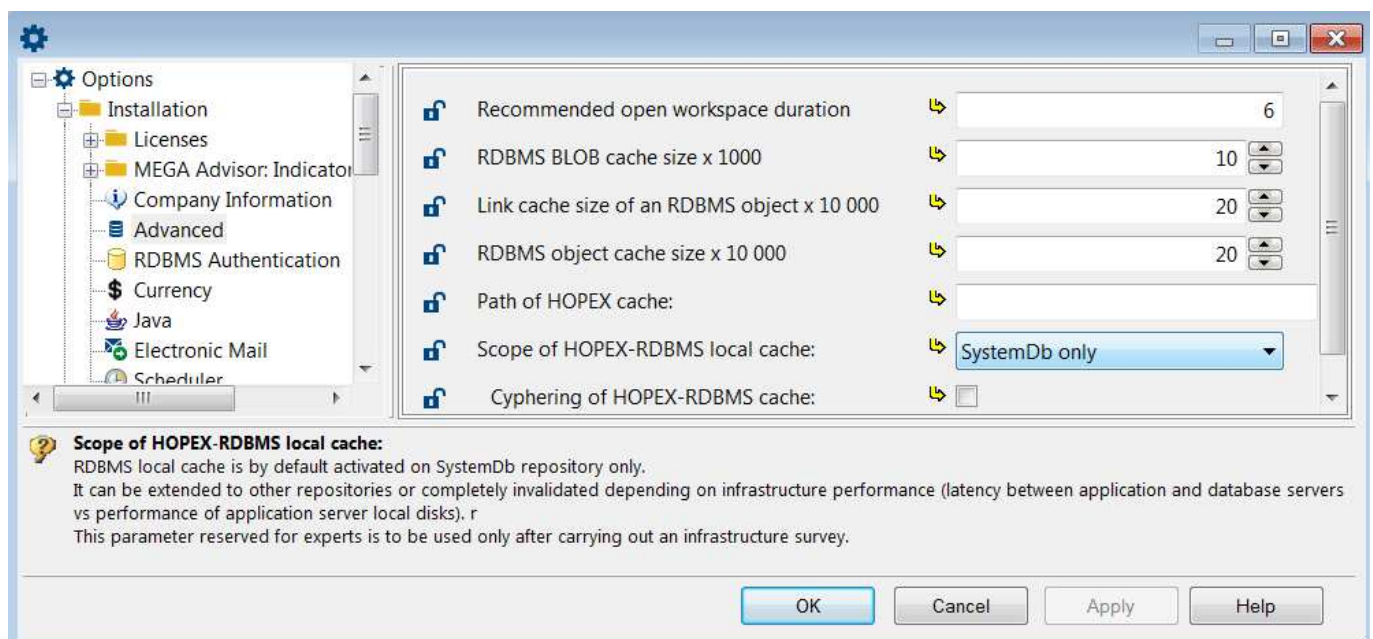
If the value returned for "**RTTs of replies in ms/avg**" (0.535 in the example) is higher than 1 ms, contact MEGA. See hrPING help for details on this command.

File Server and RDBMS local cache

See Deployment guide for generality.

For RDBMS deployments, there is a specific data caching option that is **enabled by default**. The purpose of this option is to improve the application response time by saving the environment data to the disk so that fewer roundtrips to the database server are necessary (Oracle or SQL Server). This cache is filled as the data is accessed during the use of HOPEX. The data cached that is out of date is deleted from that cache during dispatches.

The "Activate RDBMS local cache" is both accessible at the site level, or at the environment level.



To modify the RDBMS local cache globally for all environments:

1. Start Administration.exe.
2. At the top of the tree, right-click **HOPEX** and select **Option > Modify**.
3. Expand the **Installation** folder.
4. Select **Advanced**.
5. In the right pane, for the **Scope of HOPEX-RDBMS local cache** option, use the drop-down list to modify the range of that cache:
 - “SystemDb only” (default value).
 - “Disabled”: if you do not want to use it, for example if your RDBMS instance is located on the same server as your application.
 - “All repositories”: if for example you have a network latency with your RDBMS server.

By default the cache is located under the **ProgramData** folder:

```
C:\ProgramData\MEGA\HOPEX V2R1\Cache\RDBMS data\<CacheName>
```

<CacheName> is the identifier of the environment. It can be found in the megasite.ini file.

For example, given this section in the megasite.ini file:

[Environment Shortcuts]

466046A854876473=C:\Users\Public\Documents\HOPEX V2R1\Demonstration_RDBMS

the demonstration cache folder name will be:

```
C:\ProgramData\MEGA\HOPEX V2R1\Cache\RDBMS data\466046A854876473
```

The size of the cache varies depending on the amount of data contained in an environment. At least 500MB must be available on the disk. It can grow up to several GB for big environments/repositories.

To send this cache to a different location, modify the **Path of HOPEX cache** option and make sure that it is a local folder.

Architecture Model

All the architecture models described in the “Windows Front-End Architecture Overview HOPEX V2R1” document can use the RDBMS storage.

Database Server

The following sections will help your database administrator (DBA) size the Database server according to the profiles and the number of HOPEX users you plan to use.

Server disk size

Each new object takes up 30 KB on a disk (object with its attributes and links).

If you activate the HOPEX Repository Log file each action on the HOPEX repository creates an object.

It is recommended that for Oracle you initialize each new schema in a TABLESPACE that has a minimum of 5 GB available. For SQL Server, the same 5GB size should be reserved on the server disk.

Reminder:

HOPEX will stop working if the TABLESPACE is full. To avoid this, the TABLESPACE could be created with the MAXSIZE UNLIMITED option. If this is not possible, the TABLESPACE growth must be monitored carefully in order to provide more space if fullness is about to be reached.

Number of connections opened by HOPEX on the RDBMS for each HOPEX workstation

This information will help you define the amount of memory (RAM) required for the database instance used to run HOPEX on the database server

- **Oracle**

One connection is used for each RDBMS storage. It means that, when a HOPEX User is connected to HOPEX, two connections to Oracle are open (one for the SystemDb and one for the User repository).

An additional connection is used for each RDBMS storage when DDL instructions are issued to the RDBMS (for example when there is a first creation of an object type, in other words, when the first occurrence of a MetaClass or MetaAssociation is created).

An additional connection is used for each RDBMS storage when you use the HOPEX locks.

Each connection opened uses 1 MB of memory on the Oracle server

- **SQL Server**

One connection is used for each RDBMS storage. It means that, when a HOPEX User is connected to HOPEX, two connections to SQL Server are open (one for the SystemDb and one for the User repository).

An additional connection is used for each RDBMS storage when you use the HOPEX locks.

Each opened connection uses 24 KB of memory on the SQL Server.

HOPEX RDBMS Diagnostic Utility

Purpose

HOPEX provides a Java based utility that should be used before starting to use environments and repositories on an RDBMS. This utility runs several tests for which the results will be compared to some memorized values corresponding to a situation where HOPEX is likely to have close-to-optimum performances.

The **RDBMS Diagnostic** utility is stored at this path:

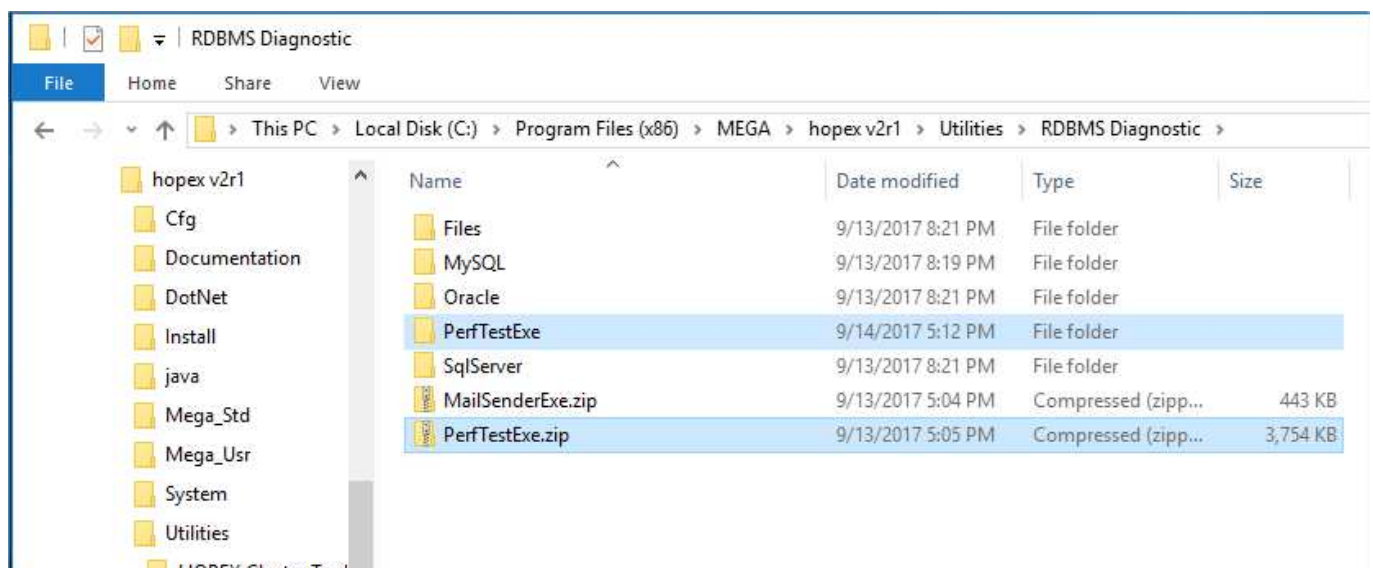
```
< HOPEX Installation Path>\Utilities\RDBMS Diagnostic\
```

Running the RDBMS Diagnostic Utility

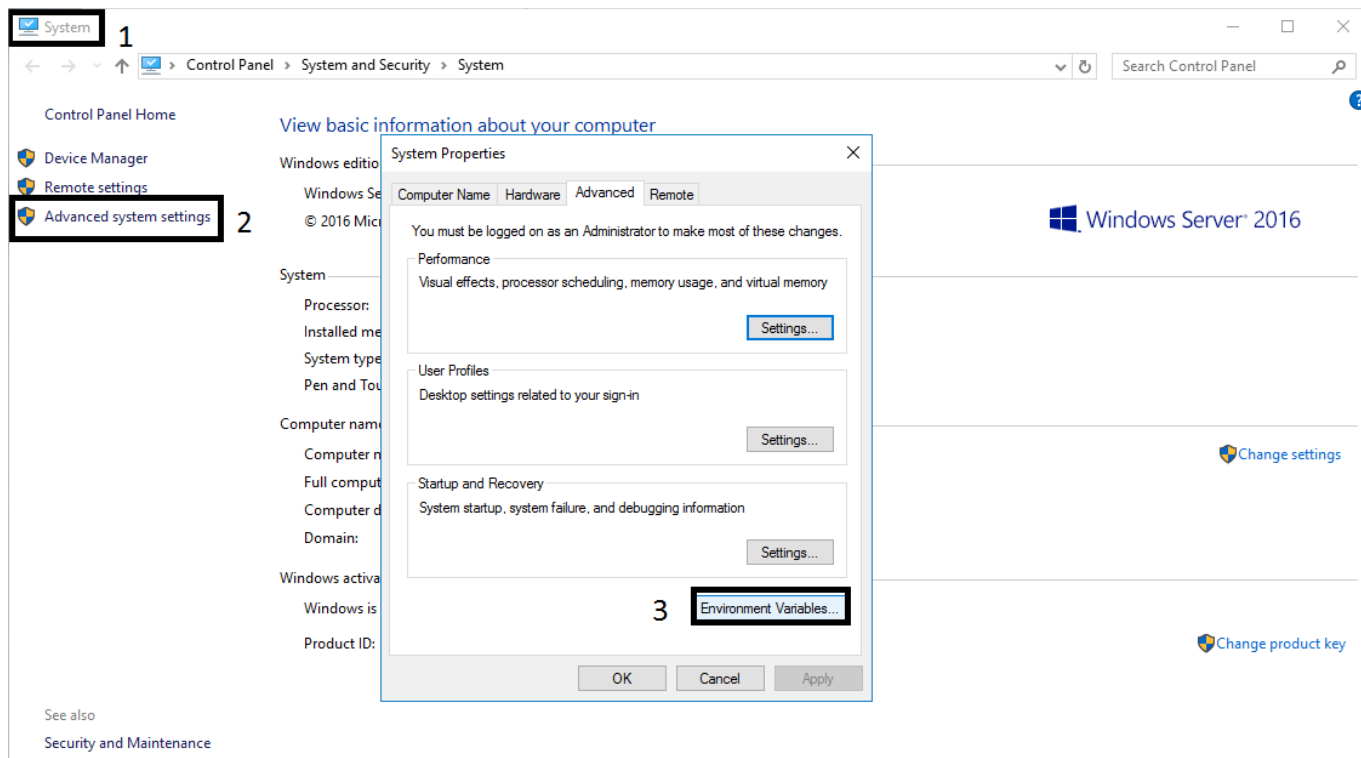
A batch file was created to run the tool.

To run the RDBMS Diagnostic Utility:

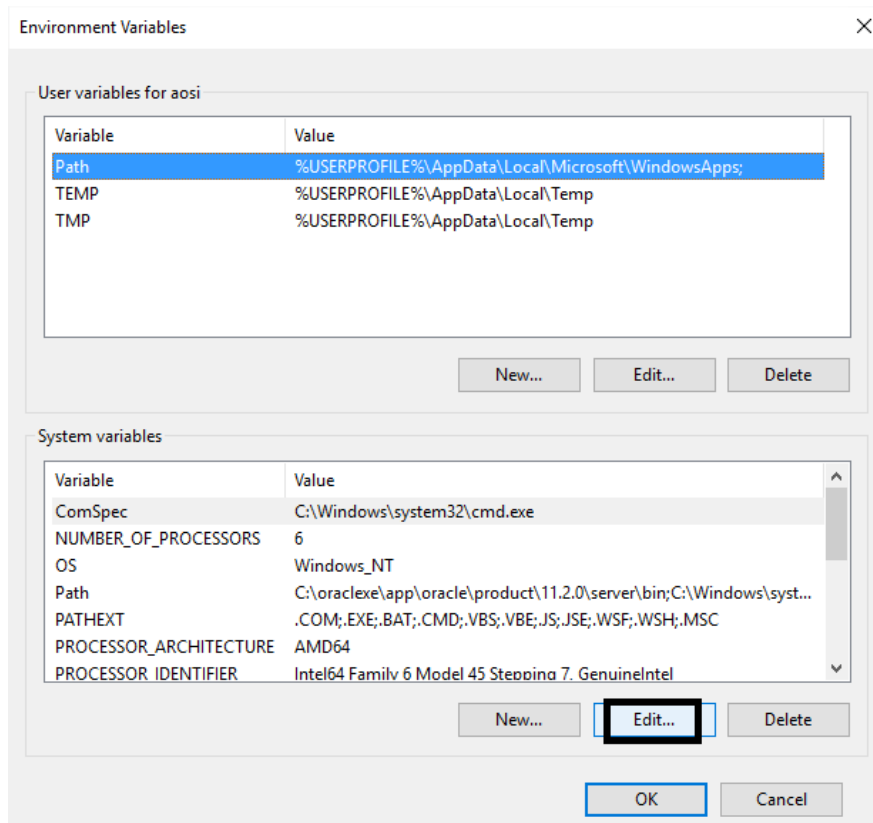
1. Extract the content of the “PerfTestExe.zip” compressed file in the same location:



2. You need to set the JAVA_HOME, so that you can run the batch that will launch the proper JAR file. One way of doing it, is to open the “Environment variables” of the server:

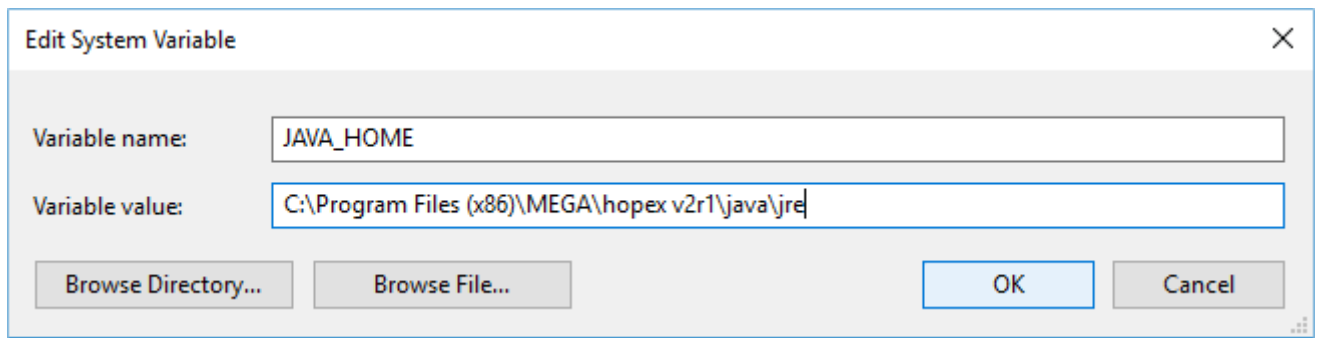


3. In the **System variables** pane, click **Edit**.

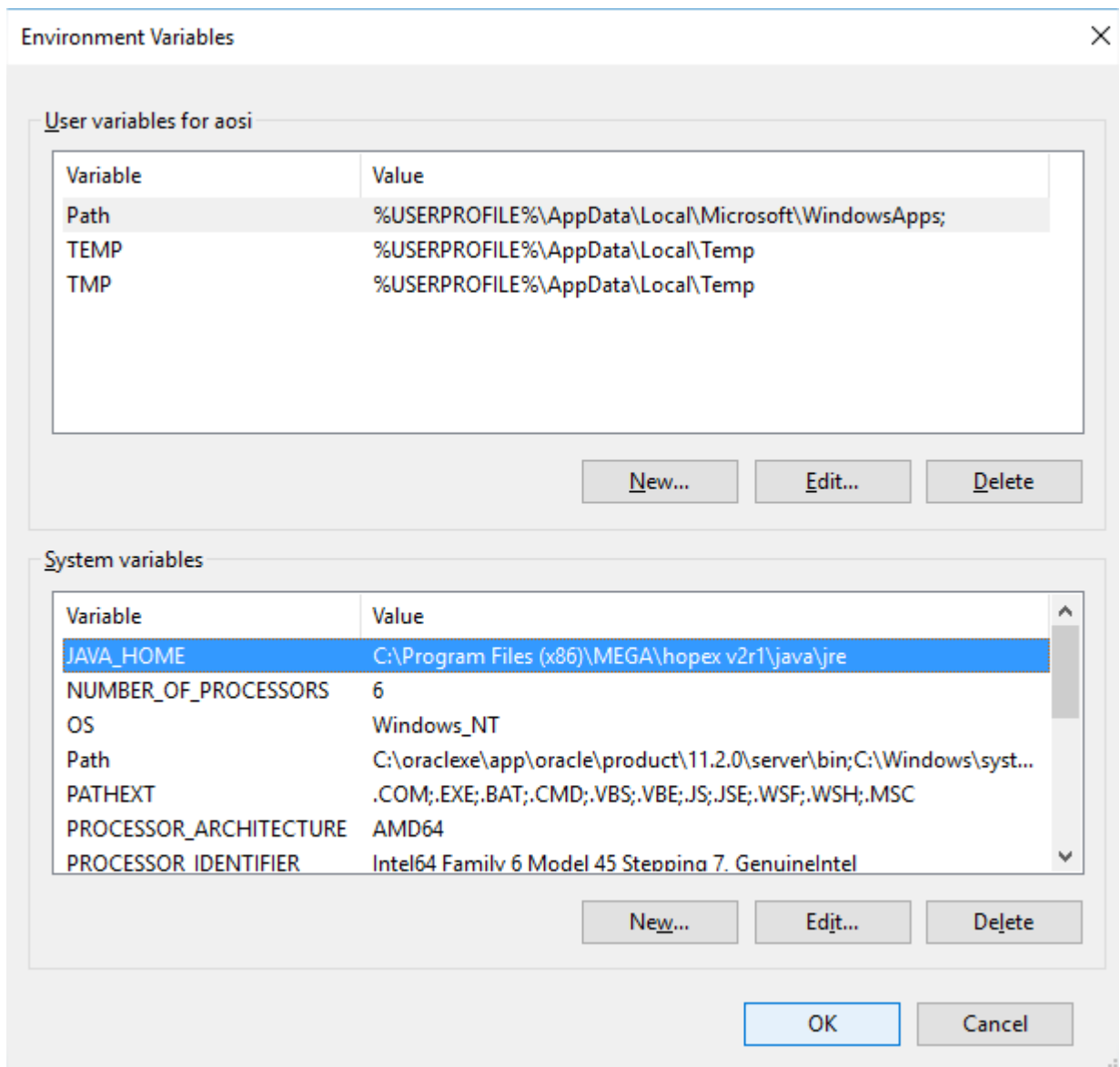


4. Create the variable “JAVA_HOME” with the value targeting the “<Hopex installation>\java\jre” folder.

For example: ``C:\Program Files (x86)\MEGA\hopex v2r1\java\jre``



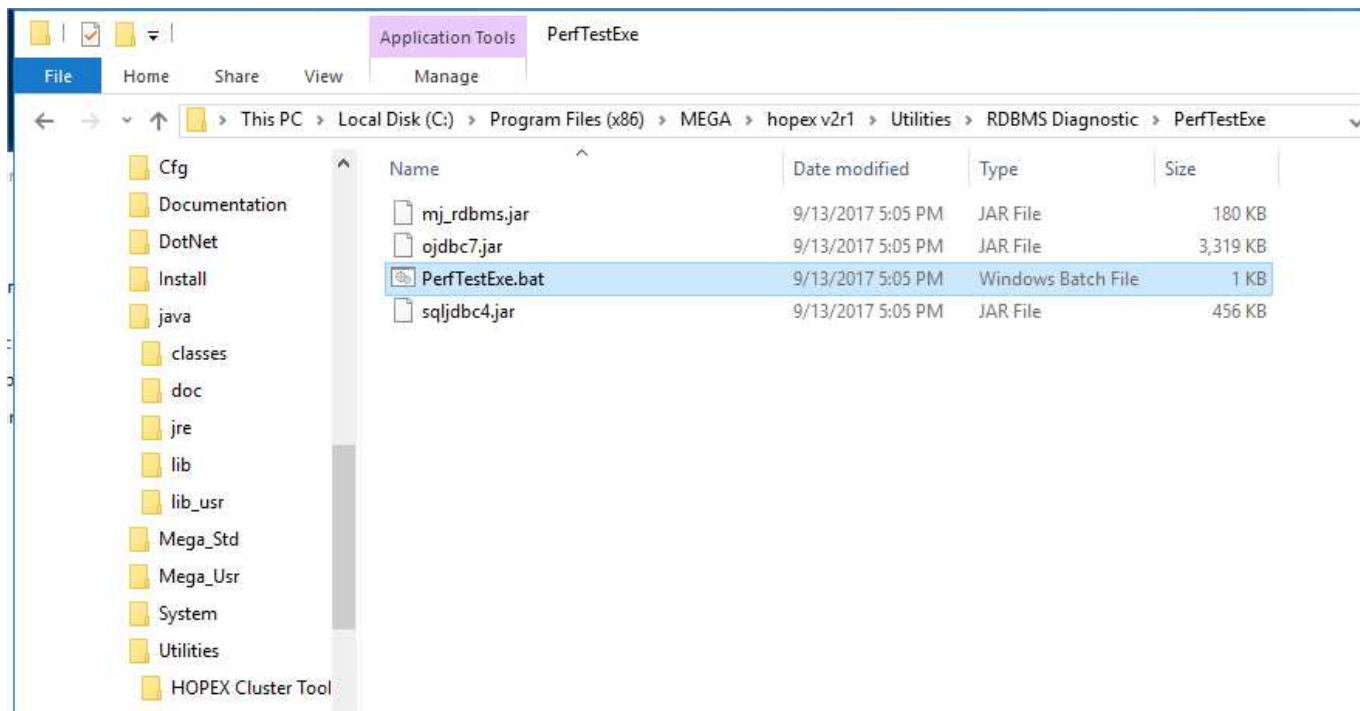
5. Click **OK**



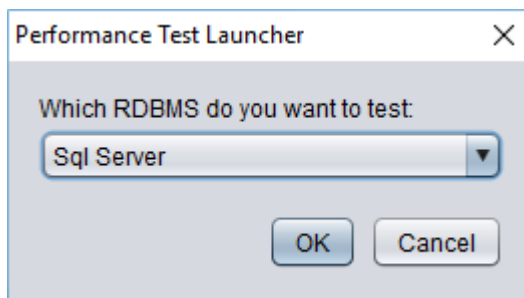
The key is created.

6. Click **OK** to close the **Environment Variables** window.

7. Go back to your file explorer, into the **PerfTestExe** folder, and execute the “PerfTestExe.bat”:

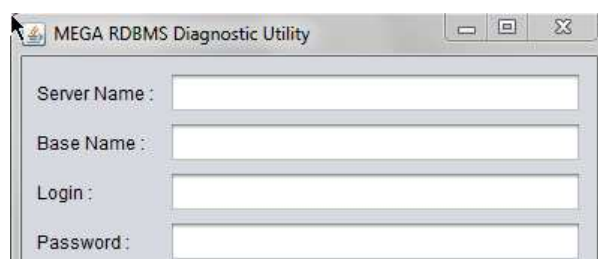


8. Select the RDBMS type (SQL Server or Oracle):

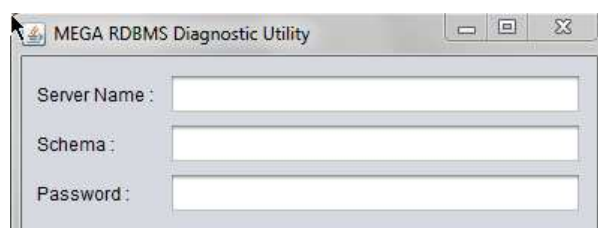


9. Enter the connection information to the RDBMS storage that is the target for hosting the HOPEX data:

- o a database name for SQL Server



- o a schema (Oracle User) name for an Oracle target



10. In order to have consistent times, the **Expected Execution Time** values were recorded after running the utility more than once and noticing that the values were stable.

So to have results that can be considered valid, run the utility twice and consider the values of the 2nd run.

Here is an example of some test results. The test was run on SQL Server:

Test Name	Execution Time (ms)	Expected Execution Tim...	Test Result
✓ DDL	13	20	Ok
✓ INSERT (LIGHT)	29402	29000	Ok
✓ INSERT (LIGHT, server I...	4532	4300	Ok
✓ INSERT (HEAVY)	10627	14000	Ok
✓ READ (LIGHT)	7925	9000	Ok
✓ READ (HEAVY)	30672	34000	Ok
✓ SERVER CPU SPEED	6084	7500	Ok
✓ SERVER DISK	20082	20000	Ok
✓ SERVER DISK (BLOB's)	19955	20000	Ok
✓ BANDWIDTH	23500	24000	Ok
✓ BANDWIDTH (BLOB's)	23418	40000	Ok
✓ RESET DB	23	100	Ok

Test Description :

By clicking on a test, you will have a short description of it.

Diagnostic :

OK: time=23500ms , expected time=24000ms
TEST 11 (BANDWIDTH (BLOB's)):
OK: time=23418ms , expected time=40000ms
TEST 12 (RESET DB):
OK: time=23ms , expected time=100ms
Batch Test Finished: Tue Mar 19 12:02:14 CET 2013

☐ Auto Commit

Copy Diagnostic to Clipboard

Start Tests Stop Tests Close

Oracle support

Oracle Database Requirements

Encoding

The HOPEX application requires UTF8 encoding.

```
Select 'Use UNICODE (AL32UTF8)'. (parameter NLS_CHARACTERSET= AL32UTF8)
```

User privileges

The Oracle user requires the following privileges for the database instance:

```
GRANT CREATE SESSION TO <MEGAUSR>;  
  
GRANT CREATE TABLE TO <MEGAUSR>;  
  
GRANT CREATE PROCEDURE TO <MEGAUSR>;  
  
GRANT SELECT on V_$PARAMETER to <MEGAUSR>;
```

Note: here is the only query that is run against the **V_\$PARAMETER** system view

```
SELECT VALUE FROM V$PARAMETER WHERE UPPER(NAME) = 'OPEN_CURSORS'
```

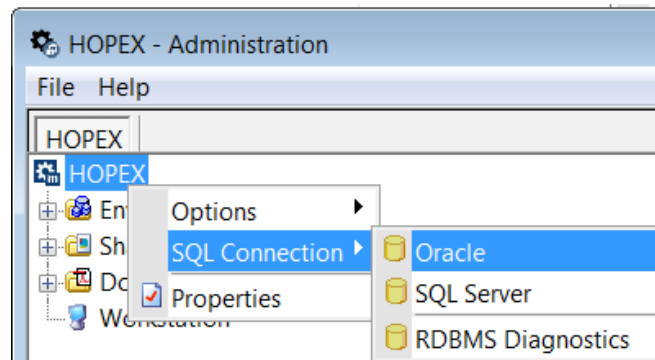
Purpose: calculate the number of distinct queries that can be put in the *Oracle statement cache*. To learn more about this mechanism, see [Oracle documentation](#).

Defining a HOPEX Oracle Connection

An “SQL Connection” menu is available in the HOPEX Administration program at different levels (site, environment, and repository) if the license contains “Repository Storage (Oracle)” products.

To define a HOPEX Oracle connection:

1. Start HOPEX Administration.exe.
2. Right-click **HOPEX** (the root of the administration tree) and select **SQL Connection > Oracle**.



3. Set the connection parameters:

- **Instance:** <Database Host Id >/<Oracle Service Name>

Database Host ID can be an IP address or the name of a machine network. If the listener service is configured on a port other than the default port, you must suffix the "Database Host ID" with the port number:

- My Server
- 174.12.5.3
- My Server:1523
- 174.12.5.3:1523

Oracle Service Name is db_unique_name.

Example for a standalone installation with Oracle Express with a listener on the 1524 port:

My Machine:1524/XE

A complete connection description can be used:

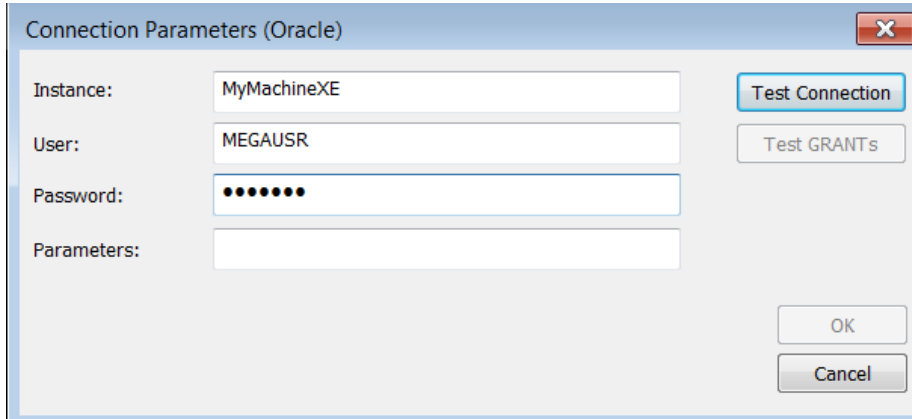
(DESCRIPTION = (ADDRESS = (PROTOCOL = TCP)(HOST = <DB server Id>)(PORT = <listener port number>)) (CONNECT_DATA = (SERVER = DEDICATED) (SERVICE_NAME = <Oracle service name>)))

The **connection description** can be used for defining a connection to an Oracle Cluster (RAC).

- **User:** user enabled to access/update Oracle
- **Password:** password of the user enabled to access/update Oracle
- **Parameters:** additional parameters of the connection string.
It is possible to use a specific Tablespace (different from the Oracle user's default one):
tablespace=TablespaceName

4. Click **Connection Test** to check connection parameters.

Note that clicking **Grants Test** has no use at this point.



Connection Parameters (Oracle)

Instance: MyMachineXE

User: MEGAUSR

Password: ●●●●●●

Parameters:


Test Connection

Test GRANTS

OK

Cancel

Important note: If the test returns the **“ORA-12705: Cannot access NLS data files or invalid environment specified parameters”** error message, this could be due to a previous installation of Oracle.

 In this case, in the registry editor:

- delete the “HKEY_LOCAL_MACHINE\SOFTWARE\ORACLE\NLS_LANG, or
- rename it to NLS_LANG.OLD” key.

Creating an Environment

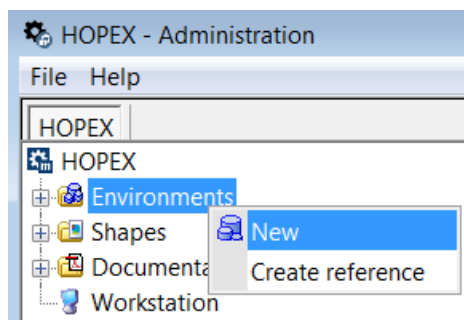
The environment creation mainly consists in creating a SystemDb repository where MetaModel definitions are stored.

Prerequisite:

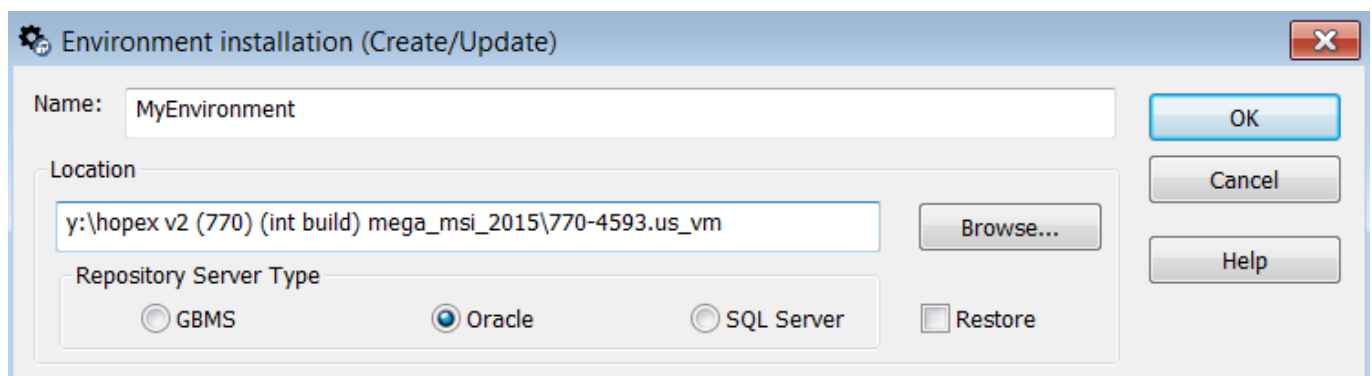
- Identify the SQL connection parameters (RDBMS instance, user and password).
- Identify the location of the environment folder on the file server.
- Verify that the Oracle database was created with the appropriate encoding (NLS_CHARACTERSET= AL32UTF8).

To create an environment:

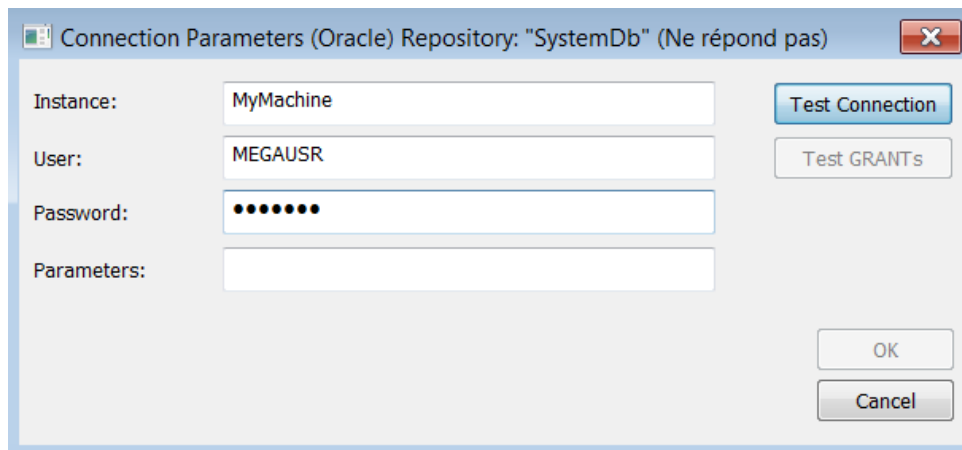
1. Start HOPEX Administration.exe.
2. Right-click the **Environments** folder and select **New**.



3. Enter the environment **Name**.
4. (If needed) Change the **Location**.
5. Select "Oracle" Repository Storage Support.



You can use the parameters specified at the root level for Oracle as they will be shown as default or overload them. In any case, when creating an environment, some more specific tests are carried out regarding the capabilities of the Oracle user to see if they match the prerequisite.



6. Click **Test connection** to check that the Oracle server is reachable.

This step must be successful for the process to continue.

7. Click **Test GRANTS** to test different actions (table creations, indexing columns etc.) that are necessary for HOPEX to be able to work.

This test must be successful for the process to continue.

8. Click **OK** to start the environment creation.

Result:

- A SystemDb repository stored in the selected RDBMS instance is created.
- A folder (HOPEX environment folder) is created on the file server.

This folder contains several files and subfolders (Db, Mega_Usr, SysDb).

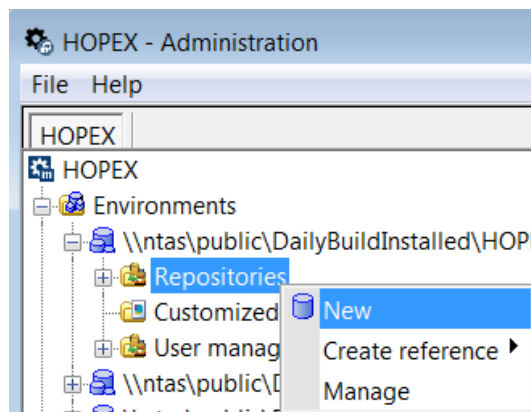
Creating a Repository

Prerequisite:

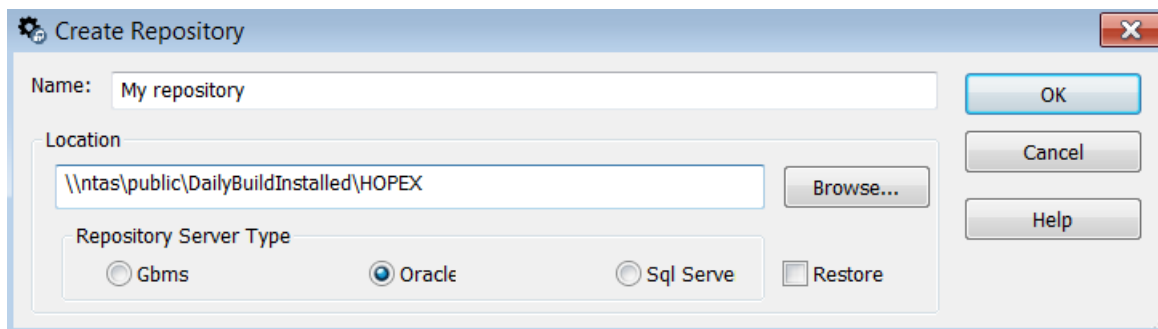
- You can create the repository in the same Oracle User's Schema as that of the SystemDb, however, **it is strongly recommended you isolate each HOPEX repository in a separate Oracle User's Schema especially for keeping the database administration simpler.**
- Verify that the Oracle database was created with the appropriate encoding (NLS_CHARACTERSET= AL32UTF8).

To create a repository:

1. Start HOPEX Administration.exe.
2. Connect to the environment concerned.
3. Right-click the **Repositories** folder and select **New**.



4. Enter the repository **Name**.
5. Select a **Location**.
6. Select the "Oracle" Repository Storage Support.
7. Click **OK**.



8. Change the Oracle User's Schema and password as recommended above or use the default parameters.
9. Click "**Test connection**". The test must be successful for the process to continue.
10. Click "**Test GRANTS**". The test must be successful for the process to continue.
11. Click **OK** to start the repository creation.

Results:

- HOPEX repository tables are created in the Oracle User's Schema.
- A folder is created in the specified location.

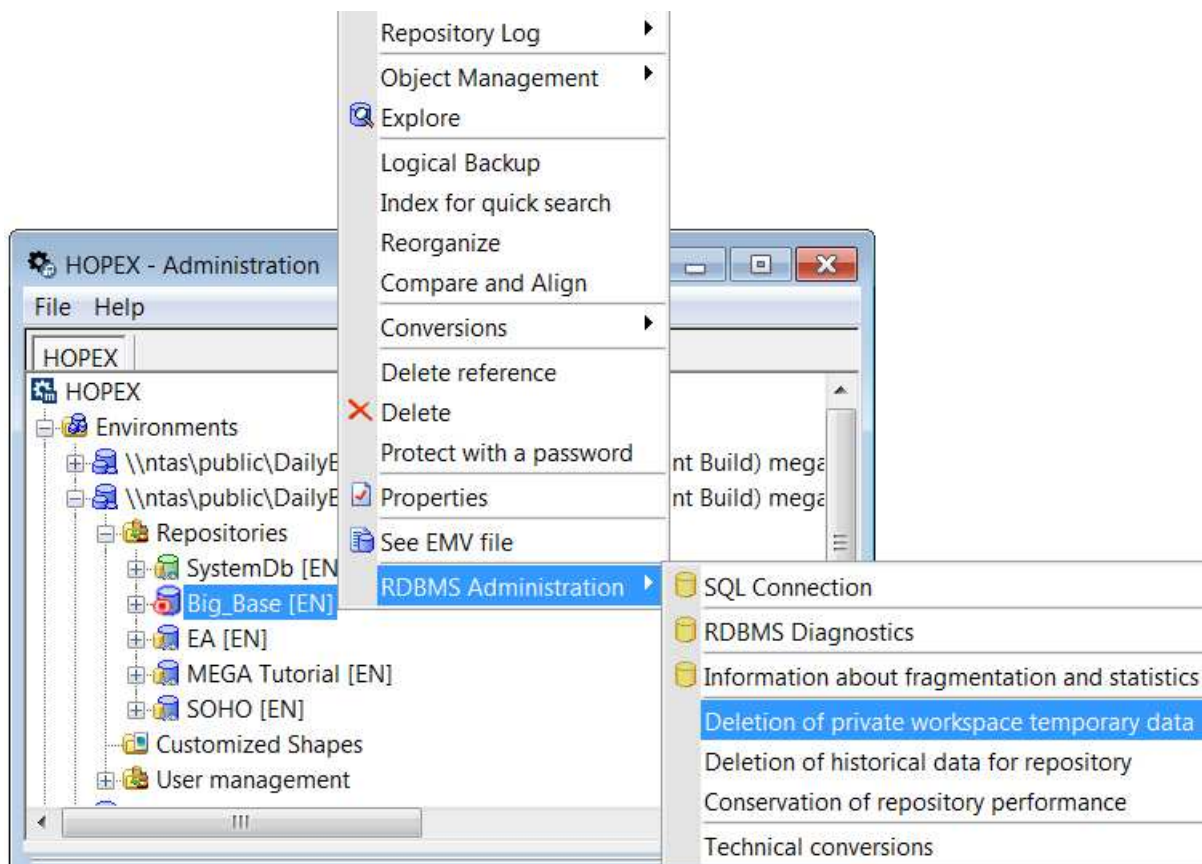
HOPEX Private Workspaces Cleanup

This procedure is used to delete the data of the terminated private workspaces of HOPEX Users. It is necessary to clean up these data often in order to reduce database growth and preserve good performances. MEGA recommends running this procedure every week if you have less than 10 users and every night if you have more than 10 users.

Installing the procedure

Warning: You must repeat this procedure for each HOPEX Repository and the SystemDb.

1. Right-click your HOPEX Database and select **Deletion of private workspace temporary data**.



This launches SP_CLEAN_MEGA_DATABASE and if the procedure:

- does not exist, the application creates it.
- **already exists, it is overwritten by this action.**

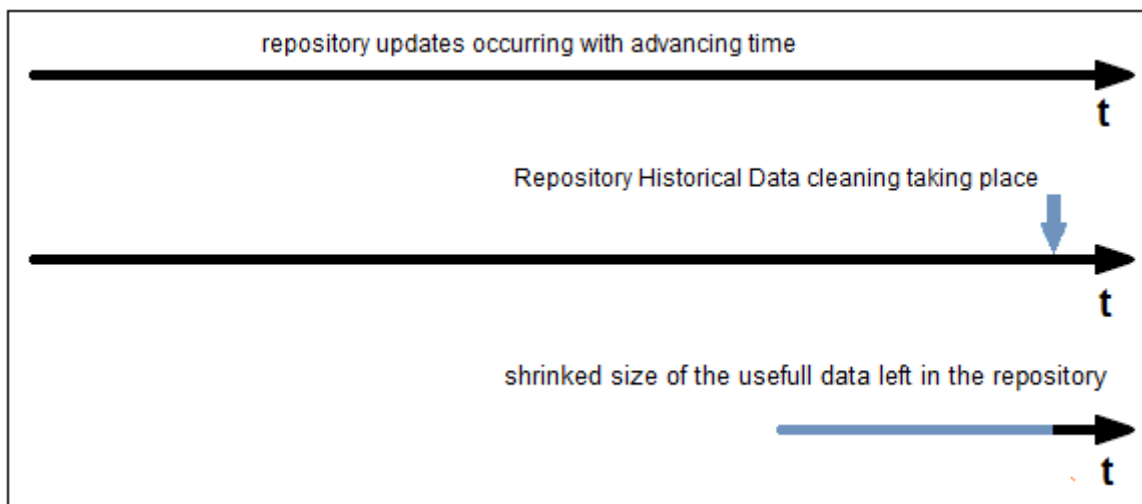
HOPEX Historical Data Cleanup

This procedure is used to delete the historical data of the HOPEX database. Each time a HOPEX object is updated, the previous data is kept in a database. This method ensures a high level of data security even when connection to SGBD is interrupted. It is necessary to often clean up these data in order to reduce database growth and preserve good performances. This clean-up will have no impact on the repository logfile. MEGA recommends running this procedure every week if you have less than 10 users and every night if you have more than 10 users.

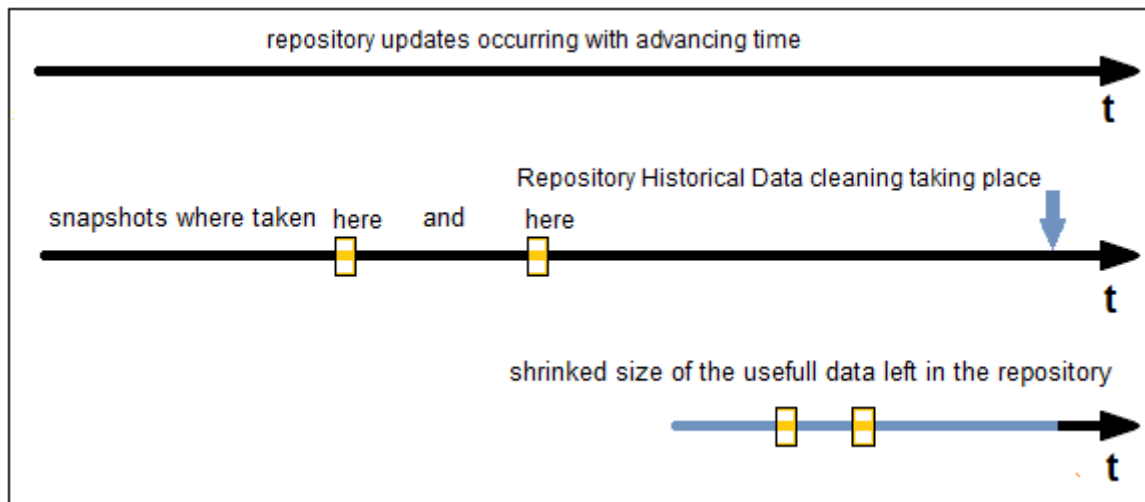
Before cleaning Historical Data

Historical data are used in the Repository Snapshot mechanism. See HOPEX Common Features > Other Features > Using Repository Snapshots > **Repository Snapshot Prerequisites** section for more details.

If you need to have Repository Snapshots taken, be aware that it will not be possible anymore for the period of time covered by the cleanings. In other words, if you need Repository Snapshots, be sure to take them before the procedure runs.



In this first illustrated case, all archived states were deleted, so all the space that these archived states were using is reclaimed physically (an actual delete in the tables was issued for every one of them).



In this second example, all archived states were also deleted except those corresponding to the state of the repository when the two Snapshots were taken.

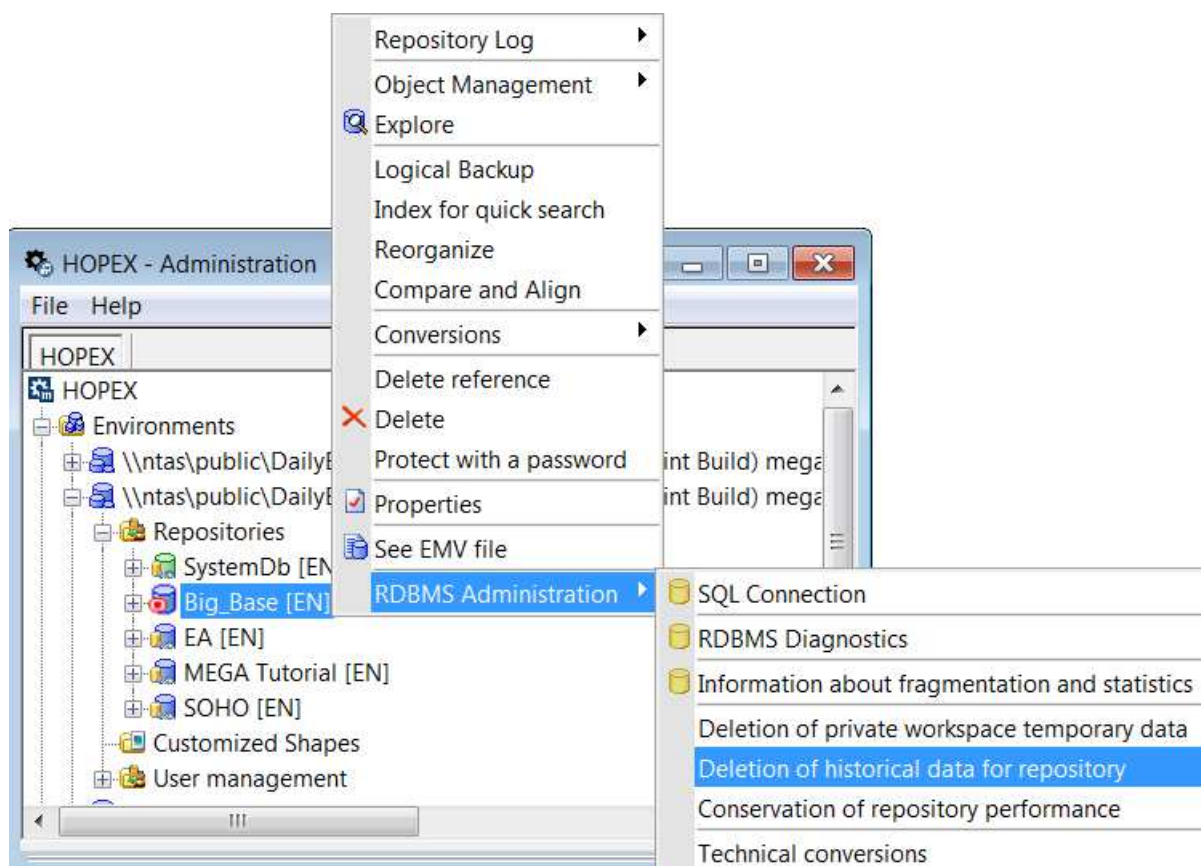
In this case, the data corresponding to the repository state for the Snapshot(s) is saved and it is thanks to this saving that special features will be available within this repository regarding this data.

