

# Installation and Deployment



HOPEX V2

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## Web Front-end Architecture Overview HOPEX V2 EN

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## Summary

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

This document applies to HOPEX V2.

It does not describe:

- How to perform installations (see installation documentation).
- How to install corrective patch (see how to upgrade CP documentation).
- How to manage installations (see administrator manuals).
- How product 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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## DEPLOYMENT TYPES

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

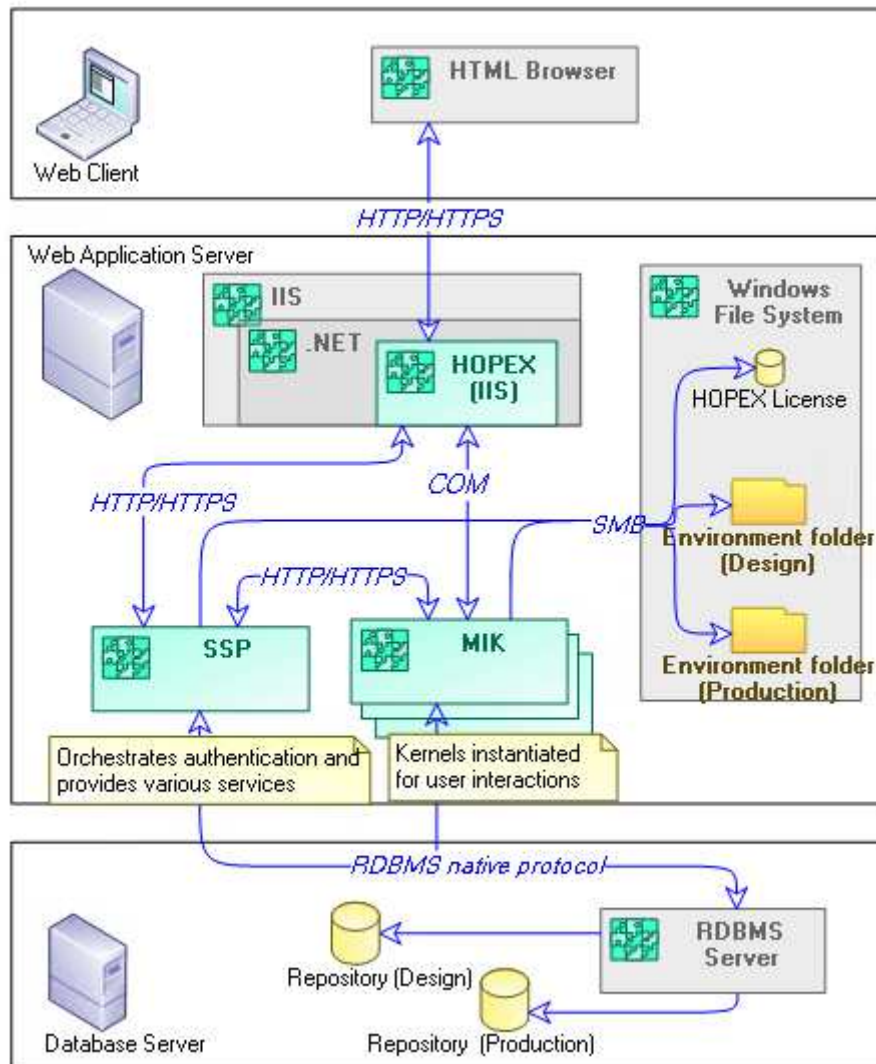
Deployment type	Recommended for	Comment
Standalone	Small deployment	2 tiers architecture All in one server. Very easy to install.
Horizontal scaling	Large deployment	Multi-tiers architecture Also called 'Scale up'
Vertical scaling	Large deployment	Multi tiers architecture Also called 'Scale out'

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

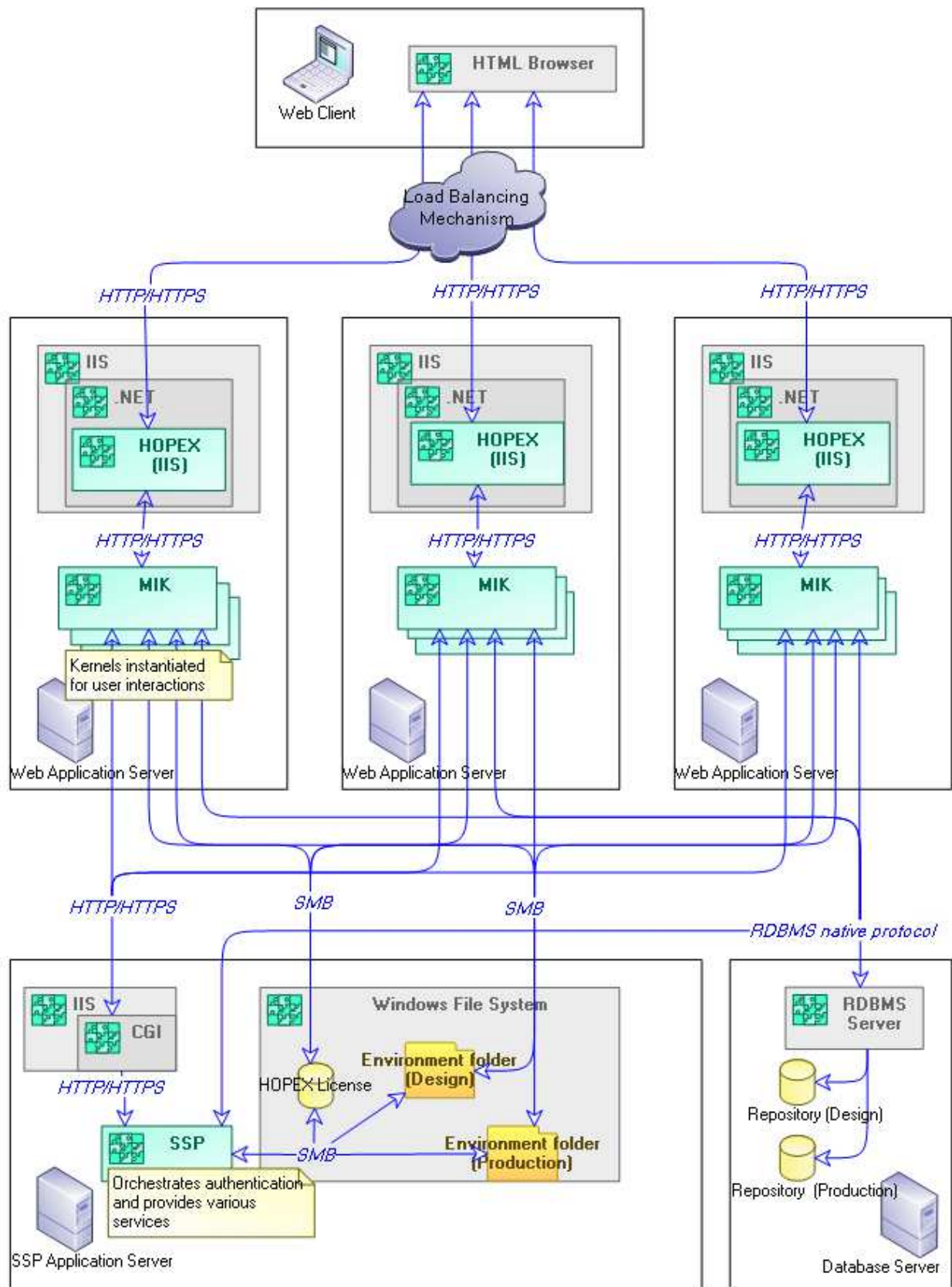
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## Standalone Deployment



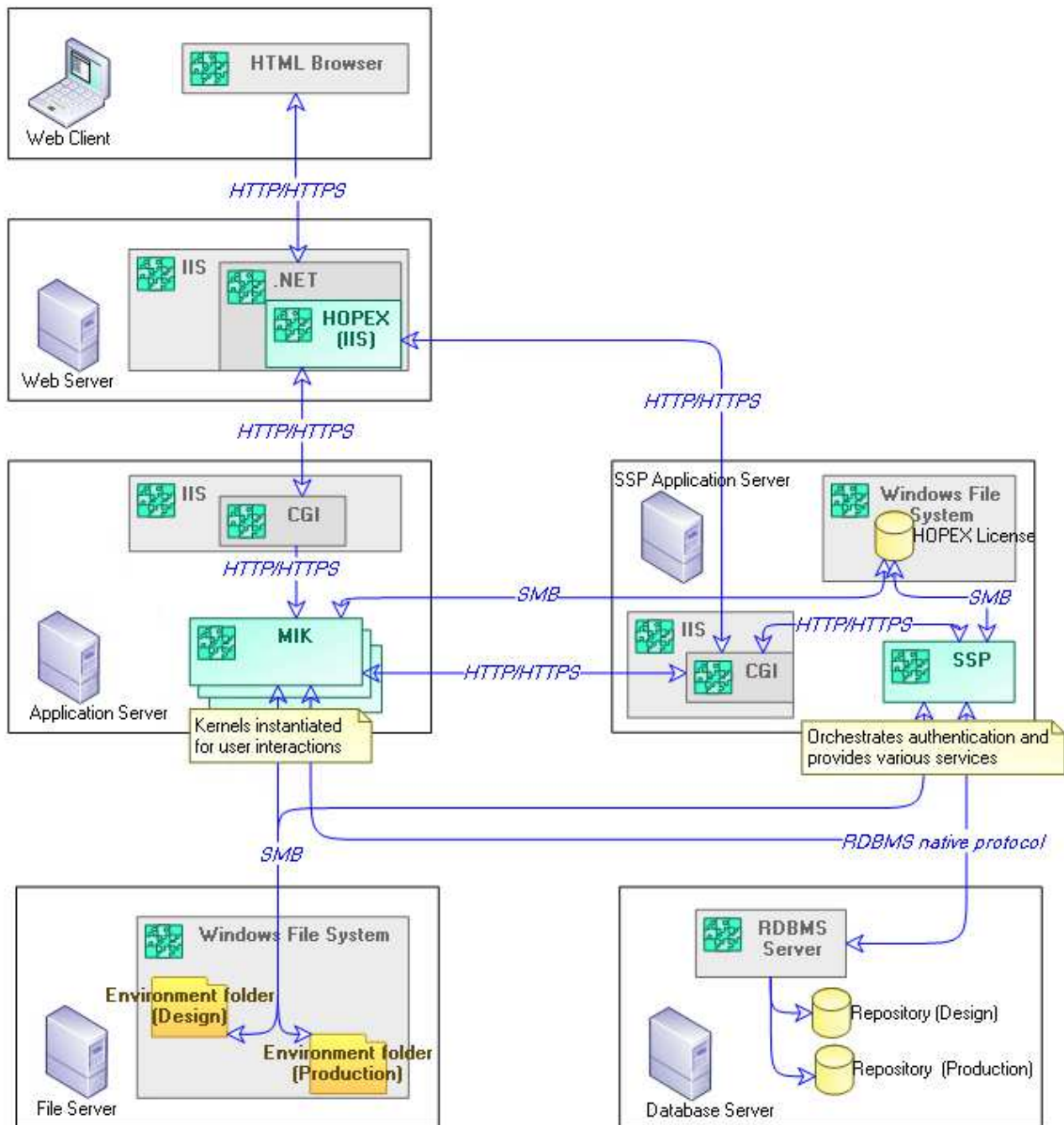
To facilitate readability, different elements have not been displayed (authentication server, mail server, SQL Server Native client required for SQL Server storage).

## Horizontal scaling Deployment



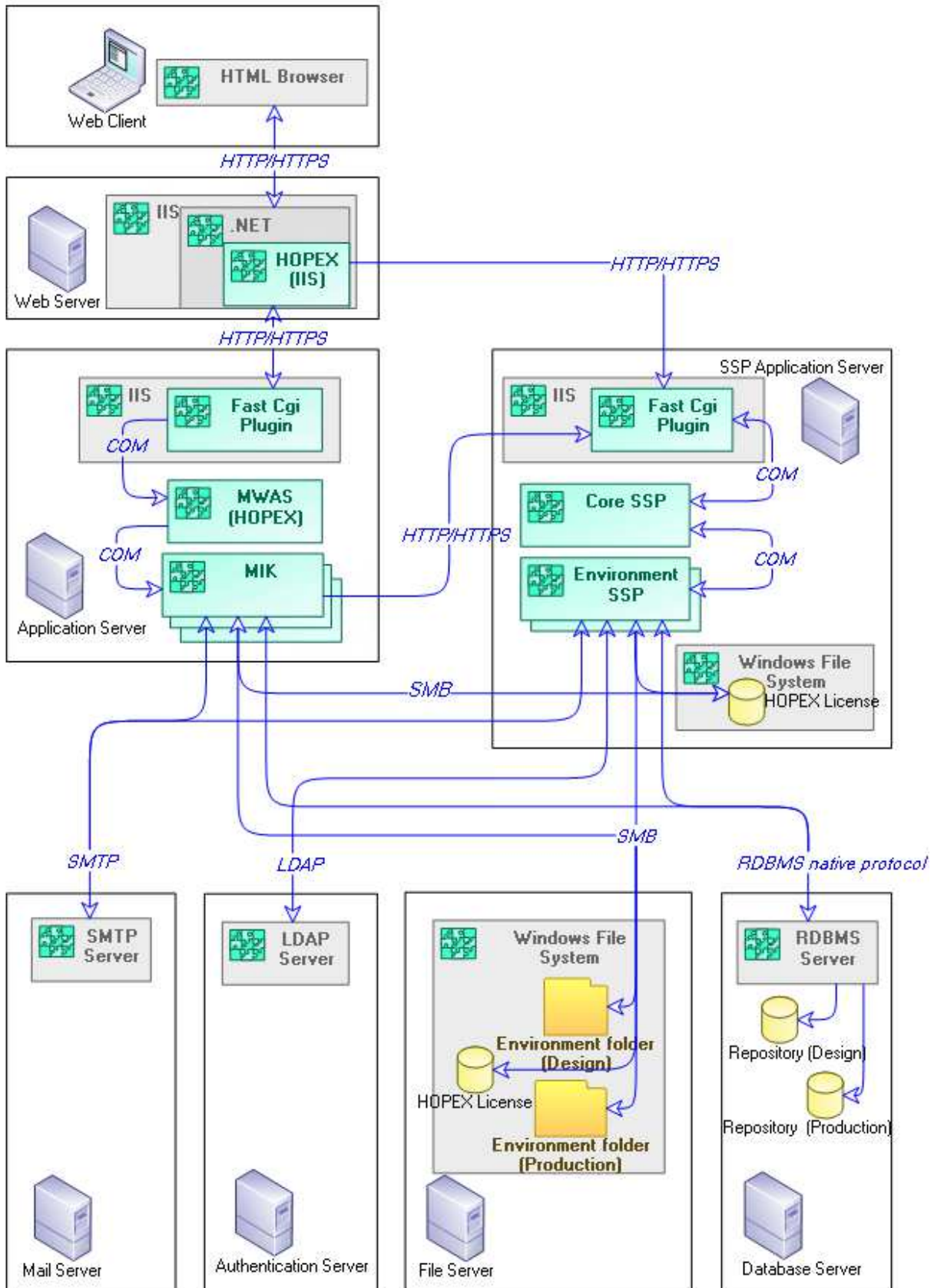
To facilitate readability, different elements have not been displayed (authentication server, document server, mail server, SQL Server Native client for SQL Server storage).

## Vertical scaling Deployment



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

## Vertical scaling Deployment (detailed view)



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

## COMMON DEPLOYMENT REQUIREMENTS

### Web Client

<b>HTML Browser 32/64 bit</b>	<b>MS Edge (1)</b> <b>MS Internet Explorer: (1)</b> 11.x recommended 10.x <b>Mozilla Firefox (1)</b> ESR <b>Google Chrome (1)</b>
<b>Configuration</b>	Screen resolution 1280x800 16 M colours JavaScript enabled Cookies enabled HTML 5 enabled Download of files enabled Popup blocker disabled
<b>Additional Software</b>	PDF reader RTF/DOC/DOCX reader XLS/XLSX reader

(1) Supported with minor restrictions. See FAQs section p. 25.

### Application Server

<b>Operating system</b>	Windows Server 2012 Windows Server 2012 R2 Windows Server 2016 For other systems a specific study is necessary <b>Visual C++ Redistributable for Visual Studio 2015 (1)</b> Supported for Microsoft Azure
<b>Hardware</b>	<b>Processor</b> Multi core <b>RAM</b> 4 GB minimum. 2 GB for the system Per environment SSP 300 MB Per equivalent modeller user 600 MB intensive use 300 MB low use <b>Disk space</b> 4 GB recommended for HOPEX Kernel 200 MB recommended for IIS applications 5 GB recommended per environment for cache 500 MB recommended for logs
<b>Additional Software</b>	SQL Server Native client 11.0 (SQL Server 2012, SQL Server 2014, SQL Server 2016) If data is stored in SQL Server

<b>Web Server</b>	MS Internet Information Services 8.0 MS Internet Information Services 8.5 MS Internet Information Services 10.0
<b>Script layer</b>	<b>ASP .NET</b> .NET Framework 4.6.1 or higher

(1) 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.

## File Server

<b>Operating system</b>	Windows Server 2012 SP2 Windows Server 2012 R2 Windows Server 2016 For other file systems a specific study is necessary
<b>Hardware</b>	<b>Processor</b> Multi core <b>RAM</b> 1 GB minimum. 1 GB for the system <b>Disk space</b> 5 GB recommended per HOPEX Environment (environment folder) 10 MB for HOPEX License

## Database Server

<b>Server System</b>	see RDBMS requirements
<b>RDBMS</b>	Oracle Database Server 12 SQL Server 2012 SQL Server 2014 SQL Server 2016
<b>Disk space</b>	Data: refer to the separate article 'RDBMS Repository Installation guide HOPEX V2'. 2 GB minimum per system database 1 GB minimum per data repository 1 GB minimum for business documents
<b>Hardware</b>	RAM: a specific study is required. Refer to the separate article 'RDBMS Repository Installation guide HOPEX V2'. CPU: see hardware requirements of the RDBMS.

## COMMUNICATION

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### Between Web Client and Web server (Web Application Server)

<b>Protocol</b>	HTTP by default
<b>Port</b>	80 by default
<b>Network bandwidth</b>	Per equivalent modeller user 60 Kbit/s average bandwidth 512 Kbit/s peak bandwidth
<b>Network latency</b>	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 V2'.

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

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

<b>Protocol</b>	Oracle: Oracle Native Protocol SQL Server: SQL Server Protocol
<b>Port</b>	Oracle: Example TCP 1521 (B) SQL Server: Example UDP/TCP 1433 (B)
<b>Network bandwidth</b>	1 Gbit/s minimum full duplex (C)
<b>Network latency</b>	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 V2'.

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

(C) For 30 concurrent users.

### Between Environment SSP or MIK and mail server

<b>Protocol</b>	SMTP
<b>Port</b>	25 by default, configurable

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

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

## Between Environment SSP and LDAP Server

<b>Protocol</b>	LDAP
<b>Port</b>	TCP 389 by default (B)
<b>Direction</b>	Bidirectional

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

## 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...)
Web Administration Desktop	Desktop of HOPEX Web Front-End	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

## 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 V2 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

## Authentication

Authentication is implemented at HOPEX Environment level.  
Several authentication models can be implemented:

Authentication models	Description	Comment
Centralized Authentication	Authentication process is external to the HOPEX platform. All types of IT corporate directory can be addressed (customized connector)	This model is recommended for advanced deployments with specific requirement. It requires a specific integration.
LDAP authentication	Authentication process is a collaboration between HOPEX Platform and an external directory. IT corporate directory supporting the LDAP protocol can be used (LDAP, Active Directory)	This model is recommended for common deployments. No integration is required, only configuration.
Standard authentication	Authentication process is managed within HOPEX Platform. Users are declared explicitly in the HOPEX Environment.	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
Centralized Authentication	According to implementation	According to implementation
LDAP authentication	LDAP directory	
Standard authentication (Autonomous)	System repository	Encrypted, hashed
Standard authentication (Active Directory)	Active Directory	According to directory specifications
Standard authentication (LDAP)	LDAP directory	

With Standard authentication, user passwords are initialized by the functional administrator. Then, they can be retrieved and reset without intervention of an administrator. With other authentication models, passwords are checked in the external directory and of course never updated through Web Front-End.