Installing the procedure

Warning: You must repeat this procedure for each HOPEX Repository and the SystemDb.

1. Right-click your HOPEX Database and select **Deletion of historical data from repository**.

This launches SP_CONSOLIDATE_MEGA_DATABASE and if the procedure does not exist, the application creates it. If the procedure already exists, it is overwritten by this action.



Batching Cleanup procedures for Oracle

It is very important to run both of the procedures on a regular basis. So If you do not want to have to remember to click the corresponding menus in the Administration.exe program every time that each of the procedure should be run, you can batch it using Oracle Scheduler.

To batch cleanup procedures for Oracle:

1. In Oracle enterprise Manager, select Server tab.
2. In **Oracle Scheduler** section, click **Jobs**.

ORACLE Enterprise Manager 11g
Database Control

Database Instance: [REDACTED]

Home Performance Availability **Server** Schema Data Movement Software and Support

Storage
[Control Files](#)
[Tablespaces](#)
[Temporary Tablespace Groups](#)
[Datafiles](#)
[Rollback Segments](#)
[Redo Log Groups](#)
[Archive Logs](#)
[Migrate to ASM](#)
[Make Tablespace Locally Managed](#)

Database Configuration
[Memory Advisors](#)
[Automatic Undo Management](#)
[Initialization Parameters](#)
[View Database Feature Usage](#)

Oracle Scheduler
Jobs
[Chains](#)
[Schedules](#)
[Programs](#)
[Job Classes](#)
[Windows](#)
[Window Groups](#)
[Global Attributes](#)
[Automated Maintenance Tasks](#)

3. Select **Create**.
4. Enter a job name.
5. In the Command section click Change Command Type to change for Stored Procedure.
6. Look for the Stored Procedure in the corresponding Schema:

Search and Select: Procedure [Cancel] [Select]

Search
To find your item, select a schema in the pulldown list and enter a word in the text field, then select the "Go" button. To see a list of all tables in the selected schema, clear the search box and click the "Go" button.

Schema

Object Name [Go]

Results

Select	Schema	Name
<input checked="" type="radio"/>	MEGAUSER	SP_CLEAN_MEGA_DATABASE
<input type="radio"/>	MEGAUSER	SP_CONSOLIDATE_MEGA_DATABASE

[Cancel] [Select]

- a. Enter the three arguments values for the job:
 - 1 : Schema name (ex: 'MEGAUSER')
 - 2 : HOPEX environment name (ex : 'Demonstration')

- 3 : HOPEX repository name (ex : 'Adventure')

Arguments

Provide the argument values of the job.

Select	Order	Value
<input checked="" type="radio"/>	1	'MEGAUSER'
<input type="radio"/>	2	'Demonstration'
<input type="radio"/>	3	'Adventure'

- Schedule its execution for running every night

General	Schedule	Options
Schedule Type <input type="text" value="Standard"/>		
Time Zone <input type="text" value="(UTC+01:00) Paris"/>		
Repeating		
Repeat <input type="text" value="By Days"/>		
Interval (Days) <input type="text" value="1"/>		
Time <input type="text" value="11"/> <input type="text" value="00"/> <input type="text" value="00"/> <input type="radio"/> AM <input checked="" type="radio"/> PM		

- Repeat the same actions for the other procedure.
- Schedule the two Stored Procedures for each repository and do not forget the SystemDb.

Maintenance tasks

By default, when the installation of the Oracle is done, an automatic job is set to update the statistics of all schemas :

```
exec DBMS_STATS.GATHER_DATABASE_STATS
```

If that job was disabled or modified, and set to refresh a set list of schemas, make sure that it includes the Mega HOPEX schemas.

SQL Server support

SQL Server Requirements

Encoding

After the database has been created, verify that "Collation" is set to "SQL_Latin1_General_CP1_CS_AS". If the database is created from the HOPEX application, the appropriate encoding is automatically configured.

User management

When the HOPEX application accesses the HOPEX data stored in the RDBMS, it uses an SQL connection string. This connection string refers to a user account that has certain privileges for the instance.

This user can either be a native account, or a Windows account :

- **Native account:**
 - **Pros:** Unique account, configured for everyone that runs the thin or thick clients.
 - **Cons:** Thought to be less secure.
- **Windows accounts:**
 - **Pros:** Don't set up any connection string in the tool.
 - **Cons:** Need to authorize several Windows accounts to have direct access to the data : the impersonate user that runs the processes of the web users, the service account that runs the SSP, every user that needs to run the thick client (either the Administration.exe or the Hopex.exe tools).

Privileges for native account

You can have several kinds of SQL server users in relation to the customer security policy:

- **Standard security policy:** the user account is enabled to manage databases. This is the easiest solution especially if the SQL Server instance is dedicated to HOPEX.

User type	Comment	Server roles	Database roles	Server permissions
User with maximum privileges	Allowed to manage any database (create database, delete database, data read access, data write access, update database structure)	dbcreator	db_owner (1)	View server state (2)

- **Advanced security policy:** only the DBA is allowed to create new databases following specific naming rules. A user is required to use the existing databases.

User type	Comment	Server roles	Database roles	Server permissions
User with limited privileges	Allowed to use an existing database (data read access, data write access, update database structure)	public	db_owner (3)	View server state (2)

(1) db_owner role is automatically assigned by the system when a database is created.

(2) To consult the view 'sys.dm_exec_sessions' for the server.

(3) db_owner role is manually assigned by the DBA after database creation.

The HOPEX application will create table, columns and index objects dynamically. The right to create Procedures is mandatory. Trigger, functions and view objects are not used.

Privileges for Windows accounts

Since this configuration requires to grant access to the different databases to several Windows accounts, and especially to accounts of people running the thick client of the application, it is recommended to limit those rights to a minimum, to reduce the risk of harming the application by directly modifying or deleting data.

- **Advanced security policy:** only the DBA is allowed to create new databases following specific naming rules. A user is required to use the existing databases.

User type	Comment	Server roles	Database roles	Server permissions
User with limited privileges	Allowed to use an existing database (data read access, data write access, update database structure)	public	db_ddladmin, db_datawriter and db_datareader (3)	View server state (2)

(2) To consult the view 'sys.dm_exec_sessions' for the server.

(3) those roles are manually assigned by the DBA after database creation.

The HOPEX application will create table, columns and index objects dynamically. The right to create Procedures is mandatory. Trigger, functions and view objects are not used.

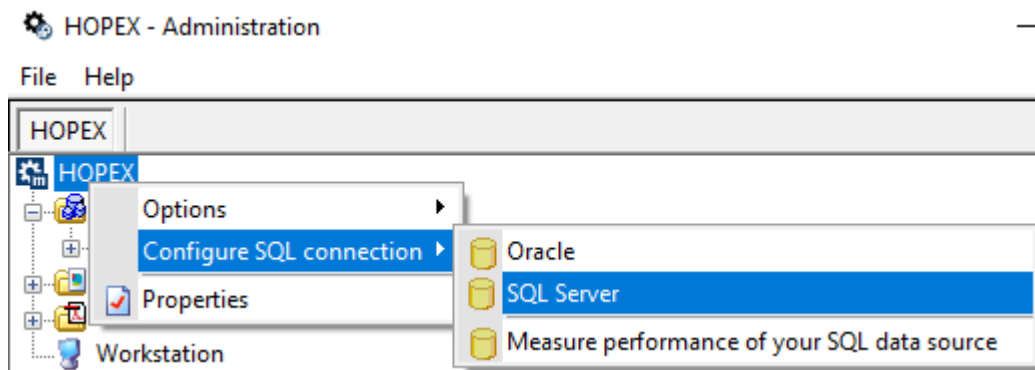
The Windows users **should not** have the "db_creator" server role.

Defining a HOPEX SQL Server Connection

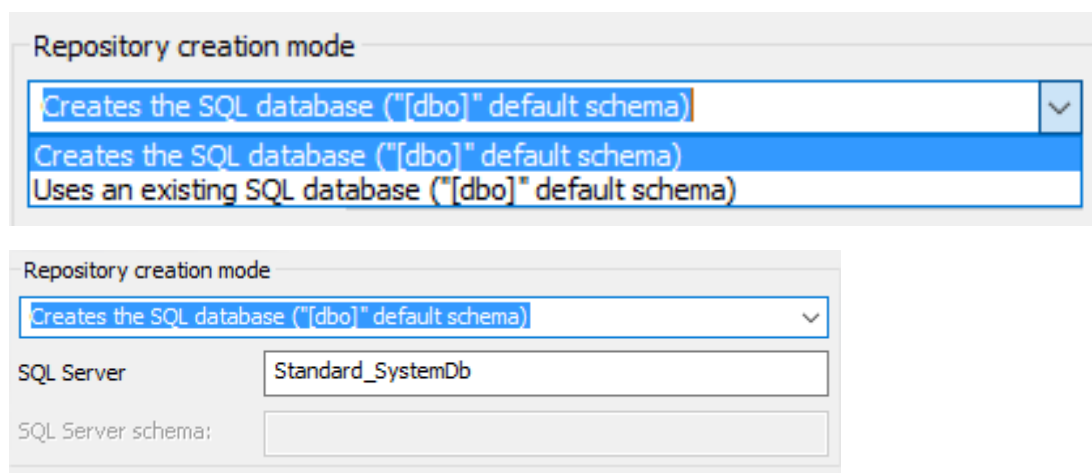
A **Configure SQL Connection** menu is available in the HOPEX **Administration** application at different levels (site, environment, and repository) if the license contains the Repository Storage (SQL Server) product.

Procedure with a native SQL account

1. Start HOPEX Administration.exe.
2. Right-click HOPEX (the root of the administration tree) and select **Configure SQL connection > SQL Server**.



3. Enter the connection parameters.
 - o **Instance:** <machine network name>\<SQL Server instance name> (1)
Example for a standalone installation with SQL Express: MyMachine\SQLEXPRESS
 - o **User:** user enabled to access/update SQL Server
 - o **Password:** password of the user enabled to access/update SQL Server
 - o **Repository creation mode:** by default you create your environment in the "dbo" schema, in the database prefixed with the environment name (here, "Standard"). You can choose to target a different database using the same schema "dbo" using the dropdown list.



4. Click **Test Connection** to check the connection parameters.

Connection Parameters (SQL Server) Repository: "SystemDb"

Instance: myserver\myinstance

User: mynativeuser

Password: ••••••••••

Parameters:

Repository creation mode
Creates the SQL database ("[dbo]" default schema)

SQL Server: Standard_SystemDb

SQL Server schema:

Test Connection

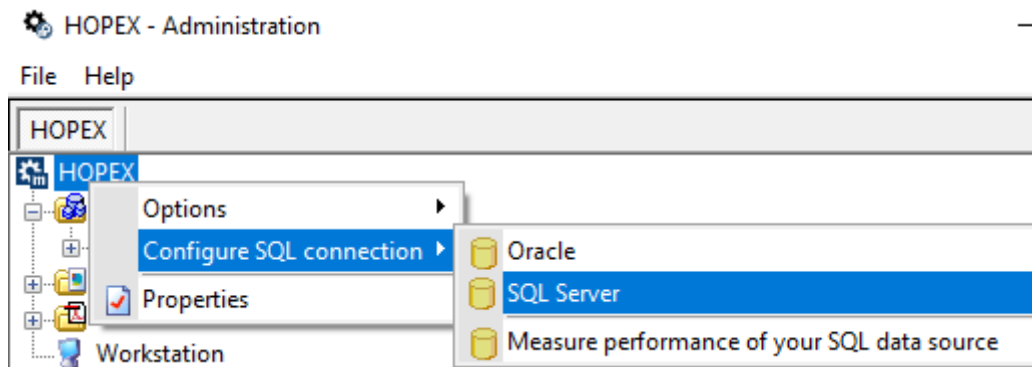
Test GRANTS

OK

Cancel

Procedure when using Windows authentication

1. Start HOPEX Administration.exe.
2. Right-click HOPEX (the root of the administration tree) and select **Configure SQL connection > SQL Server**.



3. Set the connection parameters.
 - **Instance:** <machine network name>\<SQL Server instance name> (1)
Example for a standalone installation with SQL Express: MyMachine\SQLEXPRESS
 - **User:** leave blank
 - **Password:** leave blank
 - **Parameters :** set "Trusted_Connection=Yes;"
 - **Repository creation mode:** same as the native authentication settings.
4. Click **Test Connection** to check the connection parameters.

Connection Parameters (SQL Server) Repository: "SystemDb" ✕

Instance: Test Connection

User:

Password:

Parameters: Test GRANTS

Repository creation mode

▼

SQL Server OK

SQL Server schema: Cancel

Creating an Environment

The environment creation mainly consists in creating a SystemDb repository. For SQL server, two creation modes are available from HOPEX:

- Create a new database on the SQL Server (standard security policy)
- Use an existing database of the SQL Server (advanced security policy)

Creating a new SystemDb database

Prerequisite:

- Identify the SQL connection parameters (RDBMS instance, user, password)
- Identify the location of the environment folder on the file server

Procedure:

1. Start HOPEX Administration.exe.
2. Right-click the **Environments** folder and select **New**.
3. Enter the environment **Name**.
This creates a folder on the file server.
4. (If needed) Change the **Location**.
5. Select “SQL server” Repository Storage Support.
6. Click **OK**.
7. Confirm or change SQL Connection parameters.
8. As the **Repository Creation Mode** select “Create Database” .
9. Click **Test Connection** to check that the SQL Server is reachable. This step must be successful for the process to continue.
10. Click **Test GRANTS** to check different actions (table creations, indexing columns etc.) that are necessary for HOPEX to be able to work. This step must be also successful for the process to continue.
11. Click **OK** to start the environment creation.

Result:

- A SystemDb repository stored in the selected RDBMS instance is created.
- A folder (HOPEX environment folder) is created at the selected location.
This folder contains several files and subfolders (Db, Mega_Usr, SysDb).

Using an existing SystemDb database

Prerequisite:

- Identify the SQL connection parameters (RDBMS instance, user, and password).
- Identify the location of the environment folder on the file server.
- **Verify that the “Collation” property of the database is set to “SQL_Latin1_General_CP1_CS_AS”.**
- Identify the exact name of the user database in the SQL Server. It follows this naming rule:

`<EnvironmentName>_SystemDb`

Example: `MyEnvironment_SystemDb`

Note: the environment name must match the environment folder.

Procedure:

1. Start HOPEX Administration.exe.
2. Right-click the **Environments** folder and select **New**.
3. Enter the environment “Name” (in this example : “Name” = “MyEnvironment”) This creates a folder.
4. (If needed) Modify the **Location**.
5. Select “SQL server” Repository Storage Support.
6. Click **OK**.
7. Confirm or change the SQL Connection parameters.
8. As **Repository creation mode** select “Uses an existing SQL database (“[dbo]” default schema)”.
9. Click **Test connection** to check that the SQL Server is reachable.

This step must be successful for the process to continue. If “Use existing database” option was specified, this test tries to connect to the database matching the following pattern: “MyEnvironment_SystemDb”. This test must be successful for the process to continue.

10. Click **Test GRANTS** to check different actions (tables creations, indexing columns etc.) that are necessary for HOPEX to be able to work. This test must be also successful for the process to continue.
11. Click **OK** to start the environment creation.

Result:

- The SystemDb repository is initialized.
- A folder (HOPEX environment folder) is created at the selected location. This folder contains several files and subfolders (Db, Mega_Usr, SysDb).

Creating a Repository

For SQL Server, two creation modes are available from HOPEX:

- Create a new database on the SQL Server (standard security policy).
- Use an existing database of the SQL Server (advanced security policy).

Creating a new SQL Server database

Prerequisites:

- Identify the SQL connection parameters (RDBMS instance, user, and password).

Procedure:

1. Start HOPEX Administration.exe.
2. Connect to the environment concerned.
3. Right-click the **Repositories** folder and select **New**.
4. Enter the repository **Name**.
5. Keep the default **Location**.
6. Select "SQL server" Repository Storage Support.
7. Click **OK**.
8. Confirm or change the SQL Connection parameters.
9. As **Repository creation mode** select "Creates the SQL database ("[dbo]" default schema)".
10. Click **Test connection**. The test must be successful for the process to continue.
11. Click **Test GRANTS**. The test must be successful for the process to continue.
12. Click **OK** to create the new database

Result:

- A repository is created in SQL server. It follows this naming rule:

`<EnvironmentName>_<RepositoryName>`

Example: `MyEnvironment_SQLServerRepository`

- A folder is created in the specified location.
This folder contains an EMV and an EMQ file.

Using an existing SQL Server database

Prerequisites:

- Identify the SQL connection parameters (RDBMS instance, user, and password).
- **Verify that the property 'Collation' of the database is set to 'SQL_Latin1_General_CP1_CS_AS'**
- Identify the exact name of the user database in the SQL Server. It follows this naming rule:

`<EnvironmentName>_<RepositoryName>`

Example: `MyEnvironment_SQLServerRepository`

Note that the environment name must match the actual environment folder.

Procedure:

1. Start HOPEX **Administration.exe**.
2. Connect to the environment concerned.
3. Right-click the **Repositories** folder and select **New**.
4. Enter the environment **Name**.
E.g.: `SQLServerRepository`
5. Select **SQL server** Repository Storage Support.
6. Click **OK**.
7. Confirm or change the SQL Connection parameters.
8. As **Repository Creation Mode** select "Uses an existing SQL database ("[dbo]" default schema)".
9. Click **Test** to check that the login can be performed and that the database exists.
10. Click **Test connection**. The test must be successful for the process to continue.
11. Click **Test GRANTS**. The test must be successful for the process to continue.
12. Click **OK**.

Result:

- A repository is referenced in the SQL server and initialized.

Example: `MyEnvironment_SQLServerRepository`

- A folder is created in the specified location.

`<this folder contains a .EMV and a .EMQ file.`

HOPEX Private Workspaces Cleanup

This procedure is used to delete the data of terminated private workspaces of HOPEX Users. It is necessary to clean up these data often in order to reduce database growth and preserve good performances. We recommend running this procedure every week if you have less than 10 users and every night if you have more than 10 users.

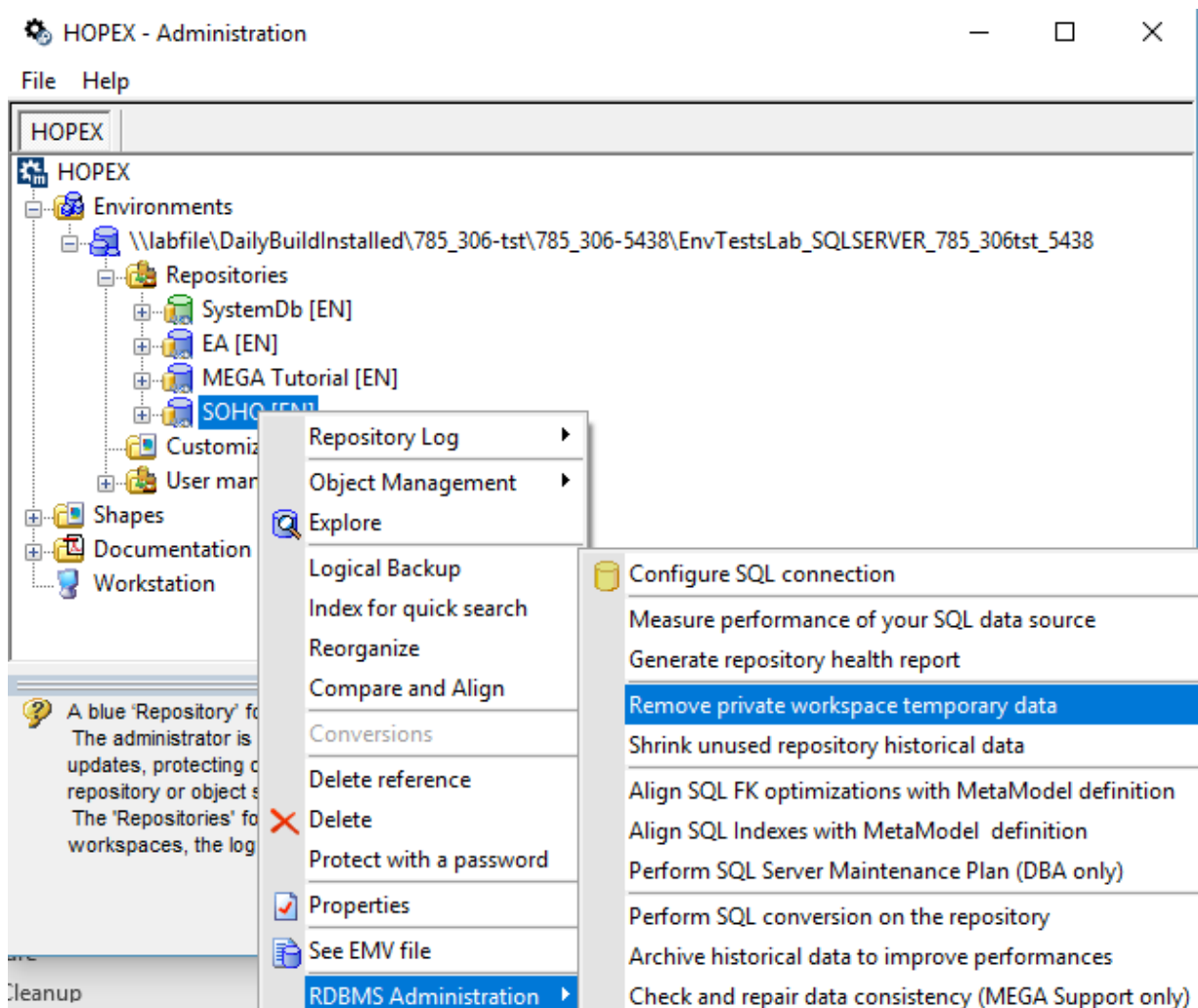
Installing the procedure

Warning: You must repeat this procedure for each HOPEX Repository and the SystemDb.

1. Right-click your HOPEX repository and select RDBMS Administration > Remove private workspace temporary data.

This will launch SP_CLEAN_MEGA_DATABASE and if the procedure:

- does not exist, the application will create it.
- already exists, it is overwritten by this action.



HOPEX Historical Data Cleanup

This procedure is used to delete the historical data of the HOPEX repository. Each time a HOPEX object is updated, the previous data is kept in database. That method insures a high data security even when connection to SGBD is interrupted. It is necessary to clean up these data often in order to reduce database growth and preserve good performances. This clean-up will have no impact on the repository logfile. We recommend running this procedure every week if you have less than 10 users and every night if you have more than 10 users.

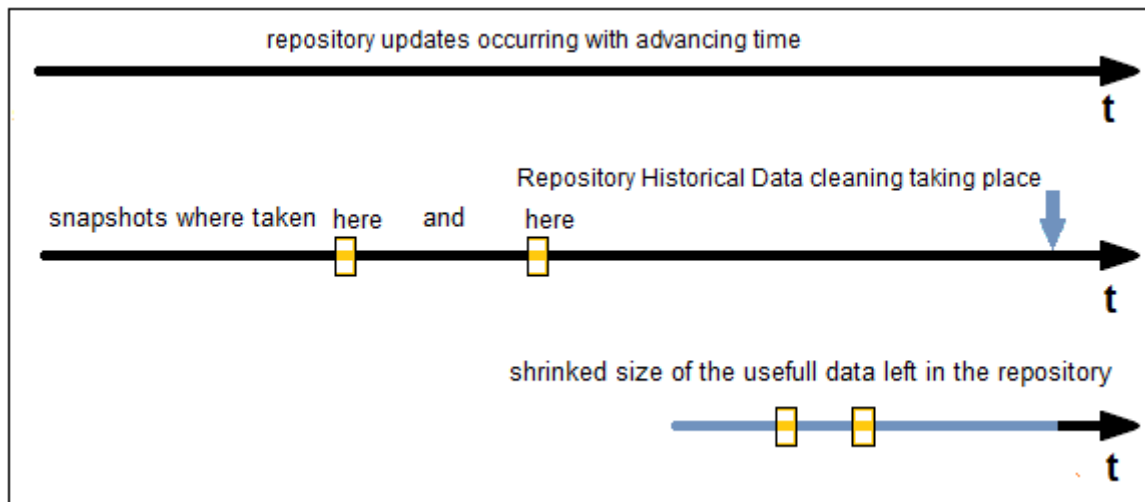
Before cleaning Historical Data

Historical data are used in the Repository Snapshot mechanism. See HOPEX Common Features > Other Features > Using Repository Snapshots: **Repository Snapshot Prerequisites** section for more details.

If you need to have Repository Snapshots taken, be aware that it will not be possible anymore for the period of time covered by the cleanings. In other words, if you need Repository Snapshots, be sure to take them before the procedure runs.



In this first illustrated case, all archived states were deleted, so all the space that these archived states were using is reclaimed physically (an actual delete in the tables was issued for every one of them).



In this second example, all archived states were also deleted except those corresponding to the state of the repository when the 2 Snapshots were taken.

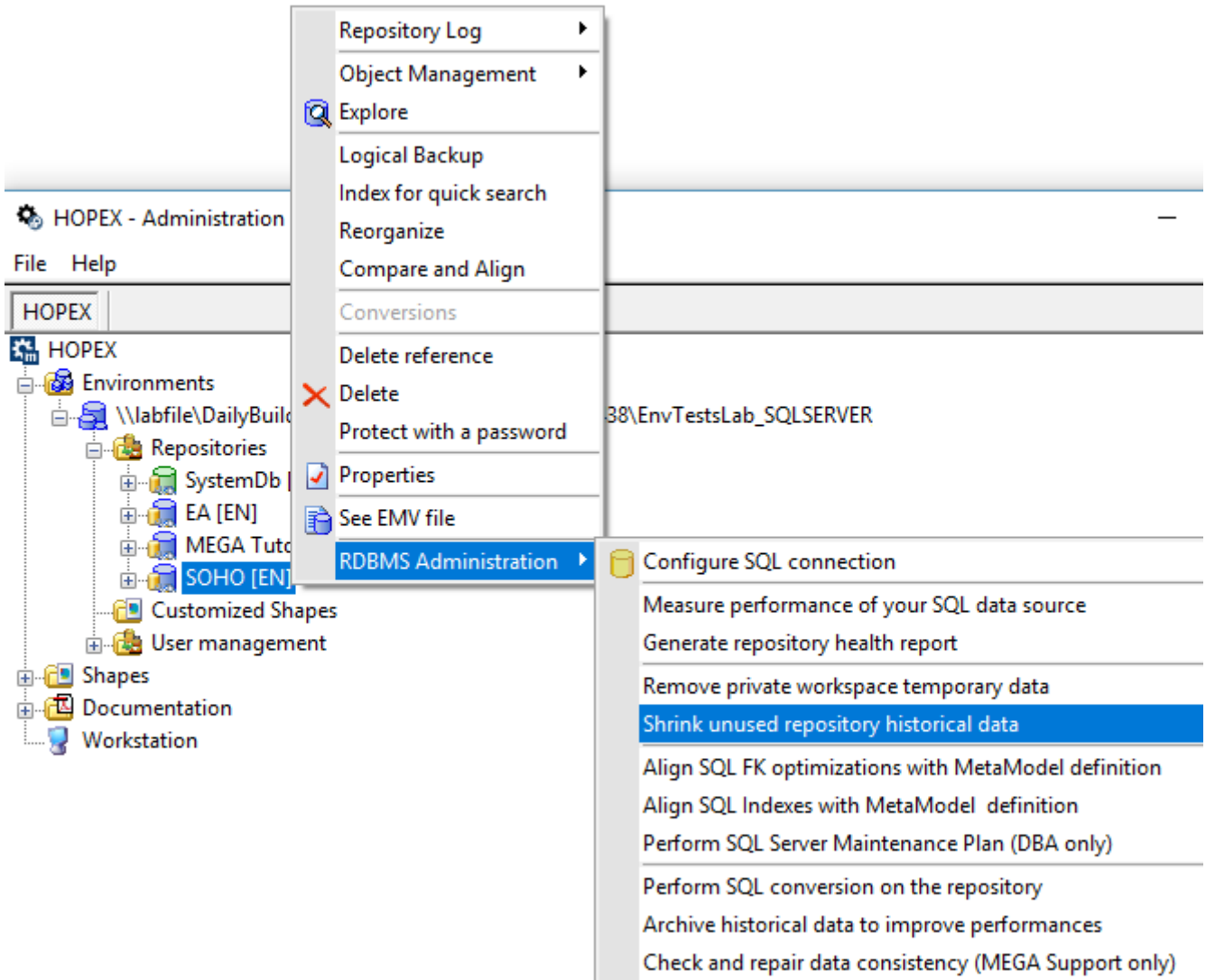
In this case, the data corresponding to the repository state for the Snapshot(s) is saved and it is thanks to this saving that special features will be available within this repository regarding this data.

Installing the procedure

Warning : You must repeat this procedure for each HOPEX Repository and the SystemDb.

1. Right-click your HOPEX repository and select RDBMS Administration > Shrink unused repository historical data.

This launches SP_CONSOLIDATE_MEGA_DATABASE and if the procedure does not exist, the application creates it. If the procedure already exists, it is overwritten by this action.



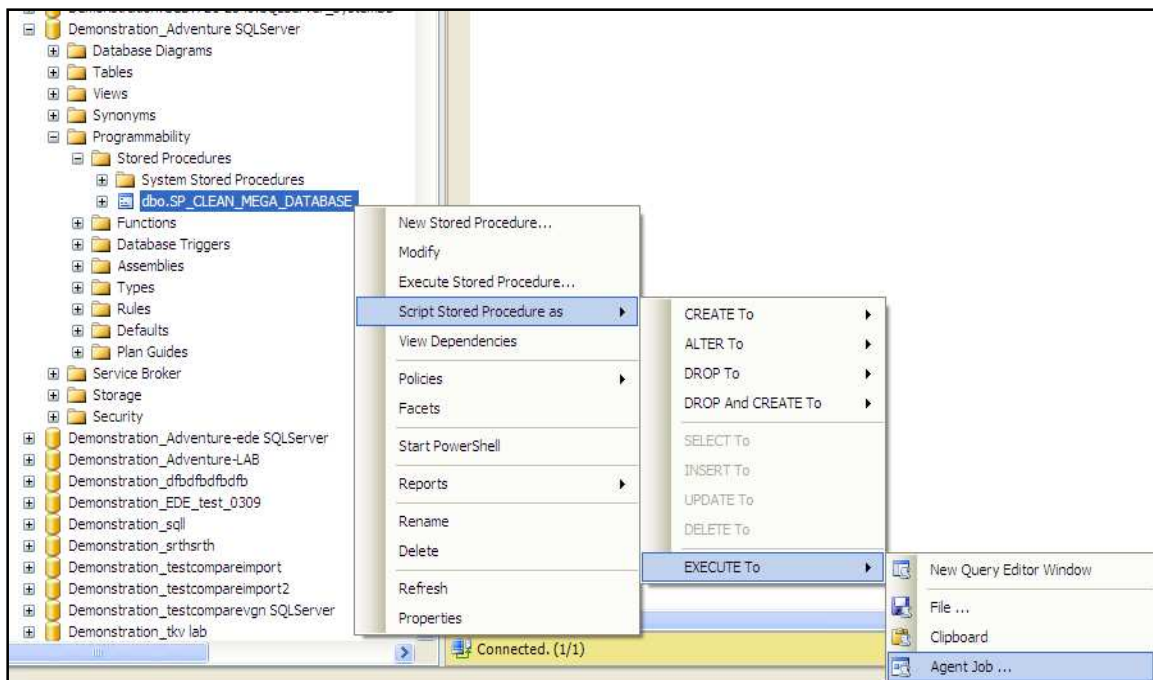
Batching Cleanup procedures for SQL Server

It is very important to run the two procedures on a regular basis. So If you do not want to have to remember to click on the corresponding menus in the Administration.exe program every time that each of the procedure should run, you can batch it using SQL Server agent job.

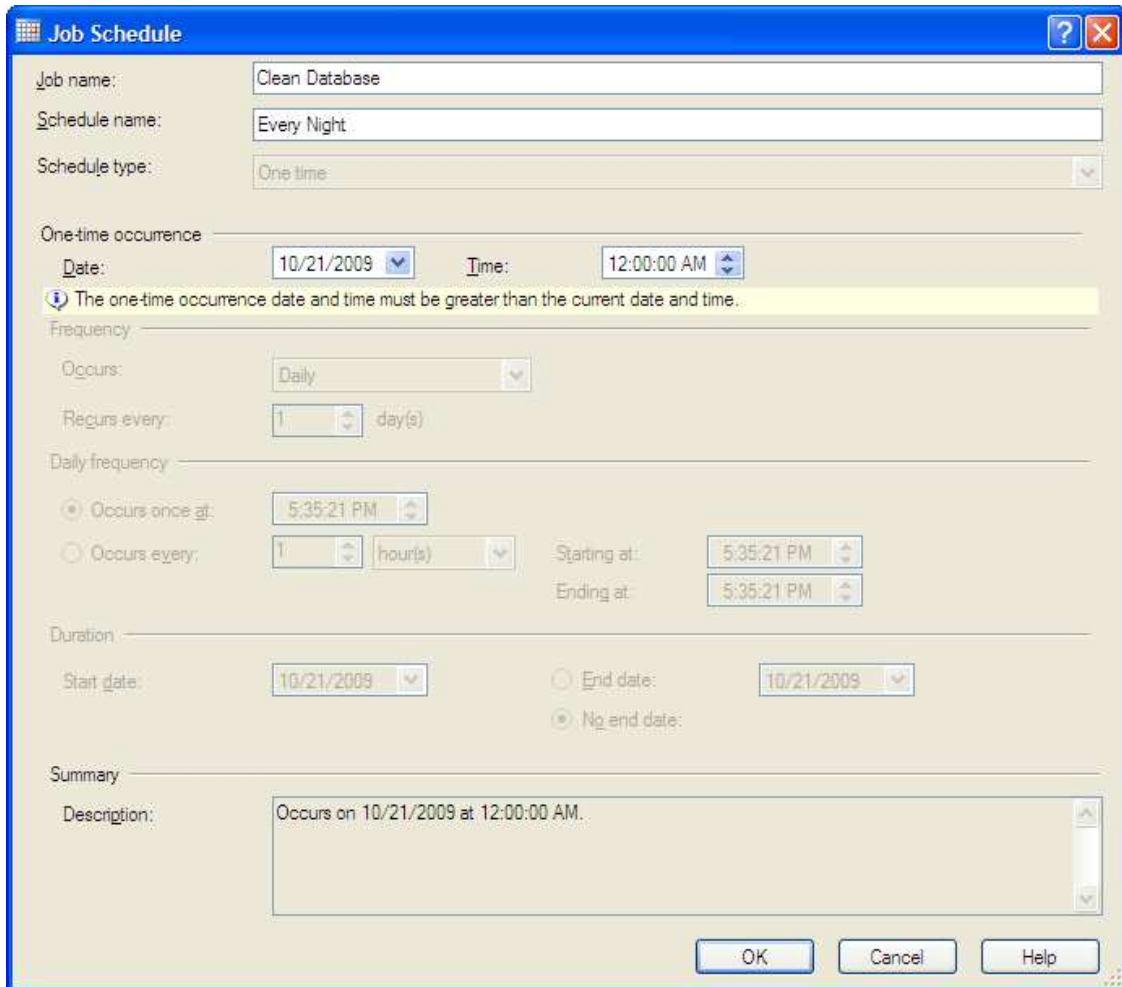
1. Using **SQL Server Management Studio**, find the SQL Server database that corresponds to the HOPEX repository for which you want to batch the stored procedure.

Reminder : the database will be named following this rule <EnvironmentName_RepositoryName>.

2. In Programmability > Stored Procedures folder, right-click this procedure and select Script Stored Procedure as > Execute to > Agent job.



Enter a name for the job and the schedule.



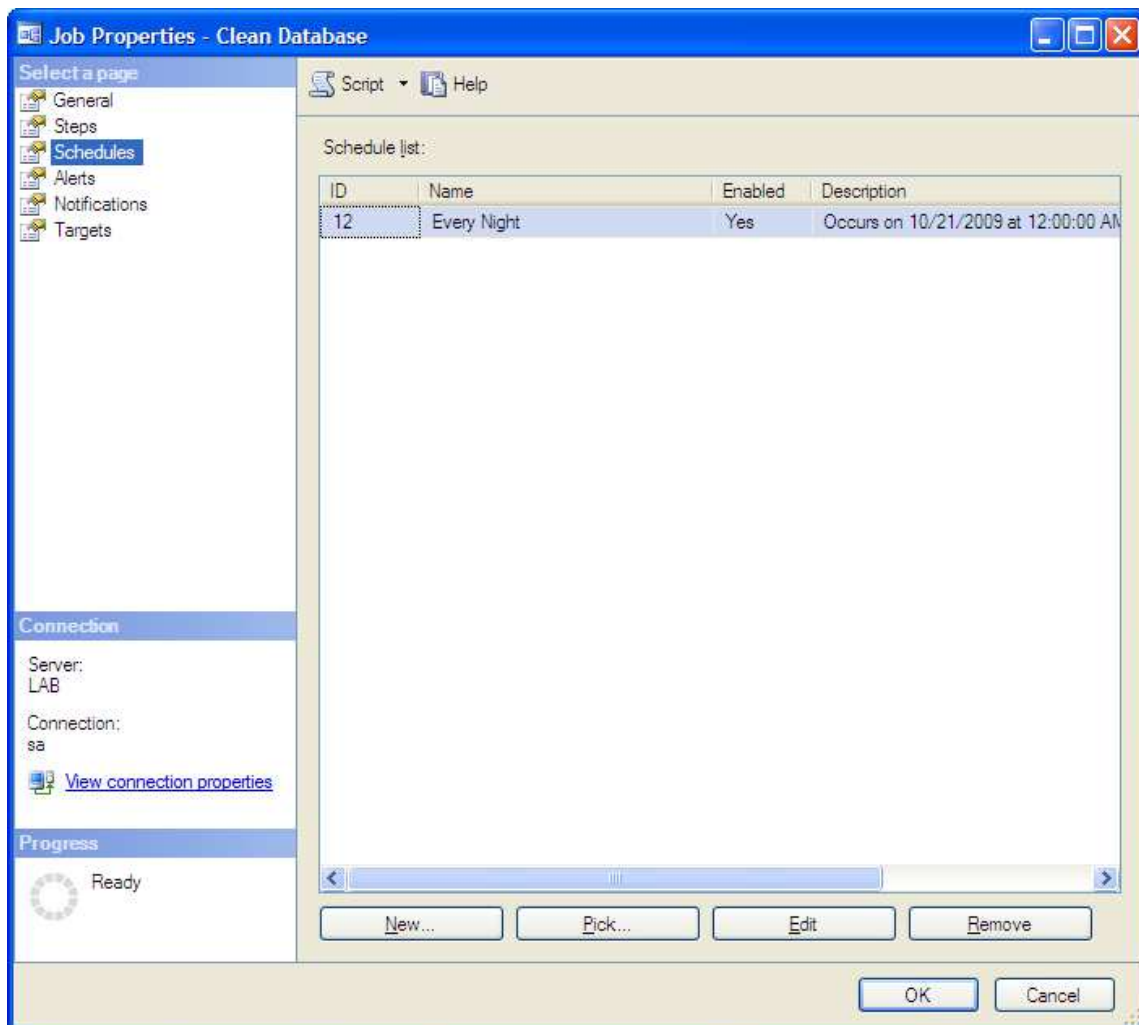
The image shows a 'Job Schedule' dialog box with the following fields and options:

- Job name:** Clean Database
- Schedule name:** Every Night
- Schedule type:** One time
- One-time occurrence:**
 - Date:** 10/21/2009
 - Time:** 12:00:00 AM
 - Message:** The one-time occurrence date and time must be greater than the current date and time.
- Frequency:**
 - Occurs:** Daily
 - Recur every:** 1 day(s)
- Daily frequency:**
 - Occurs once at:** 5:35:21 PM
 - Occurs every:** 1 hour(s)
 - Starting at:** 5:35:21 PM
 - Ending at:** 5:35:21 PM
- Duration:**
 - Start date:** 10/21/2009
 - End date:** 10/21/2009
 - No end date:** (selected)
- Summary:**
 - Description:** Occurs on 10/21/2009 at 12:00:00 AM.

Buttons: OK, Cancel, Help

The job is created.

3. Right-click this job and select **Properties**.
4. Select the **Schedules** tab and click **Edit**.



5. Set up the schedule to execute the job every night.

Job Schedule Properties - Every Night

Name:

Schedule type: ☒ Enabled

One-time occurrence

Date: Time:

Frequency

Occurs:

Recurs every: day(s)

Daily frequency

☒ Occurs once at:

☐ Occurs every: hour(s)

Starting at:

Ending at:

Duration

Start date:

☐ End date:

☒ No end date:

Summary

Description:

Maintenance tasks

The SQL Server databases need to be maintained, in order to keep the best possible performances. Tasks such as “update of the statistics”, “reorganize or rebuild of the indexes”, “shrink of the databases”, as well as backups, need to be run regularly.

We recommend set up the standard maintenance plans of SQL Server to manage those tasks. The backups can be excluded, if they are done through another channel.

Also, we can imagine to put the execution of the HOPEX cleanup procedures (see previous chapter) as the preliminary step to the SQL Server job that will run the maintenance tasks.

You can find below some screenshots of a default maintenance plan (with backups), with SQL Server 2012. It can be adapted to your version, and your rules :

1. Create a maintenance plan using the SQL Server wizard (in SQL Server Management Studio).
2. Give it a name and a schedule (click **Change**).

Maintenance Plan Wizard

Select Plan Properties
How do you want to schedule your maintenance tasks?

Name: Weekly Maintenance plan

Description:

Run as: SQL Server Agent service account

☐ Separate schedules for each task
☒ Single schedule for the entire plan or no schedule

Schedule: Occurs every week on Sunday at 12:00:00 AM. Schedule will be 1 Change...

Help < Back Next > Finish Cancel

3. Select the following maintenance tasks:

Maintenance Plan Wizard

Select Maintenance Tasks
Which tasks should this plan perform?

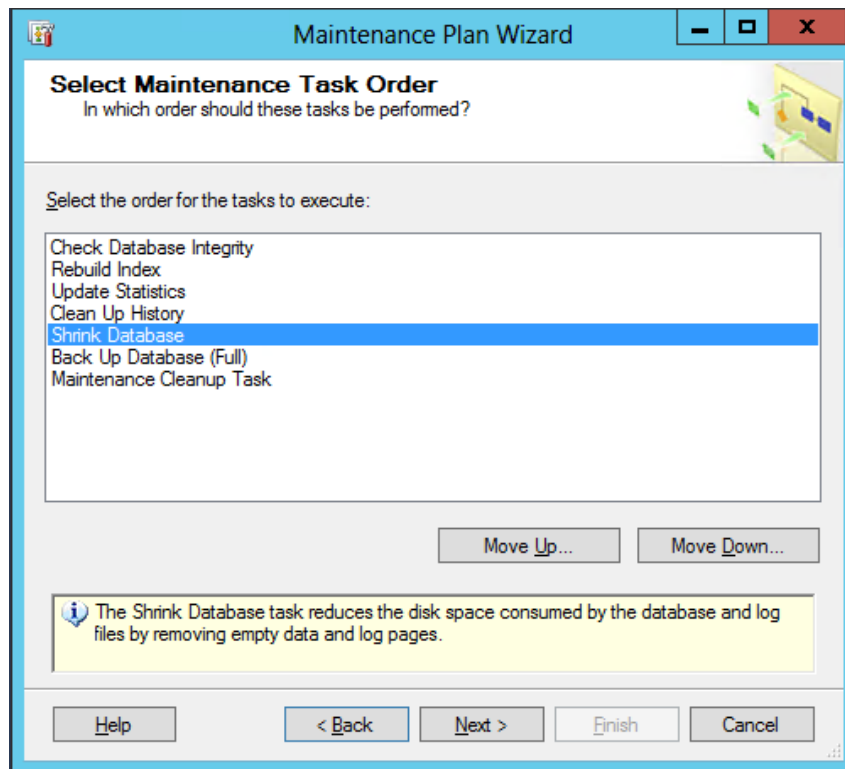
Select one or more maintenance tasks:

- ☒ Check Database Integrity
- ☒ Shrink Database
- ☐ Reorganize Index
- ☒ Rebuild Index
- ☒ Update Statistics
- ☒ Clean Up History
- ☐ Execute SQL Server Agent Job
- ☒ Back Up Database (Full)
- ☐ Back Up Database (Differential)
- ☐ Back Up Database (Transaction Log)
- ☒ Maintenance Cleanup Task

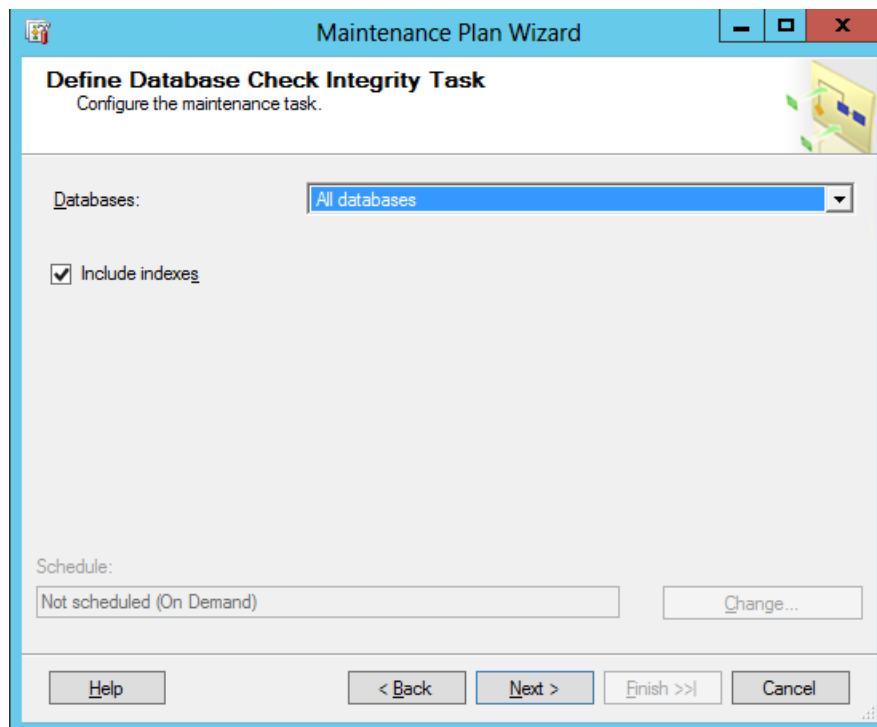
i The Check Database Integrity task performs internal consistency checks of the data and index pages within the database.

Help < Back Next > Finish Cancel

4. Order the maintenance tasks as follows:



5. Check all databases (including the system databases):



6. Rebuild indexes for the user databases:

Maintenance Plan Wizard

Define Rebuild Index Task
Configure the maintenance task.

Databases: All user databases

Object:

Selection:

Free space options

☒ Default free space per page

☐ Change free space per page to: %

Advanced options

☐ Sort results in tempdb

☐ Keep index online while reindexing

For index types that do not support online index rebuilds

☒ Do not rebuild indexes

☐ Rebuild indexes offline

Schedule:

Not scheduled (On Demand) Change...

Help < Back Next > Finish >> Cancel

7. Same thing for the update of the statistics:

Maintenance Plan Wizard

Define Update Statistics Task
Configure the maintenance task.

Databases: All user databases

Object:

Selection:

Update:

☒ All existing statistics

☐ Column statistics only

☐ Index statistics only

Scan type:

☒ Full scan

☐ Sample by 50

Schedule:

Not scheduled (On Demand) Change...

Help < Back Next > Finish >> Cancel

8. Define how long the log files will be kept:

The screenshot shows the 'Define History Cleanup Task' dialog box within the 'Maintenance Plan Wizard'. The title bar reads 'Maintenance Plan Wizard'. The main heading is 'Define History Cleanup Task' with the subtitle 'Configure the maintenance task.' Below this, there is a section 'Select the historical data to delete:' with three checked checkboxes: 'Backup and restore history', 'SQL Server Agent job history', and 'Maintenance plan history'. Underneath is a section 'Remove historical data older than:' with a spinner box set to '2' and a dropdown menu set to 'Week(s)'. At the bottom, there is a 'Schedule:' section with a text box containing 'Not scheduled (On Demand)' and a 'Change...' button. The bottom of the dialog features a row of buttons: 'Help', '< Back', 'Next >', 'Finish >>', and 'Cancel'.

9. Shrink all user databases, or at least the HOPEX databases:

The screenshot shows the 'Define Shrink Database Task' dialog box within the 'Maintenance Plan Wizard'. The title bar reads 'Maintenance Plan Wizard'. The main heading is 'Define Shrink Database Task' with the subtitle 'Configure the maintenance task.' Below this, there is a 'Databases:' section with a dropdown menu set to 'All user databases'. Underneath, there are two input fields: 'Shrink database when it grows beyond:' with a value of '50' and 'MB', and 'Amount of free space to remain after shrink:' with a value of '10' and '%'. Below these are two radio buttons: 'Retain freed space in database files' (unselected) and 'Return freed space to operating system' (selected). At the bottom, there is a 'Schedule:' section with a text box containing 'Not scheduled (On Demand)' and a 'Change...' button. The bottom of the dialog features a row of buttons: 'Help', '< Back', 'Next >', 'Finish >>', and 'Cancel'.

10. Backup all databases, choose the destination folder, and if you want to have subfolders for each database:

Define Back Up Database (Full) Task
Configure the maintenance task.

Backup type: Full

Database(s): All databases

Backup component

☒ Database

☐ Files and filegroups: ...

☐ Copy-only Backup

☐ For availability databases, ignore Replica Priority for Backup and Backup on Primary Settings

☐ Backup set will expire:

☒ After 14 days

☐ On 1/21/2015

Back up to: ☒ Disk ☐ Tape

☐ Back up databases across one or more files:

Add... Remove Contents

If backup files exist: Append

☒ Create a backup file for every database

☒ Create a sub-directory for each database

Folder: ...

Backup file extension: bak

☐ Verify backup integrity

Set backup compression: Use the default server setting

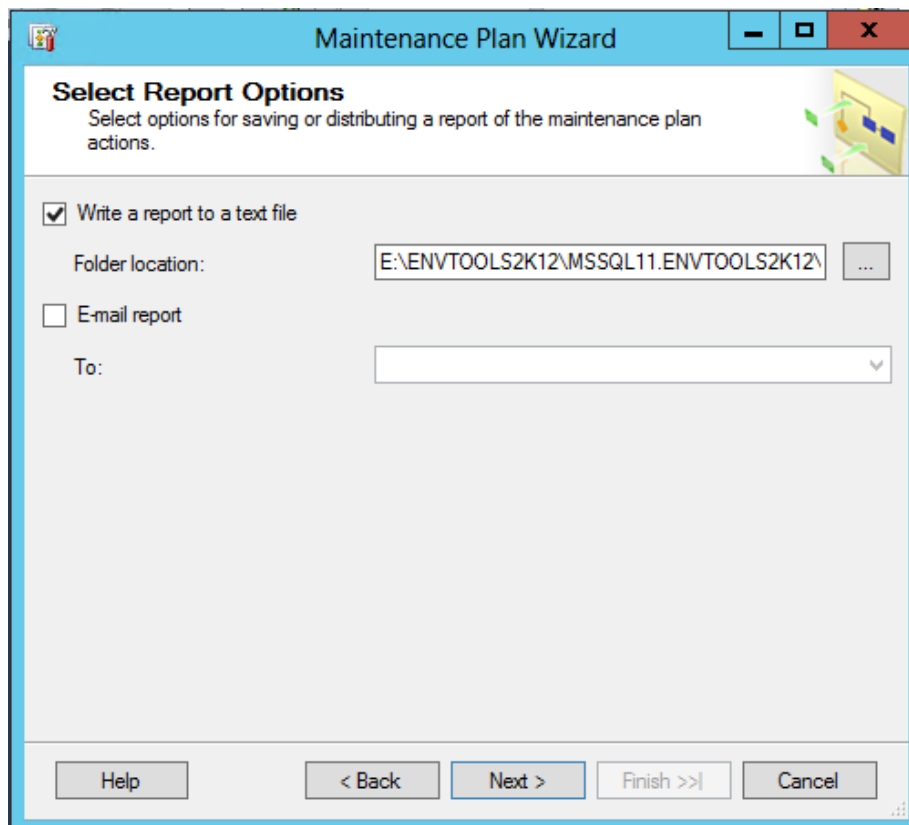
11. Provide the folder where the backups are being stored, the extension, and if you want to include subfolders, as well as how long you want to keep the files before deleting them:

The screenshot shows the 'Define Maintenance Cleanup Task' window of the Maintenance Plan Wizard. The window has a blue title bar with the text 'Maintenance Plan Wizard' and standard window controls. Below the title bar, the main heading is 'Define Maintenance Cleanup Task' with the subtitle 'Configure the maintenance task.' and a small icon of a folder with arrows. The main content area is light gray and contains the following options:

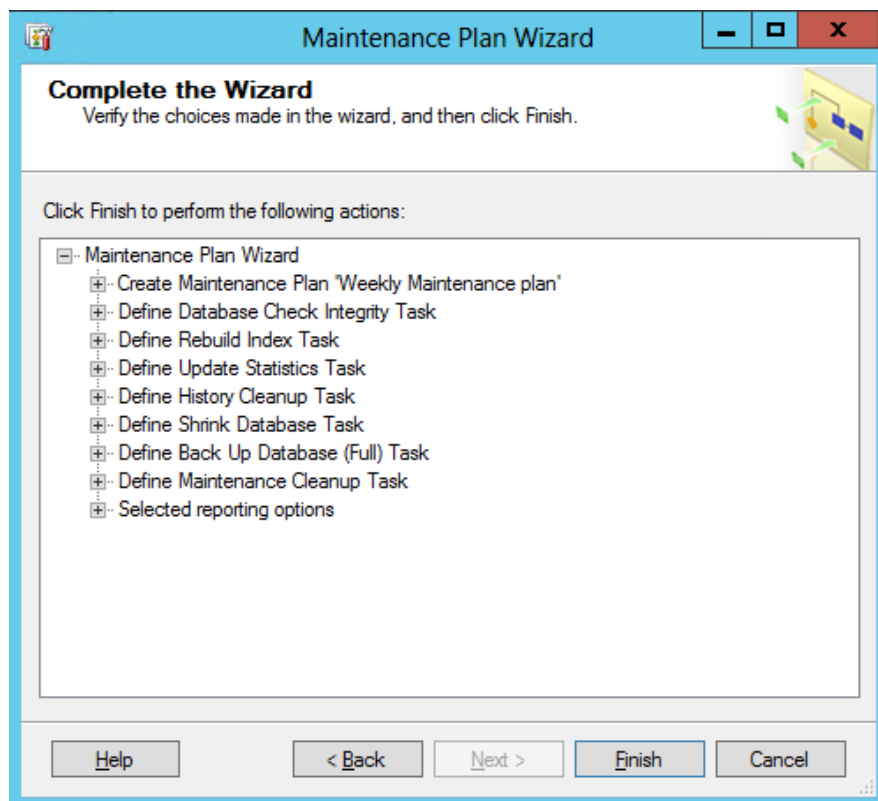
- Delete files of the following type:**
 - ☒ Backup files
 - ☐ Maintenance Plan text reports
- File location:**
 - ☐ Delete specific file
 - File name: [text box] [...]
 - ☒ Search folder and delete files based on an extension
 - Folder: [redacted] [...]
 - File extension: [.bak]
 - ☒ Include first-level subfolders
- File age:**
 - ☒ Delete files based on the age of the file at task run time
 - Delete files older than the following:
 - 2 [up/down arrows] Week(s) [dropdown arrow]
- Schedule:**
 - [Not scheduled (On Demand)] [Change...]

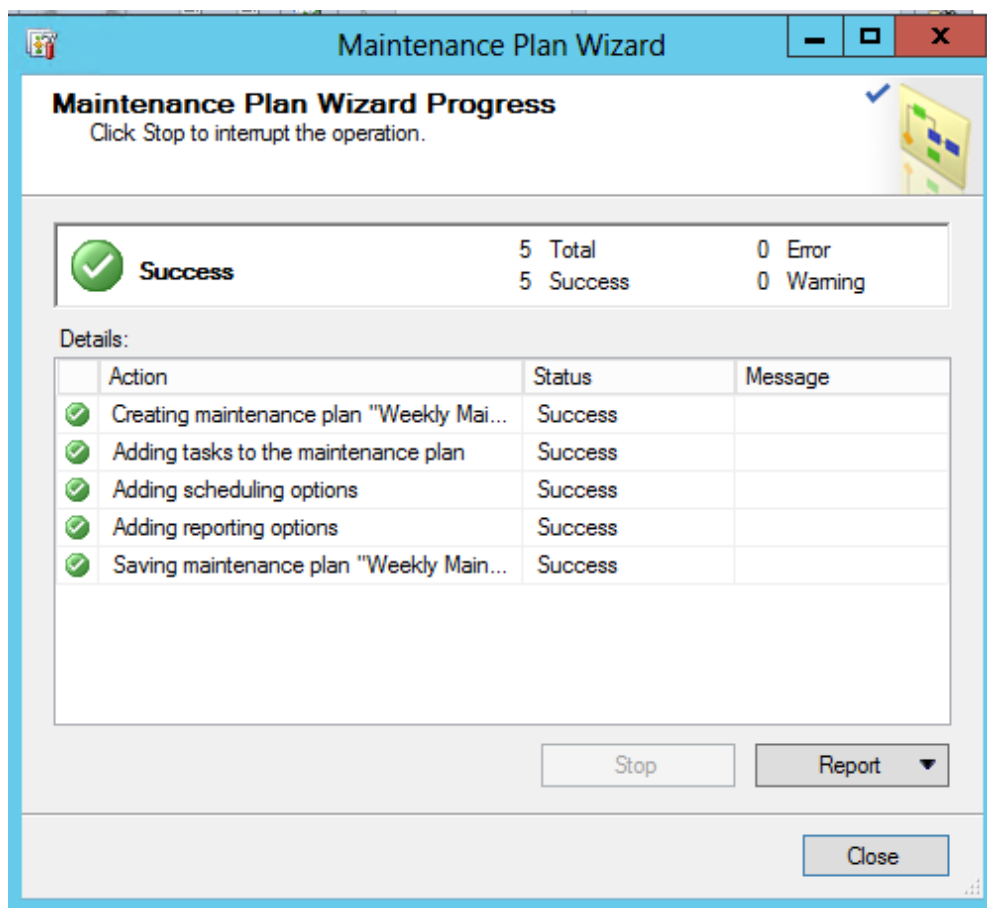
At the bottom of the window, there is a row of buttons: Help, < Back, Next >, Finish >>, and Cancel.

12. Keep the default :



13. Click **Finish** to create the maintenance plan, and the SQL Server job:





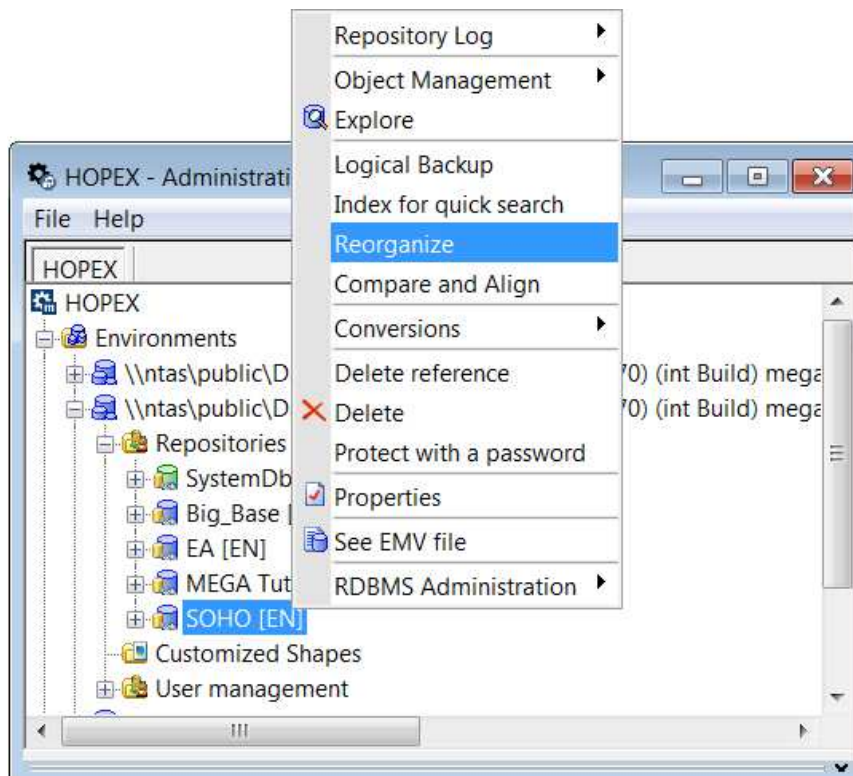
HOPEX RDBMS repositories specific administration actions

Migrating Your Data from One Storage Support to Another

General procedure:

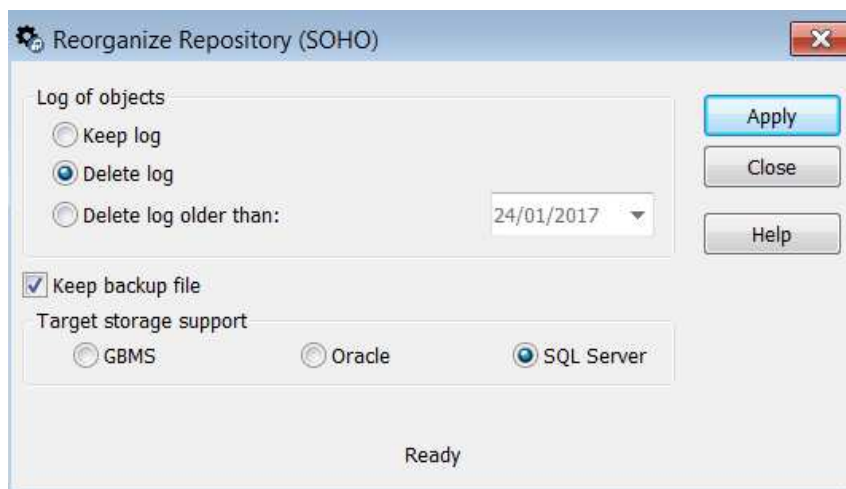
1. Start HOPEX Administration.exe.
2. Connect to the environment containing the repositories to be migrated.
3. Expand the **Repositories** folder.
4. Right-click a repository and select **Reorganize**.

NB: Launch a complete environment migration starting with the data repositories and finishing with the SystemDb repository.



To reorganize a repository:

1. Select the expected **Target storage support**.



2. Click **Apply** to start the reorganization. If the **Target storage support** is:

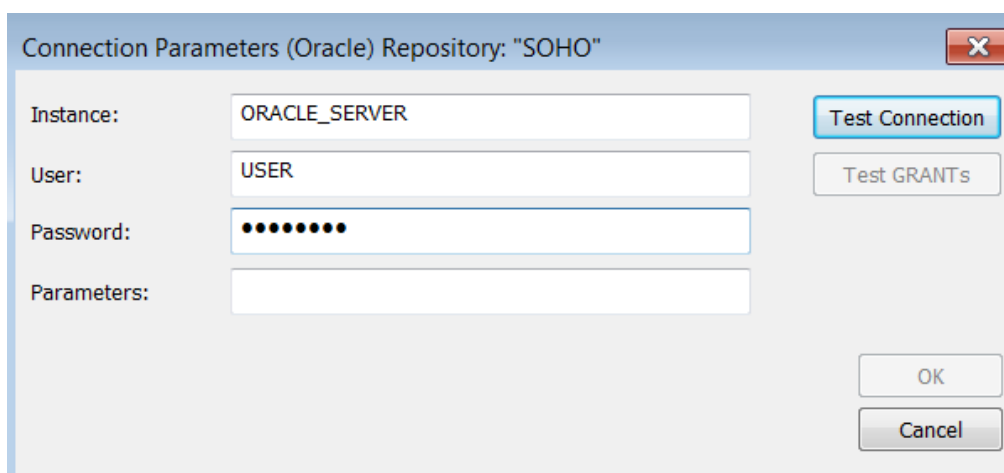
- **GBMS:**

A basic Reorganization of the file based repository takes place.

- **Oracle:**

You are required to confirm or change the SQL Connection parameters.

Note: For Oracle storage it is strongly recommended to isolate each HOPEX repository in a separate Oracle Schema.



The “Test connection” step must be successful for the process to continue.

The “Grants Test” step must be successful for the process to continue.

Note: To be successful, there should be no storage on the Oracle Server that concerning a HOPEX Database with the same name in a same HOPEX environment.

- **SQL Server:**

You are required to confirm or change the SQL Connection parameters.

Connection Parameters (SQL Server) Repository: "SystemDb"

Instance: myserver\myinstance

User: mynativeuser

Password: ●●●●●●

Parameters:

Repository creation mode

Creates the SQL database ("dbo" default schema)

SQL Server: Training_SystemDb

SQL Server schema:

Test Connection

Test GRANTS

OK

Cancel

The "Test connection" step must be successful for the process to continue.
The "Test GRANTS" step must be successful for the process to continue.

Note: To be successful, there should be no storage on the Sql Server concerning a HOPEX repository with the same name in a same HOPEX environment.

If your Sql Server User does not have the right to create databases, you need to ask your DBA to create an Sql Server database following the naming rule: <EnvironmentName>_<RepositoryName>. You should then choose the option "Use existing Sql Server Database".

Results:

- The database is now migrated to the storage you chose.
- The .emb (GBMS), .emq (SQL Server), .emo (Oracle) file corresponding to the newly created repository storage is created.
- The Megaenv.ini file is updated.
- The logical backup file, used during the process, is stored in the 'work' folder of the source repository.
- This backup is named according to the following format: Bkp_Date_BaseName.mgr .

Restoring a HOPEX environment from formatted data

There are some cases when it is needed to recreate a repository in HOPEX Administration from an existing set of data (a previously HOPEX formatted repository). For example, after a physical corruption (disk crash) of the machine hosting the HOPEX repository folder tree.

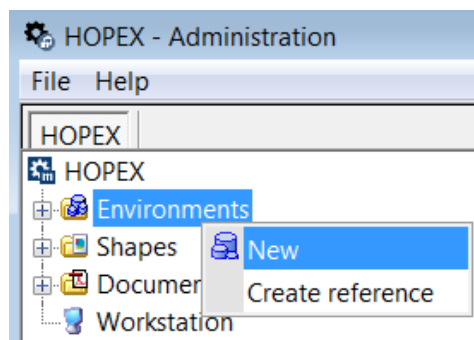
In such a situation, since the repository folder contains files indicating the way to reach the data and on which database server it can be found, the data could be considered lost from the HOPEX point of view.

It is necessary to understand that, from then on, HOPEX needs a new way to access the data inside the RDBMS. This is why this action is seen as a **Restoration** of the data: a re-creation of the repository folder structure allowing to re-save the way to access the data.

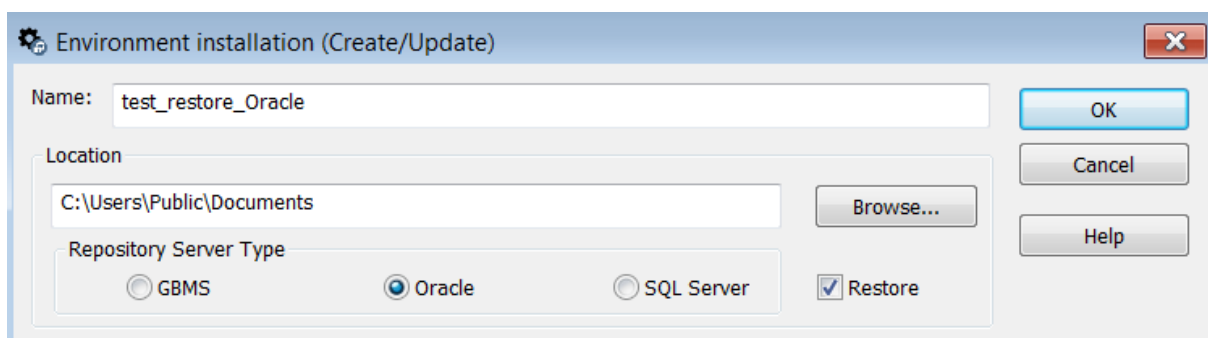
This method can also be used for duplicating an environment from a production infrastructure to a test infrastructure (or vice versa). For doing so, all the repositories (including the SystemDb) must be duplicated first in the RDBMS. The restoration can then be done on the duplicates repositories, starting with the SystemDb.

Restoring an environment (SystemDb repository)

1. Start HOPEX Administration.exe.
2. Right-click the **Environments** folder and select **New**.

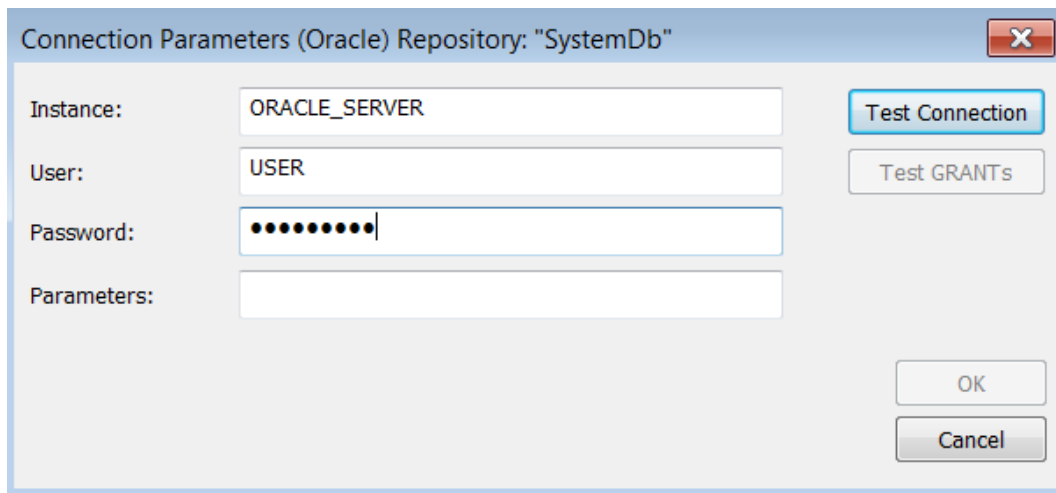


3. In **Name**, enter the name of the environment that is to be restored (the exact same name as the one used for the first creation).
4. Select **Restore**.



5. Click **OK**.

- Specify the connection parameters for accessing the RDBMS where the HOPEX -yet-unreachable data is located.



The dialog box is titled "Connection Parameters (Oracle) Repository: 'SystemDb'". It contains four input fields: "Instance:" with the value "ORACLE_SERVER", "User:" with the value "USER", "Password:" with a masked password "●●●●●●●●", and "Parameters:" which is empty. To the right of the "Instance:" field is a "Test Connection" button. To the right of the "User:" field is a "Test GRANTS" button. At the bottom right are "OK" and "Cancel" buttons.

- Click Test Connection.

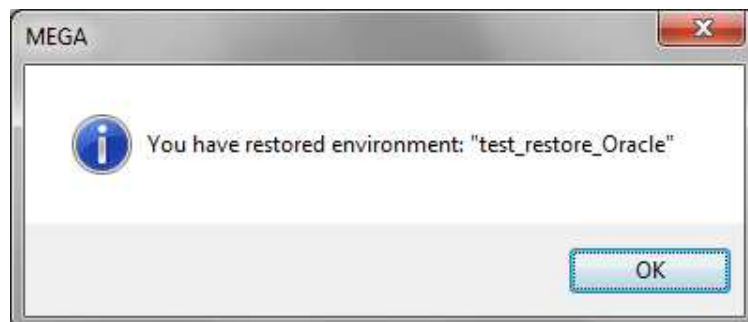
The test must be successful for the process to continue.

- Click Test GRANTS.

The test must be successful for the process to continue.

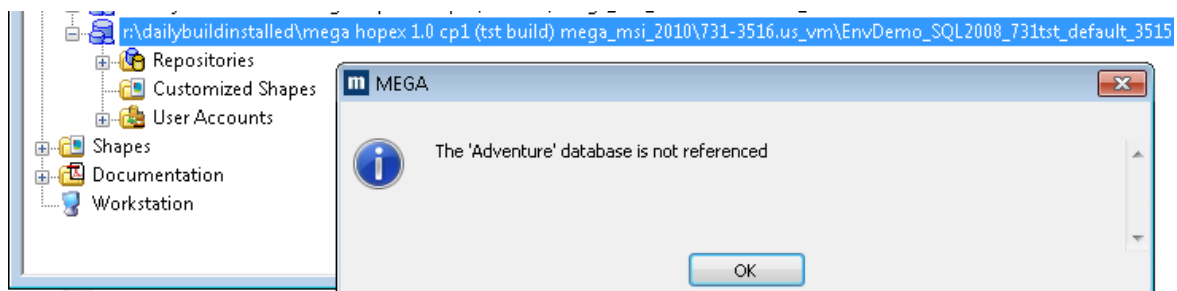
- Click **OK**.

The SystemDb repository is restored.



Once these actions are performed successfully, there are a few more actions to perform to be able to restore the repositories that were referenced into the newly restored environment.

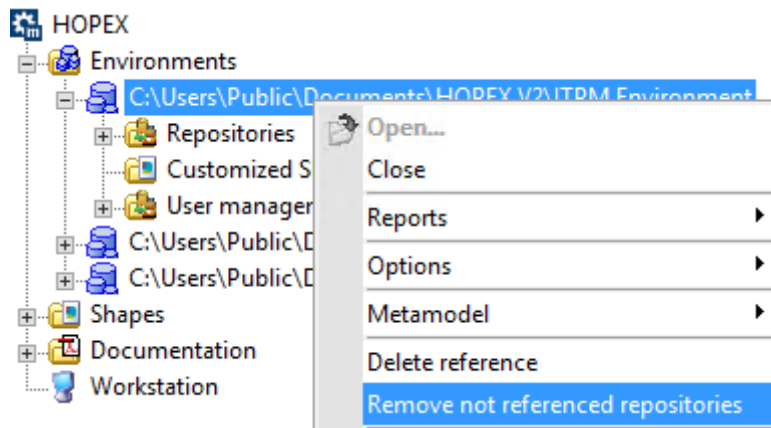
At this point, if you open the environment that was just restored, you will see the following warning message: "The <repository name> is not referenced").



The reason is that the environment that was just restored has “a knowledge” of the repositories that should be referenced in it but the references for those repositories do not yet exist in the folder tree structure of the newly restored environment.

To be able to re-reference the required repositories by restoration in this environment, you must first purge that “knowledge”:

1. Right-click the Environment and select **Remove not referenced repositories**:



Important notes



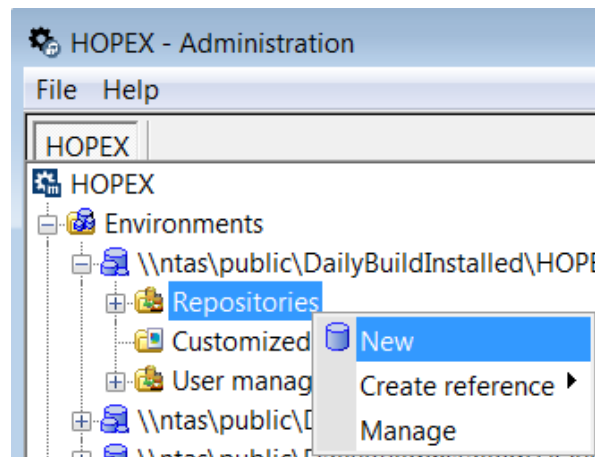
- DO NOT use **Remove not referenced repositories** if the environment is in use somewhere else as it will delete the references to the repositories there too !
- Use it only on an environment that is a physical copy on the RDBMS storage side.
- Be careful that the repositories also must be restored from a physical RDBMS copy (see next chapter for repositories restoration).
- Not taking care of this will lead to situations where users might think that they are using different sets of data when they are actually using and modifying **the same repositories** !

Restoring a data repository

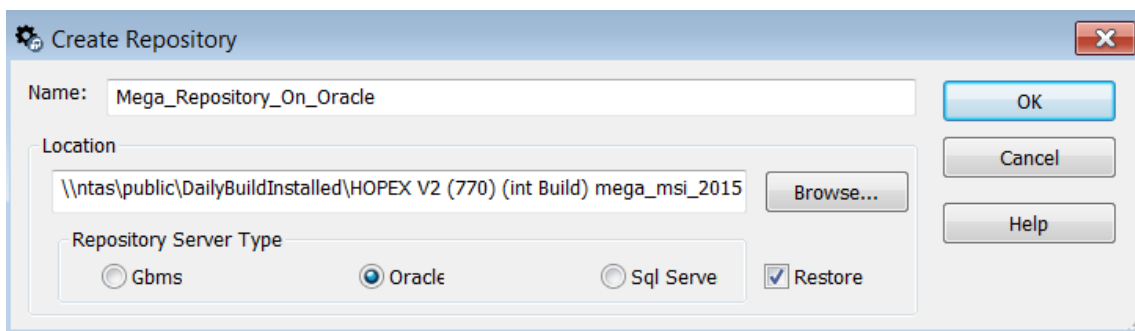
Note: A repository can only be restored within an environment that has the same name as the one in which the repository was originally created. An environment with the same name can be recreated before restoring the repository in it or the actual environment can be restored beforehand.

To restore a data repository:

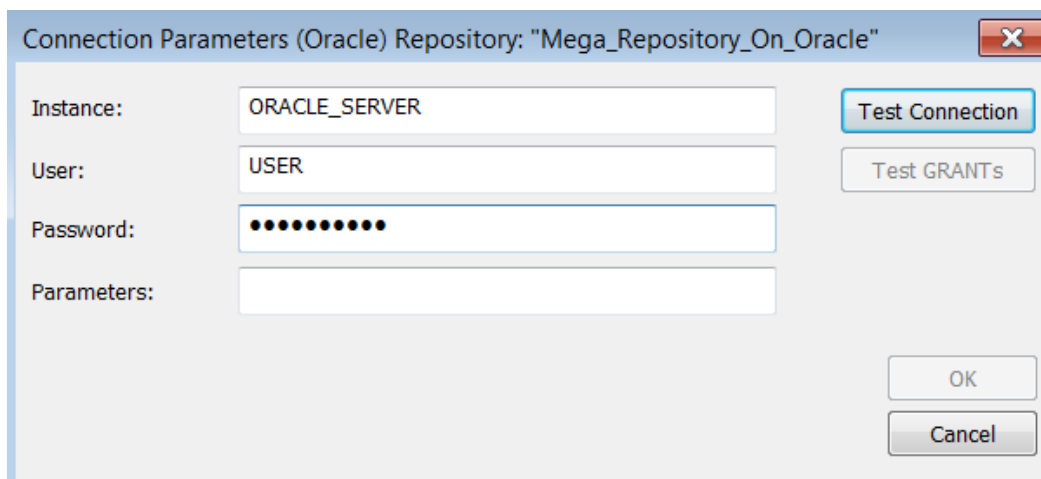
1. Start HOPEX Administration.exe.
2. Connect to the environment in which you want to restore the repository
3. Right-click the **Repositories** folder and select **New**.



4. In **Name**, enter the name of the repository that is to be restored (the exact same name as the one used for the first creation).
5. Select **Restore**.



6. Click **OK**.
7. Specify the connection parameters for accessing the RDBMS where the HOPEX -yet-unreachable data is located.



NB: For SQL Server, the “Creation Mode” parameter is disable (the choice is not possible) when the “Restore” checkbox is checked. This is because in this situation, HOPEX is actually told to re-attach to physical data so no database creation or repository initialization will be carried out.



8. Click Test Connection.

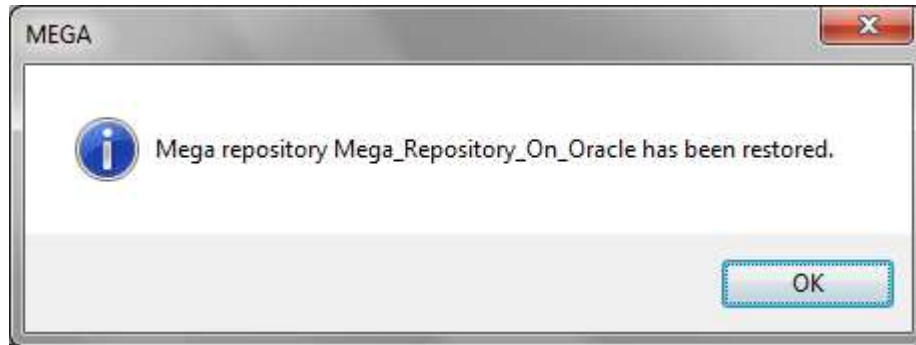
The test must be successful for the process to continue.

9. Click Test GRANTS.

The test must be successful for the process to continue.

10. Click **OK**.

The repository is restored.

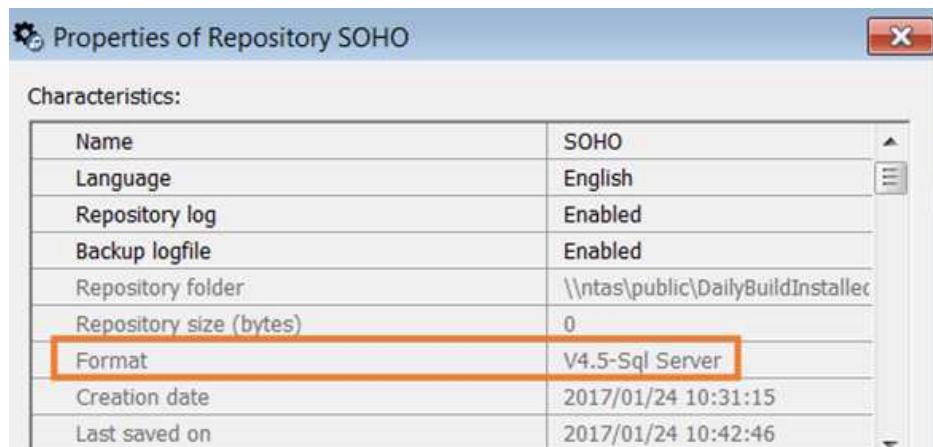
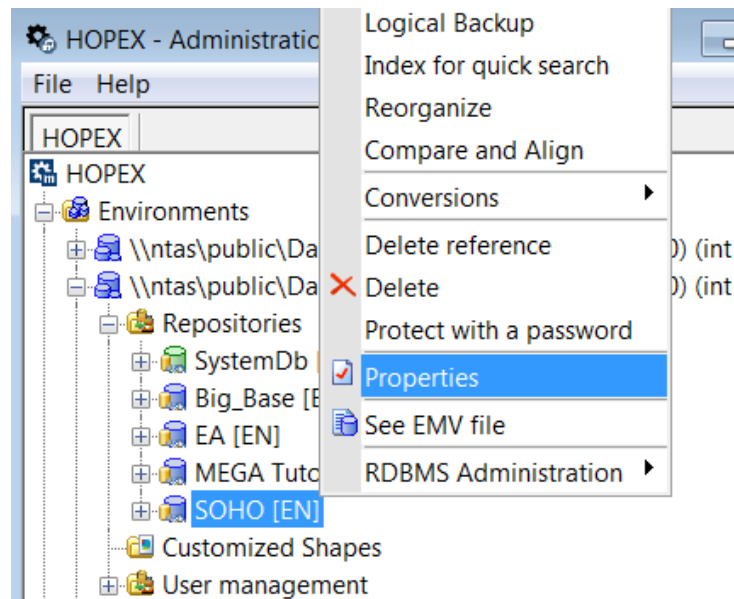


Handling of HOPEX RDBMS repositories specific internal format

There is an internal format used by HOPEX when accessing a repository that is stored on **Oracle** or **SQL Server**.

To view this internal format version:

1. Start HOPEX Administration.exe.
2. Right-click the HOPEX repository (either SystemDb or data repository) and select **Properties**.

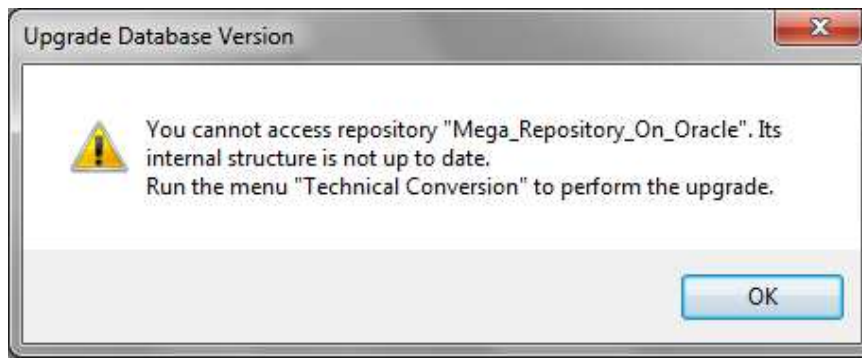


When upgrading your HOPEX installation (applying a Cumulative Patch or migrating your data from a HOPEX SP version to the next one), there might be some modifications leading to a new **internal format** version.

From Mega 2009 SP5, new menus are available to manually activate this **internal format** upgrade.

Note: Before Mega 2009 SP5, the upgrade was made "on the fly" when first accessing the Mega repository with a Mega program corresponding to a more recent **internal format** version.

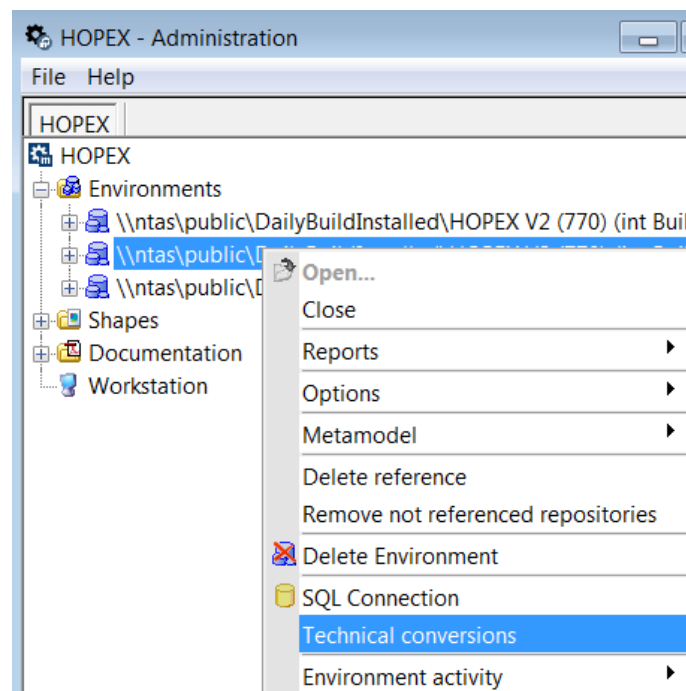
When you need to upgrade the **internal format** version, you are prompted to do it with the following window:



Note: The technical conversion of the repositories of the environment must be done before upgrading to the environment:

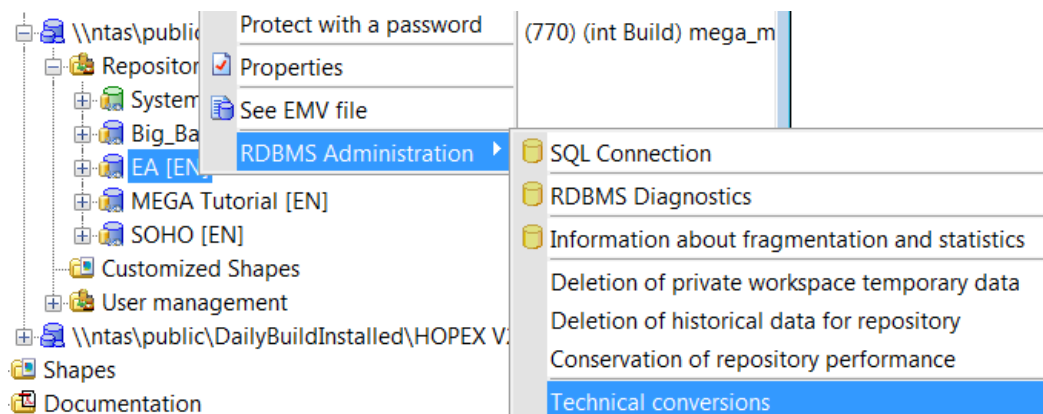
1. Apply the technical conversion on the SystemDb:

Right-click the environment and select **Technical conversions**.



2. Apply the technical conversion on the other data repositories of the environment:

For each repository, right-click the repository and select **RDBMS Administration > Technical conversions**.



ORACLE Case: From Test Environment to Production

Note: Even though the following was written for MEGA 2009 SP5, the same method can be used with HOPEX V2, taking into account that Oracle 10g is no longer supported.

This section includes a detailed scenario on how to switch from a Mega 2009 environment that has been migrated from an Oracle testing environment (OTE) to an Oracle Production environment (OPE). For the purposes of this guide, the different components are of the following versions:

- Mega: 2009 SP5
- Oracle: 10g R2 (10.2.0.4)

This document applies for more recent Oracle version as well.

The Chosen Method: Using the Data Pump Tool

Several methods exist in HOPEX for switching from an OTE to an OPE but only one will be detailed here.

This method is based on Oracle export and import tools. As you might know, there has been an export-import couple that has been used for quite some time with Oracle: these are called EXP and IMP. From Oracle 10g, a new set of tools is available (EXPDP and IMPDP) called Oracle [Data Pump](#). The Data Pump technology will be used for the switching. The reasons for this are:

- It offers more flexibility (remapping of SCHEMAS and/or TABLESPACES).
- It is quicker.
- There are no compatibility problem that can be encountered with certain data types.
- The “old” tools have been deprecated by Oracle and will probably disappear in a near future.

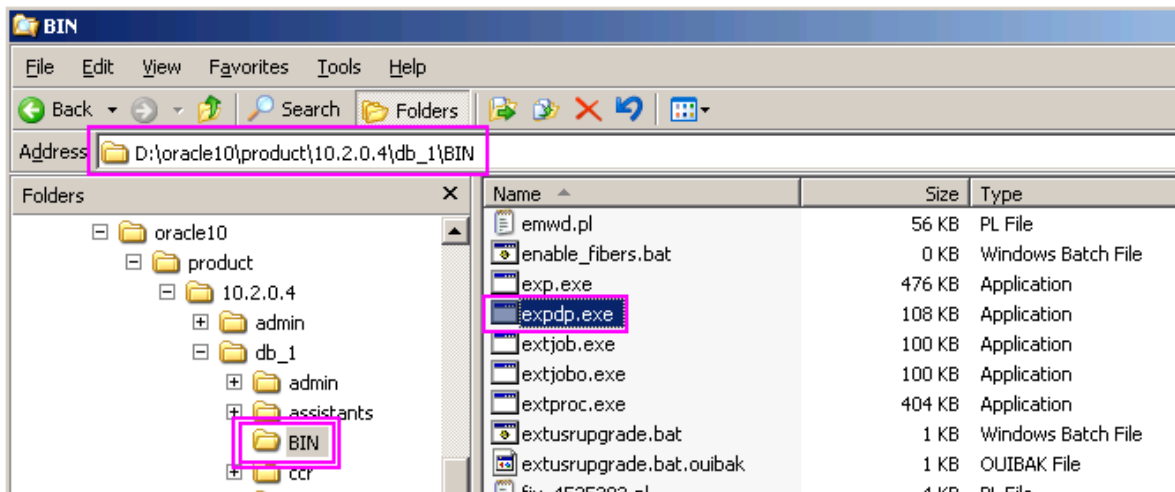


Note that data exported with EXP cannot be imported with IMPDP and vice versa.



The tools must be used symmetrically.

These tools can be found under the Oracle Home, as shown below for a “typical” windows installation of Oracle:



How about HOPEX Then?

Let us see how we can switch from an OTE to an OPE from the Mega point of view.

We will focus only on the phase: moving from OTE to OPE, assuming that the first step, which is the transfer of pre-existing HOPEX data from a Mega proprietary database format (GBMS) to a HOPEX database on Oracle, has been carried out normally (see relevant documentation on how to carry out this action).

In this example, we will show the manipulations on a simple HOPEX environment that contains only a HOPEX “SystemDb” repository and a single HOPEX repository (only the HOPEX repository “Mega (Tutorial)” has been kept in the “Demonstration” environment).



Note that the data of the “SystemDb” repository and of the “Mega (Tutorial)” repository have been isolated from each other (as recommended by Mega) in different SCHEMAS.

Connection Parameters (Oracle) MEGA Repository: "MEGA (Tutorial)"

Instance: wqa-oracle/TEST Test

User: ORASchema

Password: ••••••••

Parameters:

OK Cancel

Connection Parameters (Oracle) MEGA Repository: "SystemDb"

Instance: wqa-oracle/TEST Test

User: ORASchemaSYS

Password: ••••••••

Parameters:

OK Cancel

The Actual Export – Re-Import Phase

In our case, we have decided that the SCHEMAS hosting HOPEX data in both the OTE and the OPE are named identically. At this stage, you should keep in mind that this will lead to an Oracle error(*) when importing, since the dump produced by the export bears the creation of the SCHEMAS that it contains.

(*)It is totally normal, thus you will see the process of the import going on.

The Export

To perform the export:

```

C:\Documents and Settings\ede>cd
D:\>cd D:\oracle10\product\10.2.0.4\db_1\BIN
D:\oracle10\product\10.2.0.4\db_1\BIN>expdp system/TEST
DIRECTORY=DATA_PUMP_DIR DUMPFILE=MEGA_REPOSITORIES_EXPORT_SYSTEMDB_AND_MEGATUTORIAL.DMP LOGFILE=MEGA_REPOSITORIES_EXPORT_SYSTEMDB_AND_MEGATUTORIAL.DMP LOG SCHEMAS=ORASchema,ORASchemaSYS
  
```

The export starts:

```

C:\Documents and Settings\ede>d:
D:\>cd D:\oracle10\product\10.2.0.4\db_1\BIN
D:\oracle10\product\10.2.0.4\db_1\BIN>expdp system/*****@TEST
DIRECTORY=DATA_PUMP_DIR DUMPFILE=MEGA_REPOSITORIES_EXPORT_SYSTEMDB_AND_MEGATUTORIAL.DMP LOGFILE=MEGA_REPOSITORIES_EXPORT_SYSTEMDB_AND_MEGATUTORIAL.DMP.LOG SCHEMAS=ORASchema,ORASchemaSYS

Export: Release 10.2.0.4.0 - Production on Friday, 28 May, 2010 14:38:59

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Connected to: Oracle Database 10g Release 10.2.0.4.0 - Production
Starting "SYSTEM"."SYS_EXPORT_SCHEMA_01": system/*****@TEST DIRECTORY=DATA_PUMP_DIR DUMPFILE=MEGA_REPOSITORIES_EXPORT_SYSTEMDB_AND_MEGATUTORIAL.DMP LOGFILE=MEGA_REPOSITORIES_EXPORT_SYSTEMDB_AND_MEGATUTORIAL.DMP.LOG SCHEMAS=ORASchema,ORASchemaSYS
Estimate in progress using BLOCKS method...
Processing object type SCHEMA_EXPORT/TABLE/TABLE_DATA

```

Parameter description:

<i>expdp</i>	Invokes the export utility.
Oracle user	The user who does the export (here "system") followed by '/' and his password and "@<OracleDatabaseInstanceName>".
DIRECTORY	Specifies an Oracle Directory object. It is an Oracle object that is mapped to a path to a physical folder where the dump will be created. Here, "DATA_PUMP_DIR" is used because it does not need to be created as it is pre-existing within Oracle 10g. You can create another one if needed (refer to Oracle Documentation: see link at the beginning of this document).
DUMPFILE	The name of the dump that will be created in the DIRECTORY object.
LOGFILE	This is the name of the file where the output of the command window will be redirected.
SCHEMAS	The name of the Oracle SCHEMAS that are to be exported into the dump.

The Import

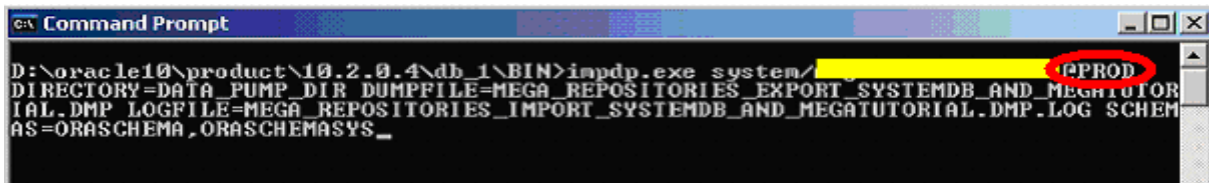
Prerequisite:

Copy the dump created during the import and paste it into the Oracle DIRECTORY object that will be specified for the import.

Note: in this example, both Oracle Databases are on the same machine, but it is highly possible that it will not be the case in a client situation.

It is also implied that on the OPE, the target SCHEMAS have been created on pre-existing TABLESPACE(S).

The import command:



```
D:\oracle10\product\10.2.0.4\db_1\BIN>impdp.exe system/ [redacted] @PROD
DIRECTORY=DATA_PUMP_DIR DUMPFILE=MEGA_REPOSITORIES_EXPORT_SYSTEMDB_AND_MEGATUTORIAL.DMP LOGFILE=MEGA_REPOSITORIES_IMPORT_SYSTEMDB_AND_MEGATUTORIAL.DMP LOG SCHEMAS=ORASCHEMA,ORASCHEMASYS_
```

Note: the name of the LOGFILE is different to enable keeping both the export and import logs (this notes only applies if the dump is read from where it was created since the LOGFILE is created next to the dump).

Launching this command will cause a few errors:

1.

ORA-31684: Object type USER:"ORASCHEMA" already exists

ORA-31684: Object type USER:"ORASCHEMASYS" already exists

This has been discussed earlier in this document and can be ignored.

2.

ORA-39083: Object type TABLESPACE_QUOTA failed to create with error:

ORA-00959: tablespace 'TESTTBL' does not exist

This is another error that needs to be explained.

- When importing the dump, Oracle "wants" to create the SCHEMAS in the same tablespace from which they were exported.
- Simply put, this tablespace was there in the OTE (obviously), but it is probably missing in the OPE.


In this case, in the OTE the tablespace is TESTTBL and in the OPE, the tablespace is PRODTBL.

Solution:

The **REMAP_TABLESPACE** parameter!

The correct import command is therefore:

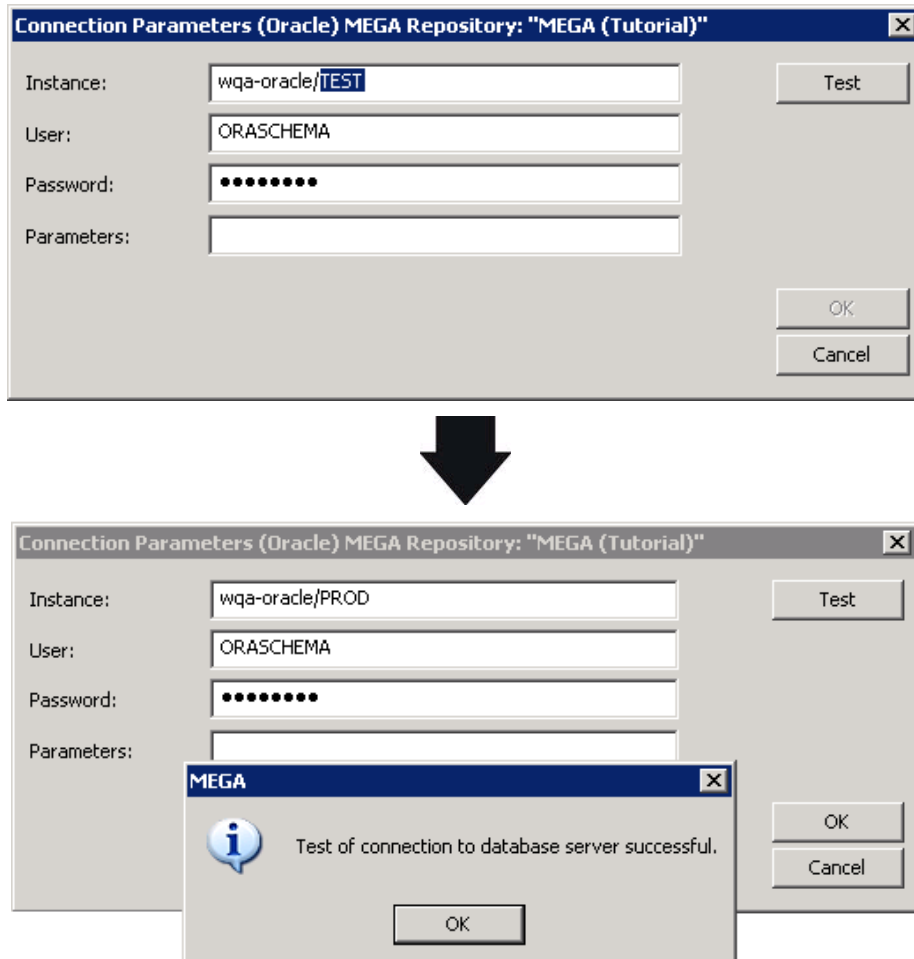
```
Command Prompt
D:\oracle10\product\10.2.0.4\db_1\BIN>
D:\oracle10\product\10.2.0.4\db_1\BIN>impdp.exe system/ [REDACTED] @PROD
DIRECTORY=DATA_PUMP_DIR DUMPFILE=MEGA_REPOSITORIES_EXPORT_SYSTEMDB_AND_MEGATUTOR
IAL.DMP LOGFILE=MEGA_REPOSITORIES_IMPORT_SYSTEMDB_AND_MEGATUTORIAL.DMP LOG SCHEM
AS=ORASCHEMA,ORASCHEMASYS REMAP_TABLESPACE=TESTTBL:PRODTBL
```

 Note that the equivalent (REMAP_SCHEMA) can be used if the hosting SCHEMAS are named differently in the OTE and the OPE.


Finalization: Switching in HOPEX from Test to Production

Ensure that the HOPEX repositories point toward the OPE:

1. In **HOPEX Administration**, change the SQL connection parameters so that they indicate the way to the database instance host machine and the correct equivalent SCHEMA to the one used in the OTE.



2. Repeat this for all the repositories and their respective SCHEMAS.

 Note: from the HOPEX installation point of view, nothing has changed except for the content of the HOPEX repositories files. It is as if the repository were the same: same name, same repository idAbs, same content (this is the aim after all).

What if...

The HOPEX environment for the production also needs to be moved to another location?