Reference:

- See online documentation, Authentication in HOPEX.
- Article 'Web connection overloading and configuration'.

## 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.

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.

## 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.

- Authentication in HOPEX.
- Profiles.
- Managing Data Writing Access.
- Managing Data Reading Access.


## 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.	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 (SQL Server 2012). 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).

Reference:

- Article 'RDBMS Repository Installation guide HOPEX V2'
- See online documentation, Products.

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## 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, Managing Business Documents.

## 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.

Different files can be created on server side:

File	Comment	Default location (example)
SSPLOGMM-DD-YY.txt	Log of Core SSP (1)(2)	%programdata%\MEGA\Logs Ex: C:\ProgramData\MEGA\Logs
ssperrYYYYMMDD.txt	Log of Environment SSP (1)(2)	%programdata%\MEGA\Logs Ex: C:\ProgramData\MEGA\Logs
MGWASLOGMM-DD-YY.txt	Log of MWAS (1)(3)	<iis root>\HOPEX\App_Data\MWAS\LOG\ Ex: C:\inetpub\wwwroot\HOPEX\App_Data\MWAS\LOG\
megaerrYYYYMMDD.txt	Error log of MIK (1) (3)	%programdata%\MEGA\Logs Ex: C:\ProgramData\MEGA\Logs
SSPSRVSM-DD-YY.txt	Log of supervision (1)(2)	%programdata%\MEGA\Logs Ex: C:\ProgramData\MEGA\Logs
swdlogMM-DD-YY.txt	Log Service Watchdog	%programdata%\MEGA\Logs Ex: C:\ProgramData\MEGA\Logs

- (1) location can be configured  
(2) Generated for the SSP application server  
(3) Generated for the web application server

## 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

- Enabling and Customizing Repository Indexing
- Performing a Quick Search

## 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 V2'.

## 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.

## 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, and German.

## 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

## 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

- Managing repositories
- Managing logfiles
- Optimizing Repository Access Performance.

## Regular administration tasks

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

Task	Server involved	Comment
Environment compilation	Application server	To build system cache. System updates are impossible during compilation
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.
Maintenance Plan	Database server	Need to stop SSP when running maintenance plan (SQL server)
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.
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)
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
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...)

Task	Server involved	Comment
		Can also be required in case of problem

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

## Reporting

There are three main categories of reports:

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

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
.DOC mode	No	Can be configured by default

Reference:


See online documentation

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

## 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.

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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'.

## Supervision

The HOPEX platform enables system monitoring.

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

The HOPEX Server Supervisor utility includes a supervision page (basic viewer for limited volume). A WMI probe enables to supervise HOPEX from standard tools supporting WMI (a specific integration is required).

## 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 V2\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 V2\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 V2\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

## Services and running processes

Two Windows services are created by the installation on the SSP application server:

Service	Executable	Startup type	User (1)	Server
Mega Site Service Provider	mgwssp.exe	Automatic	Local system	SSP server
Mega Service Watchdog	mgwdwd.exe	Automatic	Local system	Web application server

At runtime, several processes can be created.

Process	User	Comment	Number
mgwssp	Local system (1)	Core SSP	One 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)
mgwdwd.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

# FAQs

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## **What about HTML browsers other than Edge, IE, Chrome and Firefox?**

MEGA has decided to focus on IE, Chrome and Firefox. This does not mean that solutions do not run on web clients such as Apple Safari. It means only that these web clients are not supported.

## **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/>

## **What is the list of minor restrictions for Edge / IE / Chrome / Firefox?**

There are non-conformities to standards such as HTML browser zoom. The list is documented in the document 'Known issues version HOPEX V2 CPX'.

## **Is IE 9.0 still supported?**

With HOPEX V2, Internet Explorer 9.0 is supported but not recommended as support end date has passed. See <https://support.microsoft.com/en-en/lifecycle>

## **Is Windows Server 2008 R2 still supported?**

With HOPEX V2, Windows Server 2008 R2 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>

## **Is Windows Server 2016 supported?**

Windows Server 2016 is supported with HOPEX V2 CP04 and higher CP.

## **Is Oracle Database Server 11 still supported?**

With HOPEX V2, Oracle Database Server 11 is supported as database server and file server but not recommended as support end date has passed.

## **Is SQL Server 2008/2008 R2 still supported?**

With HOPEX V2, SQL Server 2008/2008 R2 is supported as database server and file server but not recommended as support end date has passed.

## **How can we guarantee high availability of the SSP Application Server?**

It is possible to build a system cluster. A specific study is required.

## **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.

## **How to configure HTTPS?**

This can be done through the installation program. See the article 'Web Front-End Installation Guide MEGA HOPEX V2'. Note that a certificate should be configured before installing HOPEX: see your IIS administrator.

## **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.

## **Can the HOPEX web Front-End run on a web server other than IIS?**

HOPEX V2 is designed for IIS only.

## **Can HOPEX solutions and products run on a mobile platform?**

Hopex products and solutions are designed for a web client running on a desktop or laptop computer with screen resolution 1280x800. It has not been designed for pads or smart phones.

However the technologies used by the HOPEX platform enabled to develop web application that can run on mobile platforms.

## **What are the web technologies used by HOPEX Platform?**

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

- Ajax.
- Extjs (4.2.x).
- Dojo.

On the server side, nothing is required except the .NET Framework. All necessary execution layers are installed by default. HOPEX V2 uses an embedded JRE (version 8).

## **What about other database servers?**

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

## **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...).

## **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.

## 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"> <li>Managing HOPEX environments.</li> <li>Managing HOPEX repositories.</li> <li>Managing HOPEX users.</li> <li>Managing HOPEX profiles.</li> </ul> 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.
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"> <li>Server 'iba.company.com'</li> <li>Server '192.888.777.666'</li> <li>Server 'SQL02'</li> </ul>
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.

Term	Definition
Environment, HOPEX Environment	<p>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.</p> <p>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.</p>
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
Fast Cgi Plugin	HOPEX component used for communication direct communication between .IIS and HOPEX Kernel component (C++) without .NET.
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."
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...
IIS (Microsoft Internet Information Services)	Microsoft technology. Web Server Platform enabling the execution of web applications.
Impersonate user	See service account

Term	Definition
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"> <li>Managing web user connections.</li> <li>Managing caches.</li> </ul> Used for HOPEX Web Front-end
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.
MWAS (HOPEX), MWAS	One of the two core HOPEX components of the web application together with the SSP component. It runs on the web application server (one per server). In a cluster installation there can be several web application servers (MWAS nodes) but only one SSP server. MWAS manages web sessions when web users login to or logout to the HOPEX (IIS) application. At runtime, MWAS is both a process mgwmwas and a process mgwmapp. MWAS instantiates different MIK (process mgwspro), depending on interactions of the end-users login to the HOPEX (IIS) application. MWAS (HOPEX) is installed with the program feature 'MEGA Web Access for hopex'.
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

Term	Definition
	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"> <li>• HOPEX (IIS)</li> <li>• MEGA Software <ul style="list-style-type: none"> <li>◦ Administration Program</li> <li>◦ Utilities</li> <li>◦ Documentation...</li> </ul> </li> </ul>
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 user 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. 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.

Term	Definition
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.
SSP	One of the two HOPEX core components of the web application together with the MWAS component. It runs on the SSP server (one per server). In a cluster installation there can be several web application servers (MWAS nodes) but only one SSP server. Within a HOPEX installation, SSP is a central component that accesses to shared information and provides internal services (authentication, supervision, scheduler...). SSP operates at two levels: core SSP and environments SSP.
SSP server, SSP application server	IIS Web server running the SSP component. It hosts the (IIS) application 'MegaSSP' and usually the HOPEX environments and the HOPEX license.
SSP, core SSP	HOPEX core component of the SSP. It runs on the SSP server (one or several per server). When started by a Windows service (Mega Site Service Provider), it instantiates one MIK (called environment SSP) per HOPEX environment. It then routes calls to appropriate environment SSP (orchestration) in particular for authentication. Core SSP also provides the supervision service. At runtime, core SSP is both a process mgwssp and a process mgwmapp.
SSP, Environment SSP	HOPEX Component providing services for a HOPEX environment. It is instantiated by the core SSP. It runs on the SSP server (one or several per server). Most services are managed though a job scheduler: indexing, alert management... At runtime, environment SSP is a process mgwspro.
Storage Format, HOPEX Storage Format	Typology of storage formats for a data repository or a system repository: <ul style="list-style-type: none"> <li>• Oracle (RDBMS, Oracle).</li> <li>• SQL Server (RDBMS, SQL Server).</li> <li>• GBMS (MEGA DBMS, proprietary format kept for compatibility).</li> </ul>
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"> <li>• A HOPEX directory (definition of users/roles/profiles).</li> <li>• A set of templates of deliverables.</li> <li>• A metamodel definition.</li> </ul>
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.
Web Client	Machine playing the client role on the internet.
Web Server	Machine playing the server role on the internet.
Web application server, MWAS server	IIS Web server running the MWAS component. It hosts the (IIS) application 'HOPEX' and 'HOPEXMWAS'.

Term	Definition
Web User	User of a web application. It may either be authenticated by the web server (IIS, Apache...) or by the web application (written in PHP, ASP, JSP, ASP.NET...). The authentication defines whether the user exists and if it can connect to the Web site.
Web.config	Configuration file of an IIS application. The file web.config of the IIS application 'HOPEX' contains key parameters for the web application.
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. 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.
Service watchdog	HOPEX Component that monitors SSP and MWAS nodes in cluster deployment. It sends to the SSP information regarding MWAS nodes availability in particular to run scheduled jobs. It is started by a Windows service 'Mega Service Watchdog'.

## Web Front-End Installation Guide HOPEX V2 EN

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**Summary**

This document describes all the steps required to install MEGA HOPEX Web Front-end on Windows Server 2008 R2 or above.

## PREREQUISITES

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### 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

In order 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.

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

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### .Net

.Net 4.5 is required.

It is already installed by default with Windows Server 2012 and 2012 R2.

For more information on installing it on Windows Server 2008 R2, please follow the following article:

[http://msdn.microsoft.com/en-us/library/5a4x27ek\(v=vs.110\).aspx](http://msdn.microsoft.com/en-us/library/5a4x27ek(v=vs.110).aspx)

### 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>

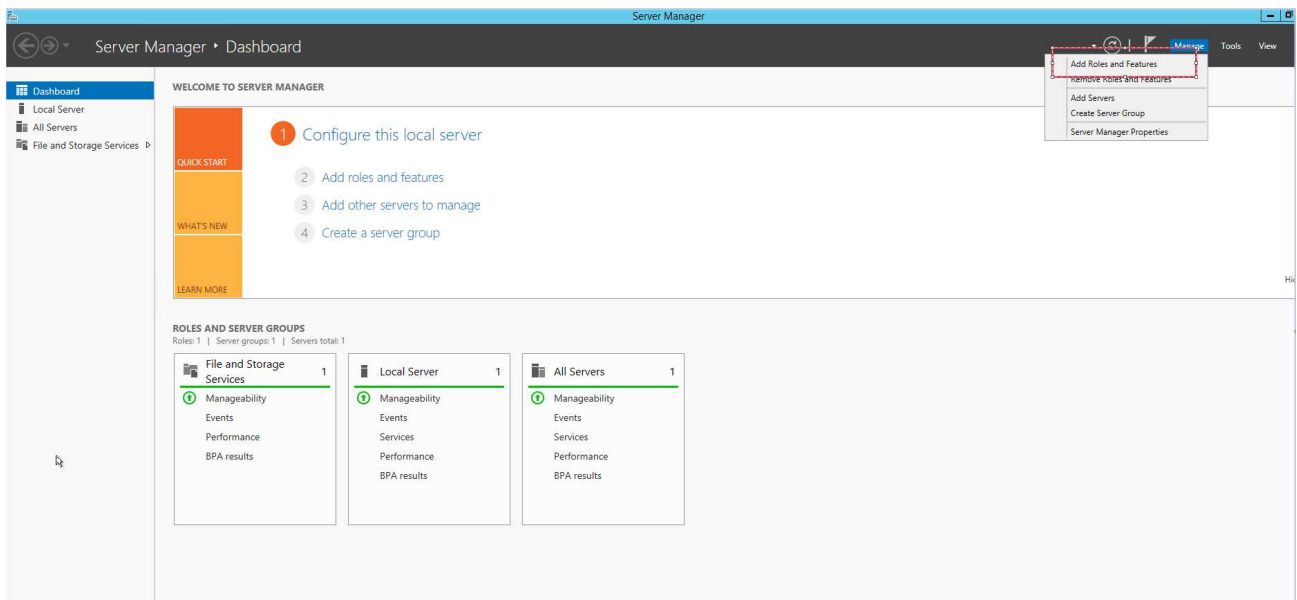
If you want to download it from that location, make sure to download the 32 bits' version, file "vc\_redist.x86.exe".

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

### Required roles

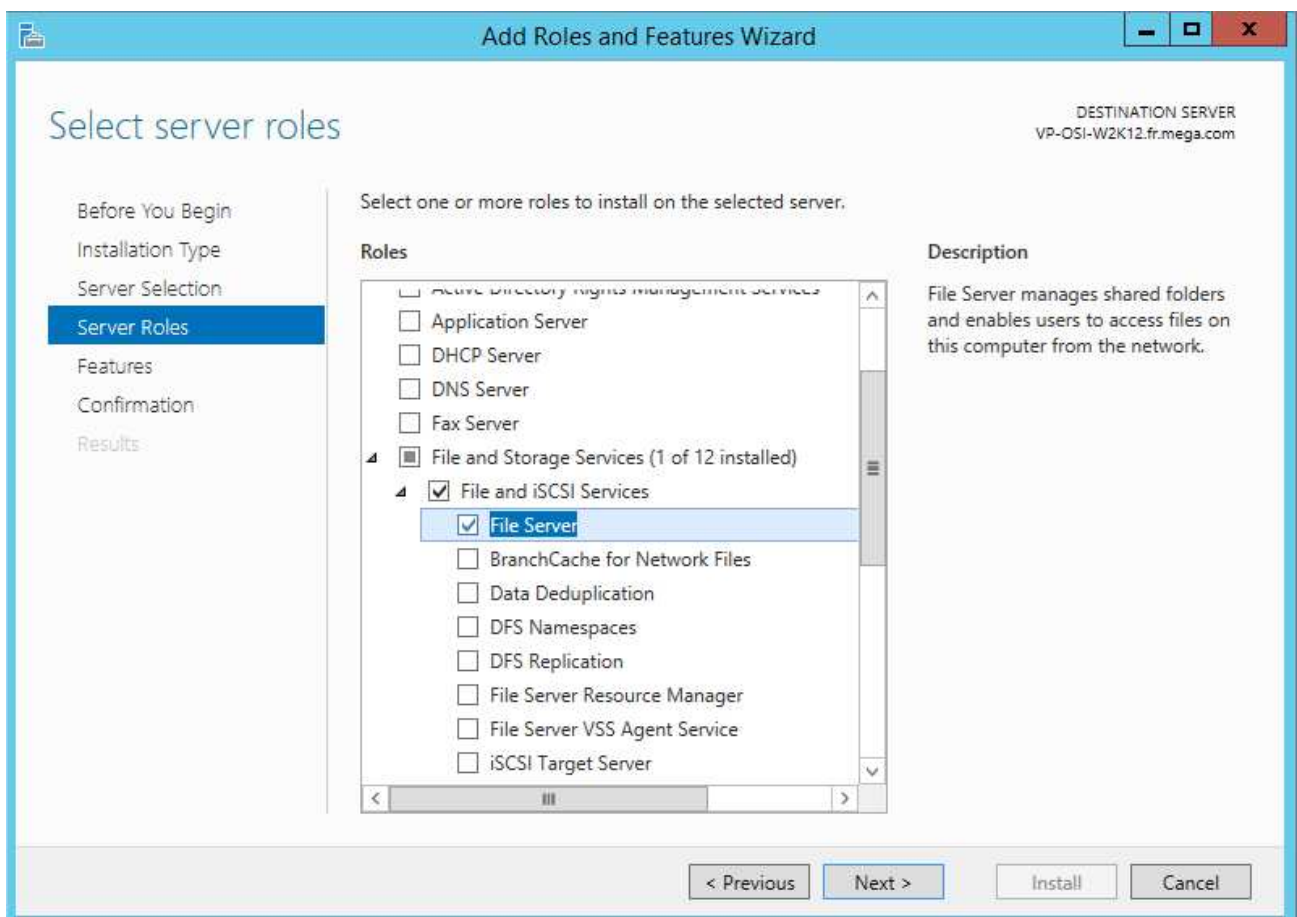
If the roles are already in place, at least check that all sub features are active.