- In this case, you can copy the entire HOPEX environment folder tree and paste it somewhere else since it has no impact on the indirection to the Oracle Database server and its SCHEMAS. The SQL connection parameters needed to reach the RDBMS are present in the HOPEX repository file ([HOPEX_repository_file_name].emo in the case of a HOPEX repository on Oracle).
- Be aware that it can only work if the HOPEX environment folder keeps the same name; only the path to the HOPEX environment can change.
- This leads to another remark: you could copy the HOPEX Environment tree before switching the SQL connection parameters to the OPE and in that case you can have the 2 environments referenced at the same time in the HOPEX Site. Use this method to compare the HOPEX environment on the OTE and the OPE, for example.

Advice

- Put the HOPEX environment offline during the time of the manipulation so that you do not end up with differences or mix-ups (HOPEX users private workspaces started in OTE and ...).
- Because this manipulation takes places directly on the data, it is quicker and it is also a way to be absolutely sure that what was tested ends up being put in production.
- It is also a way of being sure that both Oracle installations (OTE and OPE) have no important differences that could lead to odd behavior in HOPEX or hard-to-understand-errors:
HOPEX SHOULD WORK LIKE IT USED TO in the OTE, otherwise the only explanation is to be looked for on the Oracle side.
- When the comparison is made, ask the Oracle DBA to lock the SCHEMA(S) used so that there is no doubt about which Oracle SCHEMA(s) is/are being used.

Vocabulary

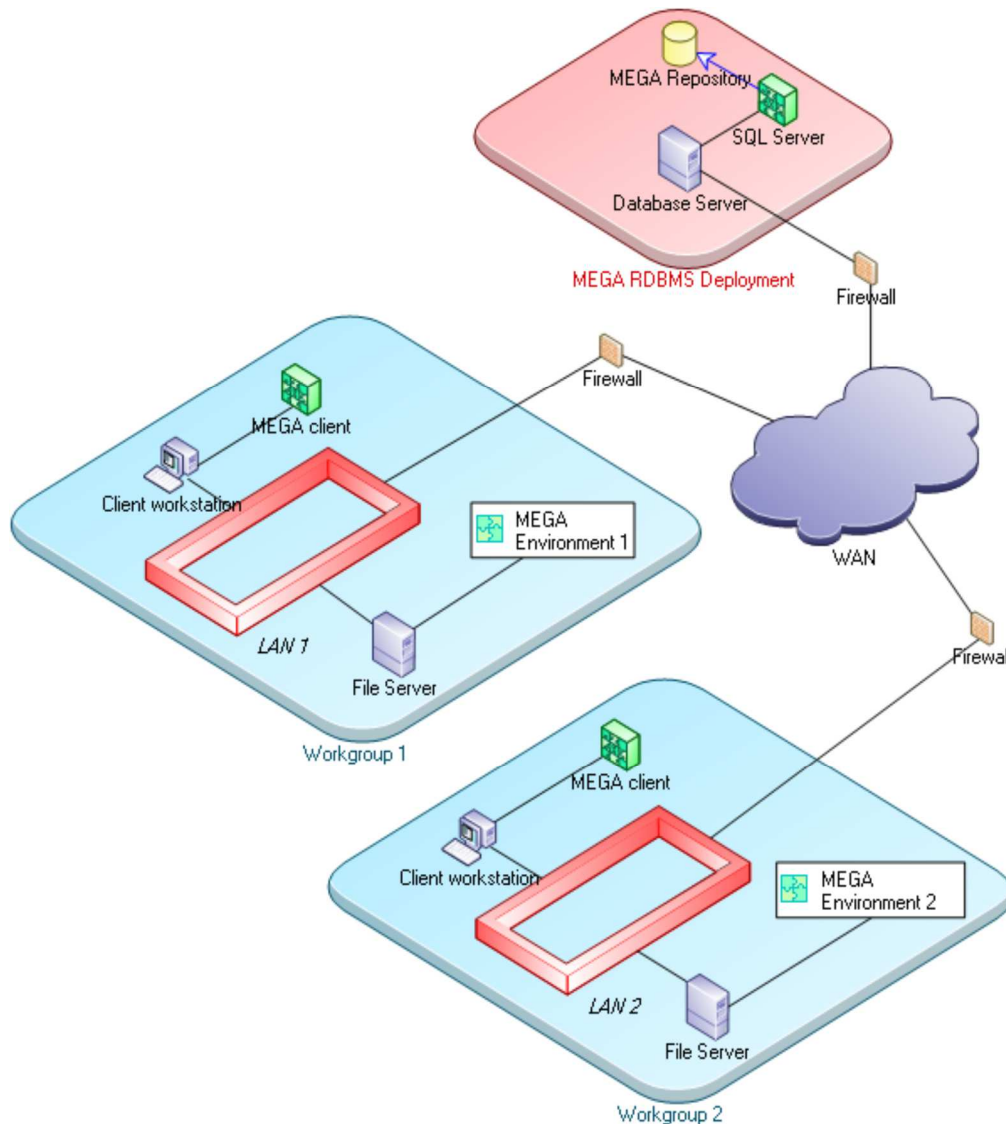
Term	Comment
Database	<p>A database is a collection of data, usually in the form of tables or files, under the control of a database management system (DBMS).</p> <p>In Oracle, a database is often called 'Instance'. Each running instance is associated to a specific process.</p>
Database server (hardware)	<p>A database server is a machine providing database services to other machines. In this document the database server is a machine running relational database management systems. A database server can host one or several instances.</p> <p>Example:</p> <ul style="list-style-type: none">• Server 'iba.company.com'• Server '192.888.777.666'• Server 'SQL02'
DBA	<p>The DataBase Administrator is responsible for administering, monitoring, and maintaining the database.</p>
DBMS	<p>A DataBase Management System (DBMS) is a set of software programs that controls the organization, storage, management, and retrieval of data in a database.</p> <p>Example: GBMS, Oracle...</p>
GBMS	<p>GBMS is MEGA's historical proprietary DBMS.</p>
Instant client	<p>Oracle technology. It enables running your applications without installing the standard Oracle client or having an ORACLE_HOME.</p> <p>Oracle instant client is embedded in HOPEX installations from MEGA 2009 SP1 and higher.</p>
HOPEX Environment	<p>On RDBMS installations, an environment is a group of directories where HOPEX generates documents, log files, etc.</p>
RDBMS	<p>Relational DataBase Management System.</p> <p>Examples: Oracle, SQL Server, DB2 Universal Database,...</p>

Term	Comment
Repository	<p>A repository is a structured collection of data.</p> <p>A HOPEX repository is a collection of HOPEX data. Data is structured in relation to a metamodel. Object names are often unique within the repository or with a namespace of the repository.</p>
Schema	<p>A schema object is a logical data storage structure.</p> <p>In Oracle, it is a collection of objects (example: tables, views, indexes, procedures, functions...) mapped to an Oracle user. A schema is stored in one/several tablespace objects of the database.</p> <p>It is strongly recommended to isolate each HOPEX Repository in a separate Oracle schema (User Repositories AND SystemDb repository)</p>
SID	Oracle term. System Identifier. It enables identifying instances (database)
Storage format	<p>HOPEX term. It defines the type of DBMS storing HOPEX data.</p> <p>Possible values are:</p> <ul style="list-style-type: none"> ○ GBMS: storage in HOPEX historical DBMS ○ Oracle: storage in Oracle DBMS ○ SQL Server: storage in SQL Server DBMS
SystemDb repository	HOPEX Term. It is a HOPEX repository that stores system data, such as, user definition, metamodel definition, template definitions, queries, diagram configuration. This data can be shared by all user repositories within a HOPEX environment. A SystemDb repository is associated to one/several user repositories.
Tablespace	Oracle term. A tablespace is a logical group of data within a database. A tablespace usually groups table and/or index objects.
User repository	HOPEX Term. This is a HOPEX repository storing data, such as diagrams, org-units...

Appendix - FAQs

Is it possible to share user repositories and the SystemDb repository through user's workgroups that do not share a file server?

Yes. You can duplicate HOPEX Environment on each side to obtain this kind of configuration.



Is it possible to have a user repository stored on a GBMS and a SystemDb repository stored on an Oracle/SQL server?

No. Some features might work but it is not tested and not supported. Moreover many specific features will not work.

Is it possible to consult the data from an Oracle/SQL Server?

It is technically possible and supported (e.g.: SELECT statement). However, this requires knowledge of the HOPEX RDBMS implementation and the HOPEX Metamodel. It is much easier to query the data from within HOPEX.

Is it possible to update the data from an Oracle/SQL Server?

It is technically possible but **NOT supported** (e.g.: UPDATE or DELETE statement). This requires the knowledge of the HOPEX RDBMS implementation and of the HOPEX Metamodel. Data updates must be performed from within HOPEX. All updates from outside the HOPEX application are made at the customer's risk. Consequences of inappropriate updates will not be supported.

MUST LICENSE INSTALLATION GUIDE HOPEX V2R1 EN

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1. SUMMARY

This document describes the procedures necessary for installing Must licenses with HOPEX V2R1.

It applies to all front-ends:

- Web front-end
- Windows Front-end

It does not describe:

- System requirements and possible architectures (see architecture overview documentation).
- How to install a product release (see installation documentation).
- How to manage installations (see administrator manuals).
- How products are licensed (see licensing documentation).
- How to use features (see user manuals).

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2. FOREWORD

HOPEX Must licensing is a technology of network licenses provided by MEGA.

To obtain or update your license, contact your sales representative.

- A UNC will be requested.
- A .must license file will be sent with installation instructions.

A Must license:

- Is a file with a .must extension.
- Contains the definition of the license (locking information, expiration date and list of products).
- Is locked on a shared folder (UNC address).

Must license installation mainly consists in:

- Installing the license.
- Configuring the license folder in the HOPEX installation.

If you want to directly install a Must license, go to the section 'Installation procedures' of this document.

After installation, the Must license can be configured to better control execution:

- Configuring the command line (/RW code)
- Configuring user x license mapping.
- Configuring user to product mapping.

A **Must license utility** is available for the license administrator to make these configurations and monitor license use.

The Administration Console is still used to create and configure HOPEX users.

A **Web licensing console** is also available to configure license.

It does not enable to monitor use of token at a given moment.

The list of available services varies with the front-end:

Service	HOPEX Web Front-End	HOPEX Windows Front-End
Locking	•	•
Shared licenses	•	•
Dedicated license	•	•
Concurrent license	•	•
Multiple licenses	• (NR)	•
Cluster license	•	•

NR: not recommended because execution warning regarding are not displayed in HOPEX Web Front-End.

Definition of services:

- **Locking:**
 - The license is programmed for a specific UNC address. The availability of this address is checked at runtime.
- **Dedicated licenses:**
 - It is possible to program a license when a token for a product will be dedicated to a user. The number of tokens equals the number of users. The product is said to be programmed in dedicated mode.
- **Shared licenses:**
 - It is possible to program a license when a token for a product will be assigned to a list of possible users. The number of tokens is lower than the number of possible users. The product is said to be programmed in shared mode.
- **Concurrent licenses:**
 - It is possible to program a license when a token for a product will not be assigned to any user. The number of possible users is set to 0. The product is said to be programmed in concurrent mode.
- **Multiple licenses:**
 - For the same HOPEX installation, it is possible to use different licenses to enable different access policies for different populations of end-users.
- **Cluster license:**
 - The same license can be used for a set of HOPEX installations on different machines (cluster).

Independently from the products/solutions, there are three exclusive types of users:

- **Viewer users:** consult data, search, use collaboration features
- **Contributor users:** consult data, search, perform limited updates, use collaboration features
- **Main users:** consult data, search, perform all updates in particular with diagram editor, use collaboration features

3. MUST LICENSE UTILITY

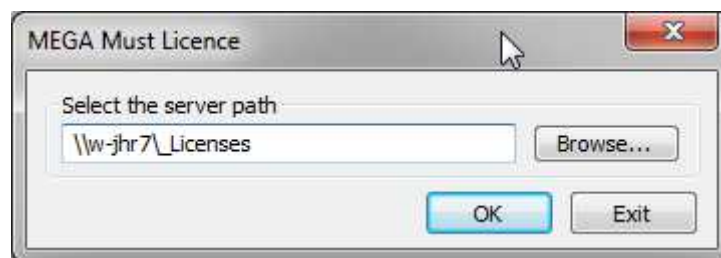
A launcher **licensing.exe** is installed in the root folder of the HOPEX installation. It is a shortcut to the program **mgwusrmng.exe** located in the 'System' folder of the HOPEX installation.

3.1. User Interface

Several windows are available:

- Select server path window: to locate a folder containing the Must license.
- User management window: to configure Must licenses located in this folder.
- Select HOPEX installation window: to locate the configuration folder of the HOPEX installation.

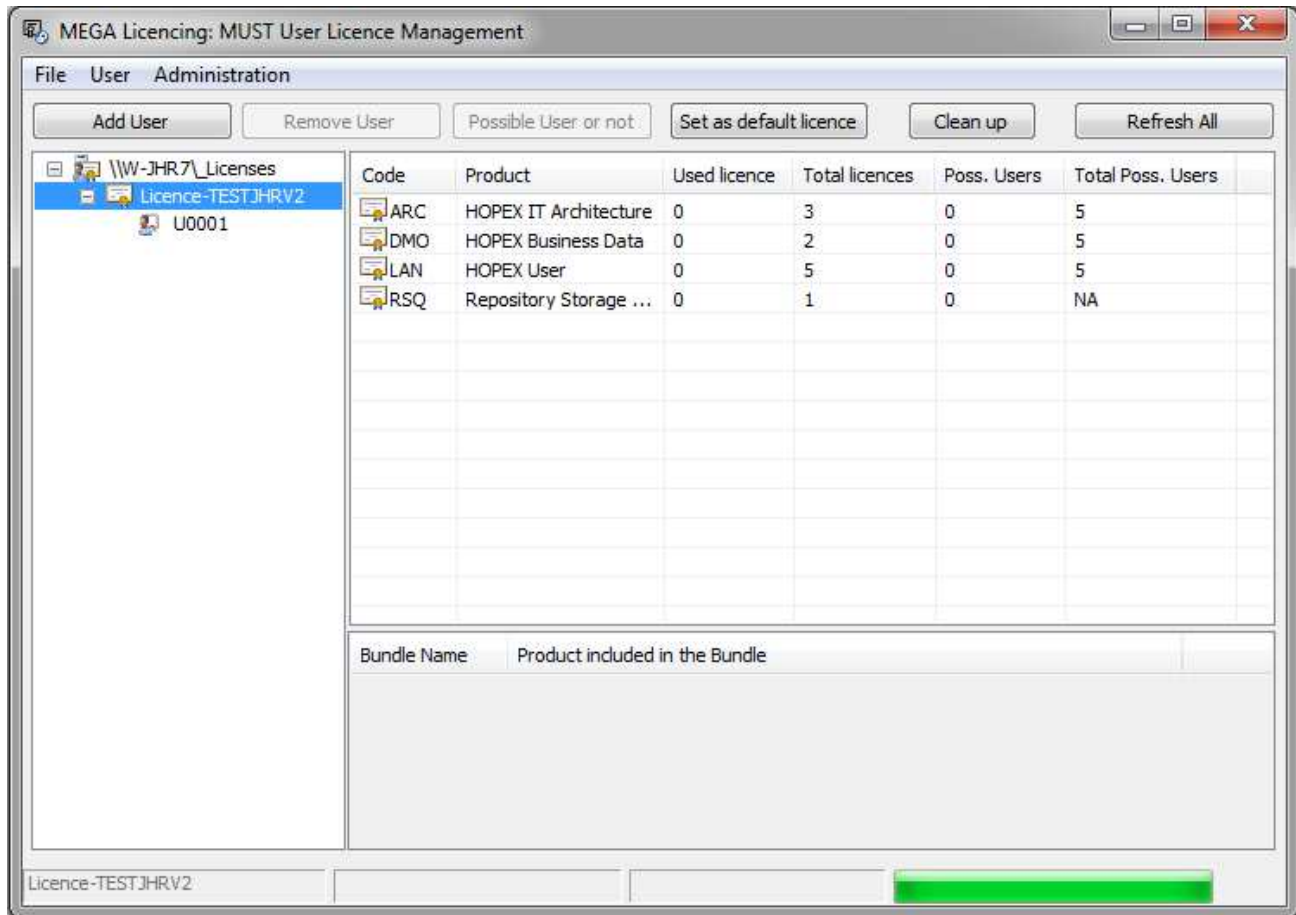
Select server path window



Click 'Browse' and select the folder containing the Must license to be configured. The 'OK' button is enabled as soon as a file with the .must extension is identified.

Verify that the server path is the same as the UNC address chosen for the license.

User management window





This window displays several elements:

- A top menu (File, User, Administration) and a toolbar 'Add User, Remove User..)
- The left pane displays the Must license available in the selected folder.
- The top right pane displays the products available for the selected license.
- The bottom right pane displays the bundle definition, if any.



The top right pane has several columns. The list is different if a user or a licence is selected:

- **Code:** the code of the technical product.
- **Product:** the name of the technical product.
- **Connected:** the number of users currently logged in to the product (this figure changes over time).
- **Used licences:** the number of licence tokens currently used for the product (this figure changes over time).
- **Remaining licences:** the number of licence tokens currently available for the product (this figure changes over time).
- **Total licences:** the number of licence tokens programmed for the product (this figure does not changes over time).
- **Poss. User:** the number of users that are set as possible users of the product (this figure changes over time).
- **Remaining Poss. Users:** the number possible users currently available for the product (this figure changes over time).
- **Total Poss. Users:** the number possible users programmed for the product (this figure does not changes over time).

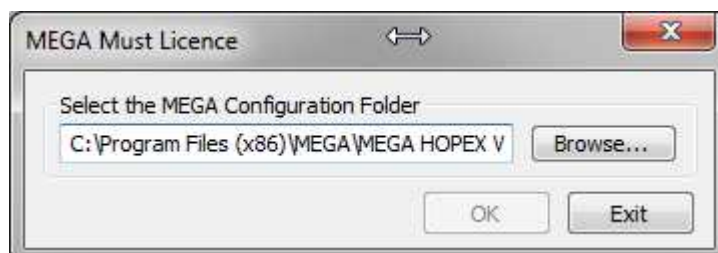
The license status is displayed in the left pane:

Display	Status	Possible causes
 Licence-T0001	Valid	-
 Licence-T0001	Invalid	License has expired Locking failed: the folder address containing the license file does not match the expected UNC

The user status is displayed:

Display	Status
 U0001	Connected
 U0001	Not connected

Select HOPEX installation window



Click 'Browse' and select the folder containing the 'CFG' folder of the HOPEX installation to be configured. The 'OK' button is enabled as soon as the Megasite.ini file is identified.

4. INSTALLATION PROCEDURES

The following procedures apply to all front-ends. They enable to install the Must license and protect a HOPEX installation with this license.

4.1. Communicating with MEGA Sales Administration

There are times where you will need a new Must license:

- When you purchase a new HOPEX product or solution.
- When you purchase additional licenses or users of HOPEX products or solutions.
- When you relocate Must license folder.

To obtain or update your license, contact your sales representative.

- A UNC will be requested.
- A .must license file will be sent with installation instructions.

If a problem occurs during license installation, see the 'FAQs and troubleshooting' section of this document. For additional assistance, contact the appropriate Support Center.

Must license installation consists in:

- Installing the Must license file.
- Configuring the license folder in the HOPEX installation.

Must license update consists in:

- Verifying that no user is connected to the former license.
- Removing the former license.
- Resetting the configuration files
- Installing the updated license.

4.2. Choosing a machine to host the Must license folder

List of requirements:

- No specific hardware requirements (CPU, Ram). However, the machine hosting the Must license must be an efficient file server.
- The machine hosting the Must license must be available for all users running the HOPEX Kernel.

List of recommendations:

- The machine must be an efficient file server:
 - Select top quality components for disks and disk controller cards.
 - During installation and configuration, choose all options that favor file service performance.
- Choose an NTFS disk.
- Choose a DFS-based folder for the license folder

4.3. Creating a Must license folder

If you do not have the technical skills or the authorization required for this step, contact you system administrator.

Steps:

- Choose a machine to host the Must licenses.
See above.

- Create a shared folder on this machine.
This will be the license folder. See requirements below.
- Configure this share folder.
See requirements below.

Folder sharing requirements:

- The license folder must be accessible as a UNC address, meaning a shared folder with one unique address on the network.
- Examples of authorized sharing:
\\Server001\Apps\Licenses
\\Domain01\Applications\HOPEX\Licenses (DFS)
[\\Server001.Domain01.com\Licenses](#) (FQDN)
- Examples of unauthorized sharing:
\\Server002\c\$\ HOPEX\Licenses (administrative share)
M:\Licenses (network letter)

License folder requirements:

- The license folder must be accessible as a UNC with **full control** to all Windows users that are allowed:
 - To configure a Must license.
 - To run HOPEX Kernel programs with a Must license.
- If you want to configure smarter permissions, consult the 'FAQs and troubleshooting' section of this document.

4.4. Sending the UNC address of the license folder

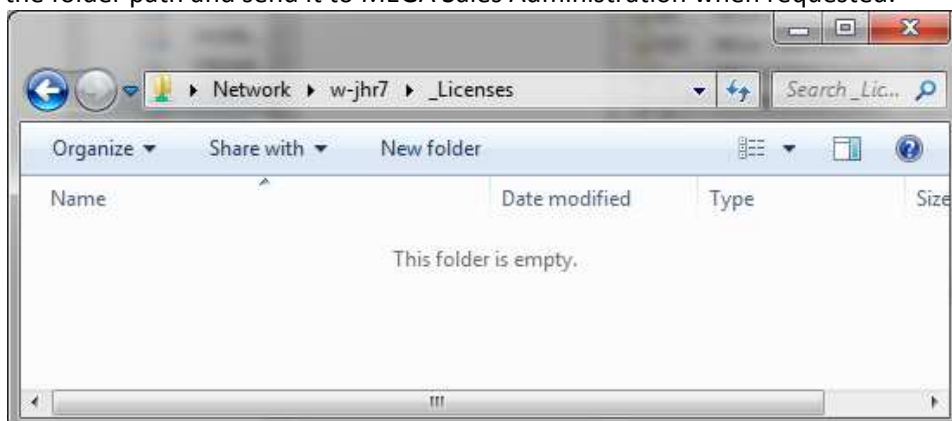
Prerequisite:

- Create a license folder.

No specific utility is provided for this step: you can use Windows explorer.

Example:

- Navigate to the license folder.
- Select the folder path in the address bar.
- Copy the folder path and send it to MEGA Sales Administration when requested.



4.5. Installing a Must license file

Prerequisites:

- Get a Must license file.
- Identify the license folder. This folder must match the UNC on which the HOPEX license file is locked.

- Verify that this folder exists and is shared (Windows permissions) for every Windows user that can run HOPEX Kernel through a Front-end.

Procedure:

1. With Windows explorer, select the folder matching the UNC.
2. Copy the .must file sent by MEGA Sales Administration to this folder.

Results:

- The Must license is installed.

4.6. Configuring the license folder in the HOPEX installation (direct reference)

Prerequisites:

- A Must license is installed in the license folder.
- A target HOPEX installation is available.

Procedure:

1. Run the Must license utility.
2. In the menu, select File > 'Update config'.
3. Click the 'Browse' button.
4. Select the 'CFG' folder of the HOPEX installation.

Results:

- The Megasite.ini configuration file is updated. A section [Must licence] is created or updated.
Example:

```
[Must licence]
Path=\\server001\Apps\Licenses
```
- It is possible to run the HOPEX installation on behalf of this Must license.

4.7. Configuring the license folder in the shared configuration folder (indirect reference)

Prerequisites:

- A Must license is installed in the license folder.
- A shared configuration folder contains a file Megasite.ini.
- A HOPEX installation is part of a cluster.

Procedure:

1. Browse the shared configuration folder.
2. Edit the file Megasite.ini.
3. Add a section [Must licence] and a variable 'Path'. Example:

```
[Must licence]
Path=\\server001\Apps\Licenses
```

Results:

- In the shared configuration folder, the Megasite.ini configuration file is updated. A section [Must licence] is created or updated.
- It is possible that each workstation of the cluster shares the same license.

4.8. Uninstalling the Must license

Prerequisites:

- Identify the Must license file to be uninstalled.
- Identify the license folder. This folder must match the UNC on which the HOPEX license file is locked.
- Verify with the Must license utility that no user is currently logged on to the license to be uninstalled.

Procedure:

1. With Windows explorer, select the folder matching the UNC.
2. Remove the .must file from this folder.

Results:

- The Must license is uninstalled.

4.9. Resetting the configuration files

When replacing a Must license with a license having the same name and UNC, it is recommended to reset the Must license configuration.

Otherwise, the license may not run correctly in particular if the number of token has become lower for a product. A consequence it will be necessary to specify again the list of possible users.

Prerequisites:

- Identify the Must license file to be uninstalled.
- Decided whether you reset the configuration
- Verify with the Must license utility that no user is currently logged on to the license to be uninstalled.

Procedure:

1. Run the **licensing.exe** utility as **Administrator**.
2. Select the server path where the license is saved.
3. Select the license in the left tree.
4. Right-click > **Reset License** configuration.
5. Confirm reset.

This will:

- Delete the possible user configuration.
- Delete the token files.
- Delete the file Router.ini

4.10. Converting licence

When upgrading from HOPEX V1R2-V1R3 CP8.0 or lower CP, it is required to convert the file Router.ini to a new format. Otherwise, various issues can occur.

Pre-requisites:

- Stop all activity regarding HOPEX Windows Front-End and HOPEX Web Front-End.

Procedure:

1. Run the **licensing.exe** utility as **Administrator**.
2. Click on the menu Administration > **Convert**.
3. Click the button **Refresh All**.

This will:

- Archive the file configuration file 'Router.ini as 'Router.bak'.
- Update the file 'Router.ini' to the new format:
 - A version tag is added (section [Router], version=x).
 - The reference to the domain (ex: @Domain01) is removed.
 - Duplicate line are removed.
- Technical files are renamed.
 - The reference to the domain (ex: @Domain01) is removed.

Example:

Router.ini (before conversion)	Router.ini (after conversion)
[User/Licence] U001@Domain01=Licence-T0001	[User/Licence] U001=Licence-T0001

U001@Domain02=Licence-T0002 U002@Domain01=Licence-T0001	U002=Licence-T0001 [Router] Version=2
--	---

4.11. Configure file permissions

At runtime, files will be created dynamically in a hidden subfolder in the licence folder.

It is necessary to configure file permissions so that execution is correct.

It is recommended to grant the permission 'Modify' for the licence folder (ex: \\Server001\Apps\Licenses and its subfolders).

The list of windows users varies with the front-end:

Front-end	Users to be configured
Web Front-end	Only the service account for the HOPEX (IIS) web application should be configured (ex: D01\hopex). Contact the person in charge of installing HOPEX Web Front-end
Windows Front-end	Each end-user can be configured (D01\u0001, D01\u0002...). It is therefore recommended that a group is created for users of the Windows Front-end.

5. CONFIGURATION AND MONITORING PROCEDURES

The following procedures apply to all front-ends.

5.1. Configuring the command line (/RO /RW code)

Each product is associated to a product code.

Ex: HOPEX IT Architecture has the code 'ARC'

A property 'Command line' can be configured at several levels:

Level	Comment
Profile level	Configuration at this level is recommended. As there are less profiles than users, configuration is easier to maintain.
User level (Login)	Configuration at this level is NOT recommended. It is mainly available for compatibility with previous versions.

At each level, it is possible to specify a command line with the following syntax:

`/RW'<list of product codes>' /RO'< list of product codes>'`

Example:

`/RW'DMO;ARC' /RO'DBB'`

Where:

- /RW: defines a list of product code accessed in read/write mode.
Note that /K (previous specification) is equivalent to '/RW'
- /RO: defines a list of product code accessed in read/only mode.
It applies only if the product 'ReadOnly Mode' (code 'ROM') is programmed.

Prerequisites:

- Identify the HOPEX environment containing the users to be configured.
- Get the table of product codes that you have bought.
- Get a company specification of user/profile x product assignment. The level of configuration (user level or profile level) must be specified for each user for the company.

Example of procedure to set /RW /RO for a profile:

- Run the Administration Console.
- Open the environment.
- Select the folder 'User Accounts > Profiles and Permissions'.
- Right-click > Manage.
- In the tab 'Profile', select the expected profile.
- Right-click > Properties.
- In the tab 'Characteristics', set the property 'Command line'.

Example of procedure to set /RW /RO for a user:

1. Run the Windows Administration Console.
2. Open the environment.
3. Select the folder 'User Accounts > Users'.
4. Right-click > Manage.

5. In the tab 'Logins', select the login of the user requested.
Ex: select the login 'Mega' for the login holder 'Mega'
6. Right-click > Properties.
7. In the tab 'Characteristics', set the property 'Command line'.

If a value is set at both level, the intersection will be considered for /RW.

If a value is set at both level, the concatenation will be considered for /RO.

Example:

Command line value set for the user (Login Level)	Command line value set for profile	Command line value considered
	/RW'ARC'	/RW'ARC'
/RW'DMO;ARC'	/RW'ARC'	/RW'ARC'
/RW'DMO'	/RW'ARC'	-
/RW'DMO;ARC' /RO'DBB'	/RW'ARC' /RO'MTS2'	/RW'ARC' /RO'DBB;MTS2'

Results:

- The profile is configured to run certain products.
- The user is configured to run certain products.

5.2. Specifying a default licence

If several licences exist in the licence folder, users must be configured explicitly. Otherwise, they cannot login. It is however possible to specify a default licence.

Procedure:

In the file in router.ini, manually add a section [Config] such as:

[Config]

DefaultLicence=<licence name>

Where 'licence name' is the name of the licence file without the .must extention.

Ex: if the file is 'License-T0002.must', the licence name is 'License-T0002'.

5.3. Declaring users

This is important in several situations:

- Several Must licences exist: users should be allocated in the different licences unless a default licence is specified.
- Shared licence: possible users should be specified beforehand.
- Dedicated licence: named users should be specified beforehand.

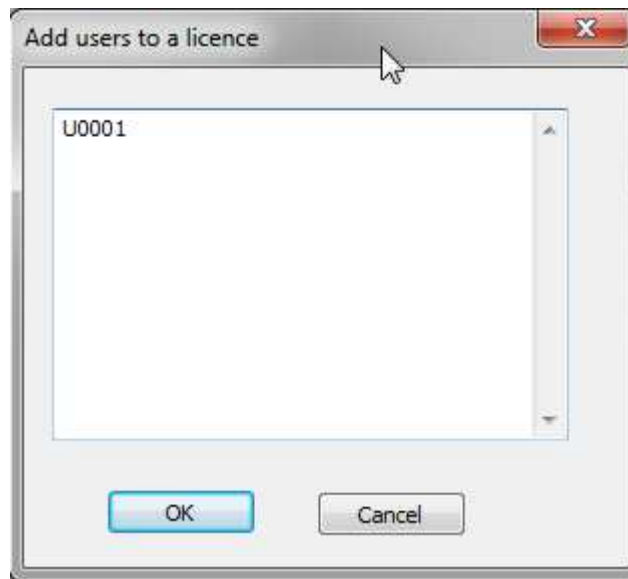
Adding a user to a license

Prerequisites:

- A Must license is installed.
- A HOPEX installation is available and configured for Must licenses.
- Get user x license mapping specification. Each user must be declared with its HOPEX login. The users must be able to know the login of each user. Ex: the HOPEX login of John Smith is 'U0001'.

Procedure:

1. Run the Must license utility.
2. Select the license folder.
3. Select the license to be configured. Ex: License-T0001.
4. Click the 'Add user' button: enter the login name (Ex: enter 'U0001' for the user 'John Smith is 'U0001') and click 'OK'.


Results:

- The user is displayed in the left pane below the license (<user login>). Ex: U0001
- The 'Router.ini' configuration file is created in the license folder for saving this specification. A section [User/Licence] is created or updated.

Example:

```
[User/Licence]
U0001=License-T0001
```

Note that you can also enter several login names separated with semicolon or line break (example: U0001;U0002)

Removing a user from a license

Prerequisites:

- A Must license is installed.
- A HOPEX installation is available and configured for Must licenses.

Procedure:

1. Run the Must license utility.
2. Select the license folder.
3. Select the license to be configured. Example: License-T0001.
4. Select the login of the user to be removed.
5. Click the 'Remove user' button.

Results:

- The user is no longer displayed in the left pane below the license.

5.4. Configuring possible users of products

Setting a user as a possible user of a product

Prerequisites:

- A Must license is installed in the license folder.
- A HOPEX installation is available and configured for Must licenses.
- Users are declared.
- Get user x product mapping specification.

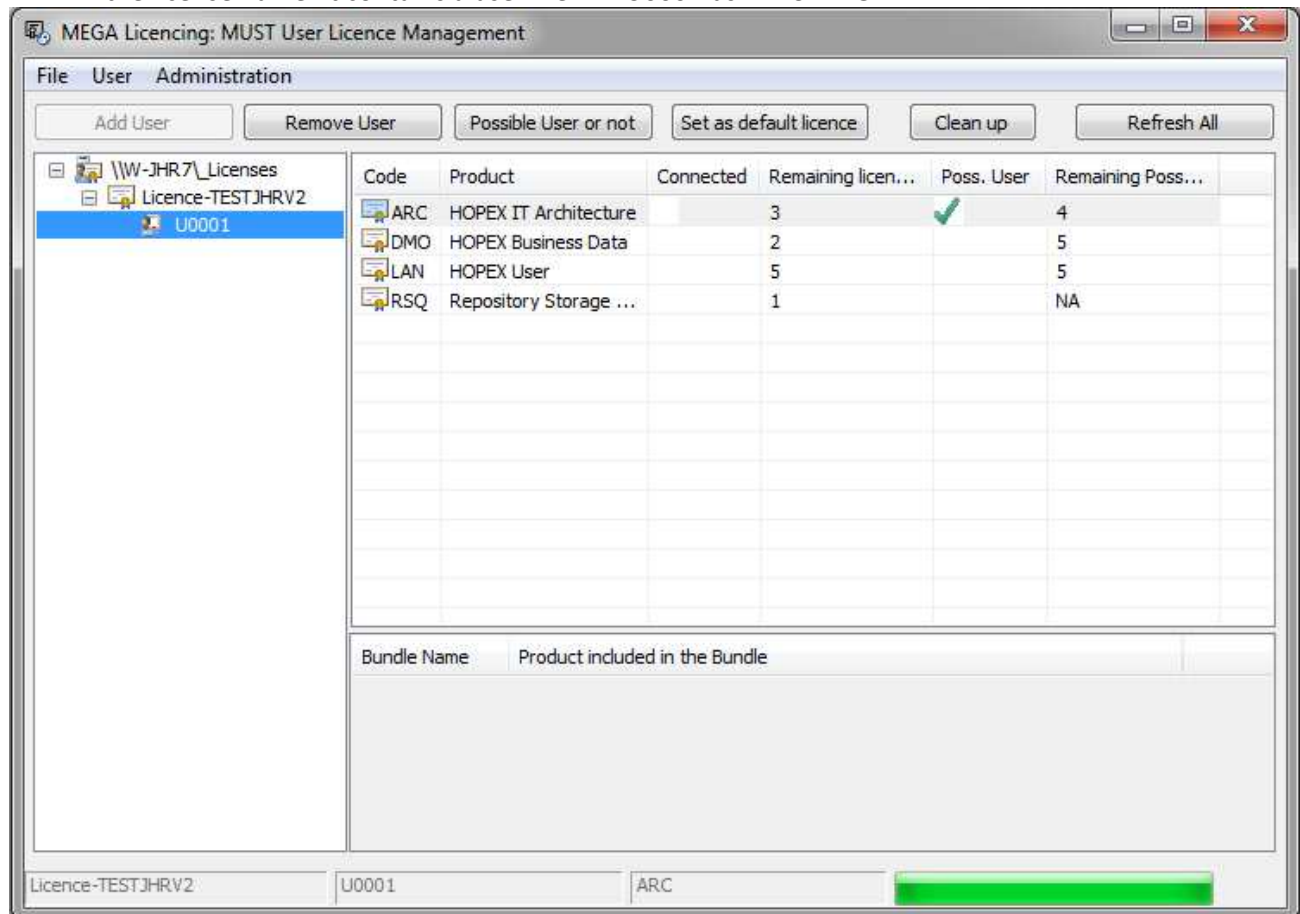
Procedure:

1. Run the Must license utility.

2. Select the license folder.
3. Select the license to be configured.
4. Select the product to be configured.
5. Select the user to be set as a possible user of the product.
6. Click the 'Possible user or not' button.

Results:

- When both user and product are selected, a checkbox is displayed in the 'Poss. User' column of the top right pane. It shows that the current user is a possible user for the product.
- Files are created in the license folder for saving this specification. A subfolder 'USERS' exists with the license name. It contains a user file. Ex: U0001.usr-ARC-MEGA.



Removing a user as a possible user of a product

Prerequisites:

- A Must license is installed in the license folder.
- A HOPEX installation is available and configured for Must licenses.
- Users are mapped to licenses.

Procedure:

1. Run the Must license utility.
2. Select the license folder.
3. Select the license to be configured.
4. Select the product to be configured.
5. Select the user to be removed as a possible user of the product.
6. Click the 'Possible user or not' Button.

Results:

- When both user and product are selected, no checkbox is displayed in the 'Poss. User' column of the top right pane.
- Files are updated in the license folder for saving this specification.

Cleaning up license tokens

Prerequisites:

- A Must license is installed in the license folder.
- A HOPEX installation is available and configured for Must licenses.
- Verify with the Must license utility that no user is currently logged on to the license to be cleaned.

Procedure:

1. Run the Must license utility **as Administrator**.
2. Select the license folder.
3. Select the license to be configured.
4. Click the 'Clean up' Button.

Results:

- Unexpected token files are purged.

Note that, if a lot of token files exist when the button 'Clean up' is first clicked, the processing can take several minutes according to the number of token files, the number of licenses and the file access performances. The token files are purged for each license displayed in the left pane. The processing will run faster the next times button 'Clean up' is clicked (as most token files will have been purged).

5.5. Instant monitoring of license connections

The Must license utility can be used to monitor connections even though it was not designed for this purpose. Display may be slow.

Prerequisites:

- A Must license is installed in the license folder.
- A HOPEX installation is available and configured for Must licenses.

Procedure:

1. Run the Must license utility.
2. Select the license folder.
3. Select the license to be monitored.
4. Select the user or the product to be monitored.
5. Read the top right pane, column 'Connected'.

6. CONFIGURING LICENSING MODES AND USER TYPES

In certain situation, the same product can be programmed in several licensing modes.

Ex:

For HOPEX IT Architecture:

- 5 access in **shared** mode
- 10 access in **concurrent** mode (floating mode)
- 5 access in **dedidated** mode

Command line parameters will be used to control user tokens (LAN_X tokens) delivery.

By default the product named LAN is used in shared mode.

There can also be a product named LAN_F for concurrent mode.

There can aslo be a product named LAN_D for dedicated mode.

The general steps will be:

- Check that .Must licence is programmed in the expected mode.
- Enable extended mode in megasite.ini.
- Configure command line.

Independantly from the products/solutions, there are tree exclusive types of users:

- **Viewer users:** consult data, search, use collaboration features. VIEW counter is used.
- **Contributor users:** consult data, search, perform limited updates, use collaboration features. CBTR counter is used.
- **Main users:** consult data, search, perform all updates in particular with diagram editor, use collaboration features. LAN_X counters are used.

Command line parameters will be used to control user tokens delivery.

- By default, LAN counter is used if no possible user is configured.
- To user viewer users, a specific command line should be used.
- To user contributor users, a specific command line should be used.

6.1. Configuration of main users with concurrent mode (floating mode)

Check .Must licence

By convention, a product programmed in concurrent mode will use the LAN_F counter for main users.

Other products must be programmed in concurrent mode.

This can be checked in the licence file description: the second digit equals 0 (except for LAN_X counter).

Extract of license description	comment
[MEGAComponentInfo]	
(LAN) HOPEX MainUser=3 ; 0	Counter of main users (shared mode)
(RSO) Repository Storage (ORACLE)=NO	-
(RSQ) Repository Storage (SQL Server)=YES	-
(DMO) HOPEX Logical Data=3 ; 5	Programmed in shared mode
(SUP) HOPEX Power Supervisor=1 ; 1	Programmed in dedicated mode
(APM) HOPEX IT Portfolio Management=1 ; 1	Programmed in dedicated mode
(ANW) Web Front-End=NO	-
(HPP) HOPEX Productivity Pack=NO	-
(HBPA) HOPEX Business Process Analysis=3 ; 3	Programmed in dedicated mode
(CBTR) HOPEX Contributor=1 ; 0	Counter of contributor users
(VIEW) HOPEX Viewer=1 ; 0	Counter of view users
APM_F=5 ; 0	Programmed in concurrent mode
LAN_D=5 ; 0	Counter of main users (dedicated mode)
LAN_F=3 ; 0	Counter of main users (concurrent mode)
[MEGABundleInfo]	
APM_F=APM	
LAN_D=LAN	
LAN_F=LAN	

Note that the extension _F is conventional (except for LAN_F). Although it is not called APM_F, APM is programmed in concurrent mode.

Configure command line

This property 'Command line' exists at login level and profile level.

Use the /RW syntax and quote product codes programmed in concurrent mode.

Ex: /RW'LAN_F,APM_F'

Reminders:

- It is recommended to configure command line for profiles rather than for logins
- Standard profiles are protected, it is recommended to create a custom profiles that inherits from a standard profile.
- Changing command lines property will reset technical data cache. A warning 'The technical data are not compiled...' will be displayed as long as technical data are not recompiled.

6.2. Configuration of main users with dedicated mode

Check .Must licence

By convention, a product programmed in dedicated mode will use the LAN_D counter for main users.

Other products must be programmed in dedicated mode.

This can be checked in the licence file description: the second digit equals the first one (except for LAN_X counter).

Extract of license description	comment
[MEGAComponentInfo]	
(LAN) HOPEX MainUser=3 ; 0	Counter of main users (shared mode)
(RSO) Repository Storage (ORACLE)=NO	-
(RSQ) Repository Storage (SQL Server)=YES	-
(DMO) HOPEX Logical Data=3 ; 5	Programmed in shared mode
(SUP) HOPEX Power Supervisor=1 ; 1	Programmed in dedicated mode
(APM) HOPEX IT Portfolio Management=1 ; 1	Programmed in dedicated mode
(ANW) Web Front-End=NO	-
(HPP) HOPEX Productivity Pack=NO	-
(HBPA) HOPEX Business Process Analysis=3 ; 3	Programmed in dedicated mode
(CBTR) HOPEX Contributor=1 ; 0	Counter of contributor users
(VIEW) HOPEX Viewer=1 ; 0	Counter of view users
APM_F=5 ; 0	Programmed in concurrent mode
LAN_D=5 ; 0	Counter of main users (dedicated mode)
LAN_F=3 ; 0	Counter of main users (concurrent mode)
[MEGABundleInfo]	
APM_F=APM	
LAN_D=LAN	
LAN_F=LAN	

Note that the extension _D is conventional (except for LAN_D). Although it is not called HBPA_D, HBPA is programmed in dedicated mode.

Configure command line

This property 'Command line' exists at login level and profile level.

Use the /RW syntax and quote product codes programmed in concurrent mode.

Ex: /RW'LAN_D,HBPA,APM'

Note that it is not required to quote all product codes programmed in dedicated mode in the command line. Here SUP, is not quoted because it is assigned to a specific login/profile.

Reminders:

- It is recommended to configure command line for profiles rather than for logins
- Standard profiles are protected, it is recommended to create a custom profiles that inherits from a standard profile.
- Changing command lines property will reset technical data cache. A warning 'The technical data are not compiled...' will be displayed as long as technical data are not recompiled.

6.3. Configuration of main users with shared mode

Check .Must licence

By convention, a product programmed in dedicated mode will use the LAN counter for main users.

Other products must be programmed in dedicated mode.

This can be checked in the licence file description: the second digit is greater that the first one (except for LAN_X counter).

Extract of license description	comment
[MEGAComponentInfo] (LAN) HOPEX MainUser=3 ; 0 (RSO) Repository Storage (ORACLE)=NO (RSQ) Repository Storage (SQL Server)=YES (DMO) HOPEX Logical Data=3 ; 5 (SUP) HOPEX Power Supervisor=1 ; 1 (APM) HOPEX IT Portfolio Management=1 ; 1 (ANW) Web Front-End=NO (HPP) HOPEX Productivity Pack=NO (HBPA) HOPEX Business Process Analysis=3 ; 3 (CBTR) HOPEX Contributor=1 ; 0 (VIEW) HOPEX Viewer=1 ; 0 APM_F=5 ; 0 LAN_D=5 ; 0 LAN_F=3 ; 0 [MEGABundleInfo] APM_F=APM LAN_D=LAN LAN_F=LAN	Counter of main users (shared mode) - - Programmed in shared mode Programmed in dedicated mode Programmed in dedicated mode - - Programmed in dedicated mode Counter of contributor users Counter of view users Programmed in concurrent mode Counter of main users (dedicated mode) Counter of main users (concurrent mode)

Configure command line

This property 'Command line' exists at login level and profile level.

Use the /RW syntax and quote product codes programmed in concurrent mode.

Ex: /RW'LAN,DMO'

Reminders:

- It is recommended to configure command line for profiles rather than for logins
- Standard profiles are protected, it is recommended to create a custom profiles that inherits from a standard profile.
- Changing command lines property will reset technical data cache. A warning 'The technical data are not compiled...' will be displayed as long as technical data are not recompiled.

6.4. Configuration for viewer users

By convention, a product programmed in dedicated mode will use the VIEW counter for main users. Check the license.

Extract of license description	comment
[MEGAComponentInfo]	
(LAN) HOPEX MainUser=3 ; 0	Counter of main users (shared mode)
(RSO) Repository Storage (ORACLE)=NO	-
(RSQ) Repository Storage (SQL Server)=YES	-
(DMO) HOPEX Logical Data=3 ; 5	Programmed in shared mode
(SUP) HOPEX Power Supervisor=1 ; 1	Programmed in dedicated mode
(APM) HOPEX IT Portfolio Management=1 ; 1	Programmed in dedicated mode
(ANW) Web Front-End=NO	-
(HPP) HOPEX Productivity Pack=NO	-
(HBPA) HOPEX Business Process Analysis=3 ; 3	Programmed in dedicated mode
(CBTR) HOPEX Contributor=1 ; 0	Counter of contributor users
(VIEW) HOPEX Viewer=1 ; 0	Counter of view users
APM_F=5 ; 0	Programmed in concurrent mode
LAN_D=5 ; 0	Counter of main users (dedicated mode)
LAN_F=3 ; 0	Counter of main users (concurrent mode)
[MEGABundleInfo]	
APM_F=APM	
LAN_D=LAN	
LAN_F=LAN	

Configure command line

This property 'Command line' exists at login level and profile level.

Use the /HV syntax and quote product codes programmed in concurrent mode.

Ex: /HV'APM'

6.5. Configuration for contributor users

By convention, a product programmed in dedicated mode will use the VIEW counter for main users. Check the license.

Extract of license description	comment
[MEGAComponentInfo]	
(LAN) HOPEX MainUser=3 ; 0	Counter of main users (shared mode)
(RSO) Repository Storage (ORACLE)=NO	-
(RSQ) Repository Storage (SQL Server)=YES	-
(DMO) HOPEX Logical Data=3 ; 5	Programmed in shared mode
(SUP) HOPEX Power Supervisor=1 ; 1	Programmed in dedicated mode
(APM) HOPEX IT Portfolio Management=1 ; 1	Programmed in dedicated mode
(ANW) Web Front-End=NO	-
(HPP) HOPEX Productivity Pack=NO	-
(HBPA) HOPEX Business Process Analysis=3 ; 3	Programmed in dedicated mode
(CBTR) HOPEX Contributor=1 ; 0	Counter of contributor users
(VIEW) HOPEX Viewer=1 ; 0	Counter of view users
APM_F=5 ; 0	Programmed in concurrent mode
LAN_D=5 ; 0	Counter of main users (dedicated mode)
LAN_F=3 ; 0	Counter of main users (concurrent mode)
[MEGABundleInfo]	
APM_F=APM	
LAN_D=LAN	
LAN_F=LAN	

Configure command line

This property 'Command line' exists at login level and profile level.

Use the /HC syntax and quote product codes programmed in concurrent mode.

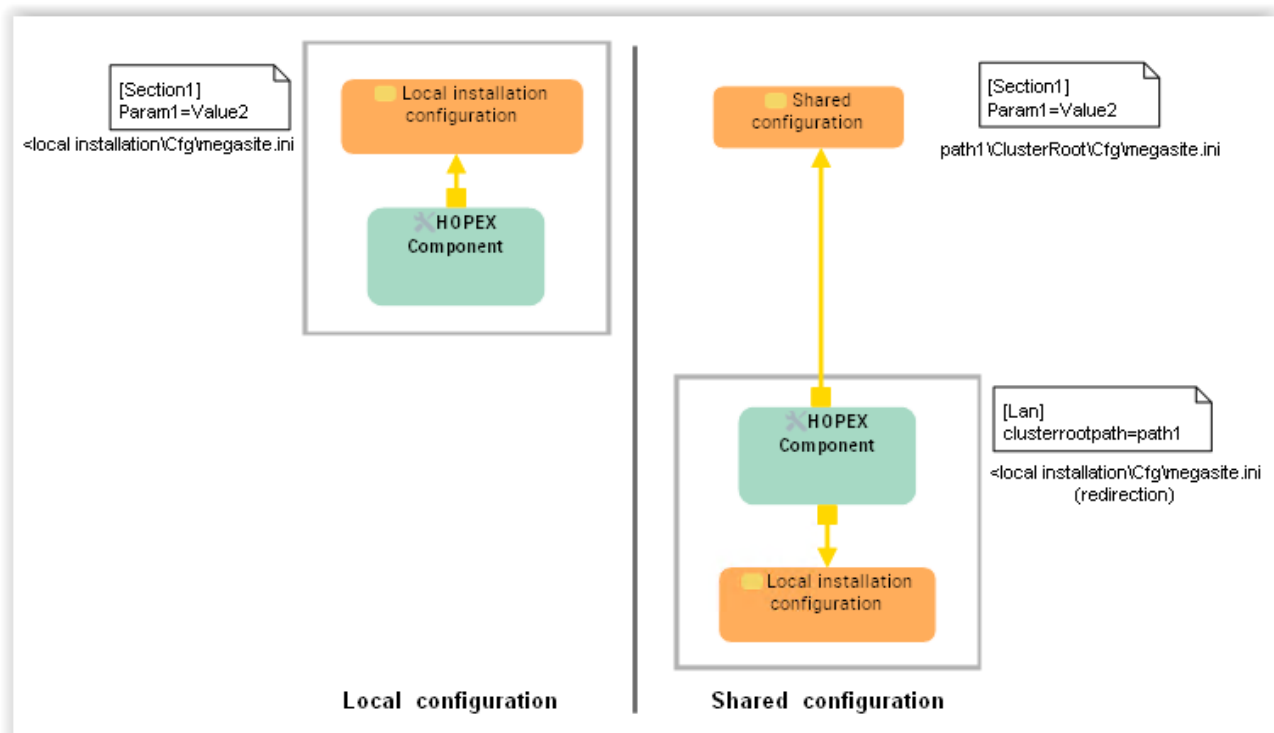
Ex: /HC'APM'

7. INSIDE

7.1. License deployment model

Two types of references can be used:

Configuration	Example of Megasite.ini	Comment
Local configuration	[Must licence] Path=\\server001\Apps\Licenses	The Must license folder (\\server001\Apps\Licenses) is configured in the file Megasite.ini of the HOPEX Installation
Shared configuration	[Lan] clusterrootpath=\\mega\data	The file Megasite.ini of the HOPEX installation refers to the root of a shared configuration folder (ex: \\mega\data\ClusterRoot\Cfg) containing another file Megasite.ini. This file contains a direct reference to the Must license folder (\\server001\Apps\Licenses). This type of reference must be used for Citrix/TSE deployment



When HOPEX is run by user U0001:

1. A configuration file (megsite.ini) is read to identify the license folder.
2. The license folder can be referenced directly (local configuration) or indirectly (shared configuration).
3. The license folder is read to identify the authorized license file for this user.
4. The Must license configuration is read to identify the products authorized for this user.
5. Connection is made if tokens are available for the authorized products.