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

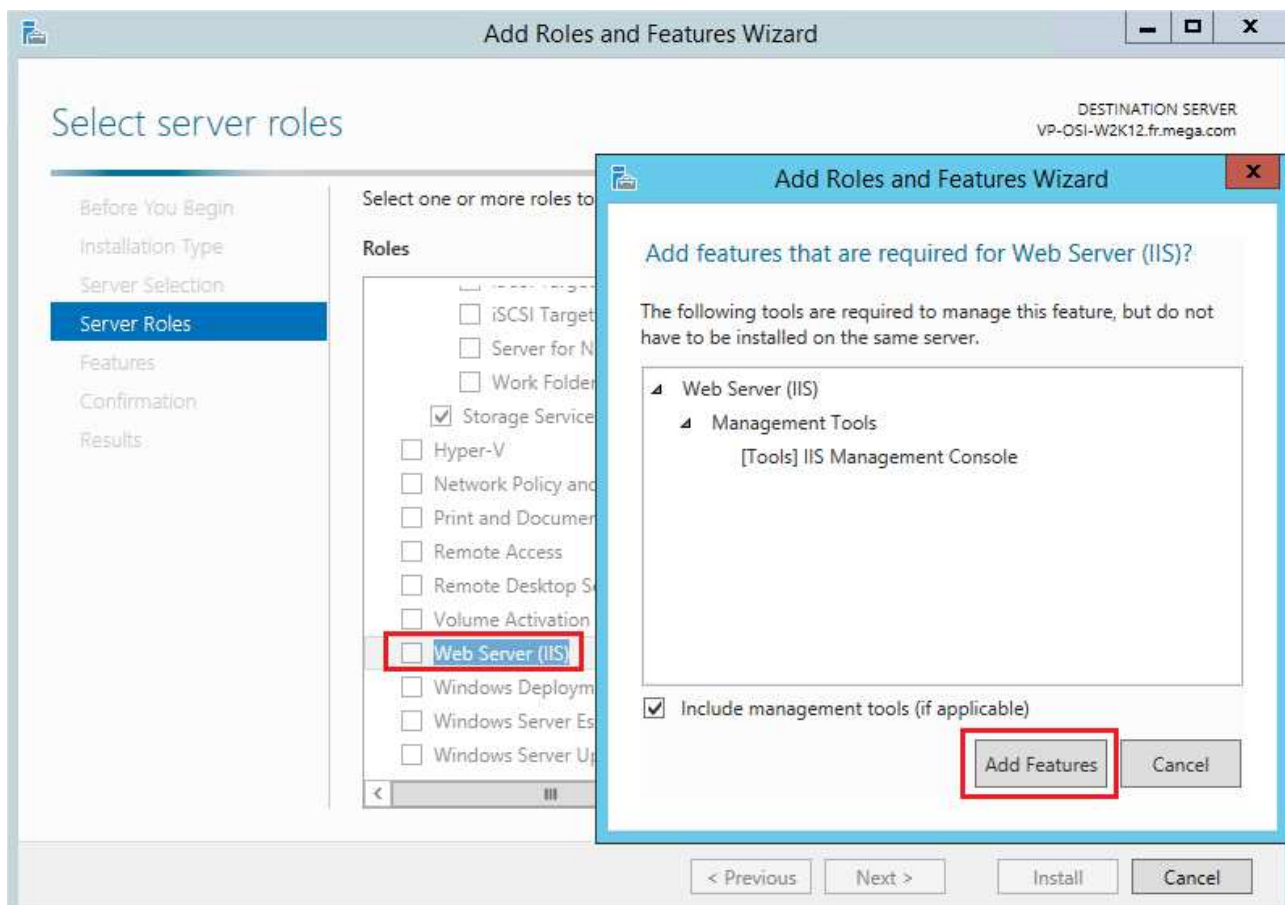


2. In the Roles, activate both:

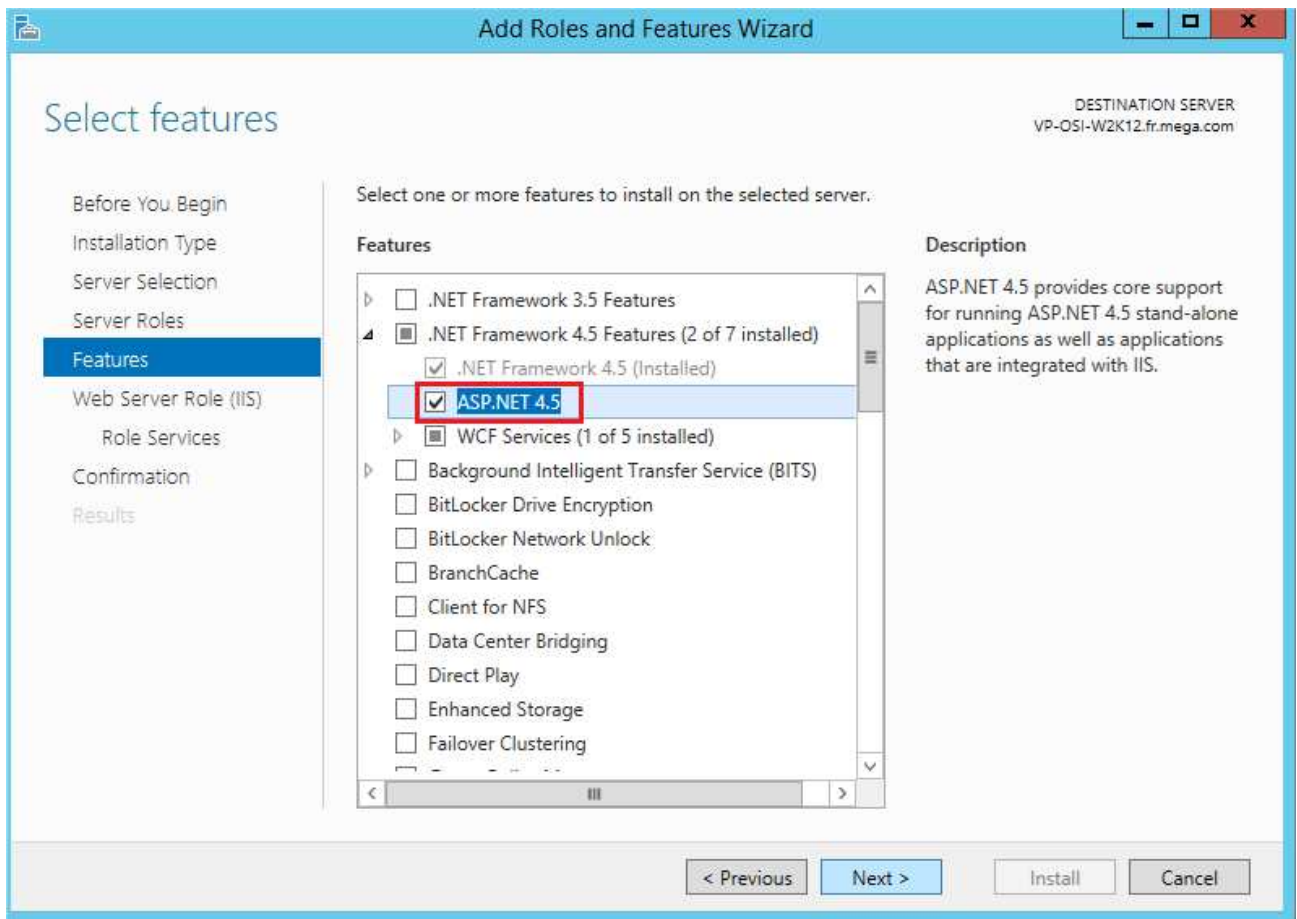
- « File Server » :



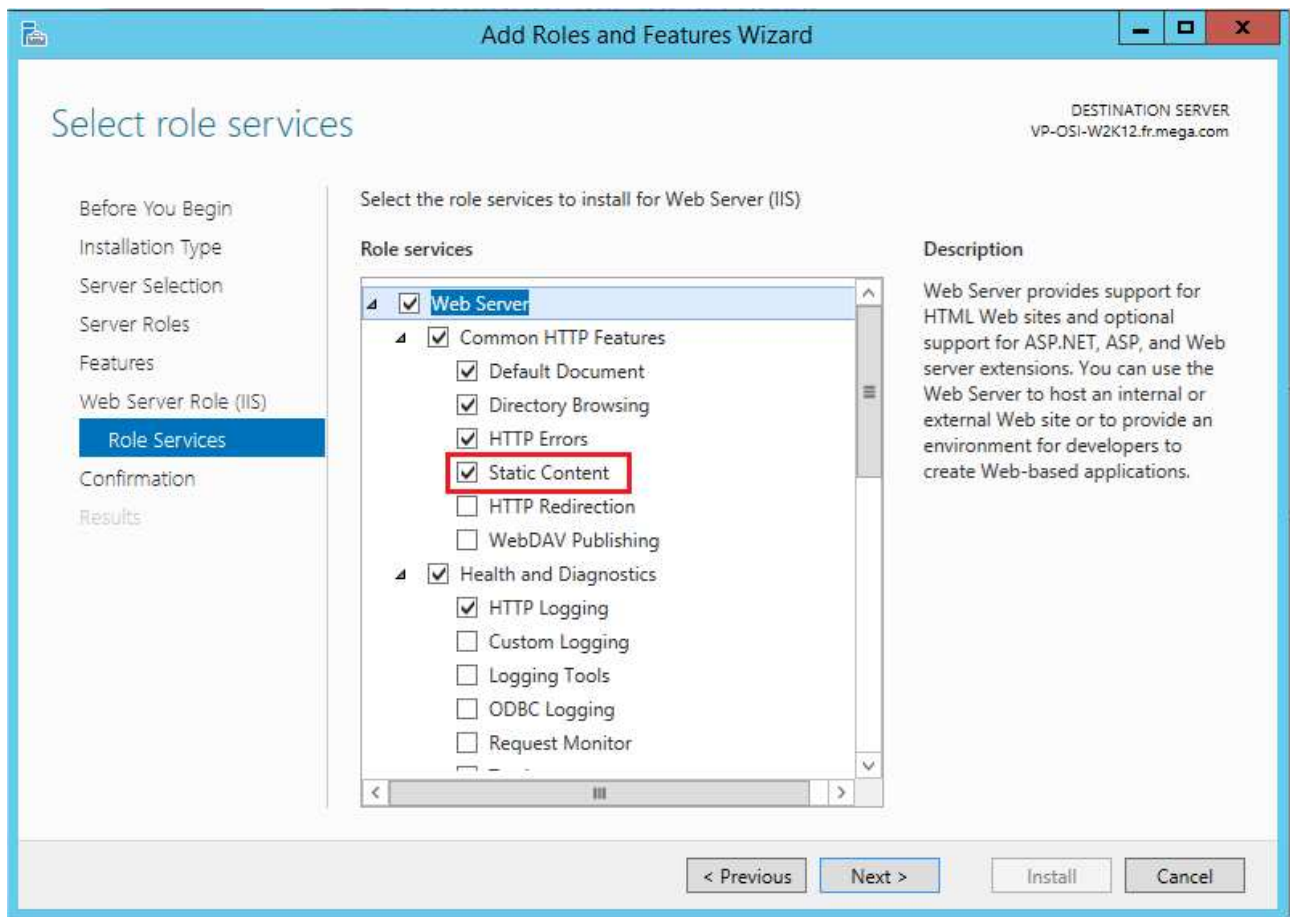
- « Web Server (IIS) » and its related features :



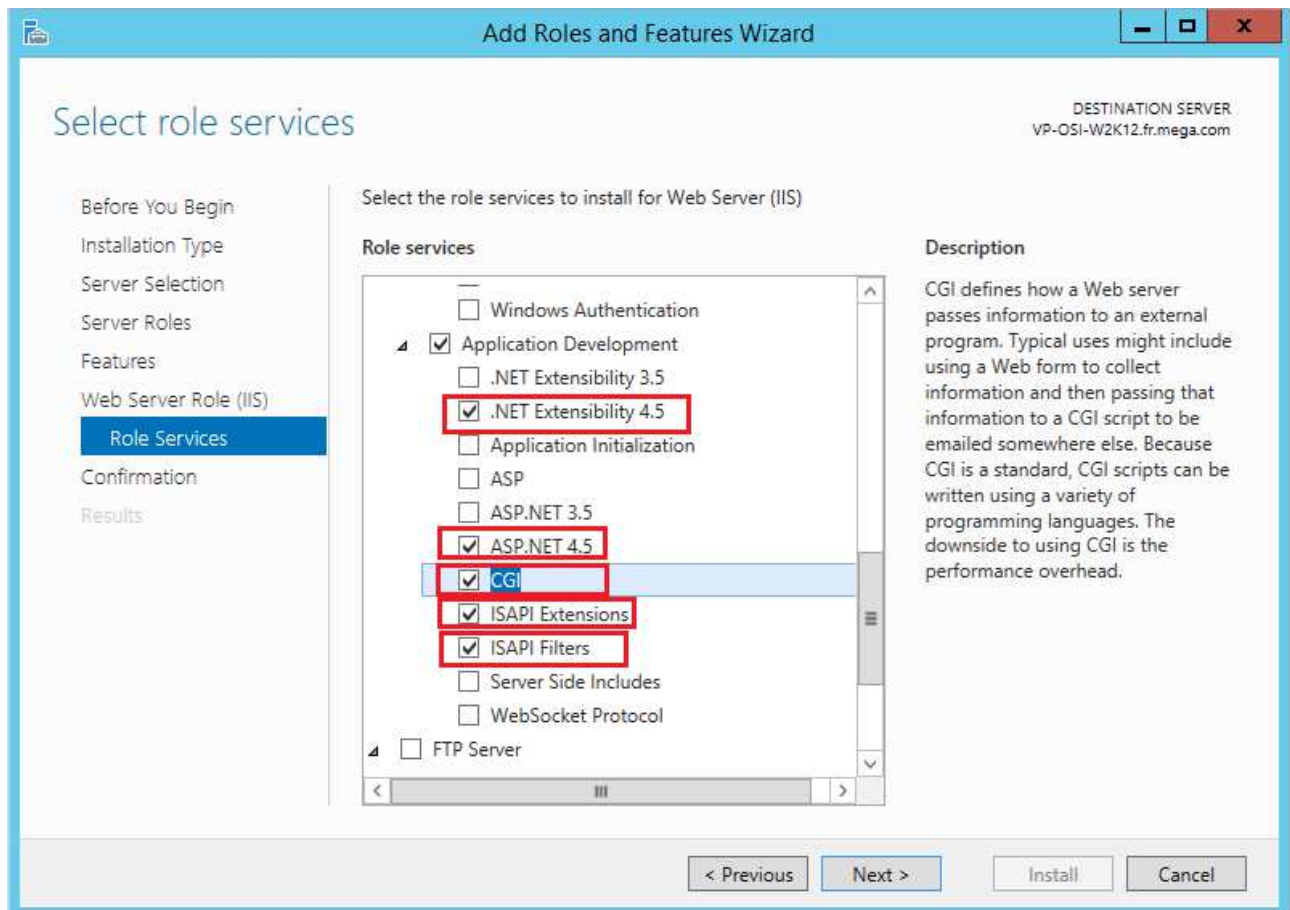
3. In the "Features", make sure to activate the "ASP.NET 4.5":



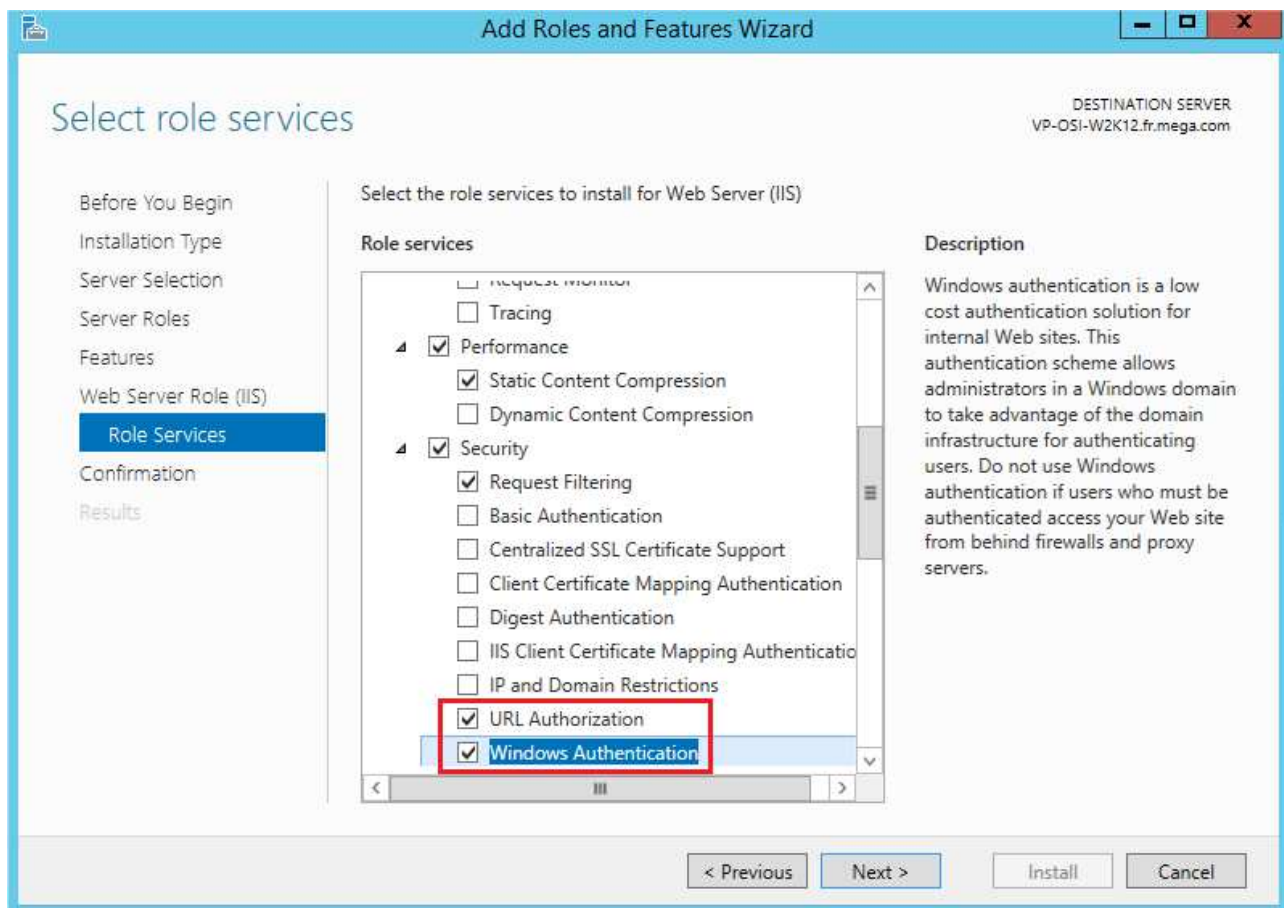
4. In the "Role Services" of IIS, make sure that "Static Content" is checked:



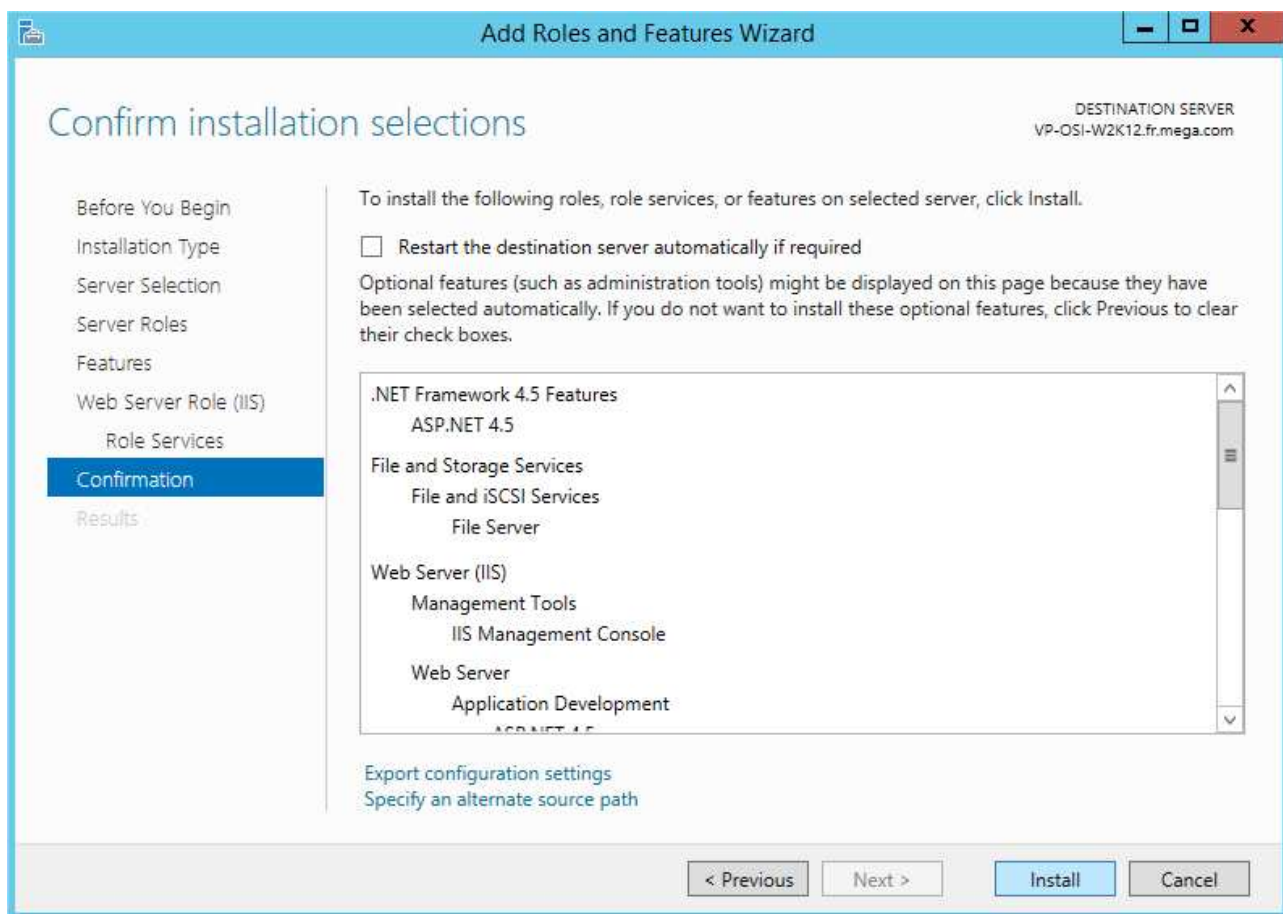
5. In addition, for the "Web Server (IIS)" role, the following "Role Services" and their dependencies must be installed:
- ASP.NET 4.5 (and related features)
  - CGI



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.

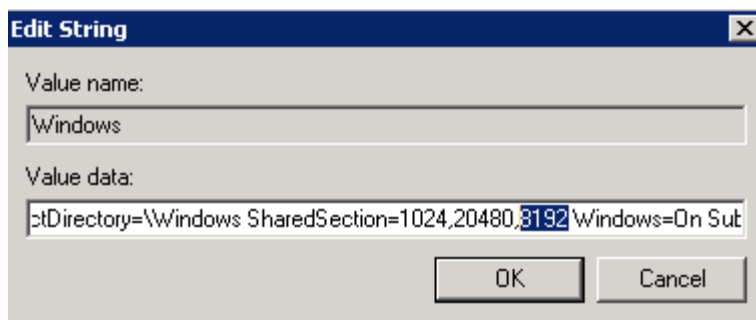
With the latest version of the application, we check that the desktop heap is set to at least 8 MB. If it isn't, anyone that will access the website will receive a warning message.