7.2. License execution

License execution is homogenous through Front-Ends or Windows Administration Console.

Windows Front-End

Context	Must license checked	Storage product checked (1)	Tokens requested	Command line considered
HOPEX.exe (main user)	Yes	Yes (2)	One token per Product One token LAN_X	Yes
Administration.exe	Yes	Yes (2)	One token SUP One token LAN_X	No
HOPEX.exe with HOPEX Power Studio (MTS2)	Yes	Yes (2)	One token MTS2 One token LAN_X	Yes
API component (3)	Yes	Yes (2)	One token per Product One token LAN_X	Yes

(1) RSQ or RSO

(2) Unless GBMS storage is used.

(3) Administration component creating a running instance of HOPEX (mgwmapp.exe)

Web Front-End

Context	Must license checked	Counter used	Tokens requested	Command line considered
HOPEX Product (multi front-end)	Yes (1)	LAN_X	One token per Product One token LAN_X	Yes
HOPEX Product (controlled multi front-end)	Yes (1)(2)	LAN_X	One token per Product One token LAN_X	Yes
HOPEX Solution	Yes (1)	LAN_X	One token per Solution One token LAN_X	Yes
SSP component	Yes (1)	-	No token (3)	No
HOPEX Explorer	Yes (1)	LAN_X	One token for HEXP One token LAN_X	Yes
HOPEX Contributor	Yes	CBTR_X	One token for CBTR_X	Yes
HOPEX Viewer	Yes	VIEW_X	One token for VIEW_X	Yes

(1) RSQ or RSO product should be programmed.

(2) ANW product should be programmed.

When running the SSP component, must license is checked but no token is requested. SSP is used systematically with HOPEX Web Front-End. It can also be used by Windows Front-End.

7.3. File access

File access in the license folder should be similar to that of accessing a HOPEX repository data file. Contact MEGA Support if you encounter problems.

8. FAQs AND TROUBLESHOOTING

8.1.1. How can I use the Web licensing console?

See online documentation.

Note that the Web licensing console

- Needs to be installed when installing HOPEX Web Front-End.
- Needs to be allowed to the administrator in charge (security configuration).
- Does not allow to see user of tokens by login.

8.1.2. Do I have to configure possible users?

This is not required. If products are programmed in shared mode and the command line is configured, you do not need to explicitly configure possible users.

When user U0001 logs in, a token is requested for each product mentioned in the command line. If possible, user seats are available, U0001 is automatically configured as a possible user of the requested products. If tokens are available, U0001 can log in to these products.

8.1.3. How can I secure configuration of the HOPEX Must license?

If you do not want to configure systematically full control, you may configure advanced file permissions:

File	Location	Administrator rights	User rights
*.must	Example: \\server001\Apps\Licenses\License-001.must	Modify	Read & execute
.	License subfolders containing the user files and token files. Example for License-001.must: \\server001\Apps\Licenses\License-001 and subfolders	Modify	Modify ¹

The users considered vary with the front-end.

Front-end	Comment
HOPEX Web Front-end	Only the service account for the HOPEX (IIS) web application should be configured
Windows Front-end	Each end-user and administrators should be configured (ex: D01\U0001)

8.1.4. How can I prevent the dynamic declaration of possible users?

There is no way of preventing a user who is not explicitly configured from logging in.

If a possible user seat is available, the system will set a user requesting a token as a possible user. For this reason, it is recommended you configure possible users beforehand.

8.1.5. How can I get a log of license connections?

Supervision logs contain information regarding connection and disconnection. However, this is technical information and MEGA does not provide a report to consolidate and display this information.

8.1.6. What is the Router.ini file?

This file contains the mapping of users to licenses.

It is updated when configuration is made using the Must license utility ('Add user' and 'Remove user' actions). Deletion of this file will not remove possible user configurations.

¹ By default, user files and token files are set as 'Not visible'.

8.1.7. How can I get the assignment of users to licenses?

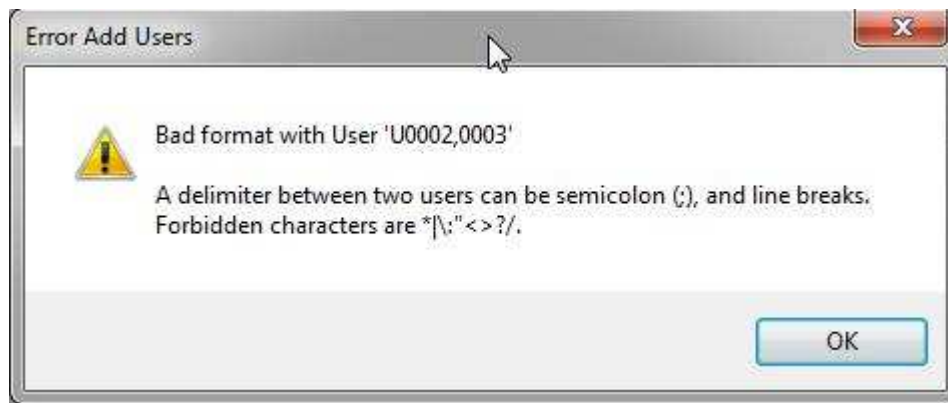
No report is available. You can consult the Must license utility (left pane) or read the Router.ini file.

8.1.8. How can I get the assignment of possible users to product?

No report is available. Consult the Must license.

8.1.9. When adding a user, I get an error 'Bad format with user 'XX'!

This is because the data entered does not match the format expected.



8.1.10. How can I get the list of logins of users?

No report is available. Consult the Windows Administration Console (Administration.exe).

8.1.11. I do not know the names of the logins. Why can't the utility provide a list of existing login?

This is a design option. The list of existing logins is related to a HOPEX environment

This would require to login to a HOPEX environment which is not in the scope of the licensing utility.

8.1.12. How can I set possible users for a selection of users?

It is not possible to select multiple users in the left pane of the Must license utility. However, a specific operating mode enables the administrator to replicate the possible user configurations of products on a license for other users.

Procedure:

1. Run the Must license utility.
2. Select the license folder.
3. Select the license to be monitored in the left pane.
4. Select a user for this license.
5. Configure possible users of the different products in the top right pane:
 - o Select the products to be configured.
 - o Click the 'Possible User or not' button.
6. Select another user in the left pane: the same list of products is selected.
7. Click 'Possible User or not': the same configurations are replicated on the products selected.

8.1.13. Can I mix shared and dedicated modes?

Yes. Note that modes are set at the product level.

8.1.14. Is my license shared or dedicated?

To check the licensing mode:

1. Open the .Must license file with a text editor such as Notepad
2. Analyze configuration: the mode depends on the combination of 2 digits

<License Product>=T ; U

Where:

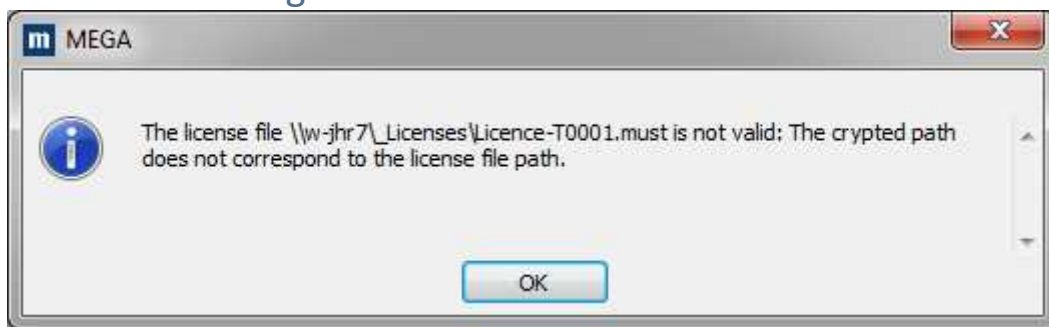
T: tokens

U: users

Licensing mode	Example
Dedicated mode (T=U)	(HITA) HOPEX IT Architecture=20 ; 20
Shared mode (T< U)	(HITA) HOPEX IT Architecture=20 ; 25
Concurrent mode/floating mode (T>U, U=0)	(HITA) HOPEX IT Architecture=20 ; 0

Note that modes are set at the product level.

8.1.15. Error message 1



Possible reasons:

- The path of the folder containing the Must license file does not match the path programmed in the license.
- The license file name does not match the file name programmed in the license (license file was renamed).

8.1.16. Where is the latest license folder used saved?

With Windows Front-End, it is saved in the user settings file (MEGASETTINGS.INI) in a section [MGWUSRMNG].

Example:

```
[MGWUSRMNG]
```

```
LastServerPath=\\server001\Apps\Licenses
```

8.1.17. How can I check that an HOPEX installation is part of a cluster?

Check the file Megasite.ini of the installation. It must contain a section [Lan] and a variable clusterrootpath.

Example:

```
[Lan]
```

```
clusterrootpath=\\mega\data
```

8.1.18. A message is displayed like You are not allowed to launch HOPEX V2R1 with your license file “xxxx.must”. It must be upgraded for this version. Please contact your sales representative to obtain a valid license file.

This is a standard warning with HOPEX V1R2-V1R3, HOPEX V2 or HOPEX V2R1.

Licences generated for lower versions (MEGA 2009, HOPEX V1R1) are not compatible with higher versions. Please contact your sales representative.

How to migrate to HOPEX V2R1

Summary

This document describes the procedures necessary for upgrading HOPEX Data:

- To version HOPEX V2R1 update 3 and higher
- From:
 - HOPEX V1R3 CP16.0 or higher CP.
 - HOPEX V2 any CP.

For prior versions (MEGA 2009 SP5, HOPEX V1R1, HOPEX V1R2...), it is necessary to perform an intermediate upgrade to one of these versions.

This document applies to version HOPEX V2R1 and higher CPs.

This document applies to all Front-Ends of HOPEX:

- Web Front-End.
- Windows Front-End.

This document also applies to the different storage formats for HOPEX Data:

- Oracle.
- SQL Server.
- GBMS (supported only for Windows Front-end).

It does not describe:

- System requirements and possible architectures (see architecture overview documentation).
- Change is product list (see your sales representative)
- How to perform installations (see installation documentation).
- How to install update (see how to install update documentation).
- How to manage installations (see administrator manuals).
- How products are licensed (see license installation documentation).
- How to use features (see user manuals).

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1. MAIN STEPS TO MIGRATE DATA TO HOPEX V2R1

The data migration consists of several main steps:

1. Prepare data for migration

This step requires the source version (HOPEX V1R3 CP16.0 or higher CP, HOPEX V2).

This step performs a validation that the existing data is compliant with the future metamodel and that customizations associated MetaAssociation behaviors are saved.

It also checks for pre-requisites, identifies solution packs used, and helps to determine the value of important parameters (options).

Most of this work requires human intelligence and knowledge of data that has been modelled within the tool. As a consequence, it cannot be automated and should be scheduled in advance of a production migration.

2. Upgrade data

This step requires HOPEX V2R1.

The process upgrades the metamodel and converts data to the format required by the HOPEX platform. This is carried out via conversion tools that need to be run manually from the Administration Console (Administration.exe). The procedures vary according to the source version your existing data.

In addition, this allows important parameters to be reviewed (options).

3. Check upgraded data and customizations

This step requires HOPEX V2R1.

This step involves validation from the end user perspective since they are most familiar with the prior state of the data.

- Modelled data has been correctly migrated.
- Customizations have been correctly migrated.

This step also requires human intelligence and knowledge of modelled data. Therefore, it cannot be automated.

2. PREPARE UPGRADE OF DATA

2.1. Check metamodel, locks, workspaces and workflows

In the source version (HOPEX V1R3, HOPEX V2), for each environment:

Check	Detail
Check that the metamodel is stable	In Windows Administration Console (Administration.exe), compile the environment. If the environment compilation generates a log entry in the HOPEX error log, you should fix such errors before migrating your data
Check that no private workspace (ex-transactions) persists	In Windows Administration Console (Administration.exe), check workspaces. If a private workspace persists, dispatch or delete it.
Check that no lock persists	In Windows Administration Console (Administration.exe), check locks. With GBMS storage, you can delete remaining locks. With RDBMS storage (Oracle or SQL Server), you need to dispatch or delete related workspace.

2.2. Decide format of report templates (MS Word)

With HOPEX, two formats are available for Report (MS Word) objects and RTF stylesheets.

Format	Recommended or required
RTF	Required for the environment in the following situations: <ul style="list-style-type: none">• If reports (MS Word) are generated from both Windows and Web Front-ends (1).• If reports (MS Word) are generated only from Web Front-ends.• If Report (MS Word) are generated in batch mode with Windows scheduler.
MS Word	Compatibility mode that can be used only if Reports (MS Word) are generated: <ul style="list-style-type: none">• In interactive mode (no batch).• From Windows Front End.

Format	Impacts
RTF	Reports have the .rtf or .docx file extension according to an option (2). RTF stylesheets has the .rtf file extension. MS word is not used at runtime. No links exist in generated reports. Fields (such as table of content) are not refreshed automatically. RTF macros are not supported. Application of styles is not enforced after generation, which may cause differences in display.
MS Word	Reports have the .doc file extension. RTF stylesheets has the .doc file extension. MS word is used at runtime. Links exist in generated reports (can be removed with detach). This format is now deprecated.

By default, with HOPEX V2R1, RTF format is used. If you need MS Word format, you must configure each HOPEX environment. See section 'Check format of report templates (MS Word)' later in this document.

- (1) A configuration enables to benefit from links and refreshing in report (MS Word). It requires that if MS Word is installed.
- (2) Option 'Activate generation of documents in DOCX'.

2.3. Identify Solution packs used

Solutions packs are add-ins installing data or templates. There are imported in data repositories using the Administration Console, but they can update the system database.

Example: DoDAF, NAF ...

For each HOPEX environment, identify the list of solution packs imported:

- In the system database
- In a data repository

2.4. Management of login assignments

To enable login to HOPEX, a user must be mapped to a profile (directly or indirectly).

The management of login assignment has changed to favor better performances.

Version of HOPEX	Comment
HOPEX V1R1 HOPEX V1R2-V1R3	An option 'Management of assignment of business roles to persons' enables to switch between 2 modes <ul style="list-style-type: none">• Person assignment mode: a user (Person (System)) is mapped to one/several Business Roles within a data repository. Each Business Role is mapped to a Profile.• Profile mode: a user (Login) is mapped to one/several Profiles within an environment
HOPEX V2 HOPEX V2R1	A unique mode called Profile assignment mode is available: a Person (System) is mapped to one/several Profiles within an environment. The previous configurations are converted to the new mode for login. The option 'Management of assignment of business roles no longer exists.

Note that person assignment is also used to manage responsibility on object (ex: John Smith is 'Local Application owner' for the application 'Internal reporting'. This kind of assignment persists with HOPEX V2R1 as in HOPEX V1R2-V1R3.

2.5. Decide 'Definition of path of MetaAssociation'

This step requires a decision for each HOPEX environment.

In the HOPEX options, group 'Repository', an option 'Definition of path of MetaAssociation' is available at installation and environment level. This option enables to control the way MetaAssociation behaviors are interpreted according to the value chosen:

- Compatibility up to MEGA 2009: MetaAssociation behaviors are interpreted using the logic of MEGA 2009.
- From MEGA HOPEX 1.0: MetaAssociation behaviors are interpreted using a new logic.


Value	Recommended
Standard Mode	Recommended for new projects. Default value.
Compatibility Mode	Recommended for compatibility with behaviors and customizations performed in version MEGA 2009 and lower (data and system database customization). When switching to 'Standard mode', a review that may require time and expertise is necessary.

Note that 'Standard Mode' is the default value from HOPEX V1R2/V1R3. You can change the value and compile the environment without impact on data except namespace. However, the change will affect the behaviors (namespace, navigation, extraction, protection, export, comparison...).

2.6. Check license with your sales representative

The list of products/solutions changes with each version:

- Certain products/solutions are removed (not available).

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- Certain products/solutions are deprecated (available and supported as is).
- Certain products/solutions are repackaged (features still available through another product/solution)

This document will not describe the product lists or the changes between versions. Please contact your sales representative to see if a new license needs to be programmed.

2.7. Review use of the profile 'Enterprise Architect'

For many version, the profile 'Enterprise Architect' (ex-EA Standard) has been used for multiple purpose

- Use legacy products (MEGA Process BPMN edition, MEGA Architecture...)
- Perform customizations
- Use HOPEX Solutions

This profile is designed for use of legacy products.

- It is not designed for customization: use the profile 'HOPEX Customizer'.
- It is not designed for use HOPEX Solutions: use dedicated profiles and desktops.

From HOPEX V2R1, the profile 'Enterprise Architect' has a command line that filters HOPEX Studio and HOPEX Solution:

/RW'NAF;ARC;HBPA;DOD2;FEA;UML;ITD;ETOM;MPL;SOIA;TOG;SAP;MBS;DMO;ERML;CMDB'

If projects need a profile and desktops that combines legacy product and HOPEX solutions or that combines HOPEX Solutions, a specific study is required.

2.8. Review authentication mode

With HOPEX V2R1, a new authentication framework called UAS (Unified Authentication Service) is available.

Authentication configured with previous versions will run natively in most cases (see section 'Other checking indications' in this document). Anyway, it is recommended to consider the UAS framework capabilities:

- OpenID authentication (out of the box, configuration required).
- SAML2 authentication (out of the box, configuration required).
- Windows authentication (out of the box, configuration required).
- .NET project template provided to quickly develop a custom authentication provider (UAS custom provider).

For more details, see article 'HOPEX Unified Authentication Service Installation guide'.

2.9. Decide to keep web settings


Web settings are user related settings. They contain information that can be considered as useful, ex:

- List of tiles selected by user in web desktop
- List of dashboards (widgets) selected by user in web desktop

From HOPEX V2R1, web settings persist in different folder.

If you need to restore this information when migrating from HOPEX V1R3 or HOPEX V2 to HOPEX V2R1, archive (file copy) the file MegaSettings-*.ini on the server hosting the source installation (HOPEX V1R3 or HOPEX V2). With HOPEX V1R3 and HOPEX V2, such files are saved in the folder:

%windir%\SysWOW64\config\systemprofile\AppData\Roaming\Mega

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3. UPGRADE DATA FROM HOPEX V1R3 or HOPEX V2

For each HOPEX environment, several steps are required:

- Check data upgrade pre-requisites.
- Perform technical conversion of the system database for SQL Server or Oracle storage.
- Upgrade of **both the system database and data repositories** using an environment update wizard. It is no longer required to convert explicitly each data repository. Of course, if a data repository is referenced after environment upgrade, the environment update wizard needs to be run again so that it is converted.

The procedure varies with the type of storage:

- RDBMS (SQL server or Oracle).
- GBMS

Note that environment upgrade consists in running:

- **Technical conversions.** They update SQL tables and indexes to the expected format. They apply for each data repository and for the systemdb database in SQL Server or Oracle storage. They do not apply for GBMS storage.
- **System database upgrade.** It upgrades the metamodel and templates stored in the system database to the format expected for the target version. They apply whatever the storage format used (SQL Server, Oracle, GBMS).
- **Functional conversions.** They update the system objects stored in system database and the data objects stored in the data repositories to the expected format. They apply whatever the storage format used (SQL Server, Oracle, GBMS).

3.1. Check data upgrade pre-requisites

Before proceeding, check the following:

Check	Detail
Data is backed up	Check with the system administrator that all HOPEX environment have been backed up (physical backup). Archive key configuration file of IIS application related to HOPEX (file web.config) and HOPEX installation (Megasite.ini). Check that all customizations have been backed up (physical backup).
Password of the login 'System'	For each HOPEX environment, check that the password of the login 'System' is known or set to empty before migration. This is very important since it will be requested to login with 'System'.
All IIS web sites related to HOPEX are stopped	For the machine running HOPEX, Run 'Internet Information Services (IIS) Manager': Check that All IIS web sites related to HOPEX are stopped.
All Windows services related to HOPEX are disabled	For the machine running SSP, in Control Panel, Administrative Tools, Services: Check if that all services with name beginning with 'HOPEX' are set to 'Disabled'. Ex: HOPEX Site Service Provider HOPEX Service Watchdog
No processes related to HOPEX is running	For the machine running HOPEX, in Windows Task Manager: Check if a process mgw*.exe is running. If a process persists, end it.

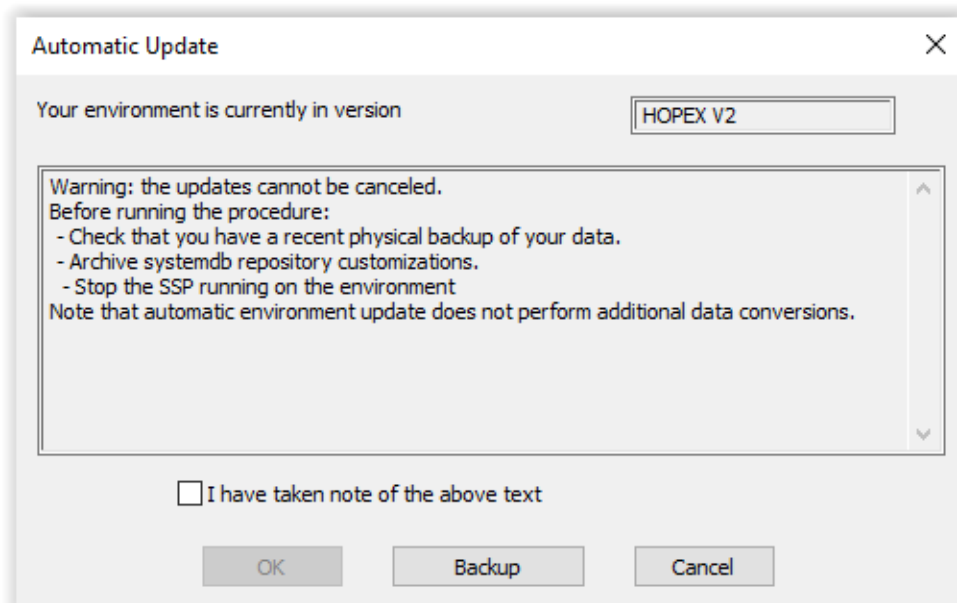
3.2. Upgrade environment with Oracle or SQL Server storage

In the procedure, various warning messages will be displayed. Most of them will be ignored.
If a message is displayed that is not quoted in the procedure, see the FAQs section of this document.

Procedure in version HOPEX V2R1:

1. Start the Windows Administration Console (Administration.exe).
2. Reference the environment to be converted.
3. Select the environment.
A warning is displayed: You cannot access repository "SystemDb". Its internal structure is not up to date. A technical conversion is necessary. Click "OK" to run it. Once updated, your repository will no more be accessible by older version of Mega.
 - Click **Cancel** to hide the warning and avoid conversion (it will be done later).
4. Select the environment and R click > **Perform SQL conversion on the repository**.
A window 'MEGA RDBMS Technical Conversion' is displayed.
 - Click **OK** to trigger technical conversion of the SystemDb repository.
 - Wait until the conversion is over. Duration can vary according to various parameters (source and target versions, size of system database, infrastructure performances). It can last from few minutes (average time) to one hour.
A line 'Technical conversion completed' is displayed'.
 - Click 'Close'.
5. Select and open the environment to be upgraded with the login **System**.
A warning can be displayed: Your environment and site are not of the same version. Your environment requires updating. Refer to documentation for how to carry out this action.
 - Click **OK** to hide the warning.
A warning can be displayed for each data repository: You cannot access repository "XXX". Its internal structure is not up to date...
 - Click 'OK' to hide the warning (it will be done later).
A Message is displayed: Your environment requires an update for compatibility with your version of HOPEX. Do you wish to run this procedure now?
 - Click **Yes** to trigger the environment upgrade.
A first wizard **Automatic Update** is displayed.

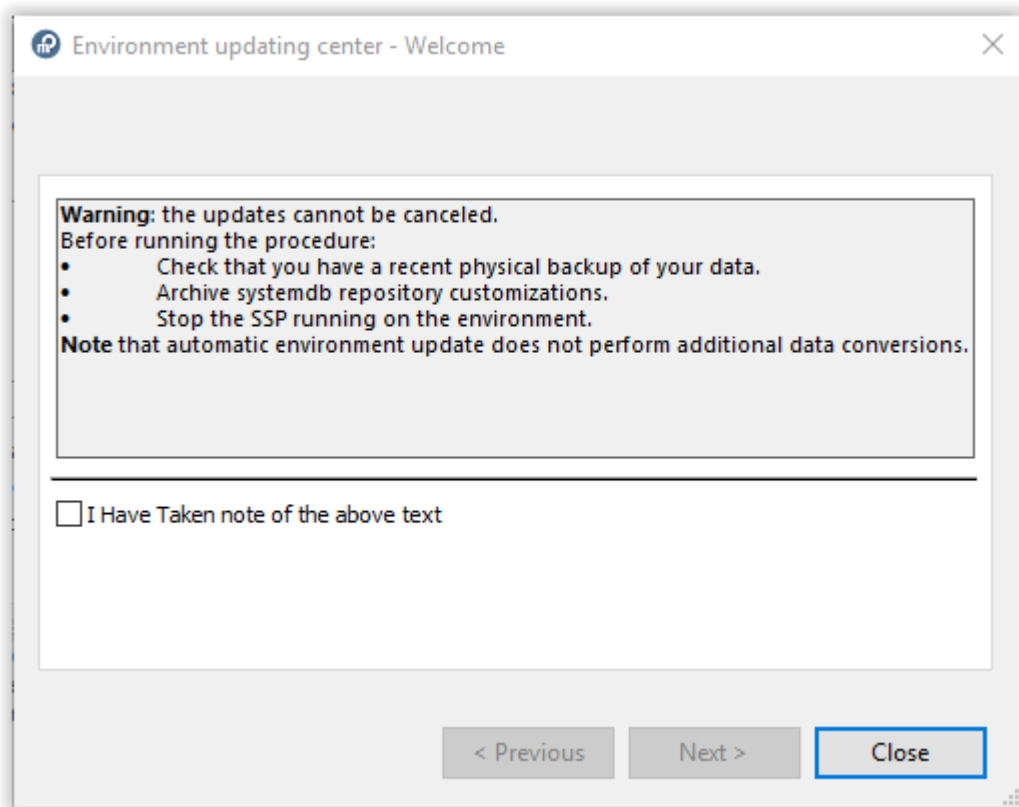
Example for a source environment in version HOPEX V2



- Verify that the major version identified for the environment is correct (HOPEX V1R3 or HOPEX V2), read the text, check the option **I have taken note of the above text** and click **OK**.

A first upgrade processing is run. Duration can vary according to various parameters (source and target versions, size of system database, infrastructure performances). It usually lasts more than 30 min.

Then, a second wizard **Environment updating center - Welcome** is displayed.



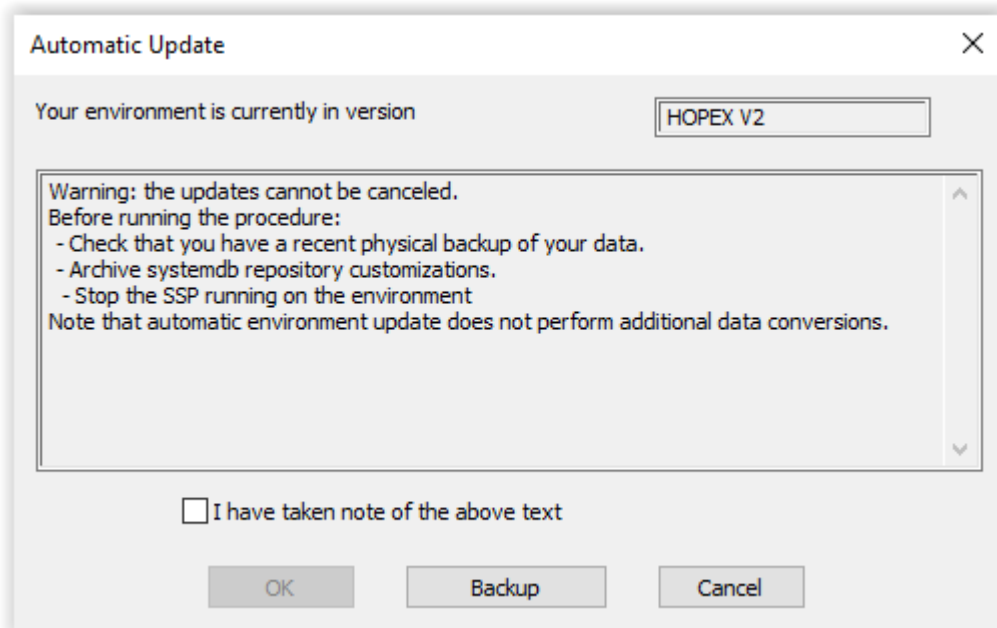
- Read the text, check the option **I have taken note of the above text** and click **Next**. A list of actions is displayed. It is recommended to keep them checked.
- Click **Run** to start the update. Duration can vary according to various parameters (source and target versions, infrastructure performances, size and number of repositories). It usually lasts about 20 min with one data repository. A list of reports is displayed (one tab for each action).
- Review reports and click **Close** to exit the wizard.
- Close the environment.
- Exit the Administration Console.

3.3. Upgrade environment with GBMS Storage

Procedure in version HOPEX V2R1:

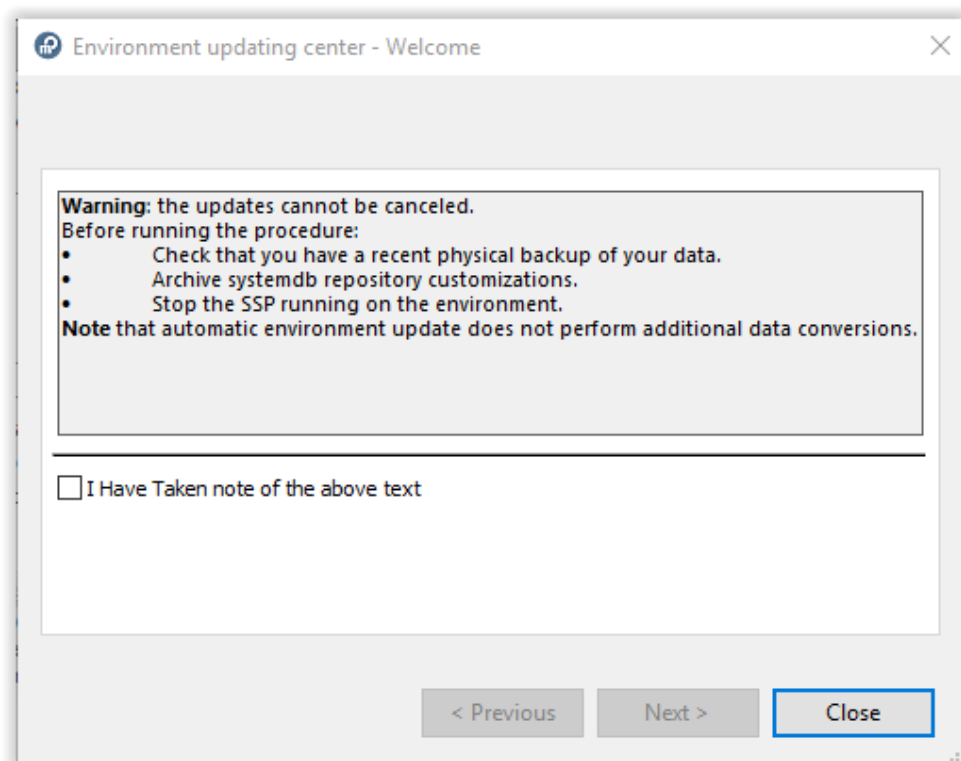
1. Start the Windows Administration Console (Administration.exe).
2. Reference the environment to be converted.
3. Select and open the environment to be upgraded with the login **System**.
A warning is displayed: Your environment and site are not of the same version. Your environment requires updating. Refer to documentation for how to carry out this action.
 - Click 'OK'
A Message is displayed: Your environment requires an update for compatibility with your version of HOPEX. Do you wish to run this procedure now?
 - Click 'Yes'.
A first wizard **Automatic Update** is displayed.

Example for a source environment in version HOPEX V2



- Verify that the major version identified for the environment is correct (HOPEX V1R3 or HOPEX V2), read the text, check the option **I have taken note of the above text** and click **OK**.
A first upgrade processing is run. Duration can vary according to various parameters (source and target versions, size of system database, infrastructure performances). It usually lasts more than 30 min.

Then, a second wizard **Environment updating center - Welcome** is displayed.



- Read the text, check the option **I have taken note of the above text** and click **Next**. A list of actions is displayed. It is recommended to keep them checked.
- Click **Run** to start the update. Duration can vary according to various parameters (source and target versions, infrastructure performances, size and number of repositories). It usually lasts about 20 min with one data repository. A list of reports is displayed (one tab for each action).
- Review reports and click **Close** to exit the wizard.
- Close the environment.
- Exit the Administration Console.

3.4. Update stored procedures with Oracle or SQL Server storage

This step is mandatory for each data repository or system database using RDBMS storage (Oracle, SQL Server). The code of existing stored procedures (created in a previous version) needs to be initialized with the HOPEX V2R1.

Pre-requisite:

- Permissions to delete and create stored procedures

Procedure:

1. Start the Windows Administration Console (Administration.exe).
2. Select and open the environment with the login **System**.
3. Select the folder 'Repositories' and R click > **Manage**.
A window 'Manage repositories' is displayed
 - In the 'Repository list', check all repositories including 'SystemDb'
 - In the 'Action list', check
 - **Remove private workspace temporary data**
 - **Shrink unused repository historical data**
 - Click 'Execute and wait until the conversion is over.'
 - Click 'Cancel' to exit the window 'Manage repositories'.
4. Close the environment.
5. Exit the Windows Administration Console.

Note that it is important that the execution of all stored procedures is scheduled (batch). Refer to the document 'RDBMS Repository Installation guide HOPEX V2R1' to get the complete list.

4. COMPLETE UPGRADE OF DATA

4.1. Re-import solutions packs

If you did not use solution packs, you can skip this section.

Otherwise, solutions packs (identified before migration) need to be imported again in HOPEX V2R1. Note that certain solution packs do not exist any longer:

Executable	Comment
Audit.exe	Solution Pack provided in HOPEX V1R2-V1R3 for HOPEX Internal Audit. Not used with HOPEX V2R1.
Compliance.exe	Solution Pack provided in HOPEX V1R2-V1R3 for HOPEX Regulatory Compliance. Not used with HOPEX V2R1.
ERM.exe	Solution Pack provided in HOPEX V1R2-V1R3 for HOPEX Enterprise Risk Management. Not used with HOPEX V2R1.
ICM.exe	Solution Pack provided in HOPEX V1R2-V1R3 for HOPEX Internal Control. Not used with HOPEX V2R1.
ITGRC.exe	Solution Pack provided in HOPEX V1R2-V1R3 for HOPEX IT Risk Management. Not used with HOPEX V2R1.
ITPM.exe	Solution Pack provided in HOPEX V1R2-V1R3 for HOPEX IT Portfolio Management. Not used with HOPEX V2R1.

For each HOPEX environment, re-install each solution pack using the standard procedure.

Pre-requisite:

For each solution pack

In the HOPEX installation:

- Browse the folder \Utilities\Solution Pack
- Uncompress the .exe related to the appropriate framework
ex: DoDAF.exe for Solution Pack 'DODAF'

Procedure:

In HOPEX installation:

- Start the Windows Administration Console (Administration.exe)
- Select and open the environment.
- Select the appropriate repository.
- R click > Object Management > Import Solution Pack
- For each solution pack
 - Select the appropriate framework and click 'OK'
wait until the process is completed
- Close the environment.
- Exit the Windows Administration Console.

4.2. Set a value for 'Definition of path of MetaAssociation'

Once a decision has been made (see section Decide 'Definition of path of MetaAssociation' sooner in the document), it must be implemented.

For each HOPEX environment:

1. Start the Windows Administration Console (Administration.exe).
2. Select and open the environment with the appropriate login (ex: system).
3. Select the environment
4. R click > **Options > Modify**
A list of options is displayed.
 - In the left tree, select the folder **Repository**
 - In the right pane, select a value for **Definition of path of MetaAssociation** according to the decision made.
5. Exit Administration Console

4.3. Review command line parameters

A property 'Command Line' is available at two levels:

- In properties of profile objects
- In properties of login objects (login objects are created when converting user objects)

If a string is set and contains codes that are not available for HOPEX V2R1 (ex: code 'PRO'), it will not be considered. No error should be displayed to screen but in the error logfile. It is therefore recommended to review command line parameters and remove codes that are not available for HOPEX V2.

Before removal	After removal
/RW'PRO,DMO'	/RW'DMO'

To identify the objects to be updated, you can run the following queries:

Object Type	Example of query for the code 'PRO'
Login	Select [Login] Where [Command Line] Like '#PRO#'
Profile	Select [Profile] Where [Command Line] Like '#PRO#'

You can get a list of codes not available for HOPEX V2R1 in MEGA Community, KB 00004513:

<http://community.mega.com/t5/custom/page/page-id/mega-kb-solution?sid=501D00000012hECIAY>

4.4. Check format of report templates (MS Word)

By default, with HOPEX V2R1,

- Standard report templates (MS Word) are installed in the format **RTF**.
- Generation mode is **RTF** (with conversion to DOCX).

According to your decision (see the section 'Decide format of report templates (MS Word)' sooner in this document), you need to do the following:

Decision	Custom report templates (MS Word)	Actions required
Keep format RTF	No	None
Keep format RTF	Yes	Convert custom report templates (MS Word) to format RTF.
Switch back to format MS word	-	Configure MS Word generation mode for each HOPEX environment.

Convert custom report templates (MS Word) to format RTF

Standard report templates (MS Word) are natively provided in the format RTF.

Custom report templates (MS Word) need to be converted if:

- Project decision is to keep format RTF
- They have not yet been converted to format RTF.

Pre-requisites:

Use a machine where

- HOPEX V2R1 is installed.
- MS Word is installed (version Office 2010/2013/2016, 32-bit version only).
- HOPEX environment to be converted are available (update file permissions).
- Verify that no process WINWORD.EXE is running.

Procedure:

For each HOPEX environment:

6. Start the Windows Administration Console (Administration.exe).
7. Select and open the environment with the appropriate login (ex: system).
8. In the folder 'Repositories', select 'Systemdb'.
9. R click > **Conversions > Utilities:**
A list of conversions is displayed.
10. Check '**MEGA Repository - Convert Report Templates (MS Word) to RTF format**'.
- Wait until the processing is finished.
11. Exit Administration Console

Result:

For the HOPEX environment

- Each report template (MS word) is saved in the RTF format in the system database.
- Each RTF style sheet used by a report template (MS Word) is duplicated and converted to the RTF format. The duplicate has the .RTF file extension and is saved in the folder 'Mega_usr' of the HOPEX environment.

It is recommended to verify in the error logfile (megaerrYYYYMMDD.txt) that each report template (MS word) has been converted without error.

Configure MS Word generation mode for each HOPEX environment

Procedure:

For each HOPEX environment:

- Manually edit the file Megaenv.ini with a text editor
- Check that the following lines are present
[Office]
DocumentFormat=20
- Save the file.

Result:

For each HOPEX environment configured, generation mode is MS Word (.doc extension).

4.5. Restore web settings

If you need to restore this information when migrating from HOPEX V1R3 or HOPEX V2 to HOPEX V2R1, restore (file copy) the file MegaSettings-*.ini on the server hosting the target installation (HOPEX V2R1). With HOPEX V2R1, such files are expected in the folder:
%ProgramData%\MEGA\HOPEX V2R1\ClusterRoot\UserSettings

5. CHECK UPGRADED DATA

It is highly recommended to back up each environment once it has been upgraded.

The standard installation and upgrading process takes care of all the conversions that can be automated. Technically speaking, conversion success is guaranteed by:

- The correct execution of the environment automatic upgrade processing.
If errors are met at this step, the migration process must be stopped so that a diagnosis is made. Check carefully the Mega error log.
- The correct execution of all mandatory conversions for the system database.
If errors are met at this step, the migration process must be stopped so that a diagnosis is made.
- The correct execution of all mandatory conversions for each data repository.
If errors are met at this step, the migration process must be stopped so that a diagnosis is made.

After complete execution of the migration process, it is highly recommended to check data and customizations through:

- First control of migration: run a quick tour to check that data looks correct.
- Check of data consistency: run utilities to enforce rules regarding data structure.
- Other checking indications.

5.1. First control of migration

It is highly recommended to run a quick tour and check that upgraded data looks correct. Of course, this kind of check cannot be exhaustive, but it usually enables to have a first feedback and quickly identify certain migration issues.

Example of scenario:

- Open a private workspace (ex-transaction).
- Browse through objects using query tools, navigation trees and diagrams.
- Perform insignificant updates (ex: change a character in a comment value, slightly move an object in a diagram...).
- Dispatch private workspace.

5.2. Check data modelling consistency

In previous versions, many things were tolerated, although not recommended. In order to ensure better consistency, there is a need for a thorough review of the repository content and, potentially, some cleaning and tidying tasks to perform. This should be considered as a separate project.

5.3. Other checking indications

If extensions were made to the metamodel, they must be reviewed regarding the structuring rules described above. A particular attention must be paid to the orientation of MetaAssociations as it governs the behaviors of the related objects.

If customizations have been made (property pages layer, diagram configuration layer, templates, programs based on script APIs...), a specific check is required based on initial customization specifications. As customizations are often based upon standard layers, they may not be ready to use and they may have a different look and feel. This check requires functional and platform development skills.

Topic	Comment
Creation tool	The implementation has changed (HOPEX V2R1). A tool converting custom creation tool to the new format is provided. It is mandatory to review declarative creation tools (MetaWizard, Category Specification/_Kindprovider) and coded tool (java..)
Person assignment	The implementation has changed (HOPEX V1R3). A tool converting user and assignments to the new format is provided. It is mandatory to review the user configuration (connection parameters, administrator privilege) unless a review was already performed in HOPEX V2. Note that with HOPEX, it is recommended to set options and command line at profile level.
Profiles	The features 'Metamodel access management' and 'Metamodel filter' (MEGA 2009 SP5) are replaced with a management of permission. A tool converting profiles to the new format is provided. It is mandatory to review the profile configuration unless a review was already performed in HOPEX V2. This review should be based on initial functional specifications. Note that profiles are renamed if the
Workflows	Configuration and implementation has evolved significantly between MEGA 2009 and HOPEX V2 and to a lesser extent between HOPEX V1R2-V1R3 and HOPEX V2. Tools converting definition of workflows to the new format is provided. It also converts data related to workflow. It is recommended to review the workflow configuration if workflows have been customized. This review should be based on based on initial functional specifications. Note that the change to profile assignment can impact customization performed in HOPEX V1R2-V1R3.
API script	The metamodel has changed. No tool can be provided for specific code. No detailed indication is provided. It is recommended to review the customized macros and applications using API script in particular for Administration APIs. This review should be based on initial functional specifications. Note that creation of threads in java code is not supported.
Authentication	A new authentication framework called UAS is available. It is compatible with basic authentication and its 3 implementations (MEGA, LDAP, Windows). Fully customized authentication provider can work provided custom code is installed and called by configuration. Windows authentication based on sample delegatedlogin_windows.aspx.cs is no longer supported. Standard UAS provider for Windows Authentication must be used. Login data need reprocessing. See KB 00007532 in MEGA Community.

The above list is not exhaustive.

6. APPENDIX

6.1. Conversion details

If mandatory conversions are not made on repositories, malfunction or loss of data can occur. Repositories need to be converted only once.

Select a repository, right-click 'Conversions > Convert data into current version' then select the source version 'From HOPEX V1R2 data' to display conversions.