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**.



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 in order 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!!** Don't 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.

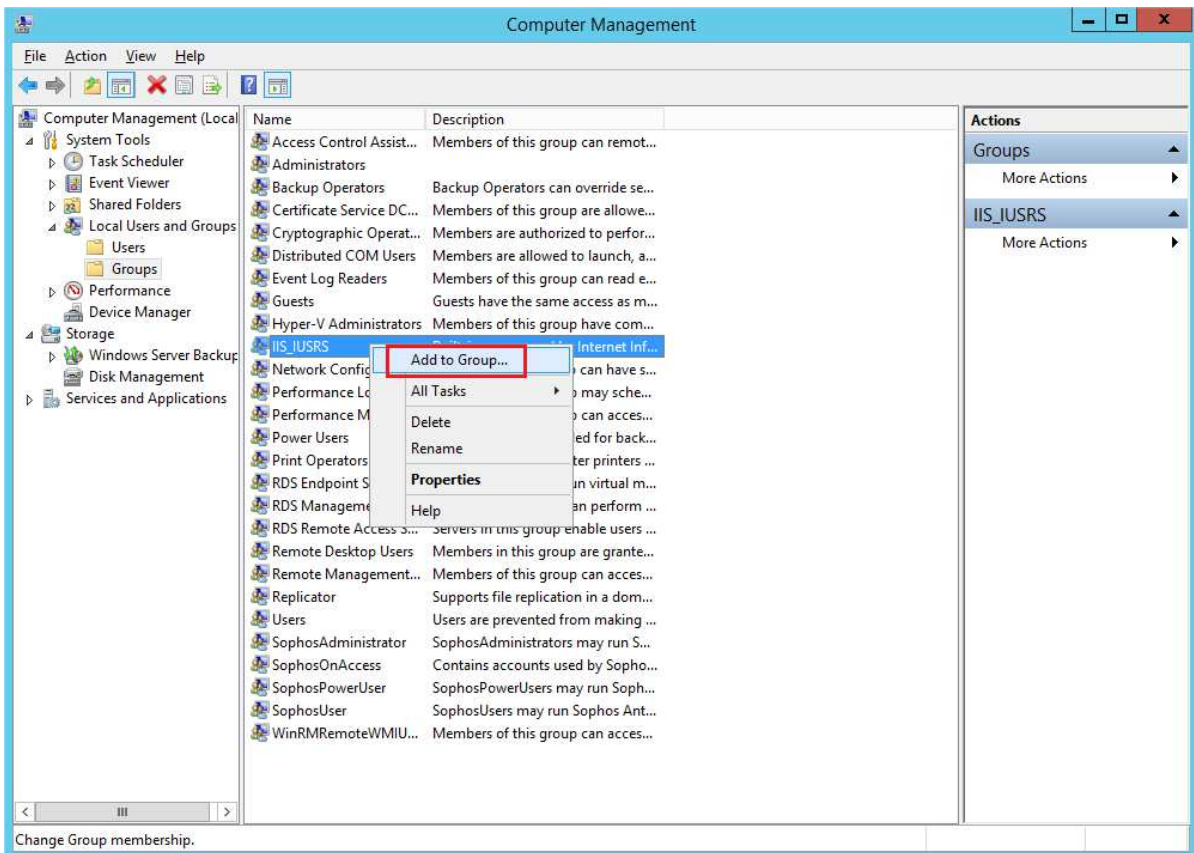
This user will be used as an impersonate user in the web application. It is specifically linked to the feature called "Mega Web Access for Hopex". All the actions carried out in MEGA HOPEX will be done under the identity of this windows user.

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.

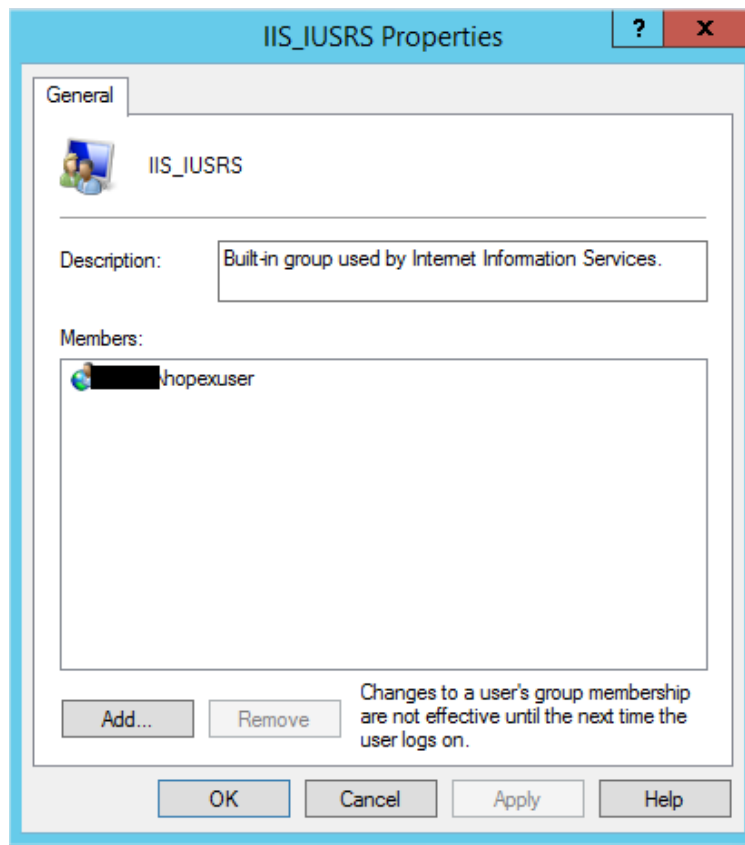
## Define Group permissions

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":

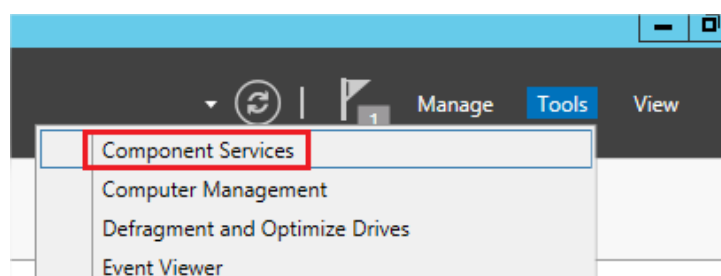


## Define MUST Licence Access

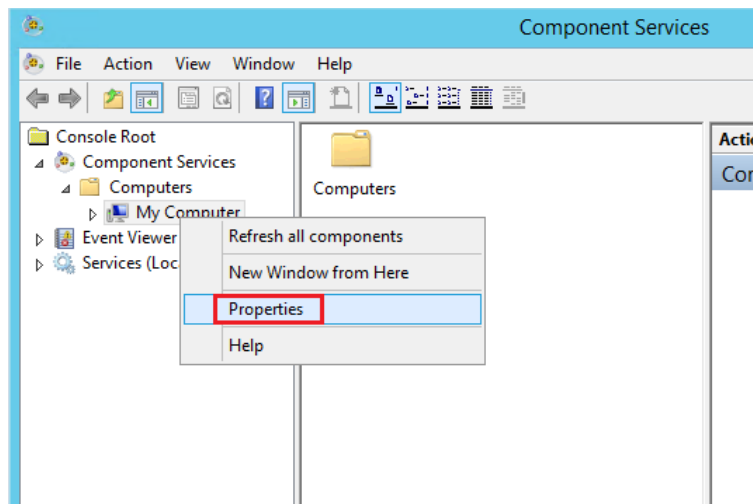
He must be registered in the MUST license tool, have the rights to read and write data in the MUST license folder and to share data. For more details, see the "Must License Installation Guide" technical article located in the Documentation folder of your MEGA installation.

## Define COM Access rights

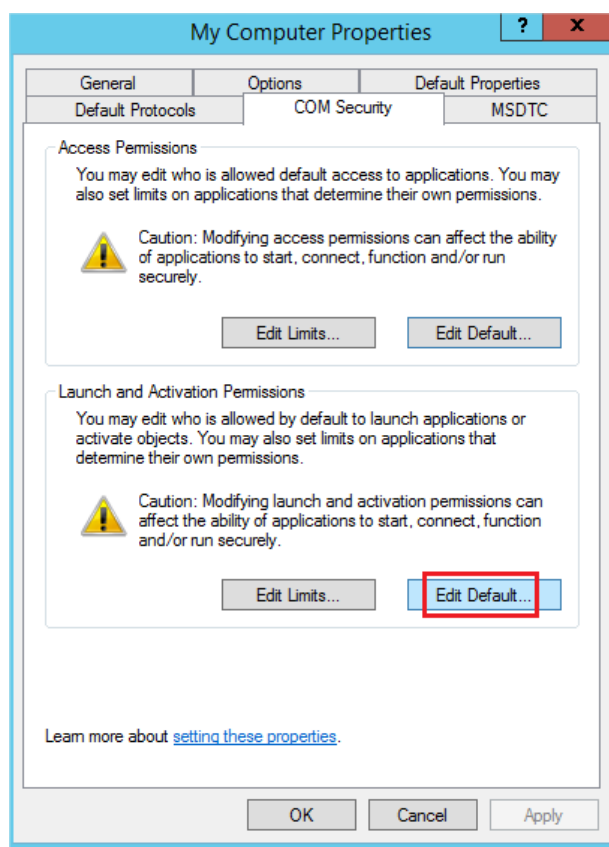
He must be able to launch COM applications by default. To assign this right, proceed from the "Component Services" dialog box through the "Tools" section of the "Server Manager":



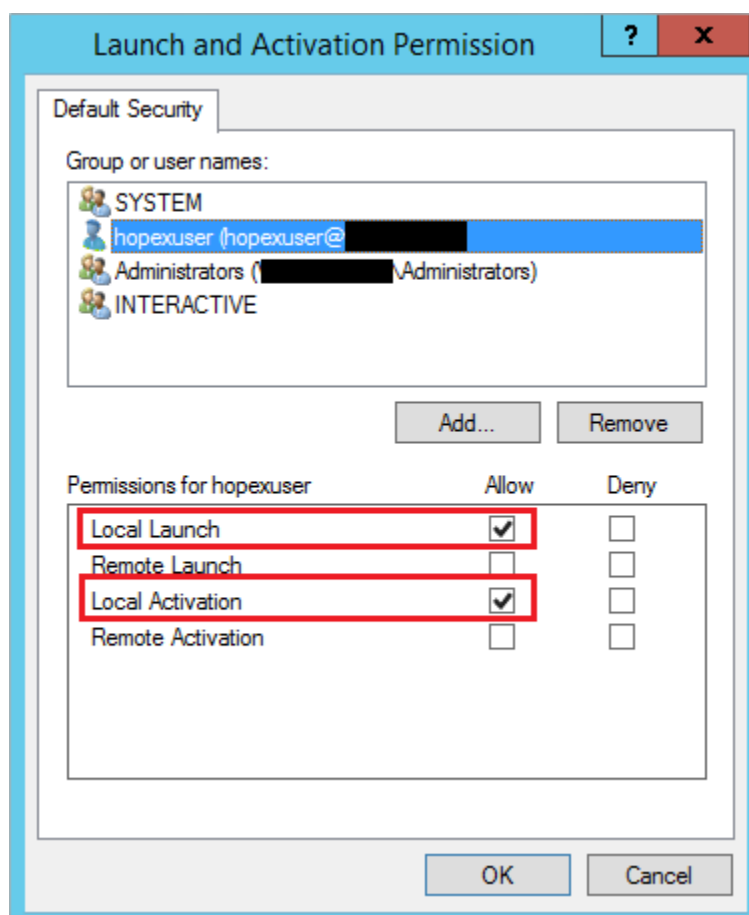
1. Expand the "Component Services" node, then Computers.
2. Right-click "My Computer" and select "Properties".



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

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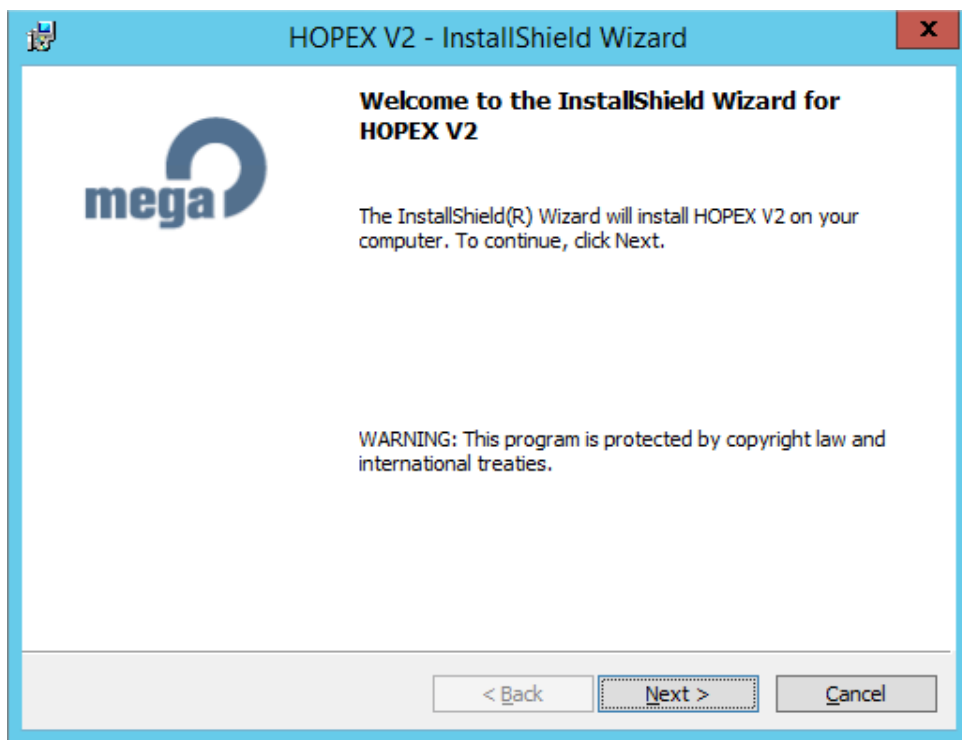
## Choosing your setup type

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. Launch the **Setup** program by double-clicking on it.
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 V2 - 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.

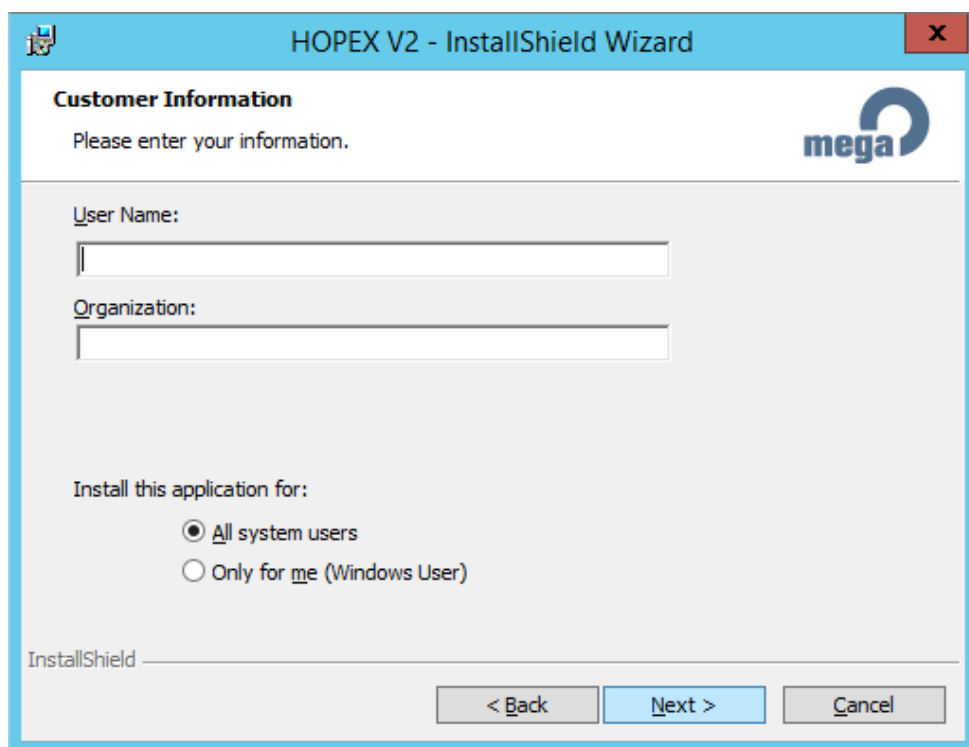
**IF YOU DO NOT AGREE WITH THESE PROVISIONS, PLEASE DO NOT INSTALL THE PRODUCTS**

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

Print

InstallShield

< Back Next > Cancel



**HOPEX V2 - InstallShield Wizard**

**Customer Information**

Please enter your information.

User Name:

Organization:

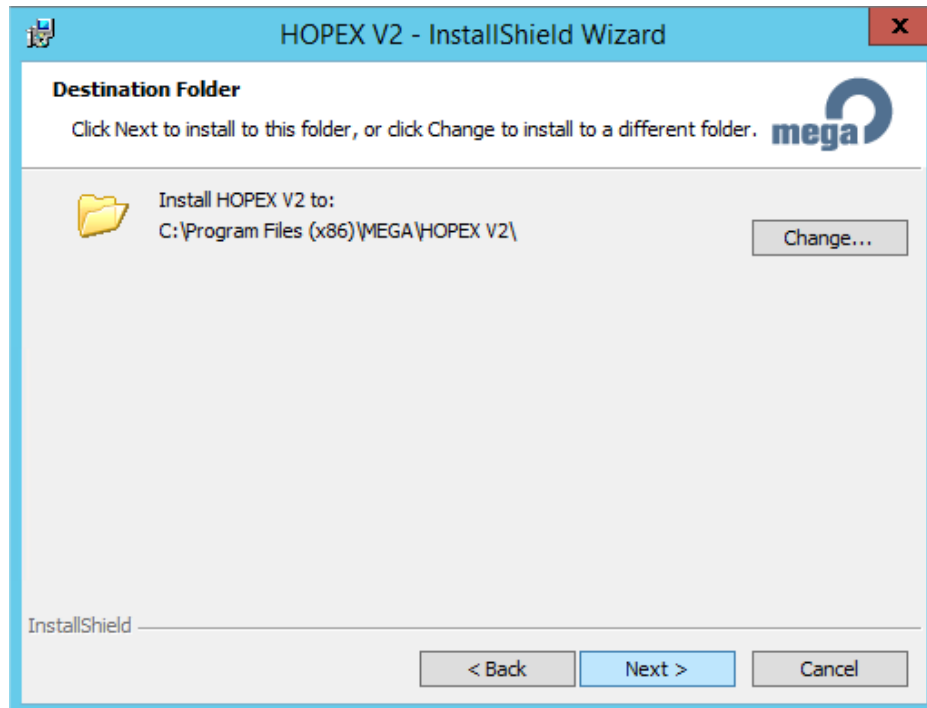
Install this application for:

☒ All system users
 ☐ Only for me (Windows User)

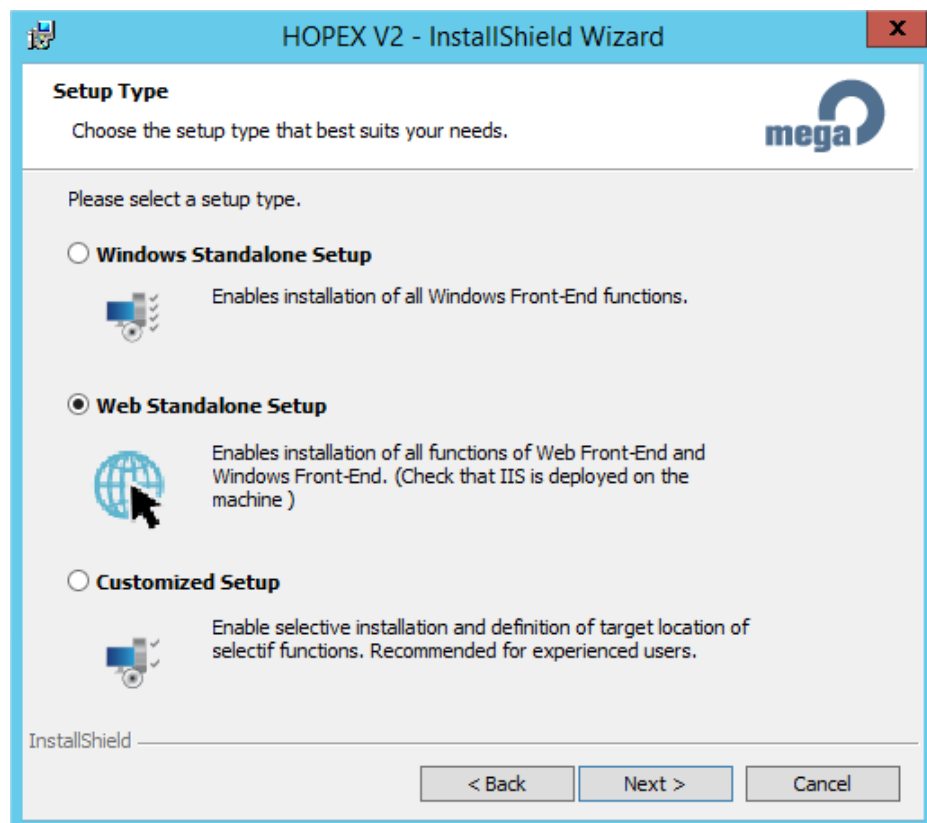
InstallShield

< Back Next > Cancel

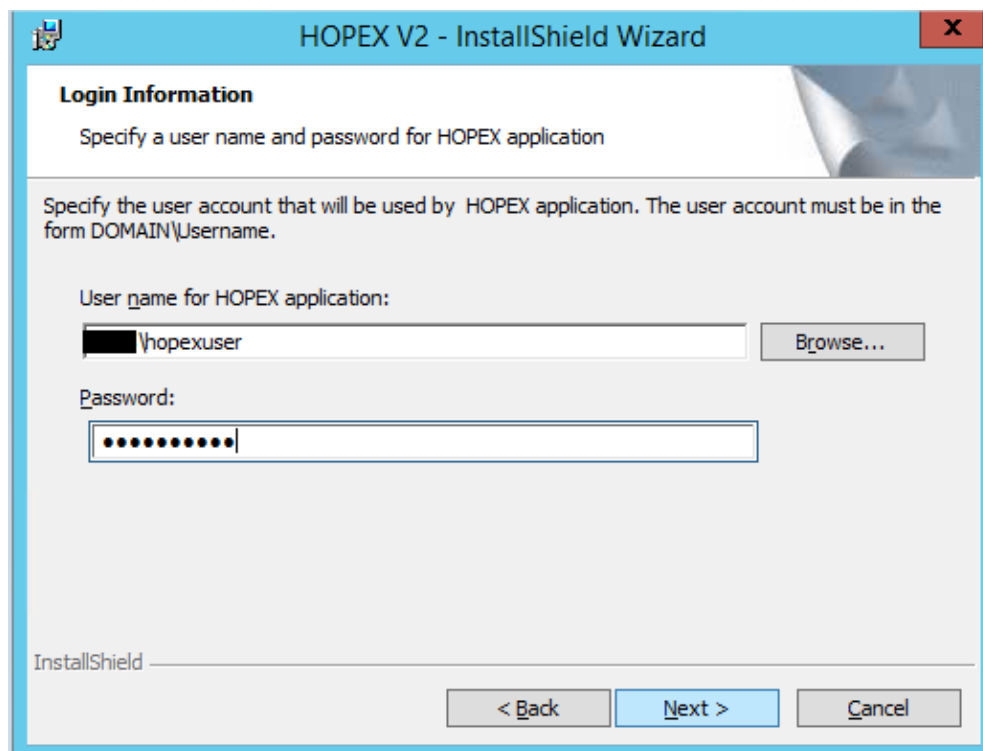
4. Choose the installation folder for the Mega Software by clicking on "Change", or keep the default if wanted:



5. Select **Web Standalone Setup**.

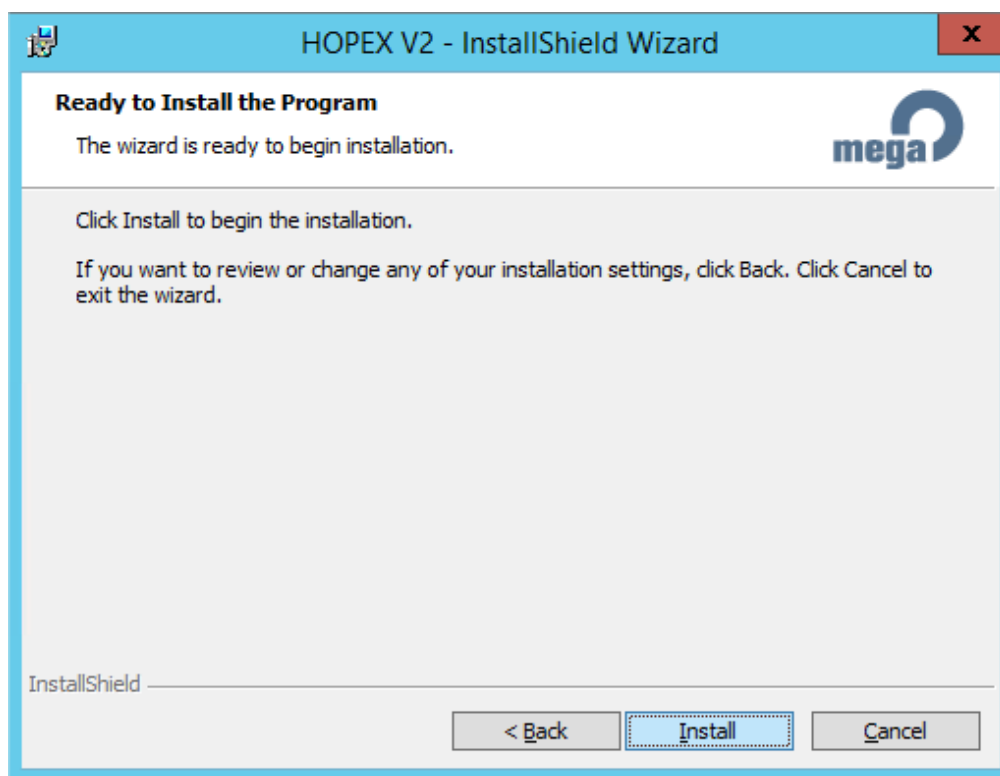


6. Enter the username and password of the **Windows User for Mega Hopex** you have chosen in the previous section of this document. It will be used for impersonation of the Web application:

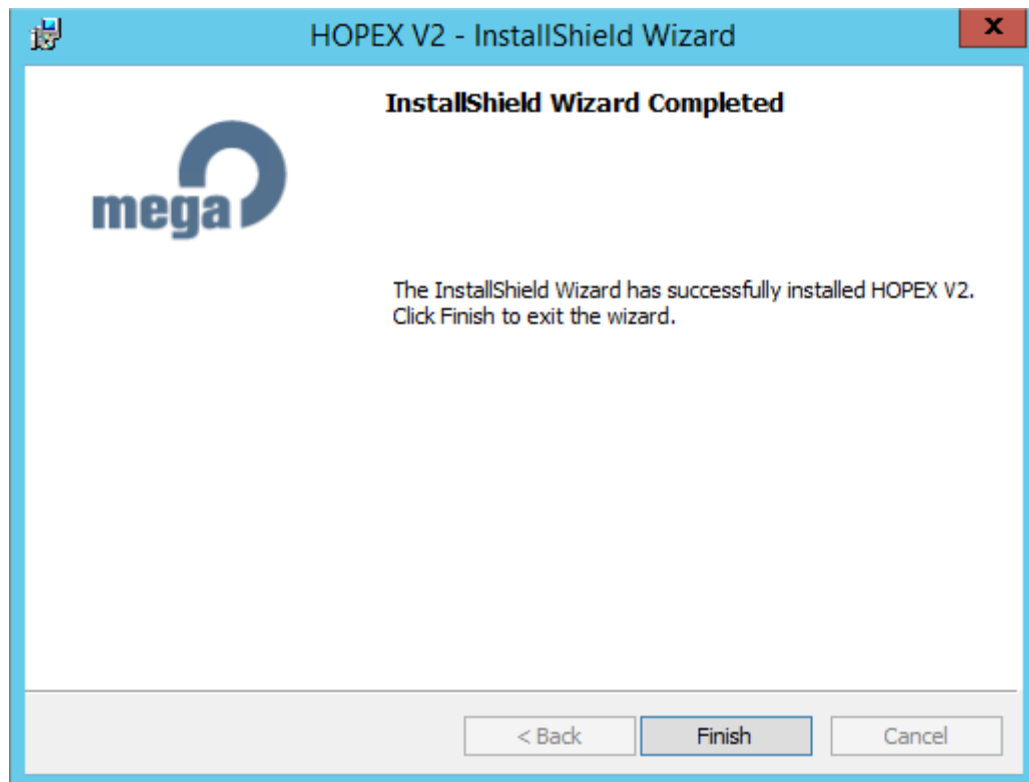


The screenshot shows the 'HOPEX V2 - InstallShield Wizard' window. The title bar is blue with a close button. The main area has a light blue header with the text 'Login Information' and a sub-header 'Specify a user name and password for HOPEX application'. Below this, a message states: 'Specify the user 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, and 'Password:' with a masked password field. At the bottom, there are three buttons: '< Back', 'Next >', and 'Cancel'. The 'InstallShield' logo is in the bottom left corner.

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



The screenshot shows the 'HOPEX V2 - InstallShield Wizard' window. The title bar is blue with a close button. The main area has a light blue header with the text 'Ready to Install the Program' and a sub-header 'The wizard is ready to begin installation.' The Mega logo is in the top right corner. Below this, a message 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', and 'Cancel'. The 'InstallShield' logo is in the bottom left corner.

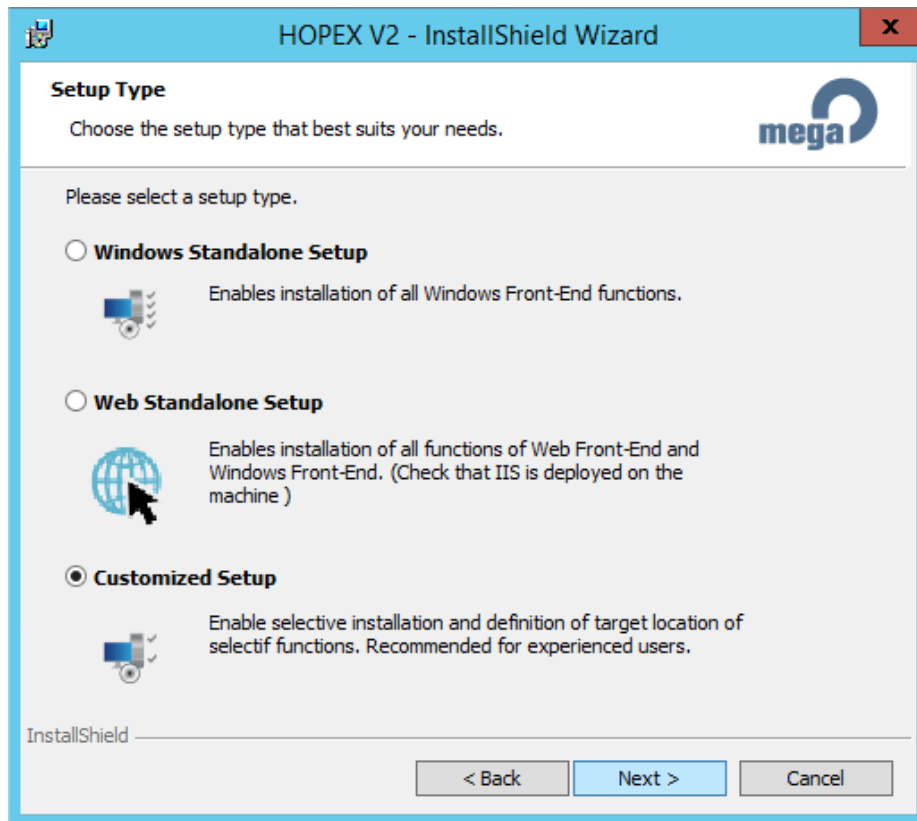


## Advanced Setup

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

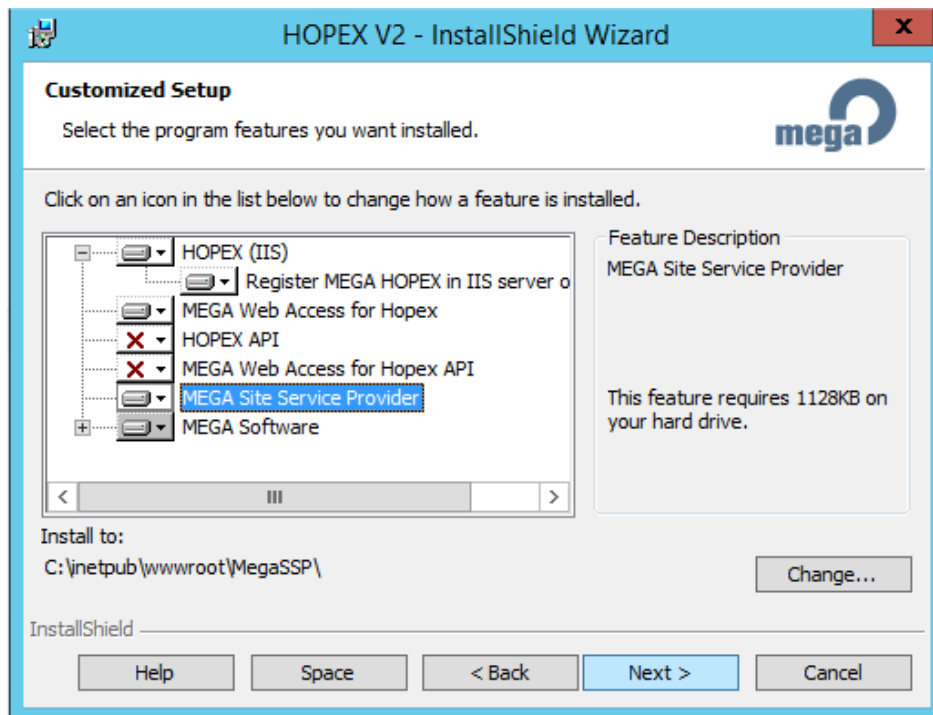
### Choice Screen

1. Choose **Customized Setup**:



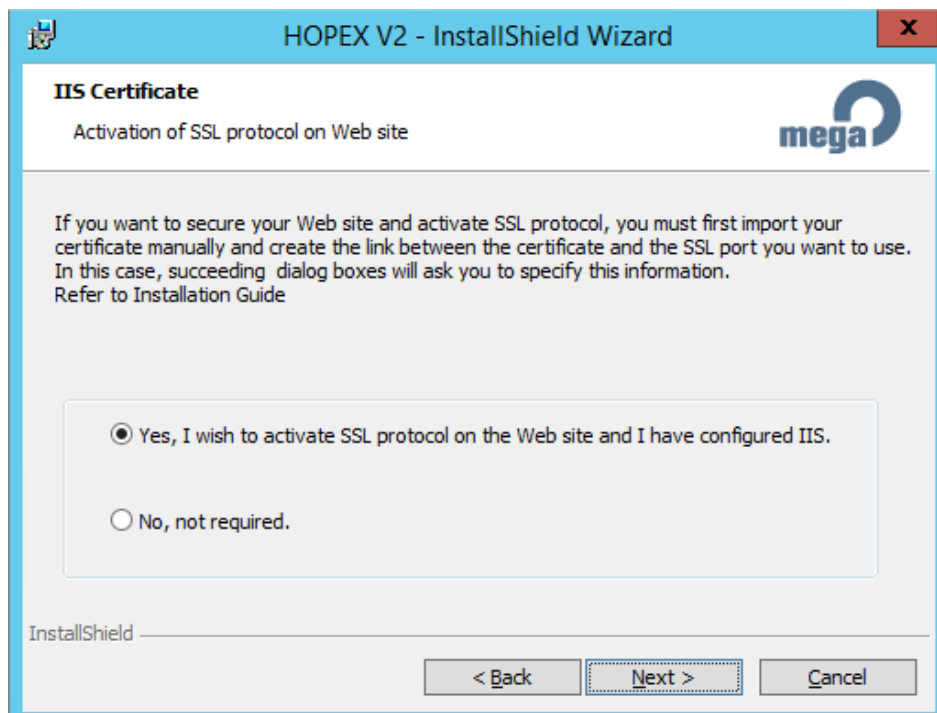
2. Choose the features that you want to install. Depending on how many servers you have, and the type of deployment you choose (see the "Web Front-end Architecture Overview" document), you need at least :
  - o HOPEX (IIS) and its subfeature
  - o Mega Web Access for Hopex
  - o Mega Site Service Provider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

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

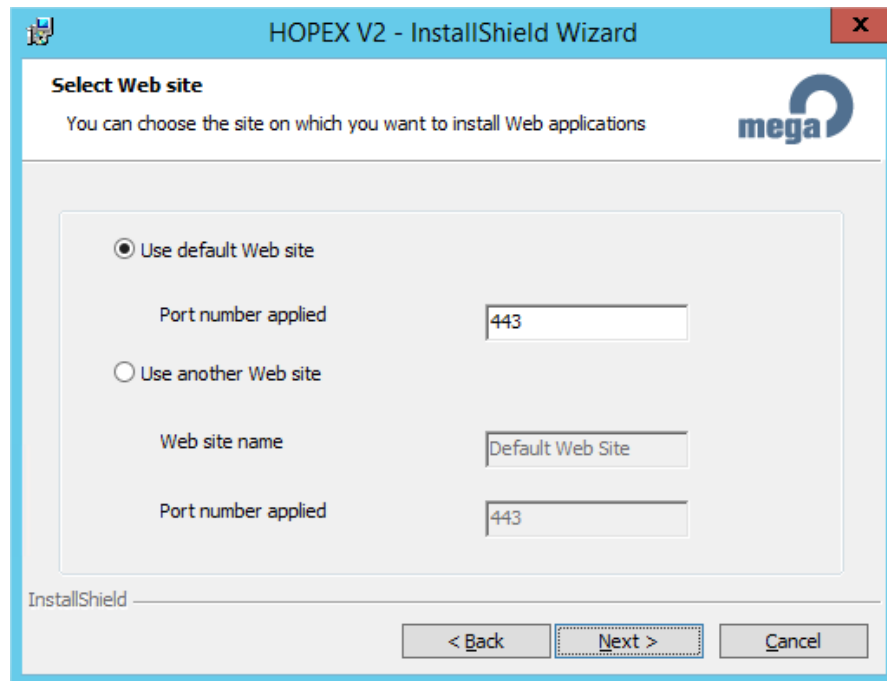


**Note** that by selecting each item, you can click on « Change » to modify the installation location of the files that are linked to a specific feature.