Conversions	Scope	Mandatory if upgrade from HOPEX V1R3	Mandatory if upgrade from HOPEX V2
Mapping - Performances This tool deletes repository log related to mapping item. It also disables repository log for the MetaClass 'Mapping Item' This tool is implemented by a VB script macro ~ie(ICrKeJf1K[Mapping - Performances.Method])	Data	Yes KB 00004883	Yes KB 00004883
MEGA Repository - Add 'Substitutable' option to Report DataSet Properties Update existing Report DataSet objects to better control property display This tool is implemented by a macro (~kQoLRZ50Pb87[Mega Repository - Add 'Substitutable' option to Report DataSet Properties.Method]) and can be customized	Data	Yes KB 00007470	Yes KB 00007470
MEGA Repository - Alignment of Profile's name with Business Role's name This tools renames each profile according to the related Business Role (Ex: EA standard is renamed to Enterprise Architect). This tool is implemented in C++ and cannot be customized.	SystemD b	Yes KB 00006394	No
'MEGA Repository - Conversion of Assessment (Location of Assessment Deployment Query Parameter Value) Converts location of objects of MetaClass 'Assessment Deployment Query Parameter Value' from system to data It applies only if assessment templates have been customized This tool is implemented by a macro and can be customized	Data	No	If custom template KB 00007540
MEGA Repository - Conversion of Assessment Template Definition This tool converts the objects of the MetaClass Scoring Rule to the new format. This tool is implemented by a VB script macro ~dY(IkwG(ITj8[MEGA Repository - Conversion of Assessment Template Definition.Impl])	Data	Yes KB 00004592	No
MEGA Repository - Conversion of Assessment Template Location (Data to System) This utility converts Assessment Template to the new format. Location is transferred from data repository to system database	Data	Yes. KB 00006063	No

Conversions	Scope	Mandatory if upgrade from HOPEX V1R3	Mandatory if upgrade from HOPEX V2
Before HOPEX V2 Assessment templates are saved in data repository After HOPEX V2 Assessment templates are saved in systemdb This tool is implemented by a VB script macro ~0wxXvkv(M1YT[MEGA Repository - Conversion of Assessment Template Location (Data to System)])			
MEGA Repository - Conversion of assignments This tool creates a Profile Assignment for each Profile that were assigned to a user through a Business Role. It applies to environments using Business Role assignment in previous versions. This tool is implemented by a VB script macro ~h5mc1AgWM16T[AssignmentConvert.Method]	Data	Yes KB 00006314	No
MEGA Repository - Conversion of assignments (Profile mode) This tool creates a Profile Assignment for each Profile that were assigned to a user. If the access was implicit, an additional assignment is created for all repositories. The target environment must be in Profile mode (option Assignment of profiles (Management of assignment of business roles to person) checked). This tool is implemented by a VB script macro ~Drs0)XWiMbUP[MEGA Repository - Conversion of assignments (Profile mode).Method]	SystemD b	Yes KB 00006315	No
MEGA Repository - Conversion of Business Documents or System Business Document This tool converts Business Document and System Business Document to the new format. Storage changes from disk (.DAT files) to database instance This tool is implemented in C++ and cannot be customized	Data SystemD b	Yes KB 00006228	No
MEGA Repository - Conversion of Deprecated MetaAssociation instances to Generic MetaAssociation instances This tool updates the metamodel to enable a generic management of certain MetaAssociations (Note, Document, ...). This tool is implemented in C++ and cannot be customized	Data SystemD b	Yes KB 00006311	Yes KB 00006311
MEGA Repository - Conversion of Deprecated MetaAssociationType to Operator This tool recovers behaviors associated with deprecated MetaAssociation Types The tool is implemented by a macro ~W1X0aNWdMPs2[convert_deprecated_MetaAssociationType_to_Operator]	SystemD b	Yes KB 00006317	No
MEGA Repository - Conversion of diagram type (described element) This tool converts Diagram Types to the new format. The generic MetaClass Described Element (or System Described Element) is used to handle the described object. This tool is implemented by a VB script macro ~piLGI9rCNfnJ[_MEGA Repository - Conversion of diagram type (described element)]	SystemD b	Yes KB 00006316	No
MEGA Repository - Conversion of ITPM Assessment Updates storage of application assessment to avoid useless computation.	Data	Yes KB 00007460	Yes KB 00007460

Conversions	Scope	Mandatory if upgrade from HOPEX V1R3	Mandatory if upgrade from HOPEX V2
This tool is implemented by a macro (~YfgIXwaKPHD0[MEGA Repository - Conversion of ITPM Assessment]) and can be customized			
MEGA Repository - Conversion of ITPM Initiatives to PPM Projects Converts the former ITPM transformation portfolio initiatives into new PPM project portfolio lines. This tool is implemented by a macro (~qrr9qL35P5NQ[MEGA Repository - Conversion of ITPM Initiatives to PPM Projects.Macro]) and can be customized	Data	Yes KB 00007464	Yes KB 00007464
MEGA Repository - Conversion of Mapping links Converts possible customization of mapping to the new format. This tool is implemented by a macro (~H8rvwXEWOTqL[_MEGA Repository - Conversion of Mapping links.Method]) and can be customized	SystemDb	Yes KB 00007280	Yes KB 00007280
MEGA Repository - Conversion of name properties This tool aligns object names with metamodel definition Conversion may take a significant time depending on the volume of data. This tool is implemented in C++ and cannot be customized.	Data SystemDb	Yes KB 00001289	Yes KB 00001289
MEGA Repository - Conversion of Notification <Notification From> MetaAttribute Converts notification objects to the new format. This tool is implemented by a macro (~qtTiDHWSPLJ5[MEGA Repository - Conversion of Notification <Notification From> MetaAttribute.Method]) and can be customized	Data	Yes KB 00007474	Yes KB 00007474
MEGA Repository - Conversion of old MetaAssociation into deprecated MetaAssociation This tool tags old MetaAssociations as deprecated. This tool is implemented by an external script 'convert_deprecated_metaassociation.vbs'	SystemDb	Yes KB 00004238	Yes KB 00004238
MEGA Repository - Conversion of Posts to Review Notes Converts posts (MetaClass Post, removed) to review notes. Attention: new objects are created every time the conversion it run This tool is implemented by a macro (~2b5nOh0pOrW4[Collaboration - Post Conversion]) and can be customized	Data	Yes KB 00007468	Yes KB 00007468
MEGA Repository - Conversion of Restricted MetaAssociation into Abstract MetaAssociation Converts restrictive MetaAssociation to the new format When specific MetaAssociations were made restrictive, parent MetaAssociations will be declared Abstract.	SystemDb	Yes KB 00007462	Yes KB 00007462
MEGA Repository - Conversion of Restrictive MetaAssociation instances to Concrete MetaAssociation instances This tool updates the metamodel to move down restricted MetaAssociation instances storage on their concrete MetaAssociation. This tool is implemented in C++ and cannot be customized.	Data SystemDb	Yes KB 00006309	Yes KB 00006309

Conversions	Scope	Mandatory if upgrade from HOPEX V1R3	Mandatory if upgrade from HOPEX V2
MEGA Repository - Conversion of tree folder menu This tool recovers menu items 'New' and/or 'Connect' on folders in tree This tool is implemented by a VB script macro ~{2H4f8nGNTOG[Convert_treefolder_menuitems]}	SystemDb	Yes KB 00006330	No
MEGA Repository - Conversion of Where Used Queries This tool converts the format of a configuration regarding Diagrams containing object. From HOPEX V1R2 CP1.0, queries are connected directly to the MetaClass. This tool is implemented by a macro calling a VBS script file (convert_where_used_queries.vbs).	SystemDb	No KB 00004829	No
MEGA Repository - Conversion of Working Environment Template Group with desktops It is no longer possible to connect Desktop to a Working Environment Group Template This conversion converts to the new format Working Environment Group Template This tool is implemented by a VB script macro (Macro ~{x2CwVr}YQDwB[ConvertWETGroupDesktopToCommands.Method]) and can be customized	SystemDb	No	Yes KB
MEGA Repository - Conversion of Working Environment Template Profile Assignments This conversion enables to convert Desktop objects into desktop manager for each concerned Working Environment Template Profile Assignment. This enables to load the appropriate Desktop for client device. This tool is implemented by a VB script macro (~{53bgJIhXQH88[MEGA Repository - Conversion of Working Environment Template Profile Assignments.Method]}) and can be customized	SystemDb	No	Optional To run HOPEX Explorer (V2) on a tablet device KB 00007744
MEGA Repository - Conversion of Working Environment Templates This conversion enables to define several Working Environment template with different desktops. This tool is implemented by a macro (~{24cD8qJKP5qE[MEGA Repository - Conversion of Working Environment Templates.Method]}) and can be customized	SystemDb	Yes KB 00007475	Yes KB 00007475
MEGA Repository - Convert Property Page Link/Tree to PropertyPageExtension This utility converts property page implementation from _PropertyPageLink to _PropertyPageExtension. It is recommended to run this utility to benefit from new customization capabilities This tool is implemented by a VB script macro ~{zTupdajIIRbB[MEGA Repository - Convert Property Page Link/Tree to PropertyPageExtension]}	SystemDb	Yes KB 00004586	No
MEGA Repository - Repair Building Block Containment Creates connections between building block (ex: library) and building block annotation (ex: report) for compliance with EA grid This tool is implemented by a VB script macro (~{JkZBYfprP9EV[MEGA Repository - Repair Building Block Containment]}) a macro and can be customized	Data	Yes KB 00007484	Yes KB 00007484

Conversions	Scope	Mandatory if upgrade from HOPEX V1R3	Mandatory if upgrade from HOPEX V2
MEGA Repository - Update initial foundation : 'MEGA Library' Imports mandatory data to the data repository This conversion is coded in C++ and can not be customized by a script (convert_update_initial_foundation.vbs) and can be customized	Data	Yes 00003025	Yes KB 00003025
MEGA Repository - Update Setting for Building Block Role extension metaclasses Updates custom creation tools. This tool is implemented by a VB script macro by a macro (MEGA Repository - Update Setting for Building Block Role extension metaclasses.Method) and can be customized	SystemD db	Yes. KB 00007483	Yes. KB 00007483
MEGA Teamwork - Conversion of workflow instance This tool changes the location of workflow instance from system database to data repository. This tool is implemented by a VB script macro (~5m5fIWg5KPfB[Mega TeamWork - Conversion of Workflow Instance System.Method]) and can be customized	Data	Yes KB 00005096	No

6.2. Utilities details

Utility	Scope	Comment
Diagram (drawings) This tool opens, saves and closes all diagrams in the repository. Enables conversion of diagrams with drawings in MGE format. Also enables to check the status all diagrams in a repository. This execution is optional for the system database and data repositories. Conversion may take a significant time depending on the volume of data. This tool is implemented in C++ and cannot be customized.	Data SystemDb	Optional KB 00001270
HITA - Convert Software Technology Fulfillments to Technical Capabilities This conversion convertst the Business Capability Fulfillment or Functionality that could exist between Software technology objects and Business Capability objects to the new format. This tool is implemented by a macro (~10v92q21QHtG[HITA - Convert Software Technology Fulfillments to Technical Capabilities]) and can be customized	Data	Optional KB 00007770
HOPEX ITPM -Conversion of Standards This tool converts certain objects of the Metaclass 'Standard' to objects of the MetaClass 'Technology'. Selection is made using the query '~5yCf7ugkIr9D[APM - Conversion - Get Standards Linked to Vendors Or Application Deployed]' This tool is implemented by a VB script macro ~2yCfd0hkITND[APM - Conversion of Standards]	Data	Optional KB 00004589
MEGA Repository - Business Function to Business Functional Area Converts a Business Functions Hierarchy from Process or BPA solution to Business Architecture's Business Functional Area composite structure models. Useful to migrate data created with MEGA Process (code PRO) and/or MEGA Process BPMN Edition (code PMN) to the solution Business Architecture (code HBAS) This tool is implemented by a macro (~18VF)i4hNfI[MEGA Repository - City planning areas to Business Capabilities.Method]) and can be customized	Data	Optional KB 00007465
MEGA Repository - City planning areas to Business Capabilities Convert City Plans to Business Capability Maps and City Plan Areas to Business Capability objects. Useful to migrate data for the solution IT Portfolio Management (Code APM). This tool is implemented by a macro (~18VF)i4hNfI[MEGA Repository - City planning areas to Business Capabilities.Method]) and can be customized	Data	KB 00007191 Optional
MEGA Repository - Cleanup This tool removes technical temporary data left invalid in repositories after upgrade (ex: recent queries). This tool is implemented by a VB script macro ~W7qD9X3HCT50[MEGA Repository - Cleanup.Method]	Data	Optional KB 00003321
MEGA Repository - Conversion of EA Projects to PPM projects Converts EA Project (former MetaClass Project renamed to EA Project) to PPM project (new MetaClass Project) and Project scope to Project Deliverables, when applicable Useful with option Product Portfolio Management (code PPM) and a compatible solution (ex IT Portfolio Management...) This tool is implemented by a macro (~6qr9AW25PntP[Mega Repository - Conversion of EA Project.Method]) and can be customized	Data	Optional KB 00007466
MEGA Repository - Conversion of ITPM Applications Exchanges (ARC -> HITA)	Data	Optional KB 00007461

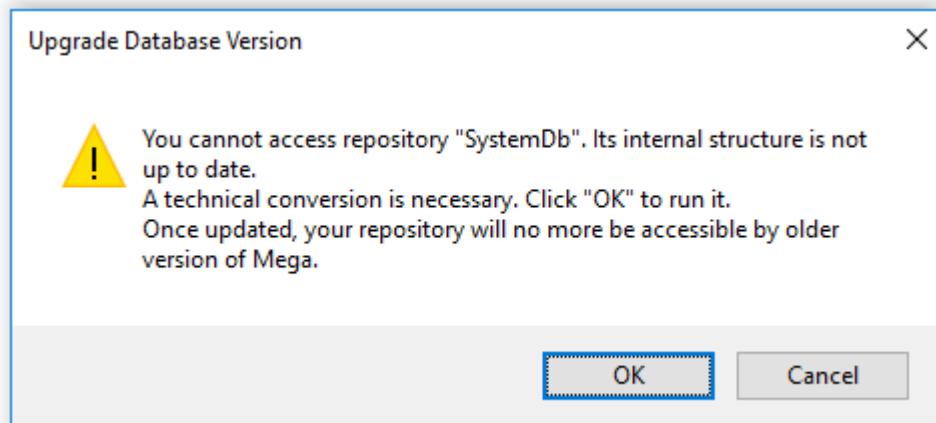
Utility	Scope	Comment
<p>Converts the description of application exchanges (based on message flows) to the new format used with IT Architecture (code HITA)</p> <p>Useful with solution IT Portfolio Management (Code APM) and new solution IT Architecture (code HITA)</p> <p>This tool is implemented by a macro (~ougT5TtIP1eB[HOPEX ITPM - Conversion of Applications Exchanges (ARC -> HITA)]) and can be customized</p>		
<p>MEGA Repository - Conversion of name properties (long name)</p> <p>This tool aligns object names with metamodel definition (long name) for certain MetaClasses.</p> <p>Conversion may take a significant time depending on the volume of data. This tool is implemented in C++ and cannot be customized.</p>	Data	Optional KB 00001892
<p>MEGA Repository - Conversion of Notes to Review Notes</p> <p>Creates review notes from notes</p> <p>This tool is implemented by a macro (~sa5nwd0pO5U4[Collaboration - Note Conversion]) and can be customized</p>	Data	Optional KB 00007469
<p>MEGA Repository - Conversion of Organizational Charts</p> <p>This utility converts the nature of Organizational Chart diagrams so that they can be open with MEGA Process BPMN Edition.</p> <p>This tool is implemented by a VB script macro ~YgaCFMJSGPv2[Organisational Chart Conversion] and can be customized</p>	Data	Optional KB 00003984
<p>MEGA Repository - Conversion of Specific Name of Dictionary Object to Term</p> <p>This conversion updates objects based on terms to the new format in case name has been customized</p> <p>This tool is implemented by a VB script macro (~ltqQKs6TQLoG[Mega Repository - Conversion of Specific Name of Dictionary Object to Term.Implementation]) and can be customized</p>	Data	Optional KB 00007723
<p>MEGA Repository - Conversion of widgets</p> <p>Converts dashboard widgets to a new format (independant from container of web desktop)</p> <p>To keep widgets used in previous versions, a prerequisite to this conversion is to restore web settings.</p> <p>This tool is implemented by a VB script macro ~DcdsKyj4QDAE[WidgetConversion.Method] and can be customized</p>	SystemDb	Optional KB 00007569
<p>MEGA Repository - Convert participants of projects</p> <p>This tools converts participants of projects to the new format</p> <p>This tool is implemented by a VB script macro ~MKy3t2XCnf7U[Convert participants of projects.Method]</p>	Data	Optional KB 00006308
<p>MEGA Repository - Convert Report templates (MS Word) to RTF Format</p> <p>This tool converts Report templates (MS Word) from Word to RTF format. This is required to generate documents with HOPEX Web Front-end.</p> <p>This tool is implemented in C++ and cannot be customized.</p> <p>Note that MS Word is required on the machine running the conversion.</p>	SystemDb	Optional Recommended If custom template and decision to user format RTF. KB 00003499
<p>MEGA Repository - Creation of links instances from MEGA fields</p> <p>This tool creates impact analysis links for objects referenced by object references (MEGA fields) in texts properties.</p> <p>Conversion may take a significant time depending on the volume of data. This tool is implemented in C++ and cannot be customized.</p>	Data SystemDb	Optional KB 00002005
<p>MEGA Repository - Objectives -> Enterprise Objective Conversion</p> <p>Creates Enterprise Objective from Objectives</p> <p>Useful to migrate data from Business Strategy (code MBS) to Business Architecture (Code HBAS)</p>	Data	Optional KB 00007463

Utility	Scope	Comment
This tool is implemented by a macro (~ueHLXNrMP1sV[Objectives -> Enterprise Objective Conversion.Method]) and can be customized		
Shapes This tool updates customized shapes to the most recent format. Shapes located in the folder 'Mega_usr' or both installation and HOPEX environment are upgraded. This conversion is optional for the System repositories. This tool is implemented in C++ and cannot be customized.	SystemDb	Optional KB 00000362

7. FAQs

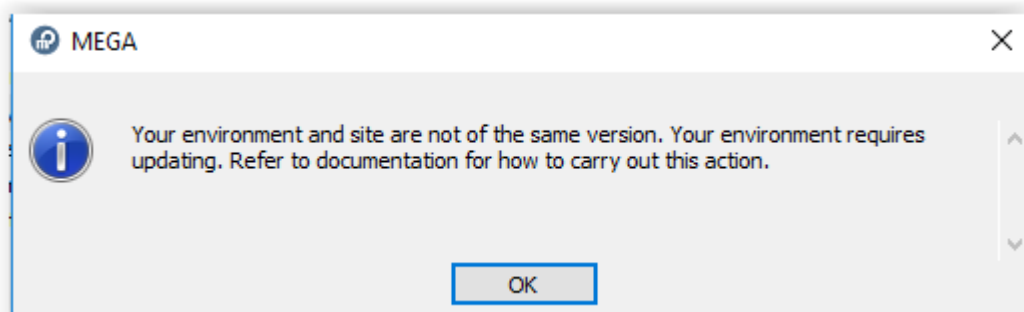
7.1.1. Warning 'You cannot access repository "XXX". Its internal structure is not up to date...'

With specific version upgrades, the technical format of the repository can change. As explained, you need to run a menu (Perform SQL conversion on the repository) from the Administration Console. See earlier in this document.

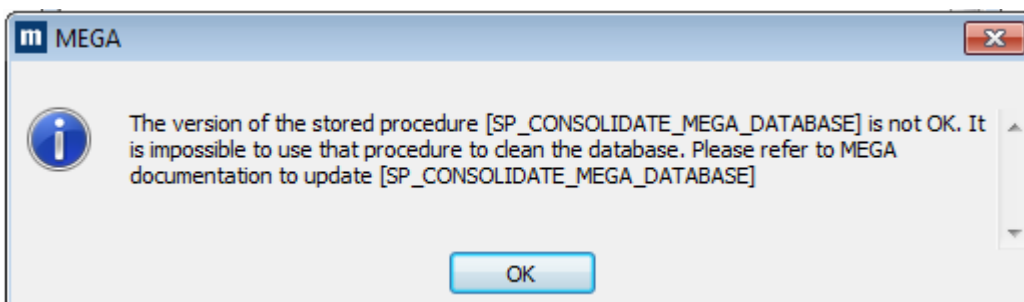


7.1.2. Warning 'Your environment and site are not of the same version. Your environment requires updating...'

This warning report that the system database is not up to date. This occurs if the programs have been updated and the environment has not/not yet been updated.



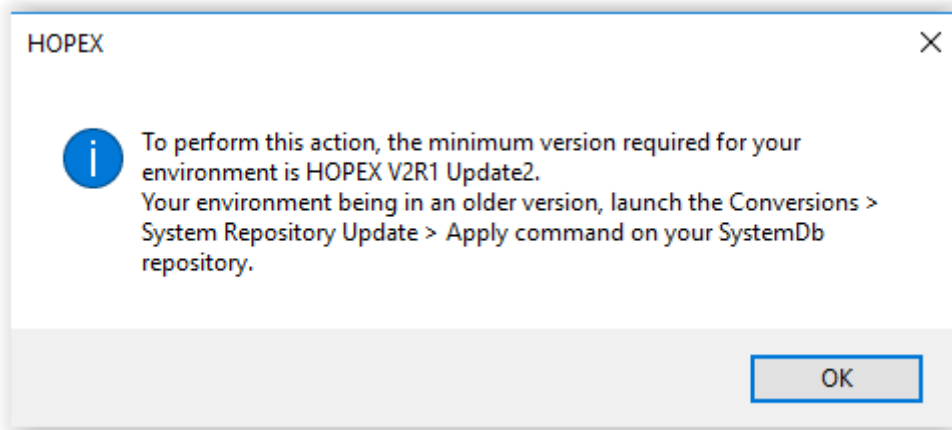
7.1.3. Warning 'The version of the stored procedure XX is not OK...'



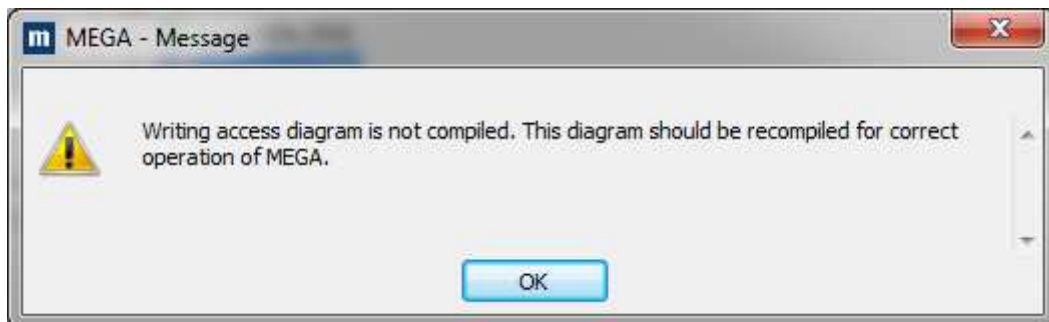
With specific version upgrades, the technical format of the repository can change, and stored procedures need to be reinitialized. See the section 'Update stored procedures' earlier in this document.

7.1.4. Warning 'To perform this action, the minimum version required for your environment is HOPEX V2R1 Update2...'

This warning explain that the menu item **Environment automatic update** cannot be run given the version of the environment. Instead, select SystemDb and R click on **Conversions > System Repository Update > Apply**.



7.1.5. Warning 'Writing access diagram is not compiled...'



Certain actions can leave the writing access diagram (ex-User diagram/Authorization diagram) is in a state not compiled.

To compile the metamodel of the environment:

1. Start the Windows Administration Console (Administration.exe).
2. Select and open the environment to be converted with the login **System**.
3. Select the folder 'User management'
4. R click > Compile writing access diagram
5. Click Start to trigger the compilation
Wait until the processing is complete.
6. Click 'Close'
7. Exit the Windows Administration Console

7.1.6. How to run a specific conversion or utility?

It is now recommended to use the update wizard instead of triggering explicitly conversions.

Before proceeding, you can consult the table 'Conversion details' in this document to understand if conversions are relevant in your context. This can be useful to save time for large repositories. Otherwise, it is recommended to keep conversions checked by default.

Procedure:

1. Start the Windows Administration Console (Administration.exe).
2. Select and open the environment to be converted with the login **System**.
In the folder 'Repositories', select '**SystemDb**'
 - R click > **Conversions > Convert data into current version** and **select From HOPEX V1R3 data or from HOPEX V2 data** according to the source version.
 - Check the appropriate conversions.
See the table 'Conversion details', later in this document
 - Click 'OK' to trigger the conversion
Wait until the conversion is complete
 - Close the environment
3. Select and open the environment to be converted with the login **System**
In the folder 'Repositories', **select a data repository**
 - R click > **Conversions > Convert data into current version** and **select From HOPEX V1R3 data or from HOPEX V2 data** according to the source version.
 - Check the appropriate conversions.
See the table 'Conversion details', later in this document.
 - In the right bottom, check '**Apply to all repositories of the environment**'.
The selected conversions will be applied to all data repositories.
 - Click 'OK' to trigger the conversion.
Wait until the conversion is complete.
 - Close the environment.
4. Exit the Windows Administration Console.

How to Install Update HOPEX V2R1 U3

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Summary

This document describes the procedures necessary to install updates starting from **HOPEX V2R1 Update 3**. It applies to Update 3 except for solution HOPEX GDPR: see document 'How to install update HOPEX V2R1 Update 3 GDPR EN'.

It does not apply when installing Update 1 or Update 2.

An update is a specific update package providing fixes and improvements.

It applies to all front-ends:

- Web front-end
- Windows Front-end

It does not describe:

- System requirements and possible architectures (see architecture overview documentation).
- How to install a product release (see installation documentation).
- How to manage installations (see administrator manuals).
- How products are licensed (see licensing documentation).
- How to use features (see user manuals).

Note that from HOPEX V2R1 Update 2, the component **Microsoft URL Rewrite Module 2.0** is required.

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1. FOREWORD

1.1. What is an update?

An Update provides a consistent set of fixes and evolutions on existing functionalities, and/or new functionalities.

Its purpose is to deliver corrections, evolutions and/or new functionalities, in-between Versions.

An Update is specific to a Version

In concrete terms, an update (U) installation program is an .EXE file.

Example: HOPEX_V2R1_U03.0.exe

The .EXE files provided for HOPEX Software do not allow skipping update levels. For each upgrade level, the installation of an .EXE file is necessary.

For example, to upgrade from HOPEX V2R1 Update 1 to HOPEX V2R1 Update 3:

- Install an EXE file #1 to upgrade from HOPEX V2R1 Update 1 to HOPEX V2R1 Update 2.
- Install an EXE file #2 to upgrade from HOPEX V2R1 Update 2 HOPEX V2R1 Update 3.
- Run the 'Environment Automatic Update' feature.

As a consequence, verify the expected update level is required before installing an update.

Before proceeding, make sure that, for all the HOPEX environments to upgrade:

- Data is backed up (physical backup).
 - The password of the login **System** is known.
- This is very important since it will be requested to login with the login System.**

2. UPGRADING HOPEX PROGRAMS

Note that from HOPEX V2R1 Update 2, the component **Microsoft URL Rewrite Module 2.0** is required. You need to

- Download it from Microsoft web site.
Ex: <https://www.microsoft.com/en-us/download/details.aspx?id=47337>
- Install it manually on each target machine.

The update installation program is an .EXE file.

For example: HOPEX_V2R1_U01.0.exe

The procedure varies with the front-ends that you may use:

- Web Front-end: an IIS web server is used, a specific SSP service (1) is used
- Windows Front-end: no web server is used; no service is used.

As a consequence, it is very important that you identify the front-ends deployed and the target machines.

Front-end	Deployment	Target machine
Web Front-end	Web standalone deployment	Unique Server where HOPEX programs are installed
Web Front-end	Web cluster deployment	Each application server of the cluster where HOPEX programs are installed <ul style="list-style-type: none"> HOPEX Front-end HOPEX Back-end SSP
Windows Front-end	Windows standard deployment	Each workstation where HOPEX programs are installed
Windows Front-end	Windows Citrix/Terminal Server deployment	Each Citrix/TSE application server where HOPEX programs are installed

Deployment	Machine	Windows Service	IIS Web site (1)	HOPEX processes
Web standalone deployment	Unique server	Yes	Yes	Yes
Web cluster deployment	Server running SSP	Yes		Yes
Web cluster deployment	Server running HOPEX Back-end Server running HOPEX Front-end	Yes		Yes
Windows Citrix/Terminal Server deployment	Each workstation	No		Yes
Windows standard deployment	Each Citrix/TSE application server	No		Yes

(1) By default, an application 'HOPEX' is configured for 'Default Web Site'.

2.1. Upgrading Web Front-end

Pre-install:

1. Identify the target machine(s).
The machine varies with the chosen deployment: see above table.
2. Archive key configuration file of IIS application (web.config file) and HOPEX installation (Megasite.ini).
3. Login in as administrator of the machine.
4. Verify 'Control Panel > Administrative tools > Services'.
The service **HOPEX Site Service Provider** must be set to 'Stopped'.
The service **HOPEX Service Watchdog** must be set to 'Stopped'.
5. Verify 'Internet Information Services (IIS) Manager'.
The web site hosting the IIS applications (by default it is 'Default Web Site') must be stopped.
6. Verify the Task Manager.
No HOPEX process (mgw*.exe or HOPEX*.exe) must be running.
7. Check that **Microsoft URL Rewrite Module 2.0** is installed
You can download it from Microsoft web sites.
8. Verify 'Control Panel > Add or Remove programs'.
The required update level must be installed.
Ex: HOPEX V2R1 U01 (HOPEX V2R1 Update 1) is a requirement before installing HOPEX V2R1 U02 (HOPEX V2R1 Update 2).

Note: you can also use the utility Hopex Server Supervisor and R click > HOPEX > Stop HOPEX Processes Services and Web Application.

Procedure:

For each machine:

1. Select the .EXE file of the update.
Example: Select HOPEX_V2R1_U02.0.exe
2. R click > **Run as administrator**
The wizard can take more than 1 min to load.
3. Click **Update >**.
The installation process can take a minute to initialize.
Wait until the processing is complete.
4. Click **Finish**.

Post-install:

- Verify 'Control Panel > Administrative tools > Services'.
The service **HOPEX Site Service Provider** must be set back to 'Automatic (Delayed Start)' and be started.
The service **HOPEX Service Watchdog** must be set back to 'Automatic (Delayed Start)' and be started.
- Verify 'Internet Information Services (IIS) Manager'.
The web site hosting the IIS applications (by default it is 'Default Web Site') must be started.

Notes:

- You can also use the utility Hopex Server Supervisor and R click > HOPEX > Restart HOPEX Processes Services and Web Application to restart installation.
- The location of the installation folder can be found after a search is conducted in the machine registry. This location is not visible on the machine during installation or in the control panel.

- If the expected update level is not identified for the HOPEX programs registered on the machine, an error is displayed.

2.2. Upgrading Windows Front-end

Pre-install:

1. Identify the target machine(s).
The machine varies with the chosen deployment: see above table.
2. Archive key configuration file of IIS application (file web.config) and HOPEX installation (Megasite.ini).
3. Login in as administrator of the machine.
4. Verify the Task Manager.
No HOPEX process (mgwmapp.exe or HOPEX*.exe) must be running.
5. Verify 'Control Panel > Add or Remove programs'.
The required update level must be installed.
For example, HOPEX V2R1 U07.0 is a requirement before installing HOPEX V2R1 U08.0.

Procedure:

For each machine:

1. Select the .EXE file of the update.
Example: Select HOPEX_V2R1_U01.0.exe
2. R click > **Run as administrator**
The wizard can take more than 1 min to load.
3. Click **Update >**.
The installation process can take a minute to initialize.
Wait until the processing is complete.
4. Click **Finish**.

3. UPGRADING HOPEX DATA

Most changes apply to HOPEX programs. However, some changes apply to the systemdb repository. It is therefore necessary to update all HOPEX environments to benefit from all the changes and fixes. The procedure varies with the storage.

3.1. Upgrade HOPEX environments

Pre-upgrade:

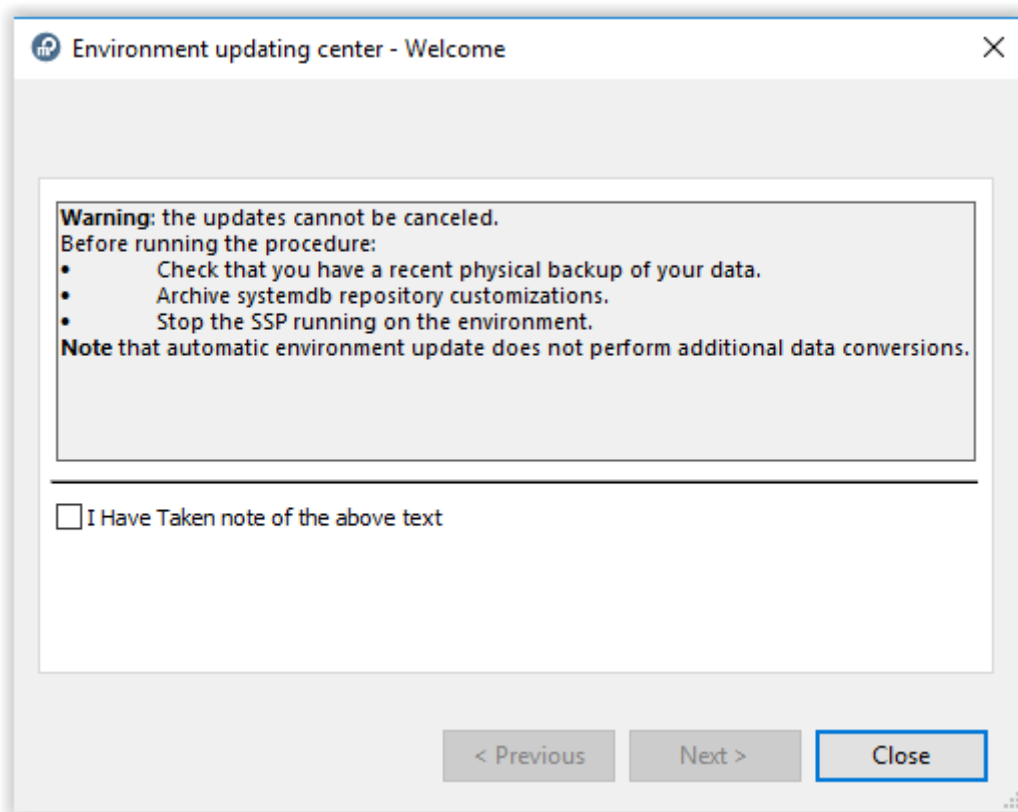
- Verify that no workspace (ex-transaction) exists.

3.1.1. Procedure (GBMS storage):

For each HOPEX environment:

1. Start the Administration Console (Administration.exe).
2. Select the environment to be upgraded.
3. R click > **Open**.
4. Login with the **System** identifier.
5. Select the environment.
6. R click > **Environment automatic update**.

A wizard 'Environment updating center - Welcome' is displayed.

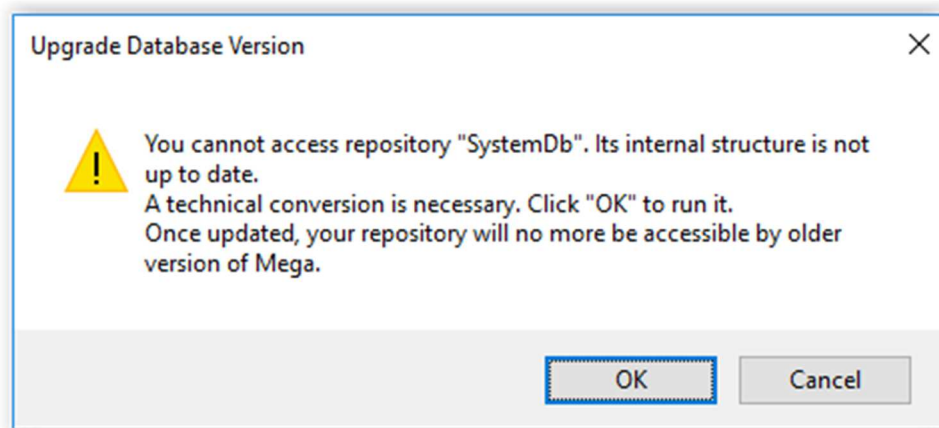


7. Read the information, check the option 'I have taken note of the above text' then click **Next**. A list of actions is displayed. It is recommended to keep them checked.
8. Click **Run** to start the update. Duration can vary according to various parameters (source and target versions, infrastructure performances, number of data repositories). It usually lasts about 15 min. A list of reports is displayed (one tab for each action).
9. Review reports and click **Close** to exit the wizard.
10. Close the environment.
11. Exit the Administration Console.

3.1.2. Procedure (RDBMS storage: Oracle, SQL Server):

With RDBMS storage, the technical format of system database and data repositories may change when installing update. In this case, a warning is displayed:

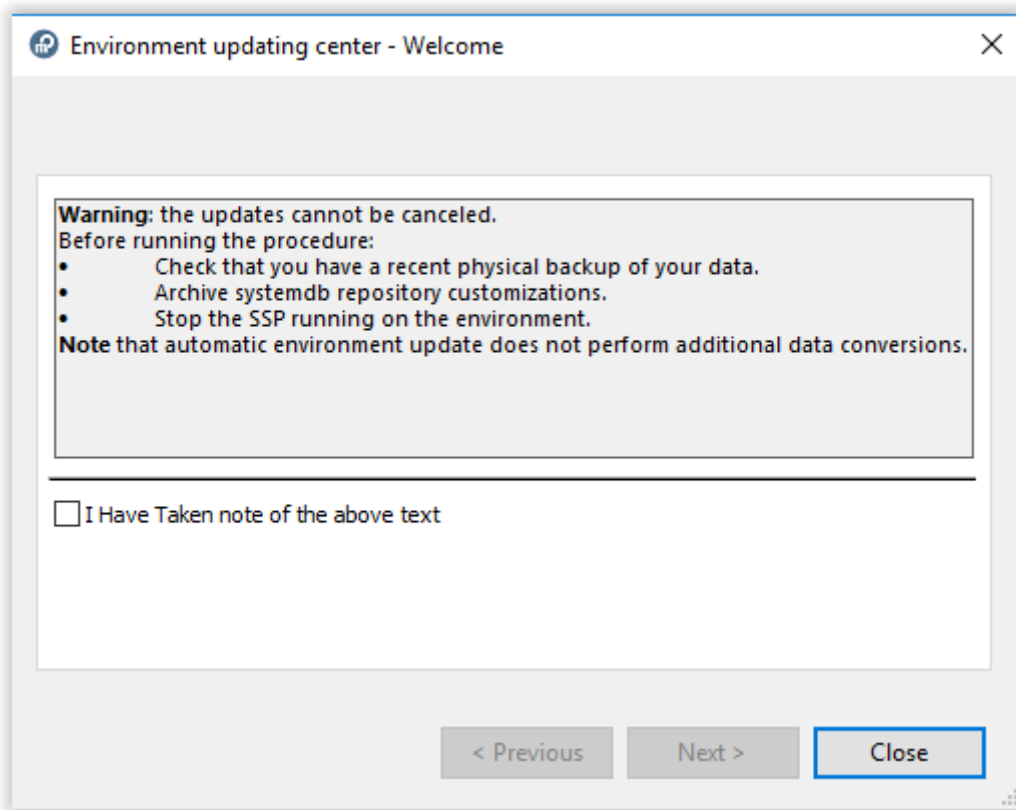
You cannot access repository XXX. Its internal structure is not up to date. ...



For each HOPEX environment:

1. Start the Administration Console (Administration.exe).
2. Select the environment to be upgraded.
3. R click > **Open**.
4. If a warning is displayed (You cannot access repository "SystemDb". Its internal structure is not up to date. ...):
 - o Select the environment in the administration tree.
 - o R click > **Perform SQL conversions on the repository**
A window 'MEGA RDBMS Technical Conversion' is displayed.
 - o Click 'OK'.
 - o Wait until the processing is complete (it takes few minutes) and click 'Close'.
 - o Select the environment to be upgraded.
 - o R click > Open.
5. Login with the **System** identifier.

6. If warnings are displayed (You cannot access repository "XXX". Its internal structure is not up to date...).
 - For each data repository (ex: ProductionData)
 - Select the data repository in the administration tree.
 - R click > RDBMS Administration > **Perform SQL conversions on the repository**.
A window 'MEGA RDBMS Technical Conversion' is displayed.
 - Click 'OK'.
 - Wait until the processing is complete (it usually takes a few minutes) and click 'Close'.
7. Select the environment
8. R click > **Environment automatic update**
A wizard 'Environment updating center - Welcome' is displayed



9. Read the information, check the option 'I have taken note of the above text' then click **Next**. A list of actions is displayed. It is recommended to keep them checked.
10. Click **Run** to start the update. Duration can vary according to various parameters (source and target versions, infrastructure performances, number of data repositories). It usually lasts about 15 min. A list of reports is displayed (one tab for each action).
11. Review reports and click **Close** to exit the wizard.
12. Close the environment.
13. Exit the Administration Console.

3.2. Check Upgraded Data

Exhaustive check of upgraded data is not possible.

The data conversion success is guaranteed by the correct environment upgrade processing.

If errors are encountered at this step, the migration process must be stopped so that a diagnosis is made.

After complete execution of the migration process, it is recommended to perform a manual check of migrated data.

Example of scenario:

1. Open a workspace.
2. Browse through objects using query tool, navigation tree and diagram.
3. Make small unimportant changes (e.g.: change a character in a comment value, slightly move an object in a diagram...)
4. Exit the workspace with save or dispatch.

4. APPENDIX

4.1. Advanced deployment

For advanced deployments (deployment automations tools...), it can be useful to get the update in the .MSP format. It is possible to extract an .MSP file from the .EXE file available for download in MEGA Community.

Note that with recent operating systems, it is required that the installation is performed not only by a user that belongs to the group of 'Administrators' but also that the installation program is executed with the privilege 'Run as administrator'.

As no command 'Run as administrator' is available on the .MSP file, a specific procedure is proposed below to install the update. Otherwise, the installation may not be fully upgraded and various problems can occur especially with HOPEX Web Front-end.

Procedure:

For each .EXE file:

1. Copy the .EXE file in a temporary folder
Example: copy HOPEX_V2R1_U01.0.exe in C:\tmp
2. In the Start-up menu of MS Windows, search 'Command prompt'.
3. Select 'Command prompt', R click > Run as administrator.
A command prompt is open with Run as administrator privilege.
4. Browse the temporary folder
5. Run a command /E to extract the .MSP file. Example:
"HOPEX_V2R1_U01.0.exe" /E
The .MSP file is uncompressed in the current folder.

4.2. Documentation of Changes

Several documents can be downloaded with the update.

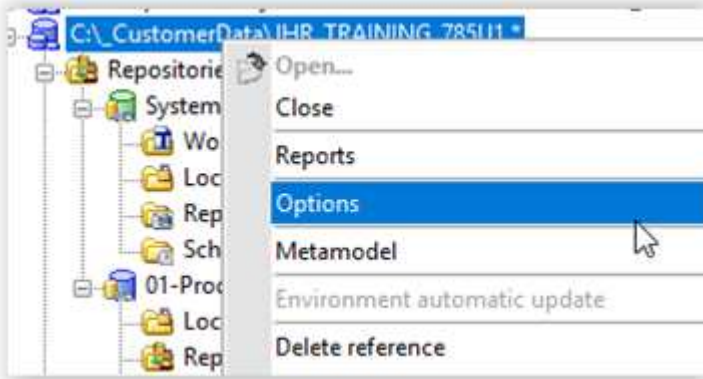
Document	Comment
Fix list document	It contains the list of elementary changes (mainly error corrections). This document is cumulative for the version. Ex: Fix list for HOPEX V2R1uX.0.htm
Update Changes document	It contains the description of functional improvements of the update This document is not cumulative and applies to the update only. Ex: HOPEX V2R1 – UX Changes.pdf
Known issues document	It contains list of elementary issues (identified and not fixed). This document is cumulative for the version. Ex: HOPEX V2R1 – UX Known Issues.pdf

The fix list is a table with the following columns:

Column	Definition	Example
Patch	Identifier of the update	7.85 u01.00
Product	HOPEX Product impacted	1 HOPEX BAV2
Subsystem	Subsystem impacted	Web Property Page
Support id	Reference to a support Case or a Solution (KB) identifier	
Id	Identifier of the fix	51248
Synopsis of the defects	Brief description of the error	Various errors regarding property pages
Front-End	Front-End impacted	Web Front-End

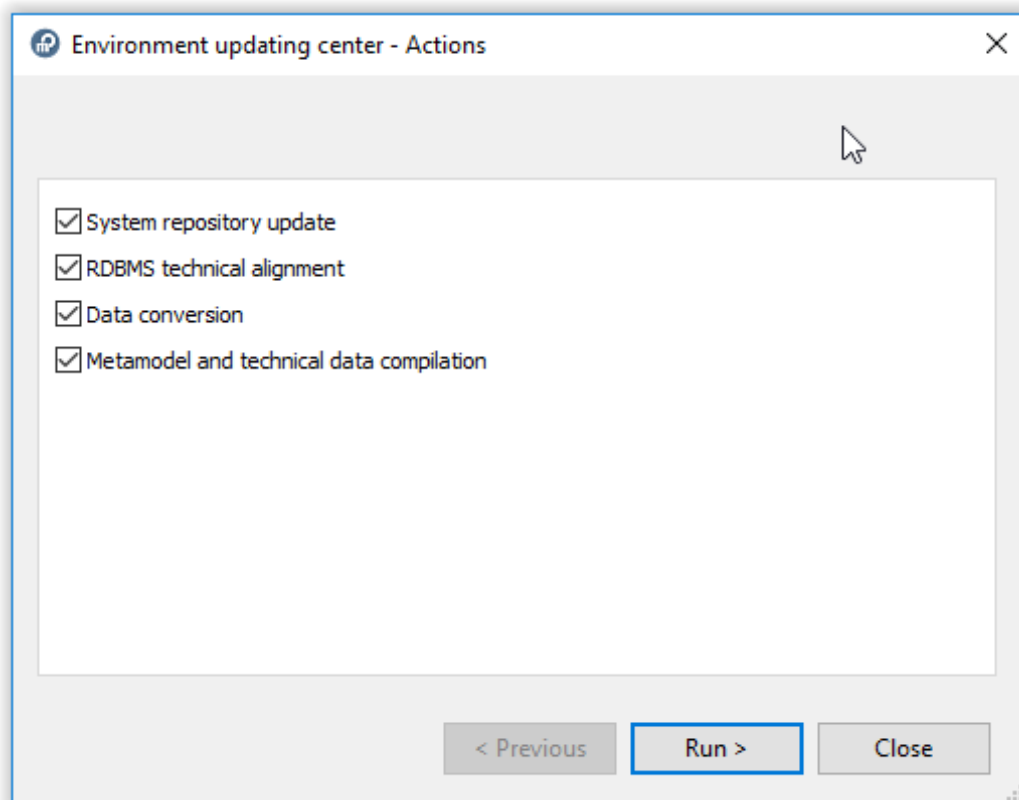
5. FAQs

5.1.1. Why is the menu 'Environment automatic update' is disabled?



The menu will be available after a first systemdb upgrade to HOPEX V2R2 Update 2 or higher. When this is done, the update wizard is available, and the menu is enabled.

5.1.2. What is the meaning of the actions?



System repository update: update of system database by import of .MOL files.

RDBMS technical alignment: update of tables at SQL level (RDBMS only);

Data conversion: additional conversion for system database and data repositories.

Metamodel and technical data compilation: compilation.

5.1.3. After a specific update installation, I get the following warning: You cannot access repository "XX". Its internal structure is not up to date. Run the menu "Technical Conversion" to perform the upgrade?

With specific updates, the technical version of the repository can change. Run the conversion from the Administration Console.

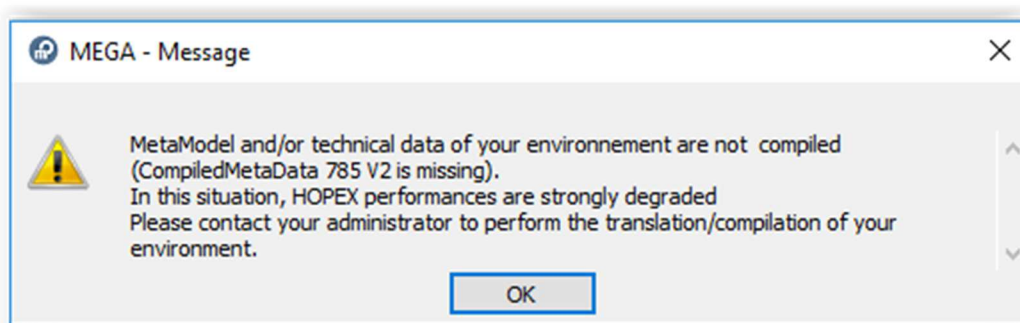
For each environment:

1. Select the environment folder.
2. R click > **Perform SQL conversions on the repository.**
3. Click OK when conversion of the systemdb repository is complete.

For each data repository of the environment:

1. Select the data repository.
2. R click > RDBMS Administration > **Perform SQL conversions on the repository.**
3. Click OK when conversion of the systemdb repository is complete.

5.1.4. I get a message 'MetaModel and/or technical data of your environment are not compiled (XXX is missing) Please contact your administrator to perform the translation/compilation of your environment.



This warning reports that certain elements are not compiled. The environment can be used but performances are downgraded. As requested, ask the administrator to translate and compile the environment. If possible, this should be done outside working hours since this processing can take time and will prevent all repository update while it is running.

5.1.5. When running the menu 'Conversions > System Repository Update, a warning says that workspaces exist.

It is not possible to run the update processing as long as private or collaborative workspaces persist. If workspaces should remain, cancel environment upgrade, delete remaining workspaces and resume environment upgrade.

5.1.6. Why are updates provided as .EXE files?

The .EXE format enables to install the update in the appropriate mode (Run as administrator). Otherwise, the installation may not be fully upgraded and various problems can occur especially with HOPEX Web Front-end.

5.1.7. The SSP Service (mgwspp.exe) keeps re-starting and therefore loads other processes (mgwspro.exe...).

To prevent automatic load of HOPEX processes (mgw*.exe.) it is recommended to disable the Windows Service and stop the IIS web site. See sooner in this document, Upgrading Window Front-end, Pre-install.

5.1.8. What is the purpose of the menu 'Conversions > System Repository Update > Simulate'?

This menu enables to preview the impact of the update installation on project customizations. By project customizations we mean objects of the system database that are installed by HOPEX (creator = mega-user) and customized by the project (modifier <> mega-user). To know more about this feature, consult the KB 00005120 in MEGA Community.

How to Install CP HOPEX V2 R1

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Summary

This document describes the procedures necessary for installing a CP for HOPEX V2R1.
It applies to HOPEX V2R1 Update 3.

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1. FOREWORD

1.1. Corrective Pack

With HOPEX V2R1 there are several levels of changes:

- **Update:** to deliver improvement and fixes. GUI can change.
Ex: Update 2, Update 3, Update 4
- **Corrective Pack (CP):** to deliver fixes only within an update. GUI should not change.
Ex: Corrective Pack 2 on HOPEX V2R1 Update 3
- **Hotfix:** to delivery urgent fixes. GUI does not change.
Ex: Hotfix 02 on HOPEX V2R1 Update 3 Corrective Pack 2

In concrete terms, a Corrective Pack installation program is a .MSP file embedded as a .EXE file.
Example: HOPEX_V2R1_U03.02.0.exe.

Each Corrective Pack is related to an update level of a major version.
Example: Corrective Pack 2 (HOPEX_V2R1_U03.02.0.exe) applies to HOPEX V2R1 Update 3

Corrective Packs are not cumulative.

Data upgrade can be done in the final CP.

Example: to upgrade from HOPEX V2R1 Update 3 CP1 to HOPEX V2R1 Update 3 CP4, it is required to:

1. Install CP2 to upgrade to HOPEX V2R1 Update 3 CP2.
2. Install CP3 upgrade to HOPEX V2R1 Update 3 CP3.
3. Install CP4 to upgrade to HOPEX V2R1 Update 3 CP4.
4. Run the 'Environment Automatic Update' feature.

As a consequence, verify the expected update level is installed before installing a Corrective Pack.

Before proceeding, make sure that, for all the HOPEX environments to upgrade:

- Data is backed up (physical backup).
- The password of the login **System** is known.
This is very important since it will be requested to login with the login System.

Note that the term FixPack was renamed to Corrective Pack.

1.2. Identification of version

Versions can be found through the About HOPEX menu.

HOPEX <Major version code> U<Update number>.<Corrective Pack number> (Build number)

Example: HOPEX V2R1 U03.02 (7.85.5174.0000)

- Major version code: V2R1
- Update number: 03
- Corrective Pack number: 02
- Build number: 7.85.5174.0000

Note these build numbers

- 7.85.4832.xxxx → Update 1
- 7.85.4903.xxxx → Update 2
- 7.85.4990.xxxx → Update 3

2. UPGRADING HOPEX PROGRAMS

The Corrective Pack installation program is an .MSP file embedded as an .EXE file.

Example: HOPEX_V2R1_U03.02.0.exe.

It must be installed on each machine where the version HOPEX V2R1 has been previously installed. The components initially installed (HOPEX Kernel and/or IIS components) will be updated.

Front-end	Deployment	Target machine
Web Front-end	Standalone deployment	Unique Server where HOPEX programs are installed
Web Front-end	Cluster deployment	Each application server of the cluster where HOPEX programs are installed <ul style="list-style-type: none"> • HOPEX Front-end • HOPEX Back-end • SSP
Windows Front-end	Standard deployment	Each workstation where HOPEX programs are installed
Windows Front-end	Citrix/Terminal Server deployment	Each Citrix/TSE application server where HOPEX programs are installed

Deployment	Machine	Windows Service	IIS Web site (1)	HOPEX processes
Web standalone deployment	Unique server	Yes	Yes	Yes
Web cluster deployment	Server running SSP	Yes		Yes
Web cluster deployment	Server running HOPEX Back-end Server running HOPEX Front-end	Yes		Yes
Windows Citrix/Terminal Server deployment	Each workstation	No		Yes
Windows standard deployment	Each Citrix/TSE application server	No		Yes

(1) By default, an application 'HOPEX' is configured for 'Default Web Site'.

2.1. Upgrading Web Front-end

Pre-install:

- Identify the target machine(s).
The machine varies with the chosen deployment: see the above table.
- Archive key configuration file of IIS application (web.config file) and HOPEX installation (Megasite.ini).
- Login in as administrator of the machine.
- Verify 'Control Panel > Administrative tools > Services'.
On the SSP server, the service **HOPEX Site Service Provider** must be set to 'Stopped'.
On all the servers, the service **HOPEX Service Watchdog** must be set to 'Stopped'.
- Verify 'Internet Information Services (IIS) Manager'.
The web site hosting the IIS applications (by default it is 'Default Web Site') must be stopped.
- Verify the Task Manager.
No HOPEX process (mgw*.exe, or HOPEX*) must be running.
- Verify 'Control Panel > Add or Remove programs'.
The required update level must be installed.
For example, HOPEX V2R1 Update 3 is a requirement before installing Corrective Pack 2 (HOPEX_V2R1_U03.02.0.exe).

Note: you can also use the utility Hopex Server Supervisor and R click > HOPEX > Stop HOPEX Processes Services and Web Application.

Procedure:

For each machine:

1. Select the .EXE file of the Corrective Pack.
Example: Select HOPEX_V2R1_U03.02.0.exe.
2. R click > **Apply**
The wizard can take more than one min to load.
3. Click **Update >**.
The installation process can take one minute to initialize.
Wait until the processing is complete.
4. Click **Finish**.

Notes:

- The location of the installation folder can be found after a search is conducted in the machine registry. This location is not visible on the machine during installation or in the control panel.
- If the expected update level is not identified for the HOPEX programs registered on the machine, an error is displayed.

2.2. Upgrading HOPEX Data

Most changes apply to HOPEX programs. However, some changes apply to the systemdb repository. It is therefore necessary to update all HOPEX environments to benefit from all the changes and fixes. The procedure varies depending on the storage.

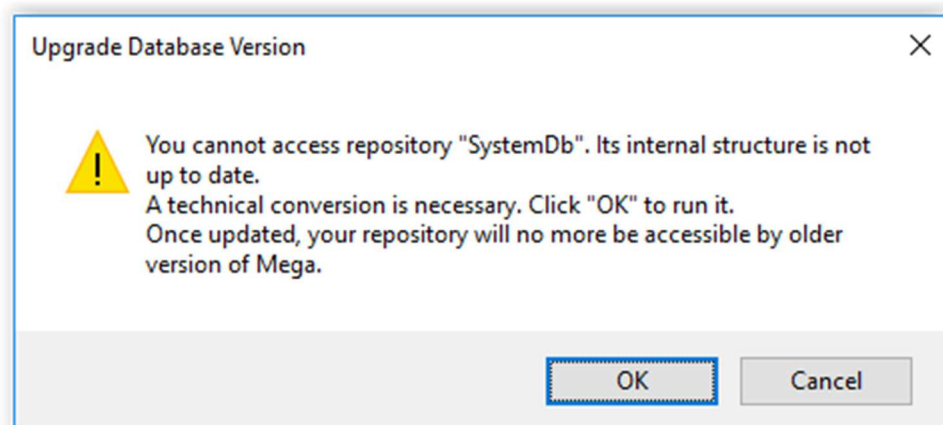
Pre-upgrade:

- Verify that no workspace exists in read/write mode.
- Verify 'Control Panel > Administrative tools > Services'.
On the SSP server, the service **HOPEX Site Service Provider** must be set to 'Stopped'.
On the all servers, the service **HOPEX Service Watchdog** must be set to 'Stopped'.
- Verify the Task Manager.
No HOPEX process (mgw*.exe, or HOPEX*) must be running.