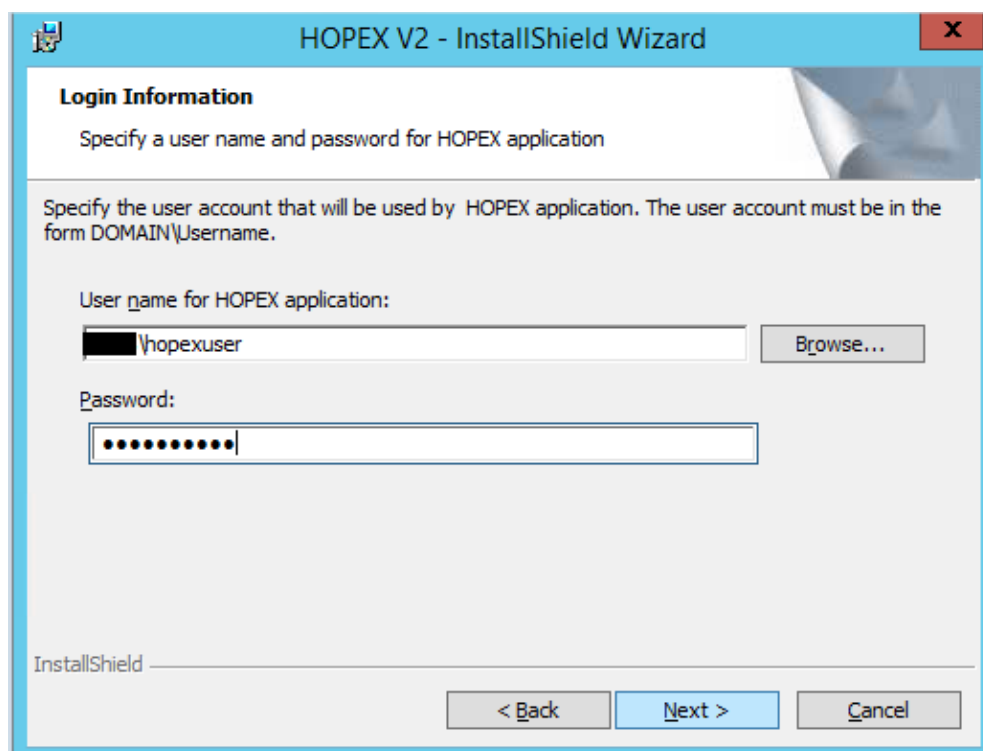
- The "HOPEX API" feature, above, is needed when you have to add web services on the platform. It requires another Windows user, different from the one used by the "Mega Web Access for Hopex" feature. If no
- Choose to activate use of SSL/TLS or not. SSL/TLS is highly recommended; however, it requires some prior configuration of IIS (see Prerequisites section). **Moreover, don't choose "Yes" unless the certificate is deployed in IIS. Otherwise, the installation will roll back:**



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 :



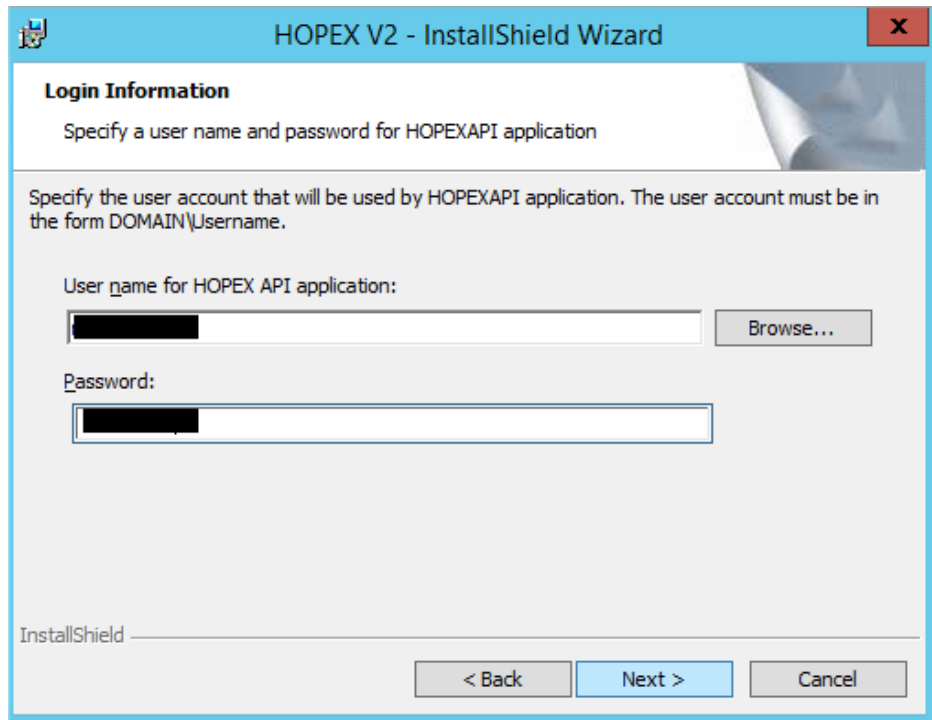
6. Enter the username and password of the **Windows User for Mega Hopex** you have chosen in the previous section of this document. It will be used for impersonation of the Web application:



## Advanced Parameters

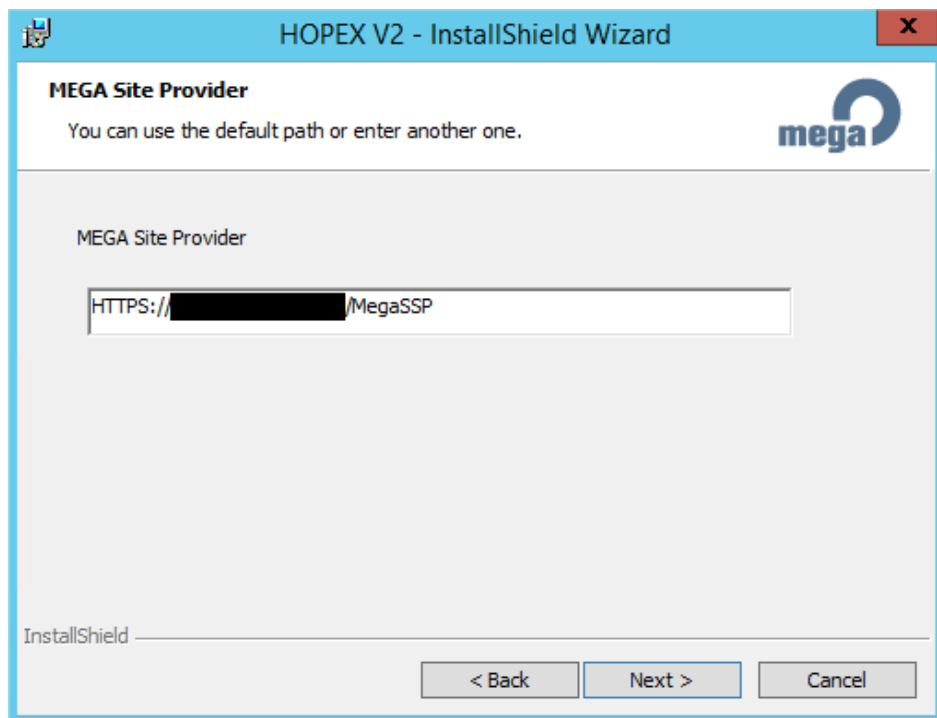
Parameters depend of the components you have chosen to install. Here is the list of parameters that are not proposed in the standalone setup.

### HOPEX API user




The screenshot shows the 'HOPEX V2 - InstallShield Wizard' window. The title bar is blue with a close button (X) on the right. The main area has a light blue header with the text 'Login Information' and a sub-header 'Specify a user name and password for HOPEXAPI application'. Below this, a message states: 'Specify the user account that will be used by HOPEXAPI application. The user account must be in the form DOMAIN\Username.' There are two input fields: 'User name for HOPEX API application:' and 'Password:'. The 'User name' field has a 'Browse...' button to its right. At the bottom, there are three buttons: '< Back', 'Next >', and 'Cancel'. The 'InstallShield' logo is visible in the bottom left corner.

### Mega Site Provider (SSP) URL

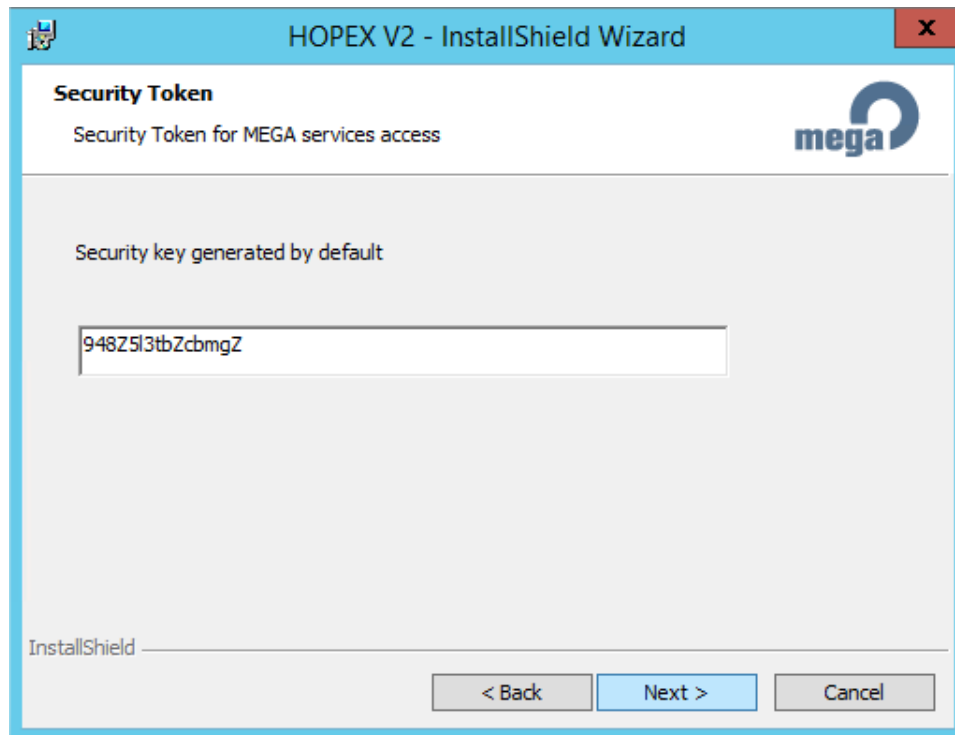


The screenshot shows the 'HOPEX V2 - InstallShield Wizard' window. The title bar is blue with a close button (X) on the right. The main area has a light blue header with the text 'MEGA Site Provider' and a sub-header 'You can use the default path or enter another one.' The 'mega' logo is in the top right corner. Below this, a message states: 'MEGA Site Provider'. There is a text input field containing 'HTTPS://[redacted]/MegaSSP'. At the bottom, there are three buttons: '< Back', 'Next >', and 'Cancel'. The 'InstallShield' logo is visible in the bottom left corner.

### Security Token

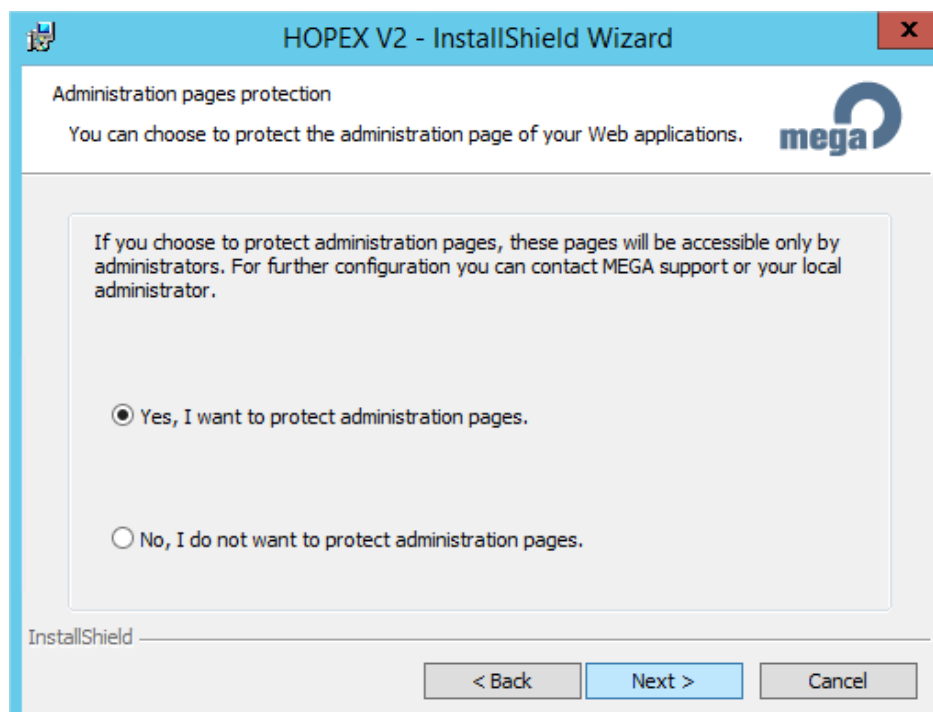
Web Front-End Installation Guide HOPEX V2 EN	page 25/53	
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It should be **identical on all Hopex installs** (Web, Windows, SSP,..) that work together in a scale up or scale out scenario




### Protection of administration pages

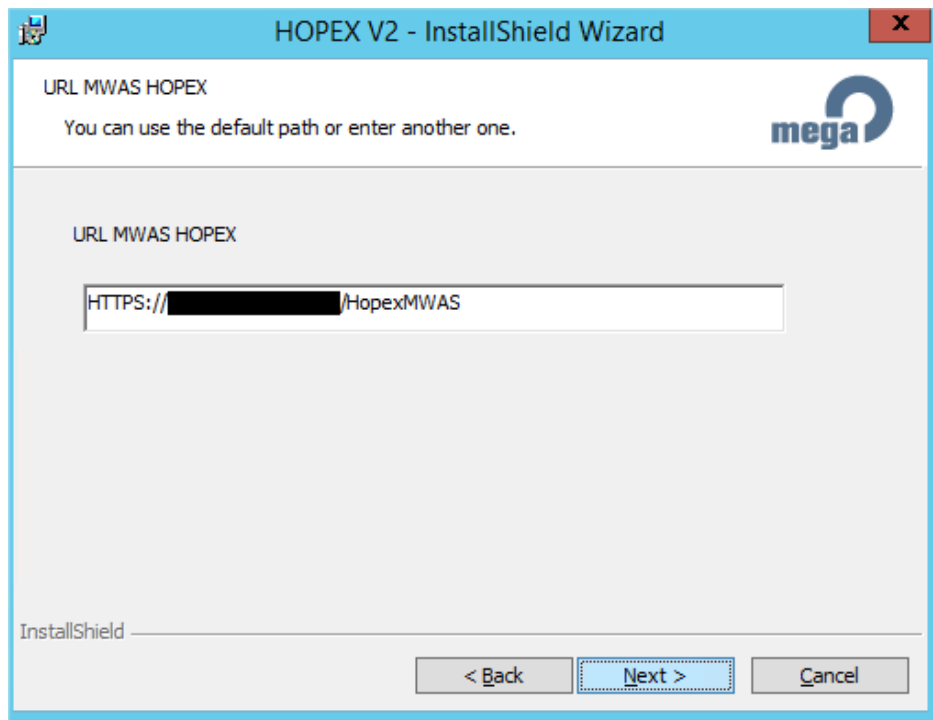
Defines whether to protect or not the /admin subdirectory of the Hopex installation (highly recommended)



### URL of HOPEX MWAS Web Site

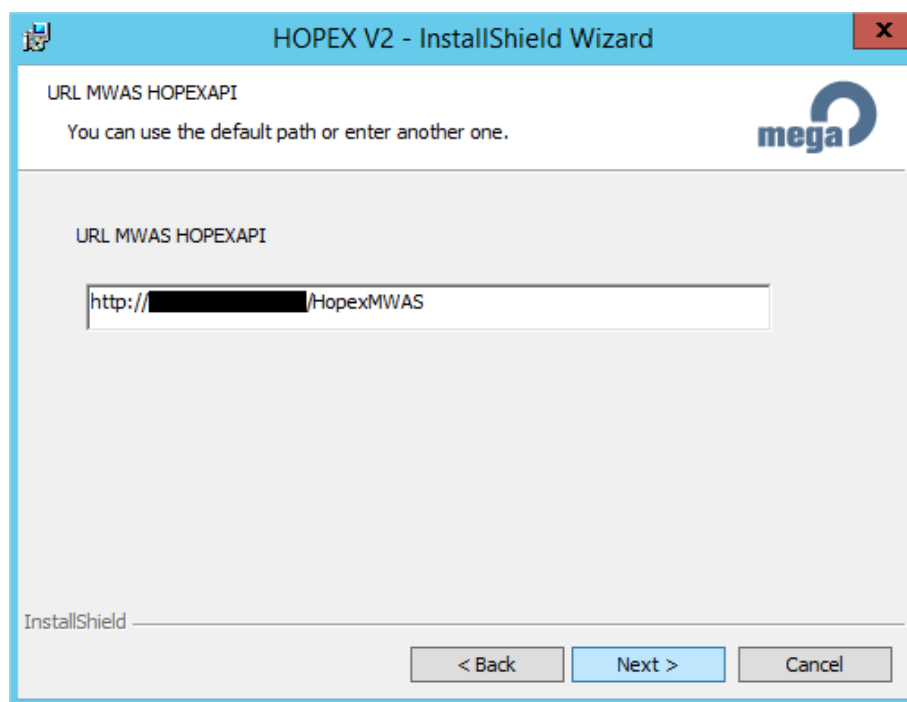
Defined on a web server to indicate the application server

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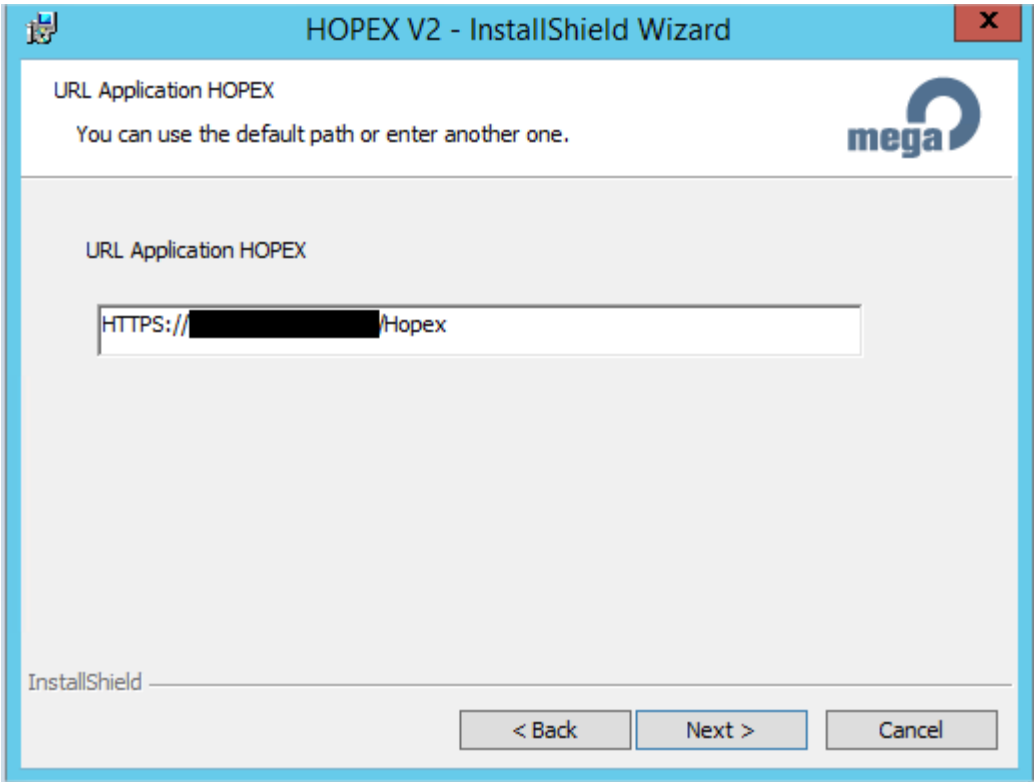
### URL of HOPEX API MWAS Web Site

Defined on a web server where you activate the "HOPEX API" feature:



**URL of HOPEX Web Site**

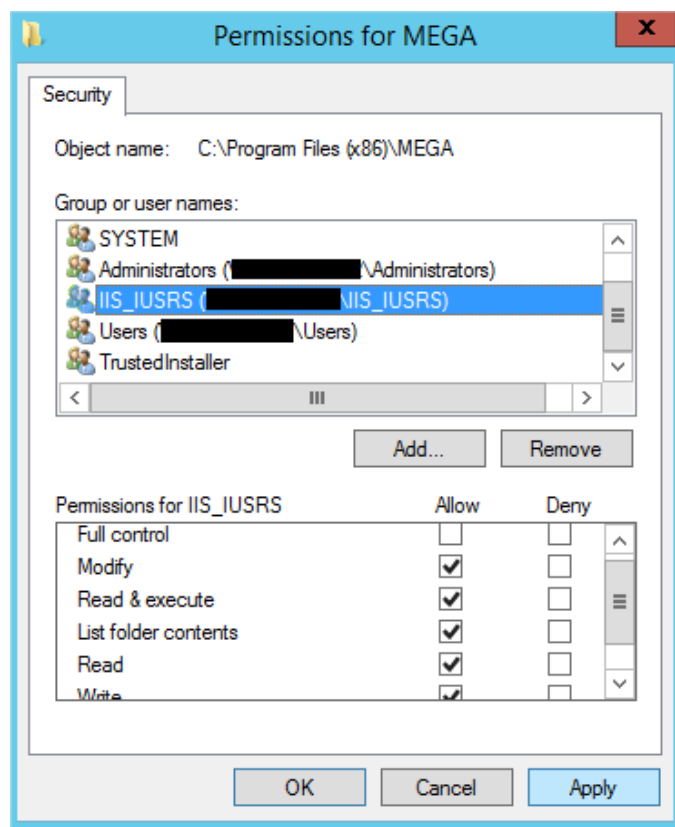
Defined on a MWAS server to indicate the web server



## 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 V2\ 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.

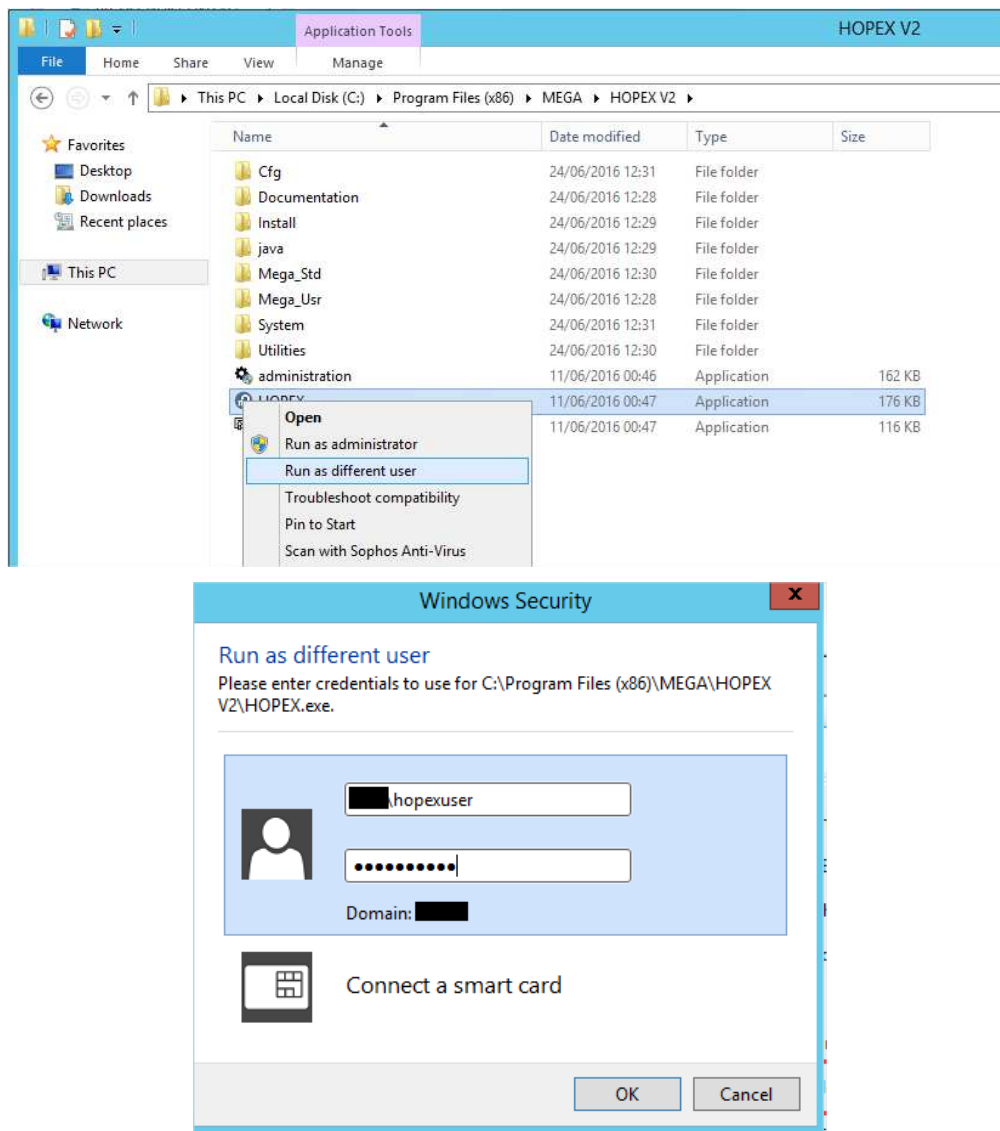
Make sure your user is correctly configured for the MUST license (for more details see the "Must License Installation Guide" technical article located in the Documentation\Articles folder of your installation).

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

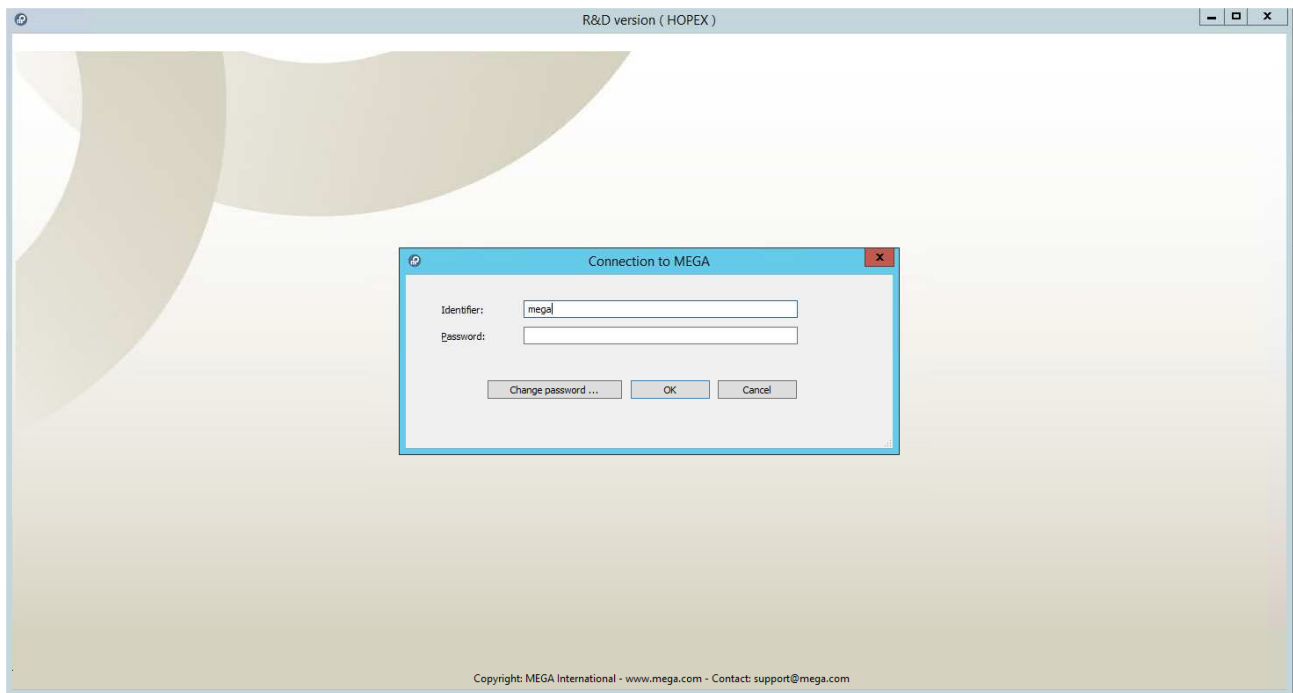
**Prerequisite:** having a Mega environment referenced on your platform. Either one of the GBMS environments that you can activate through the installer. Or an RDBMS environment that you created in a separate step.

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.

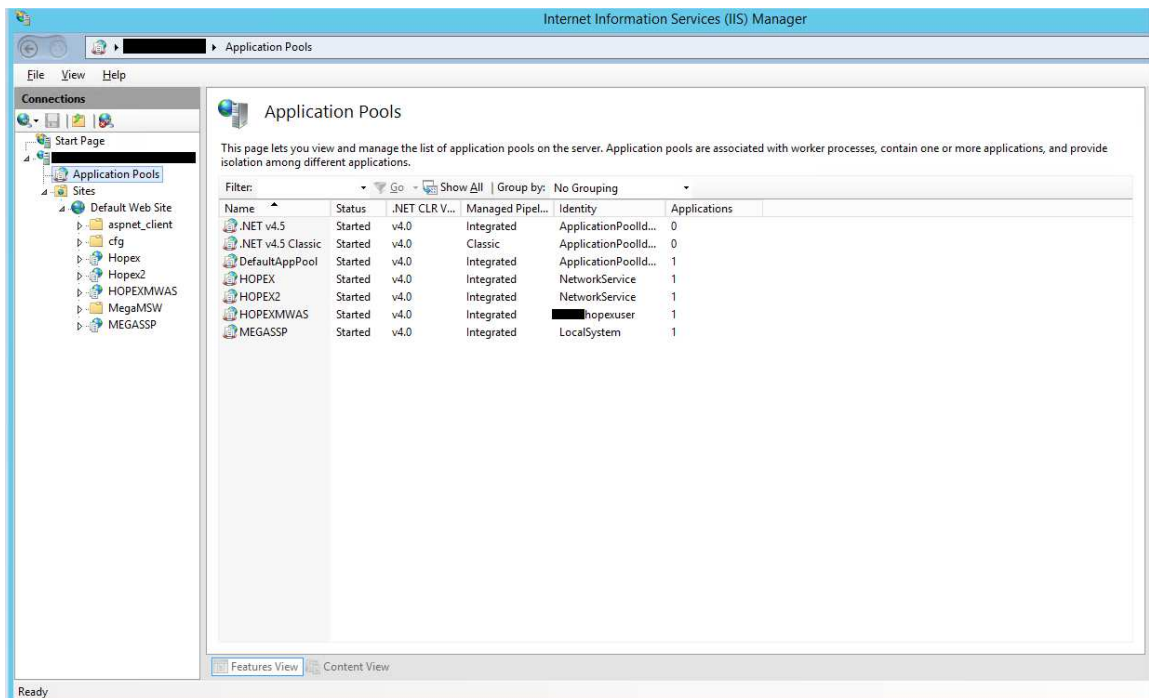
However, the fact that this process restarts, makes the browsing of connected users to fail, as they lose their browsing context.

In order 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).

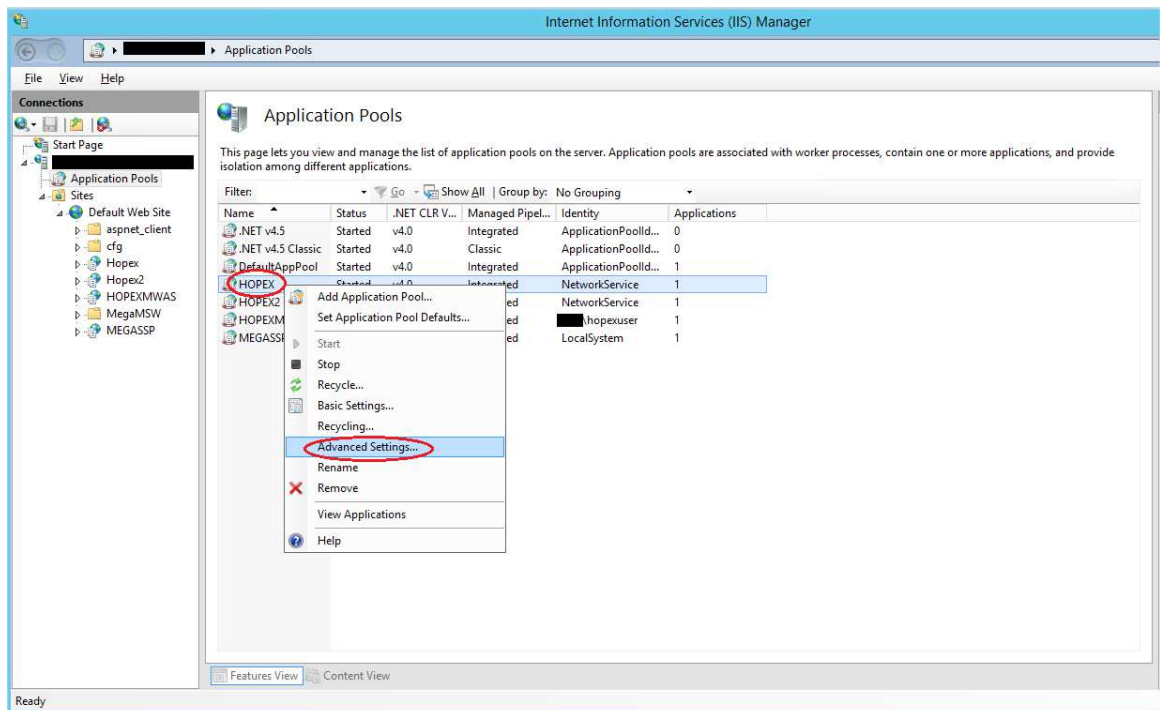
We recommend to manually add a restart at a fixed hour, when you know that no one will actually be connected on the website, to be sure it restarts at least once a day.

To do this.

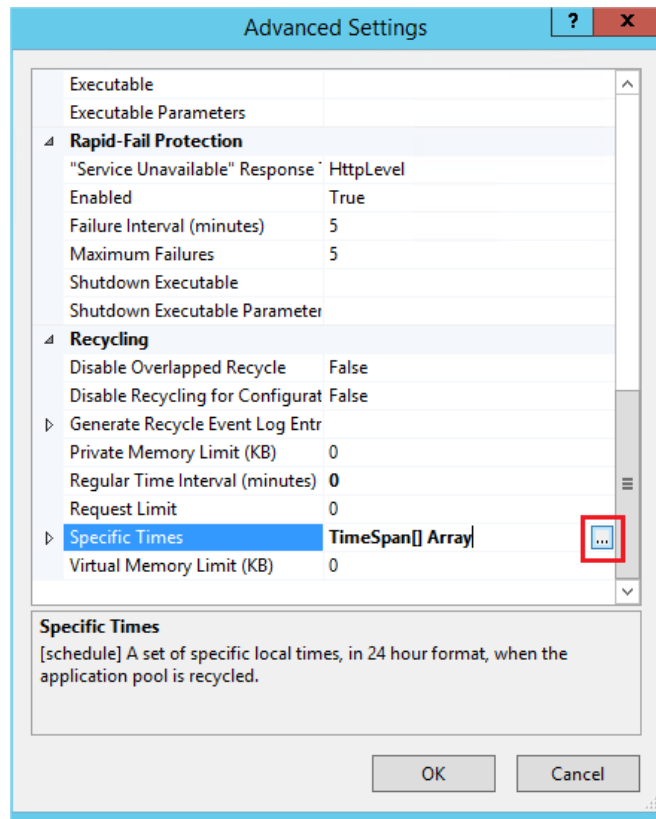
1. Open the "Internet Information Services (IIS) Manager", and go to **Application Pools**:



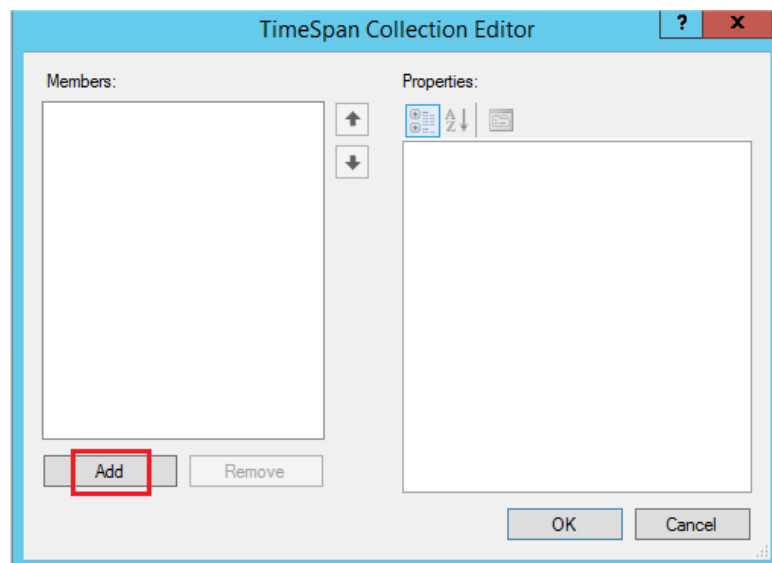
2. Select "HOPEX".
3. Click on the "Advanced Settings" option in the contextual menu:



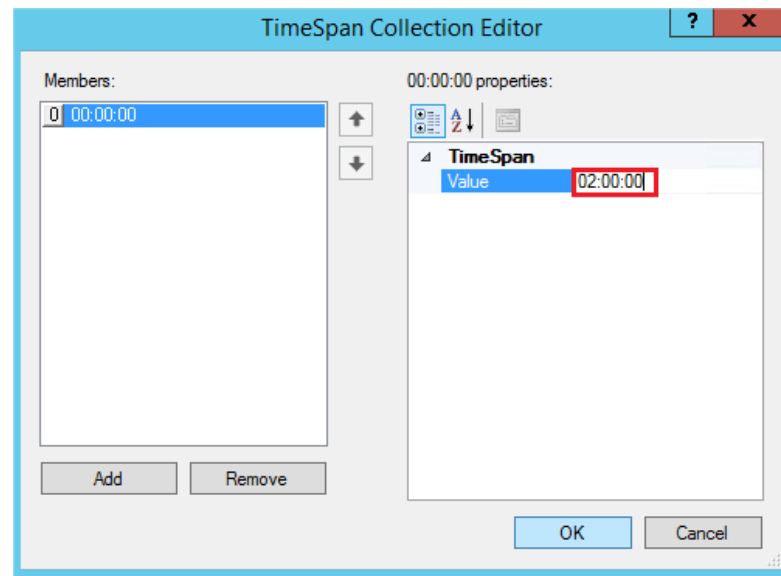
4. In the **Recycling** section, select the line Specific Times, and click on the "...” button:



5. Click on **Add**:



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

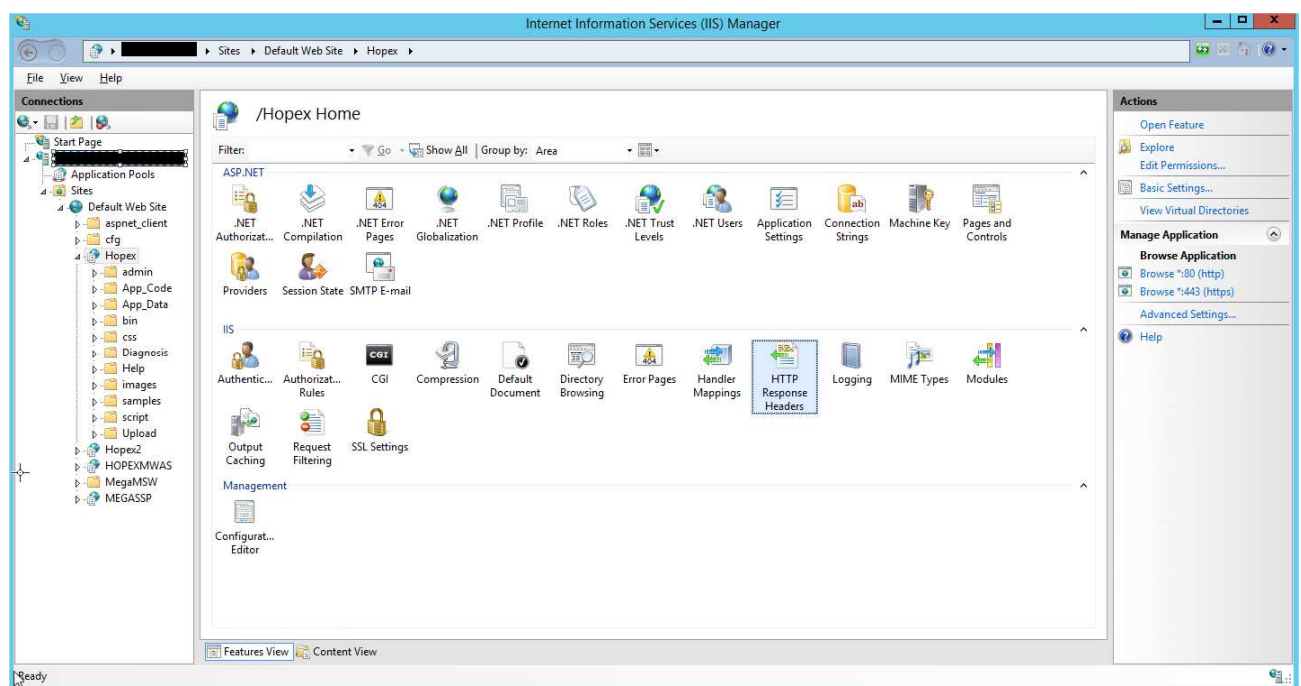


- Close the **Advanced Settings**. Reproduce this procedure for the **HOPEX2** application pool if you deployed HOPEX.