Procedure:

With RDBMS storage, the technical format of the system repository and data repositories may change when installing update. In this case, a warning is displayed:

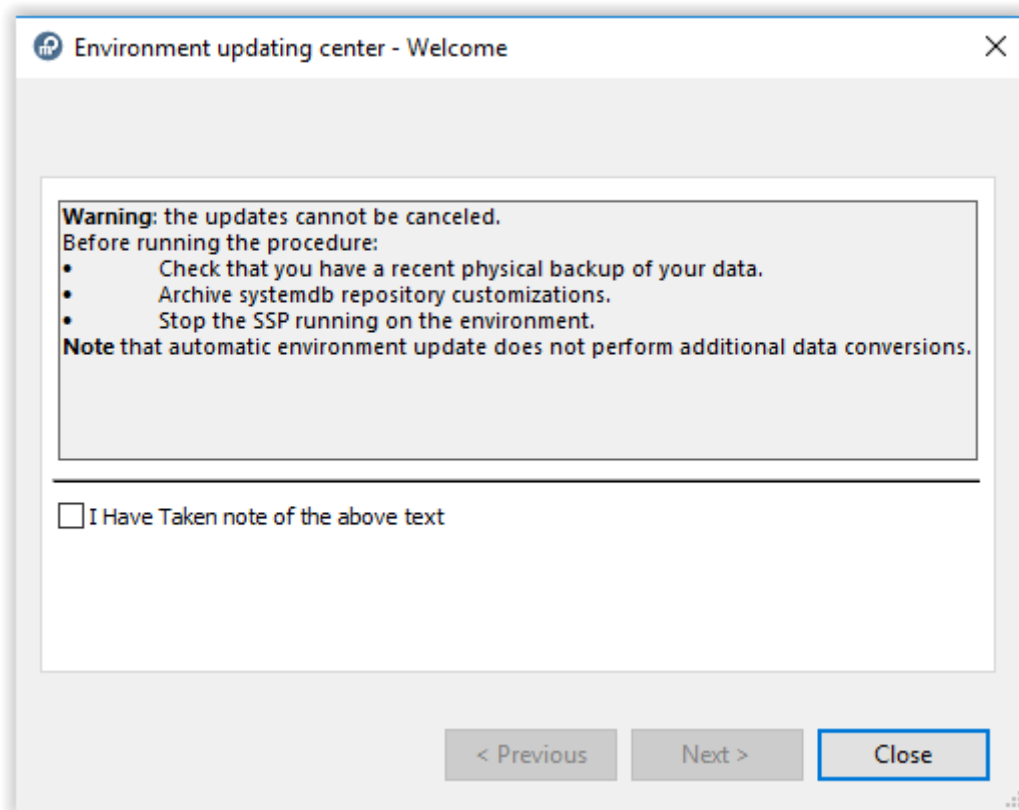
You cannot access repository XXX. Its internal structure is not up to date. ...



For each HOPEX environment:

1. Start the Administration Console (Administration.exe).
2. Select the environment to be upgraded.
3. R click > **Open**.
4. If a warning is displayed (You cannot access repository "SystemDb". Its internal structure is not up to date. ...), click 'Cancel', then :
 - Select the environment in the administration tree.
 - R click > **Perform SQL conversions on the repository**
A window 'MEGA RDBMS Technical Conversion' is displayed.
 - Click 'OK'.
 - Wait until the processing is complete (it takes a few minutes) and click 'Close'.
5. Select the environment to be upgraded.
6. R click > Open.
7. Login with the **System** identifier.
8. If warnings are displayed ("You cannot access repository "XXX". Its internal structure is not up to date..."), for each data repository (ex: ProductionData):
 - Select the data repository in the administration tree.

- R click > RDBMS Administration > **Perform SQL conversions on the repository.**
A window 'MEGA RDBMS Technical Conversion' is displayed.
 - Click 'OK'.
 - Wait until the processing is complete (it usually takes a few minutes) and click 'Close'.
9. Select the environment
10. R click > **Environment automatic update**
A wizard 'Environment updating center - Welcome' is displayed:



11. Read the information, check the option 'I have taken note of the above text' then click **Next**. A list of actions is displayed. It is recommended to keep them checked.
12. Click **Run** to start the update. Duration can vary according to various parameters (source and target versions, infrastructure performances, number of data repositories). It usually lasts about 15 min. A list of reports is displayed (one tab for each action).
13. Review reports and click **Close** to exit the wizard.
14. Close the environment.
15. Exit the Administration Console.

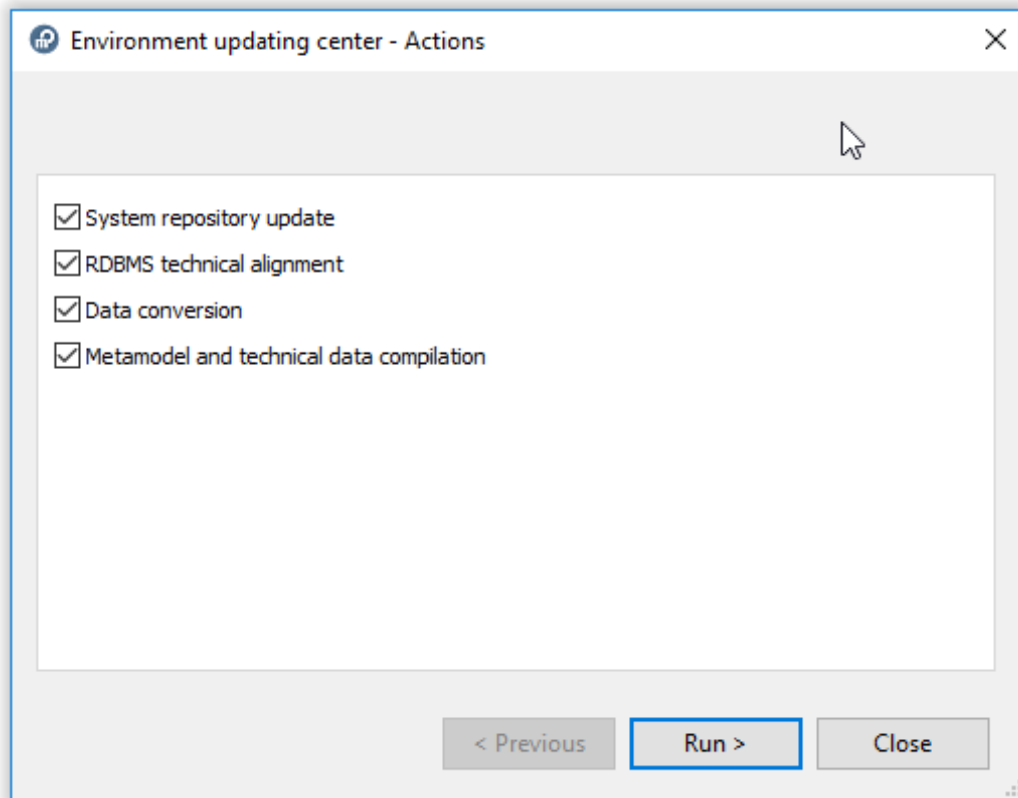
Post-installation and data upgrade:

- Verify 'Control Panel > Administrative tools > Services'.
On the SSP server, the service **HOPEX Site Service Provider** must be set to 'Automatic (Delayed Start)' and be started.
On the all servers, the service **HOPEX Service Watchdog** must be set to 'Automatic (Delayed Start)' and be started.
- Verify 'Internet Information Services (IIS) Manager'.
The web site hosting the IIS applications (by default it is 'Default Web Site') must be started.

Note: you can also use the utility Hopex Server Supervisor and R click > HOPEX > Restart HOPEX Processes Services and Web Application.

3. FAQs

3.1.1. What is the meaning of the actions below?



System repository update: update of system repository by import of .MOL files.

RDBMS technical alignment: update of tables at SQL level (RDBMS only).

Data conversion: additional conversion for system repository and data repositories.

Metamodel and technical data compilation: compilation.

3.1.2. What is the procedure for GBMS storage?

It is not recommended at all to use GBMS storage (deprecated)

- It not supported for Web Front-end
- It not supported for large repositories (size larger than 4 GB)

It is possible to upgrade data using the same procedure.

Note that some steps/actions are not applicable:

- Menu Perform SQL conversions on the repository in Administration.exe
- Action 'RDBMS technical alignment in environment upgrade wizard

-

3.1.3. How can I get the MSP file of the Corrective Pack?

Procedure:

- Copy the .EXE of the Corrective Pack file in a temporary folder, ex:
C:\tmp\HOPEX_V2R1_U03.02.0.exe
- Open a command prompt window (CMD)
- Run the following command <path of EXE> /E, Ex: C:\tmp\HOPEX_V2R1_U03.02.0.exe /E
- The installation wizard is loaded. Click 'Cancel' then 'Yes' and 'Finish' to exit the wizard.
- In the temporary folder, a .MSP file has been created, ex: MEGA HOPEX V2R1 Patch 301.msp

How to Install Hotfix HOPEX V2R1 Update 3

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Summary

This document describes the procedures necessary for installing a hotfix for HOPEX V2R1.
It applies to HOPEX V2R1 Update 3.

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1. FOREWORD

1.1. Hotfix

A hotfix provides a consistent set of changes, mainly error fixes.

In concrete terms, a hotfix installation program is a .MSP file.

Example: HOPEX_V2R1_U01_HF00.01.msp

The hotfixes provided for HOPEX Software are cumulative.

Example: Hotfix 01.03 also includes fixes of Hotfix 01.01 and Hotfix 01.02.

Each hotfix is related to an update (U) level and possibly to a Corrective Pack (CP) level.

Example:

Hotfix 01 for HOPEX V2R1 Update 1.

Hotfix 01 for HOPEX V2R1 Update 3 Corrective Pack 2.

As a consequence, verify the expected Update level or Corrective Pack level is installed before installing a hotfix.

Before proceeding, make sure that, for all the HOPEX environments to upgrade:

- Data is backed up (physical backup).
- The password of the login **System** is known.
This is very important since it will be requested to login with the login System.

2. UPGRADING HOPEX PROGRAMS

The hotfix installation program is a .MSP file.

Example: HOPEX_V2R1_U01_HF01.01.msp.

It must be installed on each machine where the version HOPEX V2R1 has been previously installed. The components initially installed (HOPEX Kernel and/or IIS components) will be updated.

Front-end	Deployment	Target machine
Web Front-end	Standalone deployment	Unique Server where HOPEX programs are installed
Web Front-end	Cluster deployment	Each application server of the cluster where HOPEX programs are installed <ul style="list-style-type: none"> • HOPEX Front-end • HOPEX Back-end • SSP
Windows Front-end	Standard deployment	Each workstation where HOPEX programs are installed
Windows Front-end	Citrix/Terminal Server deployment	Each Citrix/TSE application server where HOPEX programs are installed

Deployment	Machine	Windows Service	IIS Web site (1)	HOPEX processes
Web standalone deployment	Unique server	Yes	Yes	Yes
Web cluster deployment	Server running SSP	Yes		Yes
Web cluster deployment	Server running HOPEX Back-end Server running HOPEX Front-end	Yes		Yes
Windows Citrix/Terminal Server deployment	Each workstation	No		Yes
Windows standard deployment	Each Citrix/TSE application server	No		Yes

(1) By default, an application 'HOPEX' is configured for 'Default Web Site'.

2.1. Upgrading Web Front-end

Pre-install:

- Identify the target machine(s).
The machine varies with the chosen deployment: see above table.
- Archive key configuration file of IIS application (web.config file) and HOPEX installation (Megasite.ini).
- Login in as administrator of the machine.
- Verify 'Control Panel > Administrative tools > Services'.
On the SSP server, the service **HOPEX Site Service Provider** must set to 'Stopped'.
On all the servers, the service **HOPEX Service Watchdog** must set to 'Stopped'.
- Verify 'Internet Information Services (IIS) Manager'.
The web site hosting the IIS applications (by default it is 'Default Web Site') must be stopped.
- Verify the Task Manager.
No HOPEX process (mgw*.exe, or HOPEX*) must be running.
- Verify 'Control Panel > Add or Remove programs'.
The required update level must be installed.
For example, HOPEX V2R1 U1.0 is a requirement before installing HOPEX V2R1 U01.0 Hotfix 1.01.

Note: you can also use the utility Hopex Server Supervisor and R click > HOPEX > Stop HOPEX Processes Services and Web Application.

Procedure:

For each machine:

1. Select the .MSP file of the update.
Example: Select HOPEX_V2R1_U01_HF01.01.msp
2. R click > **Apply**
The wizard can take more than 1 min to load.
3. Click **Update >**.
The installation process can take a minute to initialize.
Wait until the processing is complete.
4. Click **Finish**.

Notes:

- The location of the installation folder can be found after a search is conducted in the machine registry. This location is not visible on the machine during installation or in the control panel.
- If the expected update level is not identified for the HOPEX programs registered on the machine, an error is displayed.

2.2. Upgrading HOPEX Data

Most changes apply to HOPEX programs. However, some changes apply to the systemdb repository. It is therefore necessary to update all HOPEX environments to benefit from all the changes and fixes. The procedure varies with the storage.

Pre-upgrade:

- Verify that no workspace exists in read/write mode.
- Verify 'Control Panel > Administrative tools > Services'.
On the SSP server, the service **HOPEX Site Service Provider** must set to 'Stopped'.
On the all servers, the service **HOPEX Service Watchdog** must set to 'Stopped'.
- Verify the Task Manager.
No HOPEX process (mgw*.exe, or HOPEX*) must be running.

Procedure:

For each HOPEX environment:

1. Start the Administration Console (Administration.exe).
2. Select the environment to be upgraded.
3. R click > **Open**.
4. Login with the **System** identifier.
5. In the folder 'Repositories', select **Systemdb**.
6. R click > Object Management > Import.
7. Select file '**UpgradeHF.mol**' and click **Import**.
It is located in the folder '\Install\Update' of the installation
Ex: C:\Program Files (x86)\MEGA\HOPEX V2R1\Install\Update
Before Update 3, this file was located in the folder '\Mega_Std' of the installation.
8. In the tree, select the environment.
9. R click > Metamodel > Translate and compile.
10. Check at least 'Compile metamodel' and 'Compile technical data' and click 'Start'.
Wait until compilation is complete.
11. Exit the Administration Console.

Post-installation and data upgrade:

- Verify 'Control Panel > Administrative tools > Services'.
On the SSP server, the service **HOPEX Site Service Provider** must set to 'Automatic (Delayed Start)' and be started.
On the all servers, the service **HOPEX Service Watchdog** must set to 'Automatic (Delayed Start)' and be started.
- Verify 'Internet Information Services (IIS) Manager'.
The web site hosting the IIS applications (by default it is 'Default Web Site') must be started.

Note: you can also use the utility Hopex Server Supervisor and R click > HOPEX > Restart HOPEX Processes Services and Web Application.

3. UPGRADING HOPEX CONFIGURATION

In specific versions, it can be required to manually update configuration (web.config) of specific IIS applications.

See in MEGA Community (personal login required)

<https://community.mega.com/t5/custom/page/page-id/mega-kb-solution?sid=5012p000000kmXqAAI>

HOPEX Unified Authentication Service

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1. UNIFIED AUTHENTICATION SERVICE OVERVIEW

Authentication is a common basic requirement for modern web-based applications as more and more customized and access controlled services move it online.

Cloud applications have become popular among organizations that share content on the Internet.

Most of the organizations have started using a centralized authentication source for their web portal, web and mobile applications.

Most of the web and mobile applications have their own authentication system to provide a better user experience. To support that need, one of our goals is to provide you with a clear framework that allows you to develop secure web based authentication system easily.

We want to provide the most secure and scalable platform on our market.

With the **Unified Authentication Service (UAS)**, you have a centralized service for your login logic and workflows in a single and well secured place.

It allows managing single sign-on (SSO) (and out) over multiple application types like web or mobile, access control for APIs and federation (support for external identity providers like Google and enterprise identity management systems via SAML and WS-Federation)

2. UAS CONFIGURATION

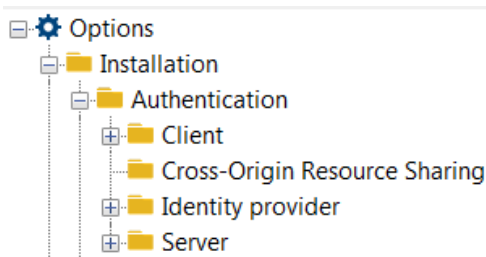
UAS is configurable by HOPEX Administration through option module.

2.1. Configuring authentication options

To configure authentication options, you must access to HOPEX Options in Extended view.

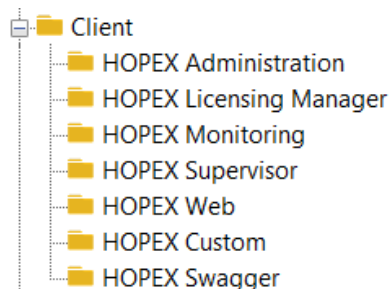
To configure authentication options:

- 1) Go to HOPEX Administration.
- 2) Right-click **HOPEX** and select **Options > Modify**.
- 3) Right-click **Options** and select **Extended**.
- 4) Expand **Installation > Authentication** folders.



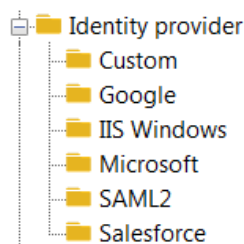
- 5) Click:
 - **Client**, and configure the client options.

➤ See Client Option Description.

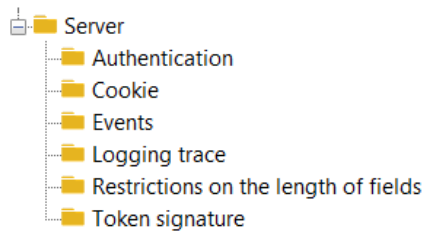


- **Cross-origin resource sharing**, and configure the cross origin resource sharing options.
 - See Cross-Origin Resource Sharing Option Description.
- **Identity provider**, and configure the identity provider options.

➤ See Identity Provider Option Description



- **Server**, and configure the server global options and specific options.
 - See Server Option Description.



2.2. Server Option Description

2.2.1. Server global options

The server global options (**HOPEX > Options (Extended view) > Installation > Authentication > Server**) are the following:

- **Name of the authentication site** (available in Standard view)
Displays name of the site used in standard views. Default to HOPEX.
- **SSL Activation**
Indicates if SSL is required for UAS. You need to activate this option if you want to secure your authentication service and work with some identity providers. Defaults to false.
- **Public origin of the site**
By default, UAS uses the host, protocol, and port from the HTTP request when creating links. This might not be accurate in reverse proxy or load-balancing situations. You can override the origin used for link generation using this property.
- **Type of information storage**
UAS allows to use the following data component types:
 - **InMemory**
This storage type allows to store data in memory of your server. It's the simplest storage type. You cannot use it with a cluster deployment and you lose your token when you reboot your server.
 - **Redis (Cluster Compatible)**
This storage type allows to store data in Redis, a nosql database storage, used for caching. You can use it with a cluster deployment. No data loss.
 - **NCache (Cluster Compatible)**
This storage type allows to store data in NCache Enterprise 4.6.2 minimum, used for caching. You can use it with a cluster deployment. No data loss.

For legal reason (License redistribution), MEGA cannot provide the assemblies to work with.
You need to put the following assemblies in the UAS binary folder (by default wwwroot/uas/bin):
 - Alachisoft.NCache.Web.dll
 - Alachisoft.NCache.Runtime.dll
 - **SqlServer (Cluster Compatible)**
This storage type allows to store data in SQL Server 2008 R2 minimum, used for caching. You can use it with a cluster deployment. No data loss.

You must launch SQL scripts which can be found in:

```
{HOPEX installation folder}\Utilities\Hopex Cluster Tools\UAS_Scripts.sql
```

- **Parameters of the UAS data component**

This parameters allows to complete the data component type. Several data components needs more informations like connectionstring or key.

- **InMemory**

No need to fill this parameter.

- **Redis (Cluster Compatible)**

Fill the Redis connection string into this parameter.

- **NCache (Cluster Compatible)**

Fill the NCache name into this parameter.

- **SqlServer (Cluster Compatible)**

Fill the SQLServer connection string into this parameter.

```
Data Source={ServerName}\{Instance};Initial Catalog={DataBaseName};Integrated
Security=False;User ID={UserId};Password={UserPassword}
```

2.2.2. Authentication options

The server authentication options (**HOPEX > Options (Extended view) > Installation > Authentication > Server > Authentication**) are the following:

- **Activation of user name backup**

Indicates whether UAS will remember the last username entered on the login page. Defaults to true

- **Activation of the local connection**

Indicates if UAS will allow users to authenticate with a local account. Disabling this setting will not display the username/password form on the login page. This also will disable the resource owner password flow. Defaults to true.

- **Activation of the login hint**

Indicates whether the *login_hint* parameter is used to prepopulate the username field. Defaults to true.

- **Limit to the number of consecutive messages**

Gets or sets the limit after which old sign in messages (cookies) are purged. Defaults to 3.

- **Activation of the capacity to redirect directly to an URL after disconnection**

Gets or sets a value indicating whether UAS automatically redirects back to a validated *post_logout_redirect_uri* passed to the sign out endpoint. Defaults to false.

- **Activation of confirmation during connection**

Indicates whether UAS will show a confirmation page for sign-in. When a client initiates a sign-in, by default UAS will not ask the user for confirmation but you can activate it. This is a mitigation technique against “logout spam”. Defaults to false.

- **The redirection timeout of the automatic post-disconnection**

Gets or sets the delay (in seconds) before redirecting to a *post_logout_redirect_uri*. Defaults to 0.

- **Activation of display of the disconnection confirmation page**

Indicates whether UAS will show a confirmation page for sign-out. When a client initiates a sign-out, by default UAS will not ask the user for confirmation.

- **The invalid sign in redirect URL**

Gets or sets the invalid sign in redirect URL. If the user arrives at the login page without a valid sign-in request, then they will be redirected to this URL. The URL can be absolute or relative (starting with “~/”).

2.2.3. Cookie options

The server cookie options (**HOPEX > Options > Installation > Authentication > Server > Cookie**) are the following:

- **Display the “Remember me” checkbox in the login page or not**

Indicates whether the “remember me” option is presented to users on the login page. If selected this option will issue a persistent authentication cookie. Defaults to false.

- **Sliding cookie Expiration**

Indicates if the authentication cookie is sliding, which means it auto renews as the user is active. Defaults to false.

2.2.4. Events options

UAS raises many events at runtime.

The server event options (**HOPEX > Options (Extended view) > Installation > Authentication > Server > Events**) are the following:

- Successful/failed authentication (resource owner flow, pre, partial, local and external)
- Token issued (identity, access, refresh tokens)
- Token handle related events (authorization code, refresh token issued/redeemed/refreshed)
- Permission revoked
- Endpoint success/failures
- Expired/invalid/no signing certificate
- Unhandled exceptions and internal errors
- CSP errors reported by the browser

By default, these events are forwarded to the configured log provider - a custom event service can process or forward them in any way suitable for the environment.

The Events options are the following (all default to false):

- **Generation of all events**

Activates all the events below

- **Generation of success events**

Activates refresh token refreshed or authentication success.

- **Generation of failure events**

Activates authentication failure, authorization code redeems failure events.

- **Generation of error events**

Activates unhandled exceptions events.

- **Generation of information events**

Activates token issued or certificate valid events.

2.2.5. Logging trace options

The server logging trace options (**HOPEX > Options (Extended view) > Installation > Authentication > Server > Logging trace**) are the following:

- **Activation of all logging**

Activates all the logging traces (http flow, katana Flow, programming web interface, programming web interface in Verbose mode).

- **Activation of Http flow logging**

When enabled, HTTP requests and responses are logged.

- **Activation of Katana Flow Logging**

When enabled, the Katana log output is logged (this is often useful to troubleshoot problems with external identity providers).

- **Activation of logging of the programming web interface**

When enabled, Web API internal diagnostic logging is forwarded to the log provider.

- **Activation of logging of the programming web interface in Verbose mode**

When enabled, the Web API diagnostics logging is set to verbose.

2.2.6. Token Signature options

The server token signature options (**HOPEX > Options (Extended view) > Installation > Authentication > Server > Token Signature**) are the following:

- **Name of the certificate to be used by the authentication server**

X.509 certificate (and corresponding private key) name for signing security tokens.

- **Password for the signature certificate of the authentication server**

X.509 certificate (and corresponding private key) password for signing security tokens.

2.3. Identity Provider Option Description

The identity provider options (**HOPEX > Options > Installation > Authentication > Identity provider**) are the following:

- HOPEX, see HOPEX provider.
- IIS windows, see IIS Windows provider
- SAML2, see SAML2 provider.
- Google, see Google provider.

- Microsoft, see Microsoft provider.
- Salesforce, see Salesforce provider.
- Custom, see Custom provider.

2.3.1. HOPEX provider

The HOPEX provider is the HOPEX default provider, which displays a login page with username and password.

To authenticate HOPEX users, use either:

- HOPEX User Native Authentication
See HOPEX Administration documentation: Authentication in HOPEX section.
- LDAP Authentication

See HOPEX Administration documentation: Authentication in HOPEX section.

2.3.2. IIS Windows provider

With the IIS Windows provider HOPEX users are authenticated by Windows Authentication.

To use IIS Windows provider, you must configure the following mandatory options:

- Enabled (Default to false)
- Name displayed for the Windows IIS access provider (Windows by Default)
- URL of the Windows IIS authentication server.

2.3.3. SAML2 provider

SAML 2.0 is an XML based framework, used to describe and exchange security information. It can be used for Single Sign On (SSO), Identity Management and Federation.

To use SAML2 provider, you must set UAS in SSL Mode.

UAS manages only Service Provider (SP) initiated SSO and not Identity Provider(IDP) initiated SSO.

We have implemented two SAML2 Identity Provider and you can find the server configuration example:

- SAML2 ADFS Server Configuration section
- OKTA Configuration section

2.3.4. Google provider

Use the Google provider to authenticate HOPEX users with a google account by OAUTH2.

To use Google provider, you must:

- set UAS in SSL Mode (Options > Installation > Authentication > server)
- Have your website accessible by Google server
- enter the following fields:
 - Enabled (Activated or not)
 - Display name (Text the user can display in the user interface, by Default Google)

- Google Client ID (Identifier of the Google access provider client)
- Google Secret code (Password of the Google access provider client)
- Google Scope (Scope of the authenticated client)

If you do not know this information, go to the Google console (<https://console.developers.google.com>) to create your API keys.

Do not forget to activate Google + API at least, otherwise you will not be able to authenticate HOPEX users.

2.3.5. Microsoft provider

Use the Microsoft provider to authenticate HOPEX users with a Microsoft account by OAUTH2.

To use Microsoft provider, you must set UAS in SSL Mode and ensure the address is accessible by Microsoft server and fill the following fields:

- Enabled (Activated or not)
- Display name (Text the user can display in the user interface)
- Microsoft Client ID (Identifier of the Microsoft access provider client)
- Microsoft Password (Password of the Microsoft access provider client)
- Microsoft Scope (Scope of the authenticated client)

If you do not know this information, go to the Microsoft website (<https://apps.dev.microsoft.com>) to create your API keys.

2.3.6. Salesforce provider

Use the Salesforce provider to authenticate HOPEX users with a Salesforce account by OAUTH2.

To use Salesforce provider, you must set UAS in SSL Mode and ensure the address is accessible by Salesforce server and fill the following fields:

- Enabled (Activated or not)
- Display name (Text the user can display in the user interface)
- Salesforce Client ID (Identifier of the Salesforce access provider client)
- Salesforce Password (Password of the Salesforce access provider client)
- Salesforce Scope (Scope of the authenticated client)

If you do not know this information, go to the website:

https://help.salesforce.com/articleView?id=connected_app_create.htm for information on how to create a connected app.

To connect Salesforce with UAS through Salesforce Admin, fill:

- **Application Url** field: `http(s)://<servername>/HOPEX/DEFAULT.ASPX`
- **CallBack Url** field: `http(s)://<servername>/UAS/signin-salesforce`

2.3.7. Custom provider

Use the Custom provider to authenticate HOPEX users with your own implementation. You must fill the following fields:

- Enabled (Boolean)
Activate or not your Custom Provider
- Parameters (string)
Parameters used by your custom provider.

To create your custom provider, see Install the Hopex Identity Provider template section.

Do not forget to:

- set **Namespace** properties to "Custom"
- call your C# project: **MEGA.UAS.IdentityProvider.Custom**

2.4. Cross-Origin Resource Sharing Option Description

(available with options in Extended view only)

Cross-origin Resource Sharing (CORS) is a mechanism that allows some web resources (e.g. fonts) on a web page to be requested from a different domain outside the domain from which the first resource was served. A web page may freely embed cross-origin images, stylesheets, scripts, iframes, and videos. Certain "cross-domain" requests, notably Ajax requests, however are forbidden by default by the same-origin security policy.

With UAS you can add resources from another domain. It can be used if you use several domains in your HOPEX installation. You can have up to 5 different CORS.

2.5. Client Option Description

2.5.1. HOPEX Custom (options in Extended view only)

HOPEX allows you to authenticate an external client with UAS and enable UAS SSO Features.

You must fill the following fields:

- Enabled (Activated or not)
- Client ID: HopexCustom (default)
- Client Name: Hopex Custom Client (default)
- Client secret: secret (default)
- Client Scopes
- Client Flow
- Client Redirect uri
- Client Allowed Redirect uri
- Client Post Logout Redirect uri

3. ENDPOINTS

3.1. Authorization/Authentication

The authorization endpoint can be used to request either access tokens or authorization codes (implicit and authorization code flow). You either use a web browser or a web view to start the process.

- ***client_id*** (required)
Identifier of the client
- ***scope*** (required)
One or more registered scopes
- ***redirect_uri*** (required)
must match exactly one of the allowed redirect URIs for that client
- ***response_type*** (required)
 - ***code*** requests an authorization code
 - ***token*** requests an access token (only resource scopes are allowed)
 - ***id_token*** token requests an identity token and an access token (both resource and identity scopes are allowed)
- ***response_mode*** (optional)
form_post sends the token response as a form post instead of a fragment encoded redirect
- ***state*** (recommended)
Unified Authentication Service will echo back the state value on the token response, this is for correlating request and response.
- ***nonce*** (required for identity tokens using implicit flow)
Unified Authentication Service will echo back the nonce value in the identity token, this is for correlating the token to the request).
- **prompt** (optional)
 - **none** no UI will be shown during the request. If this is not possible (e.g. because the user has to sign in or consent) an error is returned
 - **login** the login UI will be shown, even if the user is already signed-in and has a valid session
- ***code_challenge*** (required when using proof keys)
Sends the code challenge for proof key flows.
- ***code_challenge_method*** (optional - default to plain when using proof key)
 - **plain** indicates that the challenge is using plain text (not recommended)
 - **S256** indicates the challenge is hashed with SHA256
- ***login_hint*** (optional)
Can be used to pre-fill the username field on the login page.
- ***ui_locales*** (optional)
Gives a hint about the desired display language of the login UI

- **max_age** (optional)
If the user's logon session exceeds the max age (in seconds), the login UI will be shown
- **acr_values** (optional)
Allows to pass additional authentication related information to the user service - there are also values with special meaning:
 - **idp:name_of_idp** bypasses the login/home realm screen and forwards the user directly to the selected identity provider (if allowed per client configuration)
 - **tenant:name_of_tenant** can be used to pass a tenant name to the user service

Example (URL encoding removed for readability)

```
GET /connect/authorize?client_id=client1&scope=openid email
api1&response_type=id_token token
```

3.2. Token

The token endpoint can be used to programmatically request or refresh tokens (resource owner password credential flow, authorization code flow, client credentials flow and custom grant types).

- grant_type (required)
 - authorization_code
 - client_credentials
 - Password
 - refresh_token
 - custom
 - scope (required for all grant types besides refresh_token and code)
 - redirect_uri (required for code grant type)
 - code (required for code grant)
 - code_verifier (required when using proof keys - added in v2.5)
 - username (required for password grant type)
 - password (required for password grant_type)
 - acr_values (allowed for password grant type to pass additional information to user service)
- Values with special meaning:
- **idp:name_of_idp** bypasses the login/home realm screen and forwards the user directly to the selected identity provider (if allowed per client configuration)
 - **tenant:name_of_tenant** can be used to pass extra information to the user service
 - refresh_token (required for refresh token grant)
 - client_id (either in the post body, or as a basic authentication header)
 - client_secret (either in the post body, or as a basic authentication header)

Authentication

All requests to the token endpoint must be authenticated - either pass client id and secret via Basic Authentication or add client_id and client_secret fields to the POST body.

Example: (Form-encoding removed and line breaks added for readability)

```
POST /connect/token
```

```
Authorization: Basic abcxyz
```

```
grant_type=authorization_code&code=hdh922&redirect_uri=https://myapp.com/callback
```

3.3. UserInfo

The UserInfo endpoint can be used to retrieve identity information about a subject. It requires a valid access token with at least the “openid” scope.

Example:

```
GET /connect/userinfo
```

```
Authorization: Bearer <access_token>
```

```
HTTP/1.1 200 OK
```

```
Content-Type: application/json
```

```
{
  "sub": "248289761001",
  "name": "Bob Smith",
  "given_name": "Bob",
  "family_name": "Smith",
  "role": [
    "user",
    "admin"
  ]
}
```

3.4. Discovery Endpoint

The discovery endpoint can be used to retrieve metadata about **Unified Authentication Service** - it returns information like the issuer name, key material, supported scopes etc.

Example:

```
GET /.well-known/openid-configuration
```

3.5. Logout Endpoint

Redirecting to the logout endpoint clears the authentication session and cookie.

You can pass the following optional parameters to the endpoint:

- id_token_hint
The id_token that the client retrieved during authentication. This allows bypassing the logout confirmation screen as well as providing a post logout redirect URL
- post_logout_redirect_uri

A URI that **Unified Authentication Service** can redirect to after logout (by default a link is displayed). The URI must be in the list of allowed post logout URIs for the client.

```
/connect/endsession?id_token_hint=...&post_logout_redirect_uri=https://myapp.com
```

See the Authentication section to configure the behavior of logout endpoint and logout page.

3.6. Token Revocation

This endpoint allows revoking access tokens (reference tokens only) and refresh token. It implements the token revocation specification.

Supported parameters:

- **token** (required)
The token to revoke
- **token_type_hint**
Either `access_token` or `refresh_token`

Requests must be authenticated using one of the supported client authentication methods.

Example:

```
POST /connect/revocation HTTP/1.1
Host: server.example.com
Content-Type : application/x-www-form-urlencoded
Authorization: Basic czZCaGRSa3F0MzpnWDFmQmF0M2JW
token=45ghiukldjahdnhzdauz&token_type_hint=refresh_token
```

3.7. Introspection Endpoint

The introspection endpoint is an implementation of RFC 7662.

It can be used to validate reference tokens (or JWTs if the consumer does not have support for appropriate JWT or cryptographic libraries).

The introspection endpoint requires authentication using a scope credential (only scopes that are contained in the access token are allowed to introspect the token).

Example:

```
POST /connect/introspect
Authorization: Basic xxxyyy
token=<token>
```

A successful response returns a status code of 200 and either an active or inactive token:

```
{
  "active": true,
  "sub": "123"
}
```

Unknown or expired tokens are marked as inactive:

```
{
  "active": false,
```



An invalid request returns a 400 or a 401 if the scope is not authorized.

Note:

The introspection endpoint replaces the old access token validation endpoint. Since the introspection endpoint requires authentication, it adds privacy features to reference tokens, which were not available previously. The access token validation endpoint still exists, but it is recommended to disable it and use the introspection endpoint instead.

3.8. Access token validation endpoint

The access token validation endpoint can be used to validate reference tokens. It can be also used to validate self-contained JWTs if the consumer does not have support for appropriate JWT or cryptographic libraries.

You can either GET or POST to the validation endpoint. Due to query string size restrictions, POST is recommended.

Example:

```
POST /connect/accesstokenvalidation
token=<token>
```

or

```
GET /connect/accesstokenvalidation?token=<token>
```

A successful response returns a status code of 200 and the associated claims for the token.

An unsuccessful response returns a 400 with an error message.

It is also possible to pass a scope that is expected to be inside the token:

```
POST /connect/accesstokenvalidation
token=<token>&expectedScope=calendar
```

Note:

The access token validation endpoint does not enforce client authentication.

Do not use reference tokens for confidentiality purposes.

3.9. Identity Token Validation Endpoint

The identity token validation endpoint can be used to validate identity tokens. This is useful for clients that do not have access to the appropriate JWT or crypto libraries (e.g. JavaScript).

You can either GET or POST to the validation endpoint. Due to query string size restrictions, POST is recommended.

Example:

```
POST /connect/identitytokenvalidation
token=<token>&client_id=<expected_client_id>
GET /connect/identitytokenvalidation?token=<token>&client_id=<expected_client_id>
```

A successful response returns a status code of 200 and the associated claims for the token.

```
{
  "nonce": "nonce",
  "iat": "1413203421",
  "sub": "88421113",
  "amr": "password",
  "auth_time": "1413203419",
  "idp": "idsrv",
  "iss": "https://idsrv3.com",
  "aud": "implicitclient",
  "exp": "1413203781",
  "nbf": "1413203421"
}
```

An unsuccessful response will return a 400 with an error message.

3.10. CSP Endpoint

Unified Authentication Service provides an endpoint to record CSP errors that the browser reports. These CSP errors are raised as events in the system event

4. ESTABLISH AN SSL CONNECTION

UAS must establish an SSL connection to communicate with SAML2 Provider like as ADFS.

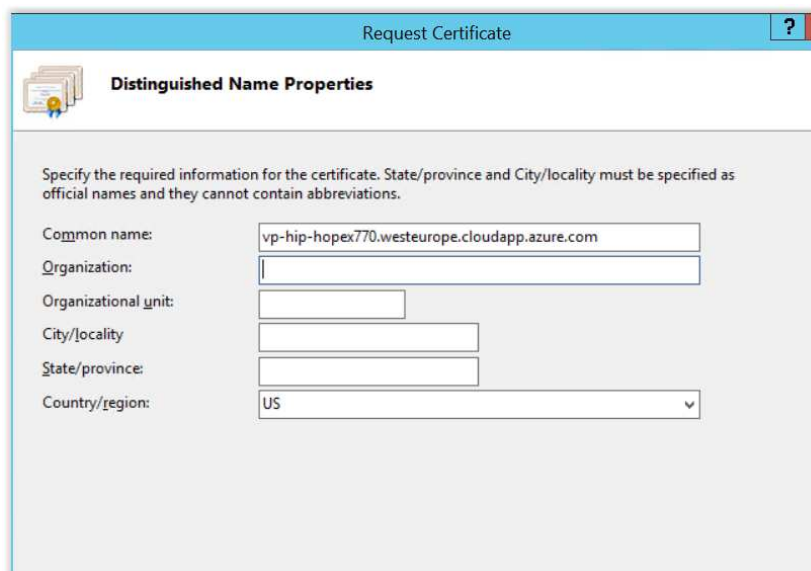
To establish an SSL connection:

Action	See
1 Create a certificate request	Creating a certificate request from IIS
2 Complete the certificate request	Completing the certificate request
3 Bind IIS with SSL certificate	Binding IIS with SSL certificate
4 Export the certificate to the local disk	Exporting certificate to the local disk

4.1. Creating a certificate request from IIS

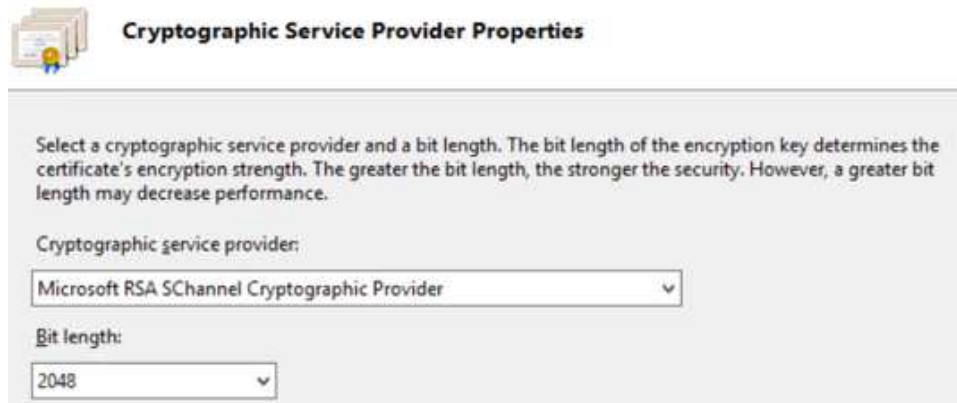
To create a certificate request from IIS:

1. Open **IIS**.
2. In **IIS** section, double-click **Server certificates**.
3. In the **Actions** pane, click **Create certificate request**.
4. In the **Common name** field, enter the server name (Fully Qualified domain name).



5. Enter all the requested fields.
6. Click **Next**.
The **Cryptographic Service Provider Properties** window appears.
7. In the **Cryptographic Service Provider** field, select "Microsoft RSA Channel Cryptographic Provider".

8. In the **Bit length** field, select “2048”.



9. Click **Next**.
10. Enter the name and saving location for the output request file
11. Click **Finish**.
12. Send this request to your CA Authority.

When you receive the certificate, complete the certificate request, see Completing the certificate request.

4.2. Completing the certificate request

To complete the certificate request:

1. Access **IIS > Server Certificates**.
2. In the **Actions** pane, click **Complete certificate request**.
3. In the **Friendly name** field, enter any name.
4. In the **Select a certificate store for the new certificate**, select “Personal”.
5. Click **OK**.

4.3. Binding IIS with SSL certificate

To bind IIS with SSL certificate:

1. In **IIS, Connections** pane, expand **Sites** folder and select **Default Web Site**.
2. In the **Actions** pane, click **Binding**.
3. Click **Add**.
4. In the **Type** field, select “https”.
5. In the **SSL certificate** field, select the certificate previously imported.
6. Click **OK**.

4.4. Exporting certificate to the local disk

To export the certificate to the local disk:

1. Open Manage certificate computer.
2. Expand **Personal > Certificates** folders.
3. Right-click your previously imported certificate and click **All Task > Export**.
4. Select "Yes, export the private key".
5. Check **Export all extended properties**.
6. Select **Password**.
7. Enter and confirm your password.
8. Select your file location to export the certificate.
9. Copy this exported certificate file to the SAML2/ADFS server.

5. INSTALL HOPEX SIGNING CERTIFICATE (MANUALLY)

By default, the installer installs the UAS signing certificate, but the certificate could also be updated with the following procedure

To install HOPEX signing certificate (manually):

1. Double-click your certificate.
2. Select **Local Machine** and click **Next** twice.
3. Fill the password field.
4. Click **Next** twice and click **Finish**.
5. Go to your certificate through "Computer Certificate Manager".
6. Go to **Personal Folder > Certificates**.
7. Right-click your certificate and select **All Tasks > Manage private keys**.
8. Add IIS_USRS as user and click **OK**.
9. Right-click your certificate and select **Properties**.
10. Enter a **Friendly Name**.

The Friendly name and the password are important for UAS configuration: do not forget to change it if it changes.

6. INSTALL THE HOPEX IDENTITY PROVIDER TEMPLATE

See *HOPEX Visual Studio Templates* documentation: Installing the HOPEX Identity Provider template section.

7. CONFIGURE UAS HOPEX BY OPTIONS

7.1. Local Configuration

7.1.1. Defining authentication options

To define authentication options:

- 1) Go to HOPEX Administration.
- 2) Right-click **HOPEX** and select **Options > Modify**.
- 3) Check that you are in “Extended” mode (right-click **Options** and select **Extended**).
- 4) Expand **Installation**, **Authentication** and **Client** folder.
Note: **Client** folder is only available in “Extended” mode.
- 5) Select **Hopex Web**, and define:
 - Redirection URL when the user is authenticated to `http://<servername>/uas/uaslogin.ashx`
 - List of authorized redirection URLs to `http://<servername>/uas/uaslogin.ashx`
 - Redirection URL after disconnection to `http://<servername>/Hopex/Default.aspx`

7.2. Cluster Configuration

In a cluster configuration, do not forget to specify the same MachineKey in the web.config of each UAS node. You also need to fix the urls on the loadbalancer urls, and not on several nodes.

7.2.1. Configuring your data component type

Hopex manages several data component for Cluster configuration (see **Error! Reference source not found.** section).

To configure your data component type:

- 1) Go to HOPEX Administration.
- 2) Right-click **HOPEX** and select **Options > Modify**.
- 3) Check that you are in “Extended” mode (right-click **Options** and select **Extended**).
- 4) Expand **Installation > Authentication** folders.
- 5) Select **Server** and in the right pane define (see Authentication section):
 - **Type of information storage**
 - **Parameters of the UAS data component**

7.2.2. Configuring your SQL Server Data component type

To configure your SQL Server Data component type:

- 1) Create a SQL Database named “UAS”.

- 2) Create the table with the script “UAS_Scripts.sql” located in {Mega installation folder}\Utilities\HOPEX Cluster Tools.
- 3) Go to HOPEX Administration.
- 4) Right-click **HOPEX** and select **Options > Modify**.
- 5) Check that you are in “Extended” mode (right-click **Options** and select **Extended**).
- 6) Expand **Installation > Authentication** folders.
- 7) Select **Server** and in the right pane define (see Authentication section):
 - **Type of information storage : SQL Server**
 - **Parameters of the UAS data component : Your connection string**

7.2.3. Configuring HOPEX Web options

To configure HOPEX Web options:

- 1) Go to HOPEX Administration.
- 2) Right-click **HOPEX** and select **Options > Modify**.
- 3) Check that you are in “Extended” mode (right-click **Options** and select **Extended**).
- 4) Expand **Installation, Authentication** and **Client** folder.
Note: **Client** folder is only available in “Extended” mode.
- 5) Select **Hopex Web** and define:
 - **Redirection URL when the user is authenticated** to front load balancer server name:
`http(s)://<servername>/hopex/uaslogin.ashx`
 - **List of authorized redirection URLs** to front load balancer server name:
`http(s)://<servername>/hopex/uaslogin.ashx`
 - **Redirection URL after disconnection** to front load balancer server name:
`http(s)://<servername>/hopex/Default.aspx`

7.2.4. Generating Machine Key

To generate the machine key:

- 1) Go to your IIS Manager
- 2) Expand
- 3) Click **UAS** application.
- 4) Double-click **Machine Key**.
- 5) Select your validation method (SHA1 by default).
- 6) Select your Encryption method (AES by default).
- 7) Clear “Automatically generate at runtime” validation key.
- 8) Clear “Automatically generate at runtime” decryption key.
- 9) In **Actions** pane, click **Generate Keys**.
- 10) Do the same with **Windows Authentication Service** if you use UAS Windows Authentication mode.

8. CONFIGURE CLIENT USING UAS

All the clients that want to communicate with UAS can use UAS SDK.

To configure the client with UAS SDK:

1. Go to <HOPEX installation folder>\DotNet\packages.
2. Download **MEGA.UAS.Client.Owin** package to retrieve UAS SDK.
MEGA.UAS.Client.Owin is an OWIN middleware.
3. Use the **ConfigureClient** method to configure the client.

The following options must be the same (case sensitive) in client configuration as in HOPEX Options configuration:

- **AuthenticationUrl** (mandatory, only in Client configuration)
Unified Authentication Service URL
- **ClientId** (mandatory)
Identifier of your client
- **ClientSecret** (mandatory)
Secret of your client
- **ClientRedirectUri** (mandatory)
Redirect Url of your client
- **ClientPostLogoutRedirectUri** (not mandatory)
Post logout redirect url of your client if you want to manage it.
- **ClientScope** (mandatory)
Scope of your client
Usually, this information is stored in web.config website.

9. STANDALONE MODE

In its nominal version, UAS is designed to work with SSP. But it is possible to operate it in an environment without SSP: it is the standalone mode. This allows it to be used by earlier version of Hopex, or even independently of Hopex.

To do so, you must declare in the appsettings section of UAS web.config file:

```
<add key="ConfigurationMode" value="Standalone" />
```

In this mode, the configuration necessary for the proper operation of UAS is retrieved from a config.json file which must be located in the UAS bin folder.

In case the Hopex provider is activated in the standalone mode, you must also add two additional keys:

- the URL to access the API for recovering old version environments:

```
<add key="HopexApiUrl" value="http://my-server/hopexapi/restapi/v1" />
```
- the URL to call in case of a forgotten password, if the mega authentication provider is used

```
<add key="ForgetPasswordUrl" value="http://my-server/hopex/account.aspx" />
```

In addition, the options that are normally retrieved from the SSP are read from the configuration file. These are not used by UAS, but can be used by custom providers.

10. ANONYMOUS ENVIRONMENT MODE

In its nominal version, UAS is designed to work with an environment list on the login page but you can replace it with a textbox.

It can be used when you have multiple environments and you do not want that your user can see them.

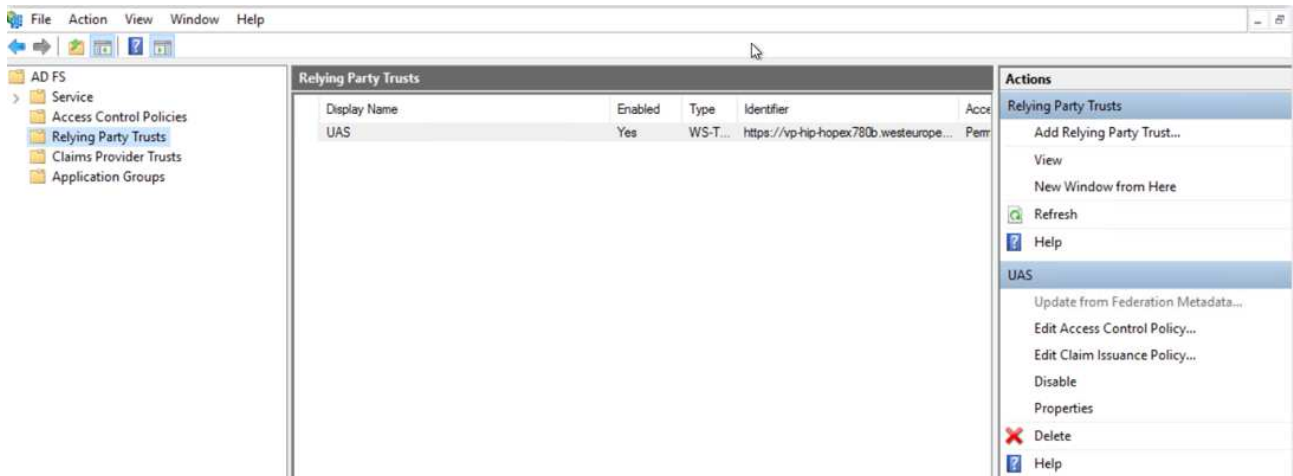
To do so, you must declare in the appsettings section of UAS web.config file:

```
<add key="IsAnonymousEnvironment" value="1"/>
```

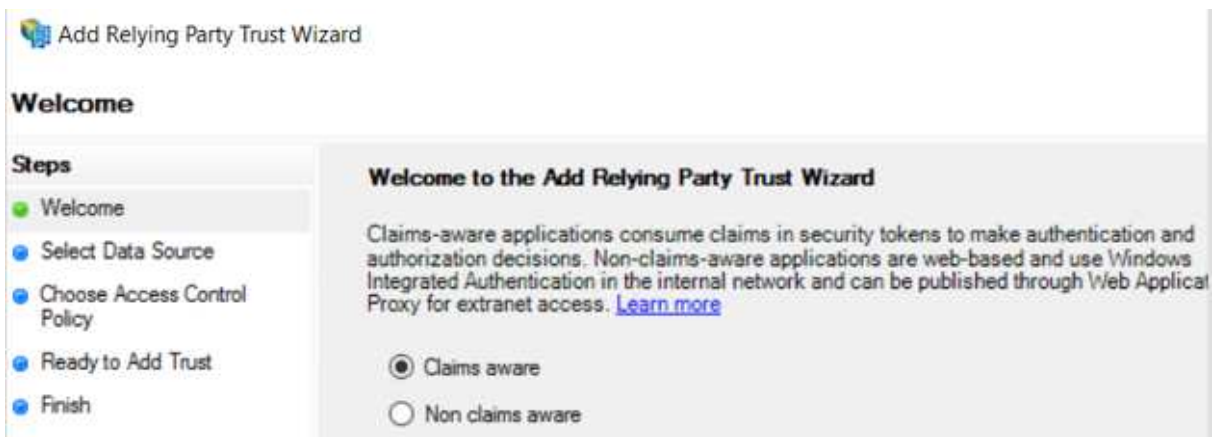
11. SAML2 ADFS SERVER CONFIGURATION

To create the Relay Party:

1. Start **AD FS Management** console.
2. In the **AD FS** folder, select **Relying Party Trust** folder.



3. In the **Actions** pane, in the **Relying Party Trusts** section, click **Add Relying Party Trust**.
4. In the **Welcome** page, select **Claims aware**.



5. In the **Specify Display Name** page, select Enter data about the relying party manually
6. Enter the Web Front-End server name.



Add Relying Party Trust Wizard

Specify Display Name

Enter the display name and any optional notes for this relying party.

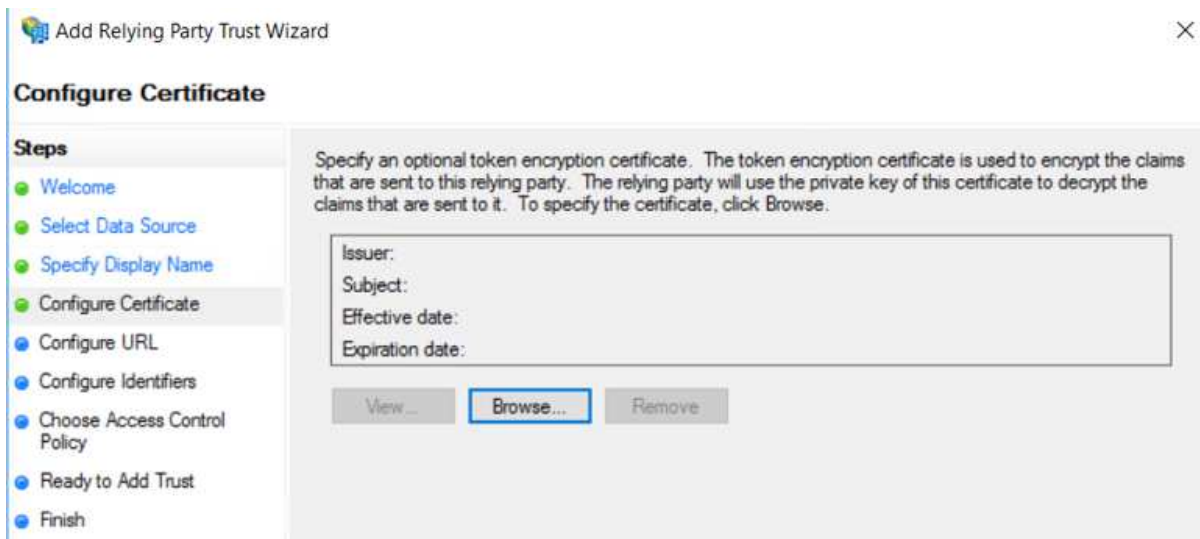
Display name:
vp-hip-hopex770.westeurope.cloudapp.azure.com

Notes:
HOPEX Web site with version 770 and UAS in standalone

Steps

- Welcome
- Select Data Source
- Specify Display Name
- Configure Certificate
- Configure URL
- Configure Identifiers
- Choose Access Control Policy
- Ready to Add Trust
- Finish

7. Click **Next**.



Add Relying Party Trust Wizard

Configure Certificate

Specify an optional token encryption certificate. The token encryption certificate is used to encrypt the claims that are sent to this relying party. The relying party will use the private key of this certificate to decrypt the claims that are sent to it. To specify the certificate, click Browse.

Issuer:
Subject:
Effective date:
Expiration date:

View ... **Browse...** Remove

Steps

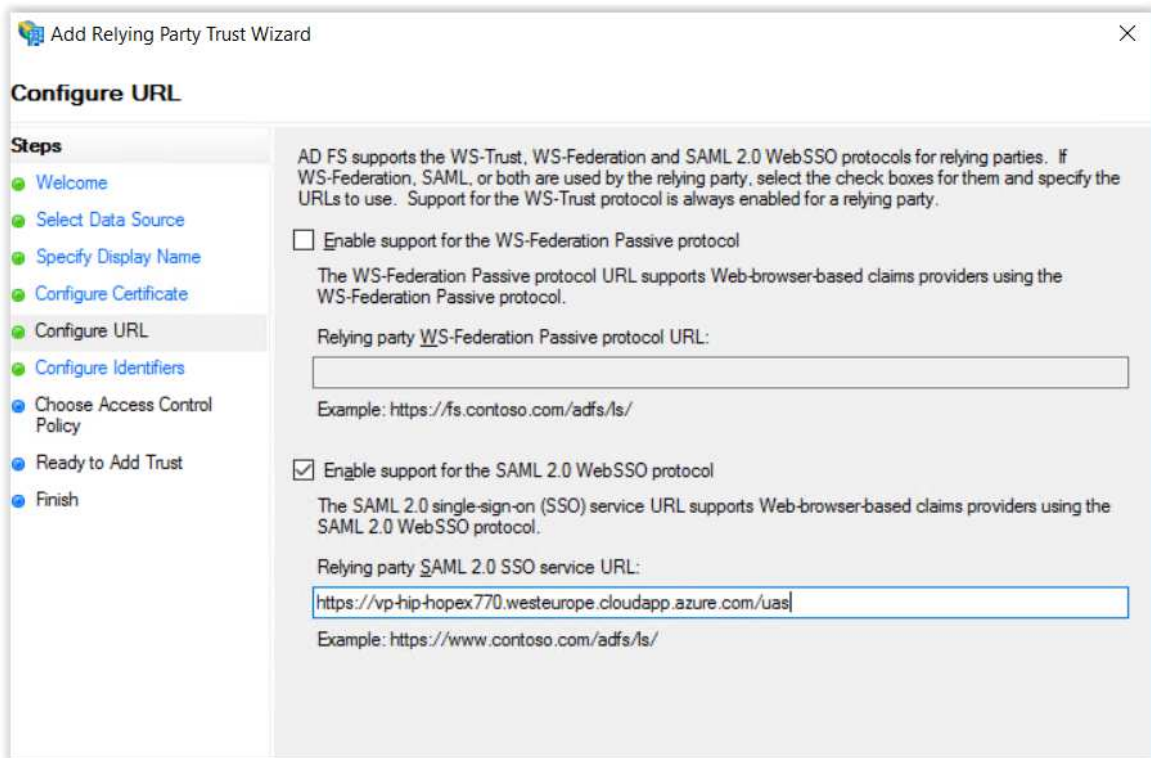
- Welcome
- Select Data Source
- Specify Display Name
- Configure Certificate
- Configure URL
- Configure Identifiers
- Choose Access Control Policy
- Ready to Add Trust
- Finish

8. Click **Browse**.

9. In the **Configure URL** page, select **Enable support for the SAML2 Web SSO protocol**.

10. Enter the **Relying party SAML2 SSO service URL**:

`http://{servername}/uas/AuthServices/Acs`



Add Relying Party Trust Wizard

Configure URL

Steps

- Welcome
- Select Data Source
- Specify Display Name
- Configure Certificate
- Configure URL**
- Configure Identifiers
- Choose Access Control Policy
- Ready to Add Trust
- Finish

AD FS supports the WS-Trust, WS-Federation and SAML 2.0 WebSSO protocols for relying parties. If WS-Federation, SAML, or both are used by the relying party, select the check boxes for them and specify the URLs to use. Support for the WS-Trust protocol is always enabled for a relying party.

☐ Enable support for the WS-Federation Passive protocol

The WS-Federation Passive protocol URL supports Web-browser-based claims providers using the WS-Federation Passive protocol.

Relying party WS-Federation Passive protocol URL:

Example: https://fs.contoso.com/adfs/ls/

☒ Enable support for the SAML 2.0 WebSSO protocol

The SAML 2.0 single-sign-on (SSO) service URL supports Web-browser-based claims providers using the SAML 2.0 WebSSO protocol.

Relying party SAML 2.0 SSO service URL:

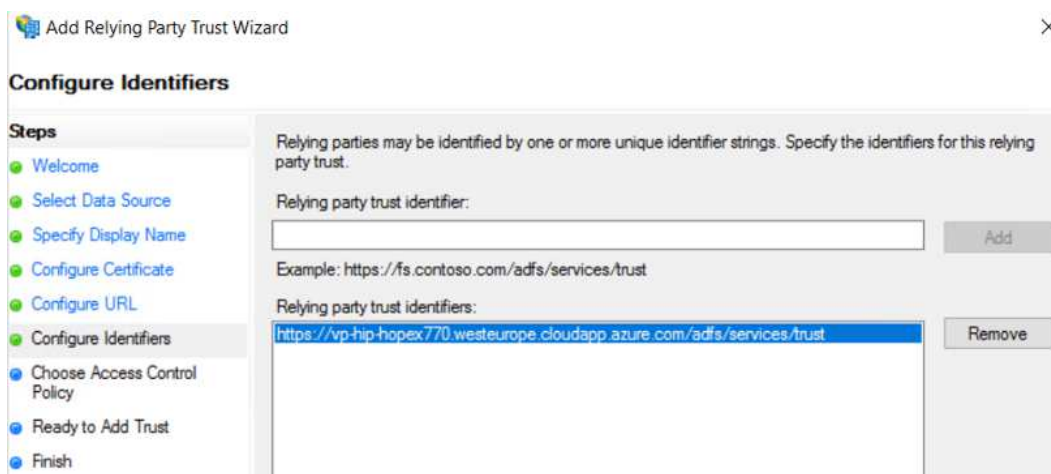
https://vp-hip-hopex770.westeurope.cloudapp.azure.com/uas

Example: https://www.contoso.com/adfs/ls/

11. In the **Configure Identifiers** page, enter the **Relying party trust identifier**:

http://{servername}/uas

12. Click **Add**.



Add Relying Party Trust Wizard

Configure Identifiers

Steps

- Welcome
- Select Data Source
- Specify Display Name
- Configure Certificate
- Configure URL
- Configure Identifiers**
- Choose Access Control Policy
- Ready to Add Trust
- Finish

Relying parties may be identified by one or more unique identifier strings. Specify the identifiers for this relying party trust.

Relying party trust identifier:

Example: https://fs.contoso.com/adfs/services/trust

Relying party trust identifiers:

https://vp-hip-hopex770.westeurope.cloudapp.azure.com/adfs/services/trust

Remove

13. Click **Next**.

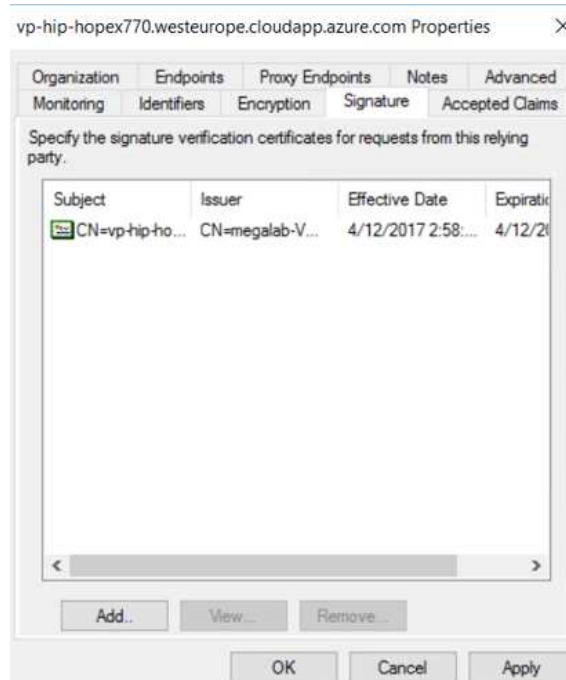
To add Signature certificate imported from the front server:

1. Import the certificate to the local storage.
2. Export the certificate without the private key.

To assign the certificate in ADFS:

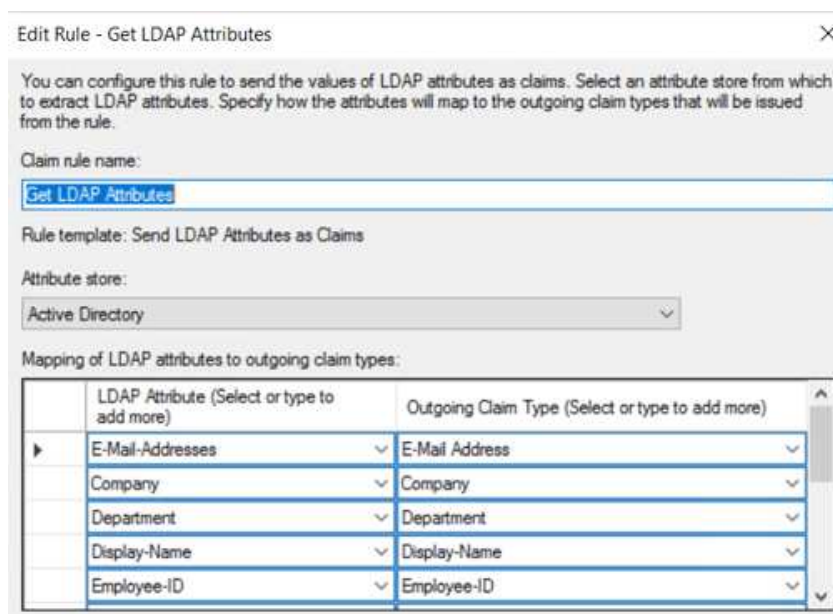
1. Right-click the Relay party.
2. In the **Signature** tab, select the imported certificate file

3. Click **OK**.



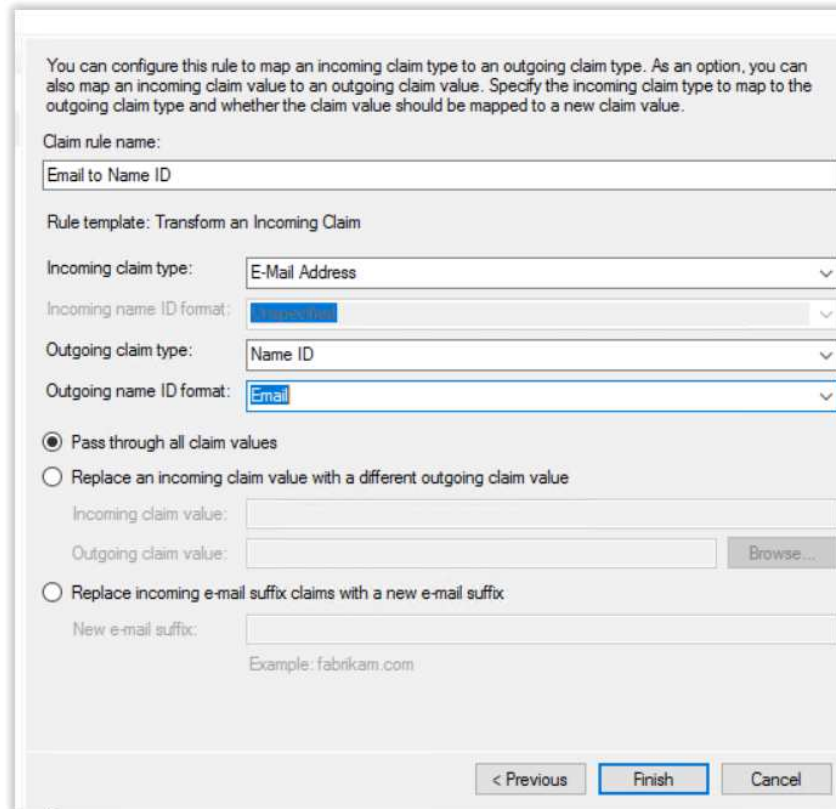
To configure claims to be returned to UAS

1. Select the Relay and click **Edit Claim Issuance Policy**.
2. Click **Add Rule**.
3. Select "Send LDAP Attributes as Claims".
4. Enter the name "Get LDAP Attributes".
5. Select Active Directory as Attribute store.
6. Add attributes and transformation rules.



7. Click **OK**.
8. Click **Add rule**.

9. Select Transform an incoming claim.
10. In the **Incoming claim type** field, select “E-Mail Address”.
11. In the **Outgoing claim type** field, select **Name ID**.
12. In the **Outgoing name ID format**, select “Email”.



13. Click **Finish**.
14. Click **Add Rule**
15. Select **Transform an incoming claim**.
16. Enter E-Mail Address to sub as rule name.
17. Select “E-Mail Address” as incoming.
18. Enter “sub” as outgoing.
19. Click **Finish**.

To configure UAS to enable SAML2 Provider and to communicate with ADFS:

1. Open **HOPEX Administration**.
2. Right-click **HOPEX** and select **Options > Modify**.
3. Expand **Installation > Authentication > Identity Provider** folders.
4. Select **Identity provider** folder, and in the right pane, select **Activation of the SAML2 identity provider**.
5. Select **SAML2** folder and in the right pane, in:
 - the **Location of the metadata file**: enter your federationmetadata.xml URL.

- the Identifier of the SAML2 identity provider: enter the ADFS URL.

12. WINDOWS AUTHENTICATION IN CLUSTER MODE WITH UAS

If you want to use windows authentication with UAS in an intranet network with a Network Load Balancer, you need some prerequisites:

1. Create an account service as follows:
 - a. This account must belong to **IIS_WPG** group.
 - b. Define the delegation level on "Trust the user for delegation to any service (Kerberos Only)".
 - c. Add this account service to **IIS_USRS** group on all the nodes of your cluster.
2. In the **appHost.config** file (c:\windows\system32\inetsrv\config), deactivate the kernel mode.
3. Activate the account service use: **useAppPoolCredentials="true"**.
4. Add read rights with account service on:
 - c:\inetpub\wwwroot
 - c:\inetpub\wwwroot\uas
 - c:\inetpub\wwwroot\hopex
 - c:\inetpub\wwwroot\windowsAuthenticationService
5. Add full control with account service on:
 - C:\Windows\Microsoft.NET\Framework64\v4.0.30319\Temporary ASP.NET Files
 - C:\Windows\Microsoft.NET\Framework32\v4.0.30319\Temporary ASP.NET Files
6. At DNS level:
 - a. Define a host name for the Network Load Balancer(NLB).
 - b. Define an alias host name by machine in the same Network Load Balancer domain.
 - c. In your port rules, put single affinity.
7. Configure the Service Principal Name (SPN):
 - a. Set SPN on the NLB by FQDN and Short Name with your account service
 - b. Set SPN on each node of your cluster by FQDN and Short name with your account service

Example:

```
setspn -S HTTP/NLBName.domain.com domain\webapplicationaccount (NLB)
setspn -S HTTP/NLBName domain\webapplicationaccount
setspn -S HTTP/ServerName1.domain.com domain\webapplicationaccount
setspn -S HTTP/ServerName1 domain\webapplicationaccount
setspn -S HTTP/ServerName2.domain.com domain\webapplicationaccount
setspn -S HTTP/ServerName2 domain\webapplicationaccount
```

13. OKTA CONFIGURATION

13.1. Configuring OKTA

To configure OKTA:

- 1) Connect to your OKTA account.
- 2) Go to **Admin Portal > Applications**.
- 3) Click **Add application**.
- 4) Click **Create New App**.
- 5) Select **Web platform and SAML2 sign on method**.
- 6) Click **Create**.
- 7) Enter the **General Settings** as you want.
- 8) Click **Next**.
- 9) Enter **Single Sign on URL** with the following URL syntax:
`http://<server name>/uas/authservices/acs`
- 10) Enter **Audience URI** and **Default Relay state** with the following URL syntax:
`https://<server name>/uas`
- 11) In **Attribute statements**, do not forget to add an attribute named “sub” and its value will be your UAS login so you can choose user login or email.
- 12) Retrieve the SAML metadata and store it in UAS folder or secured folder in your network accessible by HTTP.

13.2. Configure UAS with OKTA

To configure UAS with OKTA:

- 1) Go to HOPEX Administration.
- 2) Right-click **HOPEX** and select **Options > Modify**.
 (Check that you are in Extended view)
- 3) Expand **Installation > Authentication** folders.
- 4) Select **Identity Providers** and in the right pane, select “Activation of the SAML2 identity provider”.
- 5) Expand **Identity Providers** and select **SAML2**.
 - In the “**Contact email**” field: enter OKTA administrator email.
 - In the “**Location of the metadata file**” field: enter the UAS URL where you store the metadata retrieved before.
 - In the “**Identifier of the SAML2 identity provider**” field: enter the Url in the following format:
`http://www.okta.com/<youroktaid>`
 - In the “**Return URL**” field : enter the Hopex URL in the following format:
`https://<server name>/hopex`
 - In the “**Sign on URL**” field Enter your Sign on URL:

`https://<name of your organization>.okta.com/app/<appname>/<oktaid>/sso/saml`

- Set the certificate friendly name and password if it is necessary.

14. TERMINOLOGY

14.1. Client

A client is a piece of software that requests tokens from UAS - either for authenticating a user or for accessing a resource (also often called a relying party or RP). A client must be registered with the OP.

Examples: Web applications, native mobile or desktop applications, Single Page Applications (SPA), server processes etc.

14.2. User

A user is a person who is using a registered client to access his or her data.

14.3. Scope

Scopes are identifiers for resources that a client wants to access. This identifier is sent to the OP during an authentication or token request.

By default, every client can request tokens for every scope, but you can restrict that.

They come in two flavors.

14.3.1. Identity scopes

Requesting identity information (aka claims) about a user, e.g. his name or email address, is modeled as a scope in OpenID Connect.

There is e.g. a scope called profile that includes first name, last name, preferred username, gender, profile picture and more. You can read about the standard scopes [here](#) and you can create your own scopes in UAS to model your own requirements.

14.3.2. Resource scopes

Resource scopes identify web APIs (also called resource servers) - you could have e.g. a scope named calendar that represents your calendar API.

14.4. Authentication/Token Request

Clients request tokens from the OP. Depending on the scopes requested, the OP will return an identity token, an access token, or both.

14.4.1. Identity Token

An identity token represents the outcome of an authentication process. It contains at a bare minimum an identifier for the user (called the sub aka subject claim). It can contain additional information about the user and details on how the user authenticated at the OP.

14.4.2. Access Token

An access token allows access to a resource. Clients request access tokens and forward them to an API. Access tokens contain information about the client and the user (if present). APIs use that information to authorize access to their data.

15. PROTOCOL SPECIFICATIONS

Open ID Specifications: <http://openid.net/connect/>

OAUTH2 Specifications: <https://tools.ietf.org/html/rfc6749>

SAML2 Specifications: <https://tools.ietf.org/html/rfc7522>

16. TROUBLESHOOTING

16.1. General

If you have problems with UAS, launch HOPEX Daily Logs, you need to activate “Hopex Web App Logs” to see UAS logs.

You can also use Hopex Monitor Console.

16.2. Get information about configuration

UAS use an SSP webservice to retrieve HOPEX options.

You can request it to know if your configuration is well defined.

You need to type this URL below if you want to retrieve a specific authentication configuration :

`http://<servername>/megassp/sitecfg.mgsp?skey=<serialkey>§ion=<sectionname>&key=<keyname>`

16.3. Redirect Server name to Full Qualified Domain name

To redirect Server name to Full Qualified Domain name:

1. Download IIS rewrite module 2 at:

http://download.microsoft.com/download/D/D/E/DDE57C26-C62C-4C59-A1BB-31D58B36ADA2/rewrite_amd64_en-US.msi

2. Install it.

3. Into system.webServer in the web.config file, add the following:

```
<rewrite>
  <rules>
    <rule name="Redirect2FQDN" stopProcessing="true">
      <match url="(.*)" />
      <conditions>
        <add input="{HTTP_HOST}" pattern="^(^\.]+$" />
      </conditions>
      <action type="Redirect" url="http<s>://{HTTP_HOST}.mega.com/hopex" />
    </rule>
  </rules>
</rewrite>
```

4. Change the domain **.mega.com** by yours.

16.4. Client configuration in Windows Authentication mode

To avoid the basic login popup, you must configure this website like a Local intranet website.

To configure the website like a local intranet website:

- 1) Open your "Internet browser".
- 2) Go to **Internet Options**.
- 3) Select **Security** tab.
- 4) Click **Local Intranet**.
- 5) Click **Sites**.
- 6) Click **Advanced**.
- 7) In the **Add this website to the zone** field, enter: "http://<domain name>".
- 8) Click **Add**.
- 9) Click **Close**.

16.5. Filtering Windows group

In Windows authentication mode, when you have too many Windows groups, you can filter them.

You can filter either by group number or by group name.

16.5.1. Filtering Windows group by number

MaxWindowsRoles enables to filter the Windows groups by number.

By default, the filter is disabled (value="0").

You can set this value to the number of Windows groups you want.

To filter Windows group by number:

- 1) In HOPEX installation folder, expand **wwwroot** > **WindowsAuthenticationService** folders.
- 2) Open the **Web.config** file.
- 3) In the **appSettings** section, set the **MaxWindowsRoles** value to the number of Windows group you want:

```
<appSettings>
  <add key="MaxWindowsRoles" value="<number of Windows groups>" />
  <!-- <add key="WindowsRoles" value="" />-->
</appSettings>
```

16.5.2. Filtering Windows group by name

Windows Roles enables to filter the Windows groups by name.

By default, the filter is disabled.

Values are group names separated with a " ; ".

To filter Windows group:

- 1) In HOPEX installation folder, expand **wwwroot** > **WindowsAuthenticationService** folders.
- 2) Open the **Web.config** file.

- 3) In the **appSettings** section, remove the comment characters (`<!-- -->`) and add the group names separated with a `“;”`:

```
<appSettings>
  <add key="MaxWindowsRoles" value="0"/>
  <add key="WindowsRoles" value="GroupName1;GroupName2;GroupName3"/>
</appSettings>
```

UAS Tools

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1. PURPOSE

UAS Tools serves as an easy means to configure and diagnose UAS. It is made of two entities: the Configuration section and the Diagnostic section. Its purpose is thus twofold: prevent UAS configuration errors by validating options beforehand and provide insight on existing UAS errors by analyzing the log files.

You may access it via you web browser, at the following address:

`http(s)://<hopex_server_or_cluster_url>/uastools`

2. CONFIGURATION

The **Configuration** tab of UAS Tools displays a wizard that allows you to configure UAS options. It aims at showing and asking you the least information possible, as several options can be inferred from others.

You will input information in the home page (the configuration page) and if everything is valid, you will then be presented with the result page that will give you information on how to include the generated configuration files in UAS.

2.1. Configuration page

The configuration tab is split in three categories presented as a wizard:

- Getting Started
- Identity Provider
- CORS (Cross-Origin Resource Sharing)

You can go from step to step as you wish if there are no client-side validation errors.

If there are any errors at this point, they appear either below the corresponding field, or at the top of the related section.

The **CORS** section includes a publish button ("**Generate configuration**"), which submits all the form data to the server where they will be subject to more advanced validation. As with the client-side errors, server-side errors will be shown at their correct location, and the wizard will switch back to the first section.

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2.1.1. Getting Started

[Configuration](#) [Diagnostic](#) [Documentation](#)

[Getting Started](#) [Identity Provider](#) [CORS](#)

[Basic Settings](#) [Identity Provider Settings](#) [Cross-Origin Resource Sharing Management](#)

General Information (everything is required)

★Topology

Standalone

Front server

☐ Use HTTPS

★Front URL (load balancer or server name)

http://vp-dl-785int2

★Orchestrator server (SSP) Url

http://vp-dl-785int2/megassp

★Security key

.....

Signing certificate

★Certificate name

mega.com

★Certificate password

.....

Next

In the **General Information** section, you can select the topology of the server, which defaults to Standalone. In case of Cluster mode, some additional options pertaining to cache management are displayed.

The **Front server** section lets you input Hopex and SSP URLs, as well as the related Security Key.

- Front Server URL should indicate only the root address, i.e., do not add */hopex* or */uas*
- SSP URL is usually the same address as above, appended with */megassp*
- The Security Key is found in clear text during HOPEX install time, or encrypted in the UAS **web.config** file

The certificate section lets you input information concerning the certificate. It must be installed on each server UAS is installed on. This is especially important in Cluster mode.

2.1.2. Identity Providers

Configuration
Diagnostic
Documentation

Getting Started
Basic Settings
Identity Provider
Identity Provider Settings
CORS
Cross-Origin Resource Sharing Management

Please select at least one provider.

HOPEX
☒ Use HOPEX
[More information](#)

SAML2
☐ Use SAML2
[More information](#)

Microsoft
☐ Use Microsoft
[More information](#)

SalesForce
☐ Use SalesForce
[More information](#)

Windows
☐ Use IIS Windows
[More information](#)

Google
☐ Use Google
[More information](#)

Custom OpenID
☐ Use Custom provider
[More information](#)

Previous
Next

In the providers sections, you can add the authentication providers UAS will use. You need to select at least one authentication provider. Unlike almost all other sections in UAS Configuration tool, the following providers information cannot be validated on the server-side, so make sure they are correct:

- Microsoft
- Google
- Salesforce

Note: for now, the client secret for these providers will be written in plain text in megasite.ini for Hopex V2R1.

If you need help for a provider, click the “More information” link at the bottom of every section, which will open the UAS documentation directly on the correct section.

2.1.3. CORS

Configuration Diagnostic
Documentation

Getting Started
Basic Settings
Identity Provider
Identity Provider Settings
CORS
Cross-Origin Resource Sharing Management

Add or remove CORS as needed. Order is not important.

More information

Add Remove

URL
http://www.mega.com

Client
Hopex Web Site

Add Remove

URL
http://www.microsoft.com

Client
API

Add Remove

URL
http://www.apple.com

Client
Windows

Previous
Generate configuration

In the **CORS** section, you can add or remove CORS as needed, up to a maximum of 5, by using the Add and Remove buttons.

The order in which you add them is not important.

If you need help concerning CORS, click the **More information** link pointing to UAS documentation that will give you more details.

When you are done with everything, click **Generate configuration** to validate your changes and create a configuration file that will be used to configure UAS.

2.2. Result page

Configuration
Diagnostic
Documentation

Configuration results

1 Replace or add this settings

```
<add key="AuthenticationUrl" value="http://vp-dl-785int2/uas" />
<add key="DelegatedLogin" value="2" />
```

Copy this settings and paste it in your appsettings section in your HOPEX web.config

2 Download the following file and update your megasite.ini contents

[Click here to download](#)

Copy this file content and paste it in your megasite.ini

After successful validation of the configuration, the **Result page** is displayed.

Depending on the Topology, you have specific actions to perform. You have to:

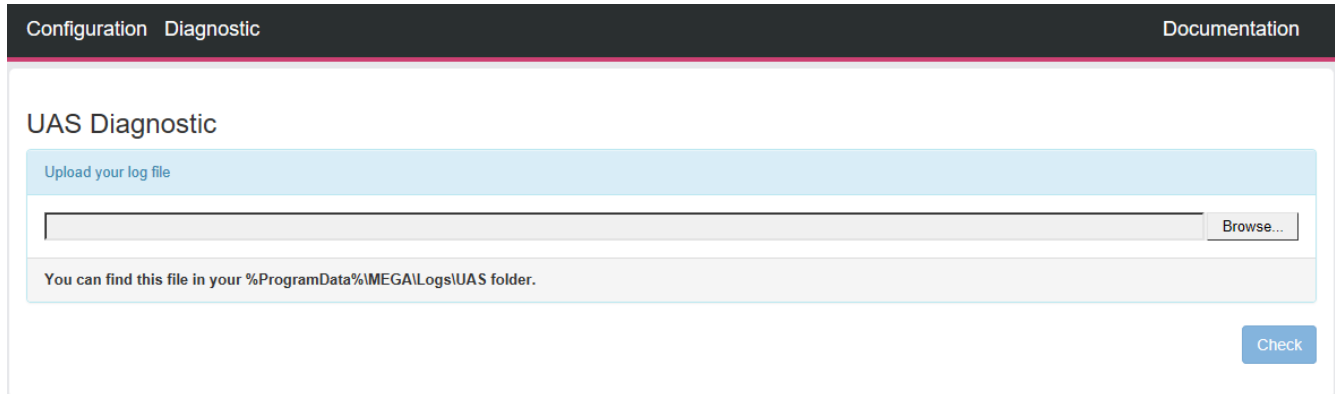
- Edit the HOPEX web.config and perform the changes displayed in the first section of this page (*Replace or add these settings*)
- For HOPEX V2R1
 - Download the megasite.ini file, populated with entries concerning UAS, that need to be injected in HOPEX megasite.ini
- For HOPEX V2
 - Download and overwrite UAS config.json file
- In cluster mode, install the same signing certificate on each node.

3. DIAGNOSTIC

As well as helping you configure UAS, UAS Tools also allows you to diagnose existing issues.

To diagnose existing issues:

1. In the UAS Tools menus, click the **Diagnostic** tab.



1. In the **Upload your log file** section, upload the log file you want to diagnose:
 - a. Click **Browse**.
 - b. In the dialog box: enter %ProgramData%\MEGA\Logs\UAS to reach the log file location.
 - c. Select the log file.

Your file is uploaded.

2. Click **Check** to analyze the log file.

UAS Diagnostic tool automatically loads the configuration from the log file (the last one present in the file), and it analyzes it too.

When UAS Diagnostic is done, the **Diagnostic result** page is displayed.

Diagnostic result

General

⚠ SSP Url
Impossible to contact SSP Website

[Edit Configuration](#)

Provider

Logging

i Your log file doesn't reveal any serious anomalies. If there is a real problem, please send the logs to Mega Support for investigation.

Log details :

Time	Source	Message
09:49:36,123	/LM/W3SVC/1/ROOT/UAS	Unhandled exception System.NullReferenceException: Object reference not set to an instance of an object. at Mega.UAS.DataComponent.CustomViewService.SanitizeEnvironments(HopexEnvironments environments) at Mega.UAS.DataComponent.CustomViewService.Login(LoginViewModel model, SignInMessage message) at IdentityServer3.Core.Results.LoginActionResult.<>c__DisplayClass2.<<.ctor>b_0>d_4.MoveNext() --- End of stack trace from previous location where exception was thrown --- at System.Runtime.CompilerServices.TaskAwaiter.ThrowForNonSuccess(Task task) at System.Runtime.CompilerServices.TaskAwaiter.HandleNonSuccessAndDebuggerNotification(Task task) at IdentityServer3.Core.Results.HtmlStreamActionResult.<Render>d__0.MoveNext() --- End of stack trace from previous location where exception was thrown --- at System.Runtime.CompilerServices.TaskAwaiter.ThrowForNonSuccess(Task task) at System.Runtime.CompilerServices.TaskAwaiter.HandleNonSuccessAndDebuggerNotification(Task task) at System.Threading.Tasks.Task.Wait(TimeSpan timeout, CancellationToken cancellationToken) at IdentityServer3.Core.Results.LoginActionResult.<Render>d__0.MoveNext() --- End of stack trace from previous location where exception was thrown --- at System.Runtime.CompilerServices.TaskAwaiter.ThrowForNonSuccess(Task task)

It is split in three main sections:

- **General** and **Provider** sections give you either the errors it encountered while analyzing the logs, or a message saying that the configuration is ok. You can edit the current configuration with the **Edit Configuration** link.
- **Logging** section shows a dump of the actual errors from the log file, with a message giving you advice on how to solve these issues, if necessary.

How to Migrate Data from Oracle to SQL Server Storage

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Summary

This document describes the procedures necessary for migrating data from Oracle storage to SQL Server storage.

It applies to HOPEX V2R1 Update 3.

This migration is an administration task performed by HOPEX Administrator in coordination with Oracle DBA and SQL Server DBA.

Note that repository snapshot objects are tied to low level information and cannot be transferred when data repository is rebuilt logically.

This means that they will NOT be available after migration from Oracle to SQL Server.

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2. RECOMMENDATIONS	5
3. PROCEDURE	6
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4. CHECK DATA	11

1. PRE-REQUISITES

1) Stop user activity and backup data

Follow standard procedures.

The objective is to make sure that data are not accessed not updated.

This means an interruption of service. Duration can vary according to volume of data.

Dummy run will enable to evaluate real duration.

2) Verify that a physical backup of data is available

Follow standard procedures.

3) Dispatch of delete all pending workspaces

Follow standard procedures.

The objective is that no pending update exist.

They can be exported as MGR file, cancelled or dispatched.

3) Verify you have enough working space

The process used the reorganization feature of HOPEX.

For each repository, data will be dumped to a large command file on disk using logical backup feature.

The generation folder is a subfolder of HOPEX environment folder. There is one file per repository. Ex:

<Myenvironment path>\SysDb\WORK

<Myenvironment path>\Db\MyDataRepository\WORK

4) Create SQL Server database with appropriate permissions

See SQL Server DBA.

For each repository (data repository or system repository) a SQL Server is required.

SQL Server database must be empty.

A SQL server user with appropriate permission must be created.

See HOPEX Administrator for details.

For more details, see only documentation.

Installation and Deployment : RDBMS Repository Installation Guide : SQL Server support, SQL Server Requirements.

Basic metrics:

For logical backup file: size of Oracle dump for the schema of the repository **x 5**

For logical backup file: size of Oracle dump for the schema of the repository **x 1**

Example	Size of .DMP in Oracle	Size expected for SQL Server database	Disk expected for logical backup file
Schema of MyRepository	5 Go	5 Go	25 Go
Schema of SystemDb	3 Go	3 Go	15 Go

5) Performances tuning indications

The article below contains optional indications to favor performances when performing mass import in SQL Server

<https://community.mega.com/t5/custom/page/page-id/mega-kb-solution?sid=5012p0000015TWLAA2>

2. RECOMMENDATIONS

1) Decide if you can delete repository log

Deciding to delete full/partially repository log has several benefits:

- Process is faster
- Process is more reliable
- Process requires less working space
- Final data will be less voluminous

2) Upgrade to most recent version available.

The version must be HOPEX V2R1 Update 3 or higher.

The objective is to benefit from recent fixes and to be under maintenance if ever an error occurs

- Make sur you are in a supported version
- Apply last CP/hotfix.

3) Use a server machine close to SQL Instances

The machine should be located as close as possible from Oracle instance and SQL server instance.

The objective is to have a performant and reliable access to data.

4) Leave the process running quietly.

In particular:

- Do not stop the HOPEX Process of the machine where it is running
- Do not stop Oracle instance (source data)
- Do not stop SQL Server instance (target data)
- Do not try to move the HOPEX environment folder used

5) Check process (test) on a copy of production

The more recent backup, the better vision you will have (duration, success).

a) Restore data according to standard procedures

b) Check that logical backup runs fully (dummy run)

If errors occur (related to logical backup step), analyze the errors with MEGA Technical Support.

c) Check complete process (dummy run)

If errors occur (likely related to import step), analyze the errors with MEGA Technical Support.

6) Loop until the processing runs without unexpected error.

You will have a good idea of

- Disk size required (logical backup file)
- SQL Server size required
- Global duration of operations

If an error occurs and the process fails or stops, do NOT reuse the target SQL Server database

For each repository involved:

- Delete the SQL Server database.
- Create a new SQL Server, possibility with same name.

3. PROCEDURE

3.1. General process

For each environment:

- Reorganize data repository **first**
- Reorganize system repository **last**

For each repository, it will be required to set:

- SQL Server Instance used
- SQL Server user/password used

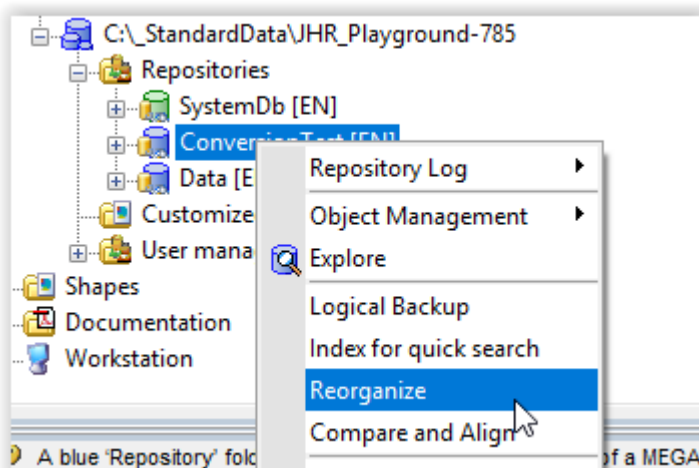
3.2. Procedure

Run Administration.exe

Open environment

Select the repository to reorganize

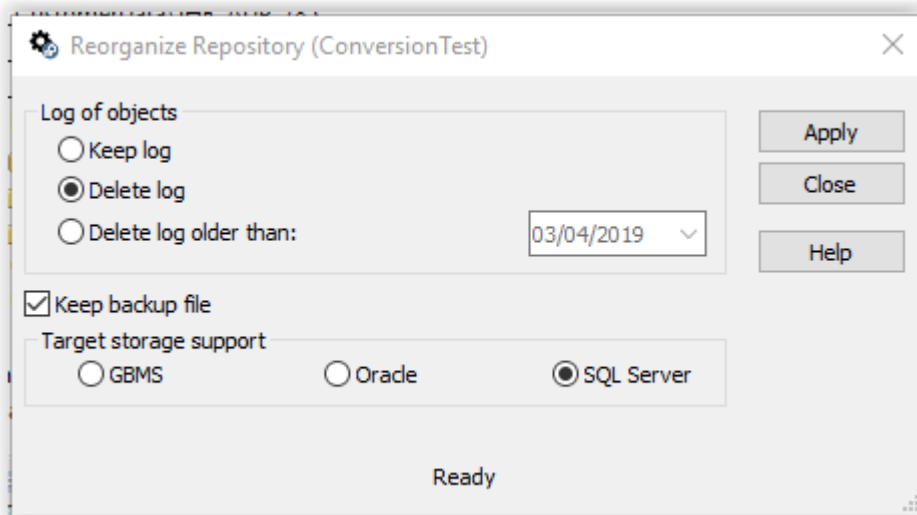
Right click > **Reorganize**



Configure window (Reorganize Repository (XX))

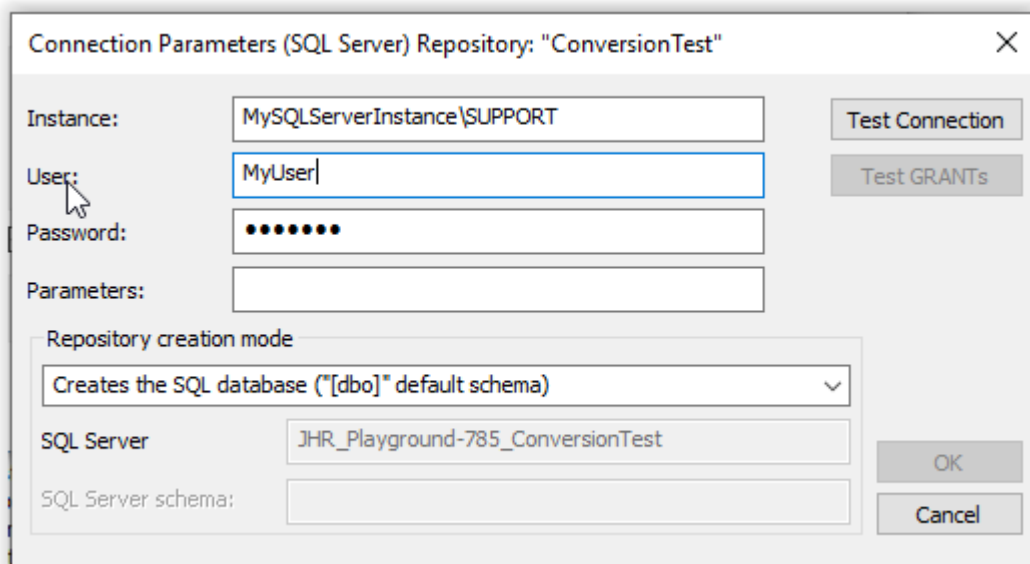
- Set **Logs of objects** (keep log, delete log, delete log order than date) according to decision
- Keep backup file** checked
- Select target storage support **SQL Server**

Example

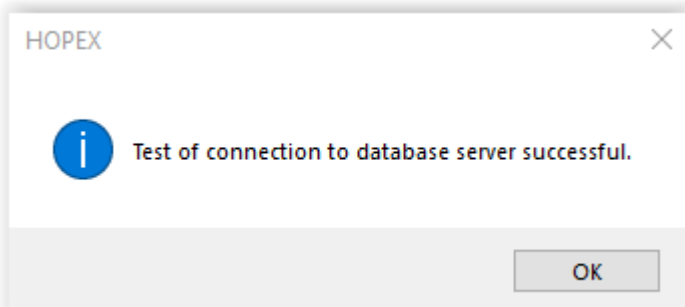


Click Apply

Set Connection parameters

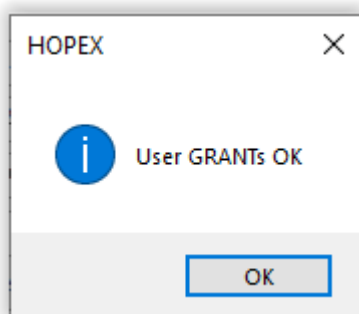


Click button 'Test Connection'

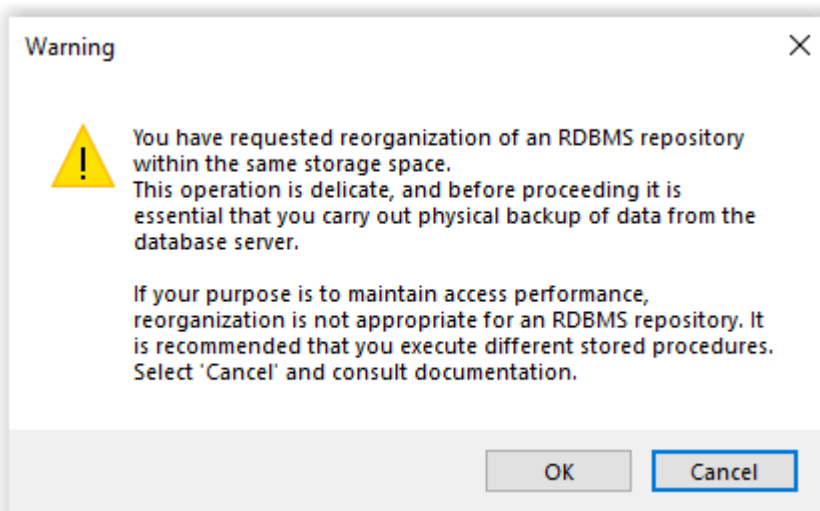


Click OK

Click button 'Test GRANTs'

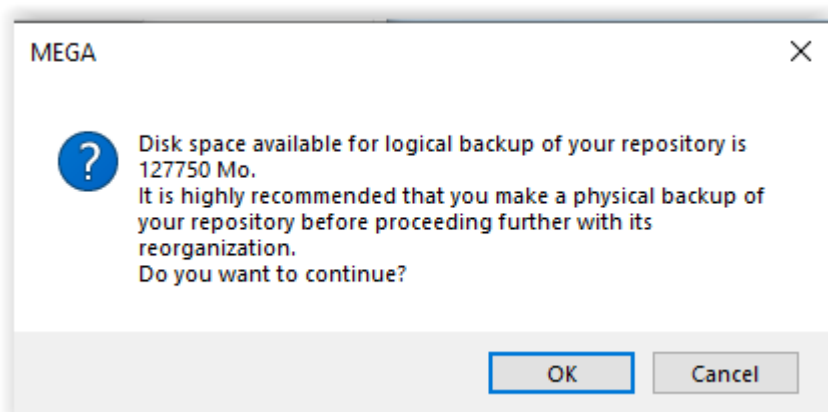


Click OK



Click OK to confirm

Note that reorganization is appropriate in this situation even if the following warning can create a doubt.
If your purpose is to maintain access performances, reorganization is not appropriate for an RDBMS repository

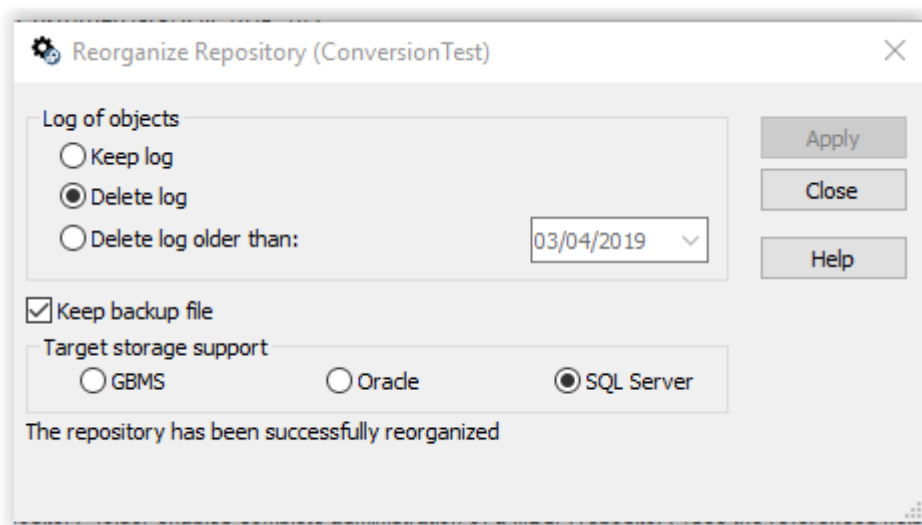


Click 'OK' to confirm

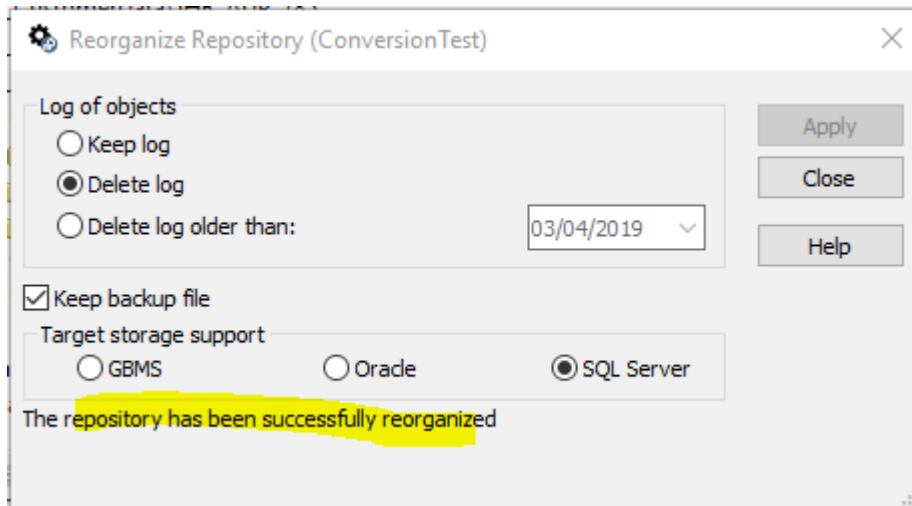
Process starts. Note that it goes through 2 mains steps:

- Logical backup
- Import

Wait until process ends. The following windows should be displayed.



Check message, ex 'The repository has been successfully reorganized'



Click button 'Close'

For more details, see only documentation, reorganization feature

HOPEX Administration: Administrator Guide : Managing Repositories : Managing Repositories :
Reorganizing an RDBMS Repository

4. CHECK DATA

The best proof is the fact that the process could run without error or that errors can be understood and accepted.

As a precautionary measure, you run a quick tour and check that upgraded data looks correct. Of course, this kind of check cannot be exhaustive, but it usually enables you to have a first feedback and confirm the migration process went well.

Example of scenario:

- Open a private workspace (ex-transaction).
- Browse through objects using query tools, navigation trees and diagrams.
- Perform insignificant updates (ex: change a character in a comment value, slightly move an object in a diagram...).
- Dispatch private workspace.