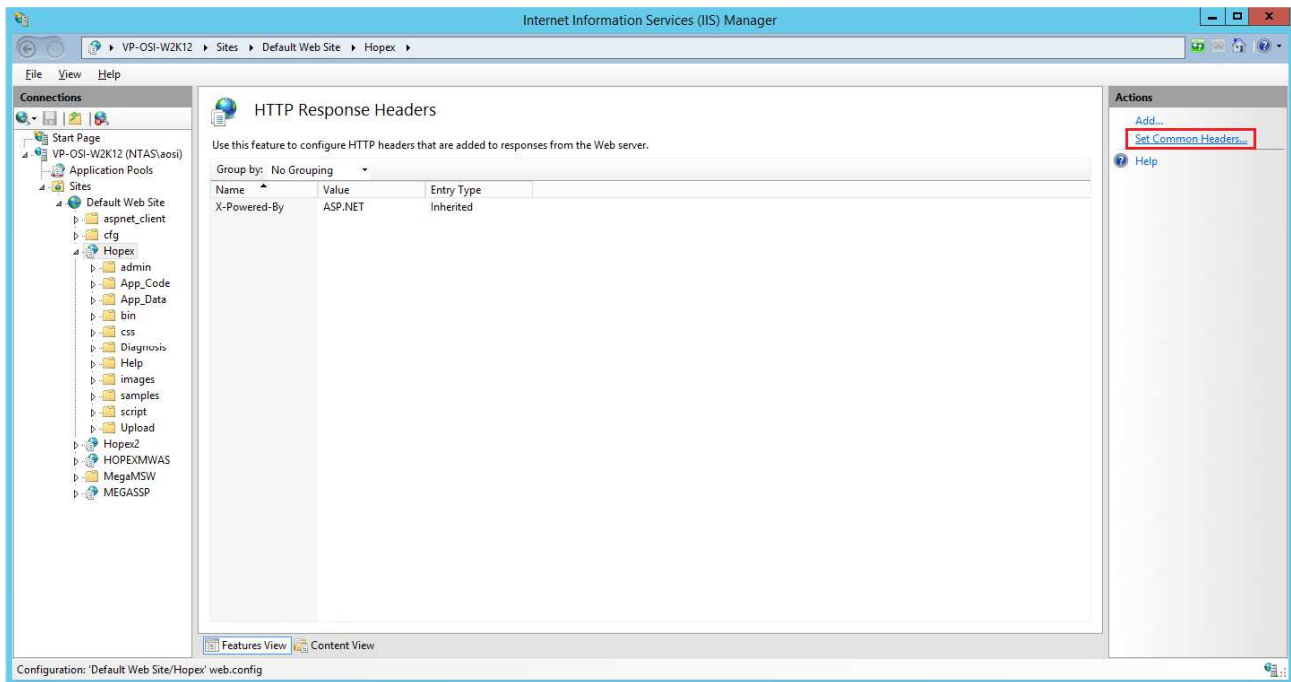
A restart of IIS will be needed to make this configuration active.

## Configure Web Content expiration

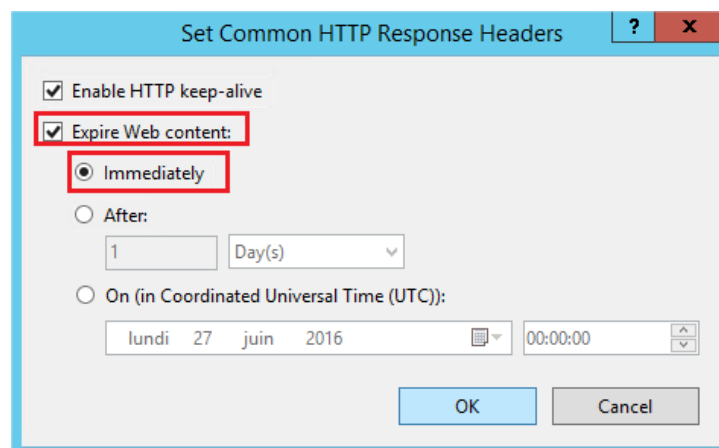
- In the "Internet Information Services (IIS) Manager", expand **Web Sites**, then **Default Web Site**.
- Select "HOPEX"
- Double-click the **HTTP Response Headers** functionality to open the feature:



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



5. Set it to expire immediately :

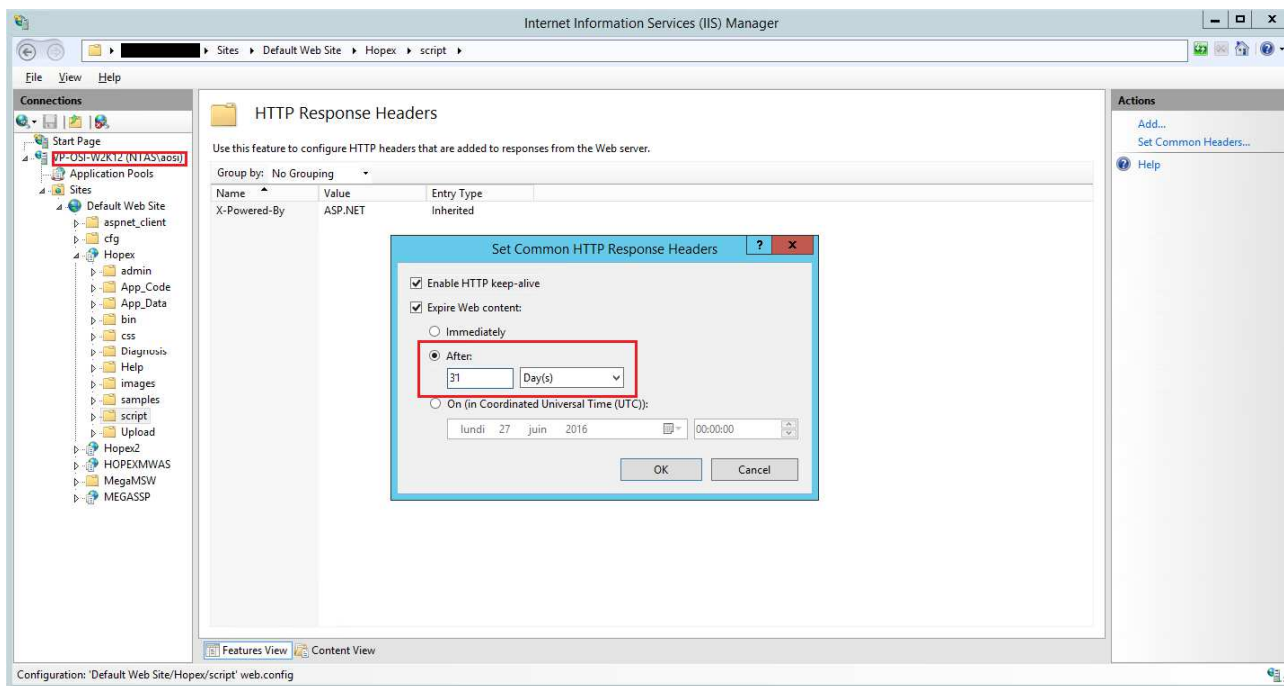


6. In the "Internet Information Services (IIS) Manager", expand **HOPEX**

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.



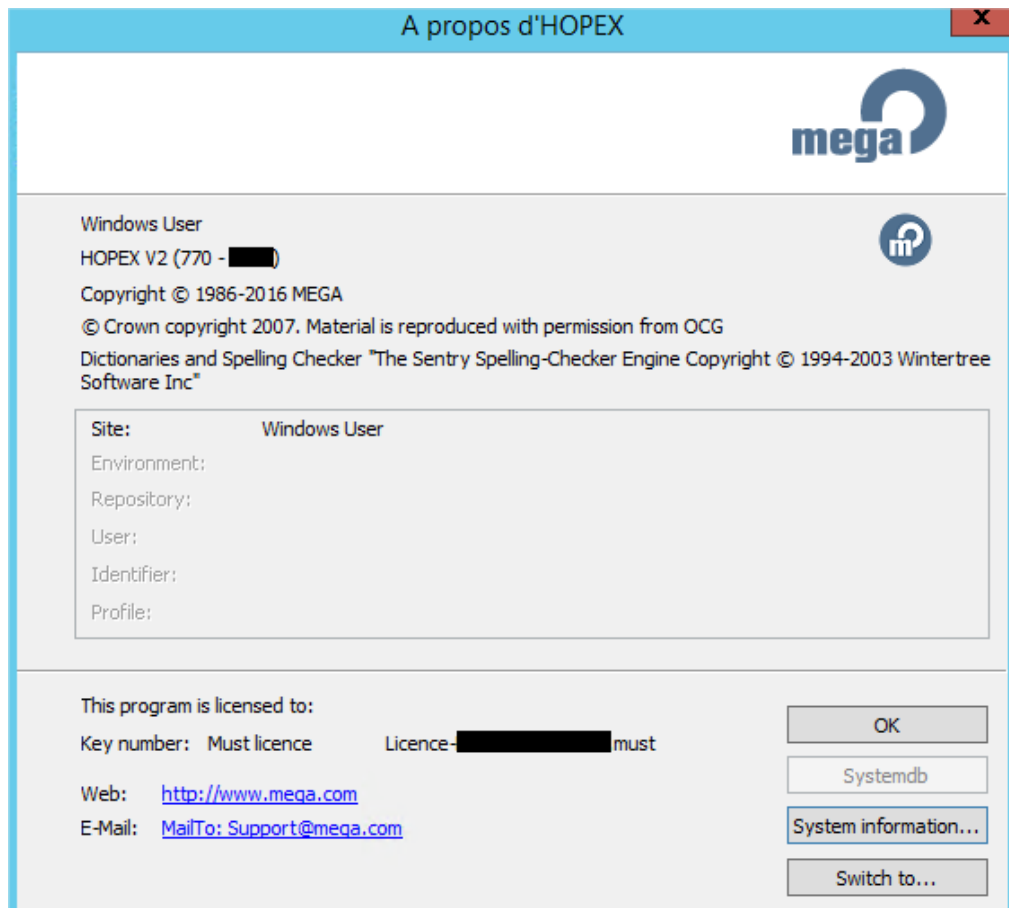
10. Repeat this step on the **css** and **images** folders.

## TESTING THE INSTALLATION

---

A pre-requisite for the test is to install the example environment (called 'Demonstration').

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



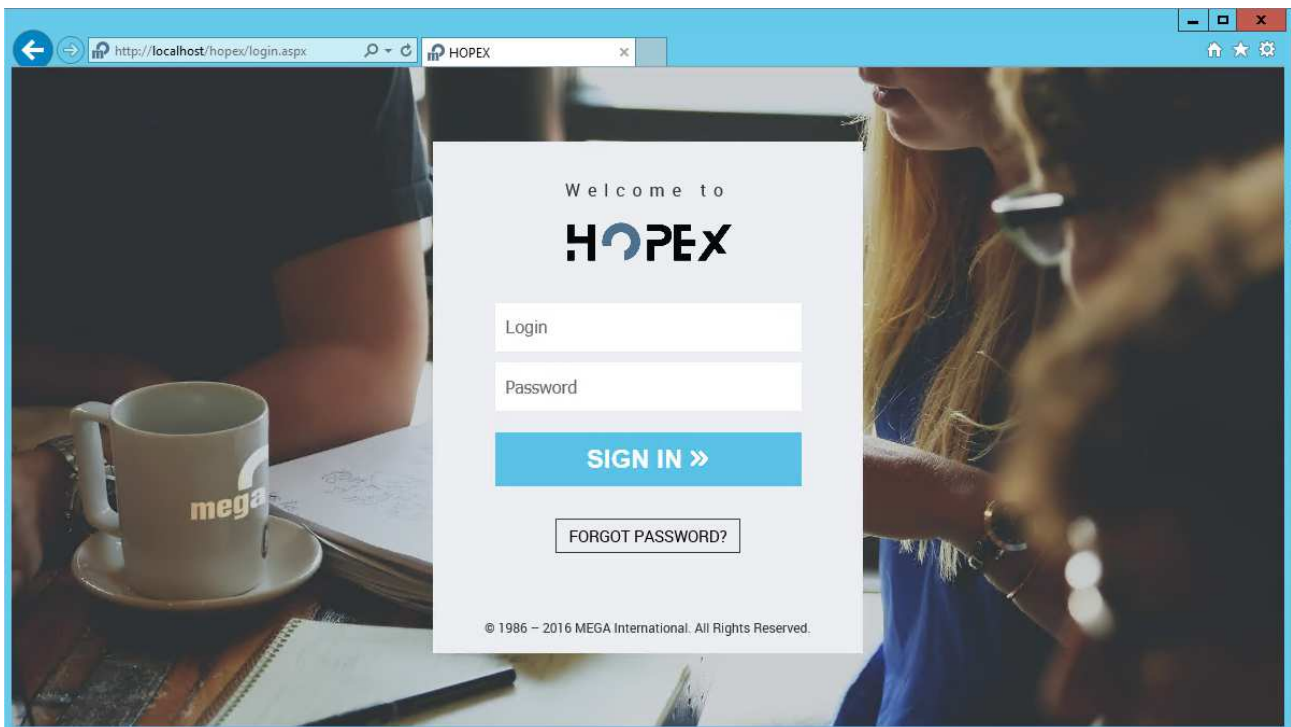
If the Administration Console does not start or if the license is not the one expected, you need to review the license configuration before going further.

## Testing MEGA HOPEX Web Front-End

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

On the server, open a supported browser and browse to <http://localhost/HOPEX/>.

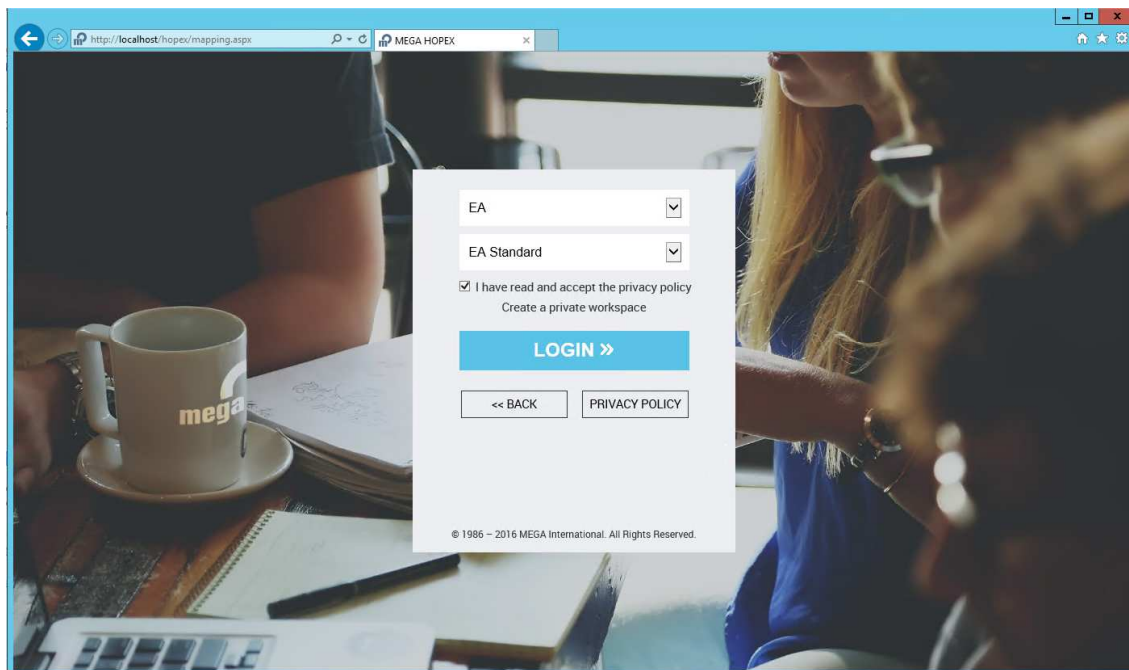
The login page should appear.



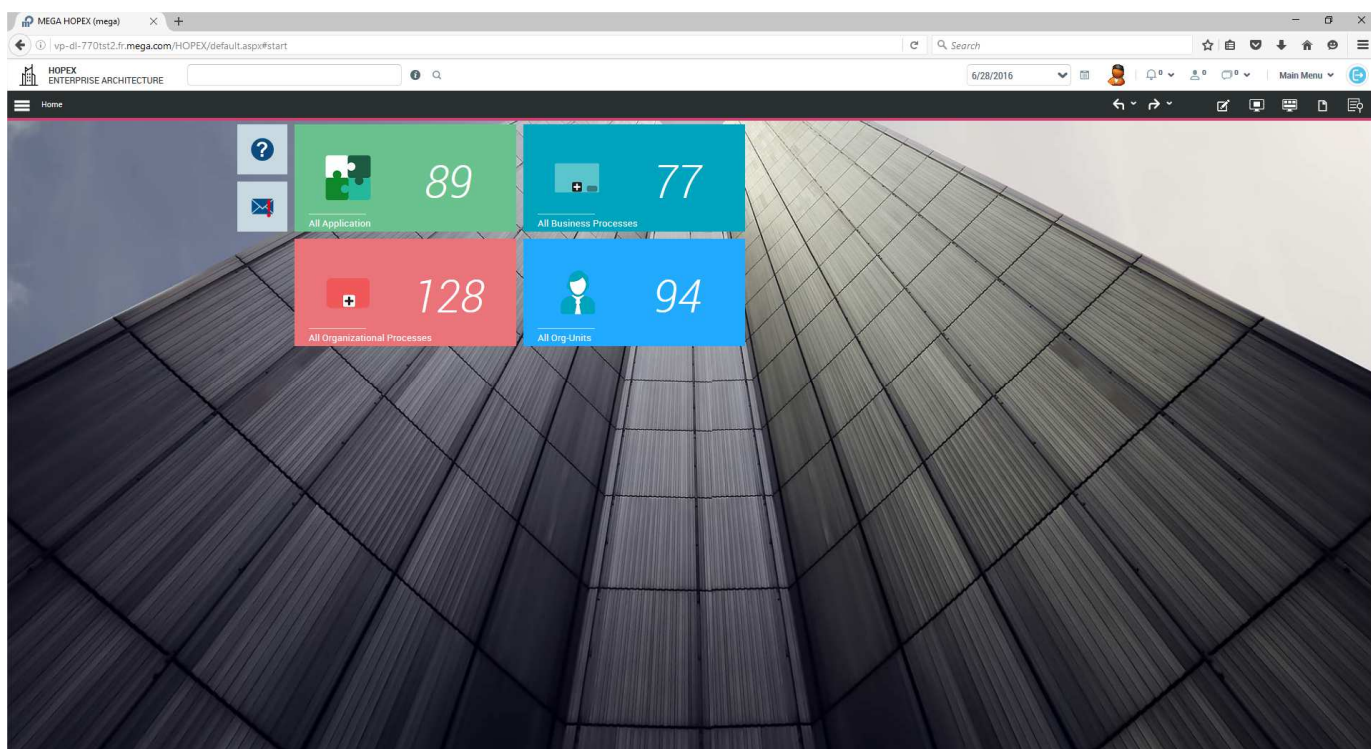
Now, use another client machine with any supported browser and browse to <http://<servername>/hopec/>. The login page should appear.

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

Then select:



The web workspace should be displayed:



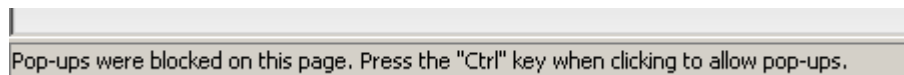
Depending on available licenses, the displayed content may vary.

## 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)

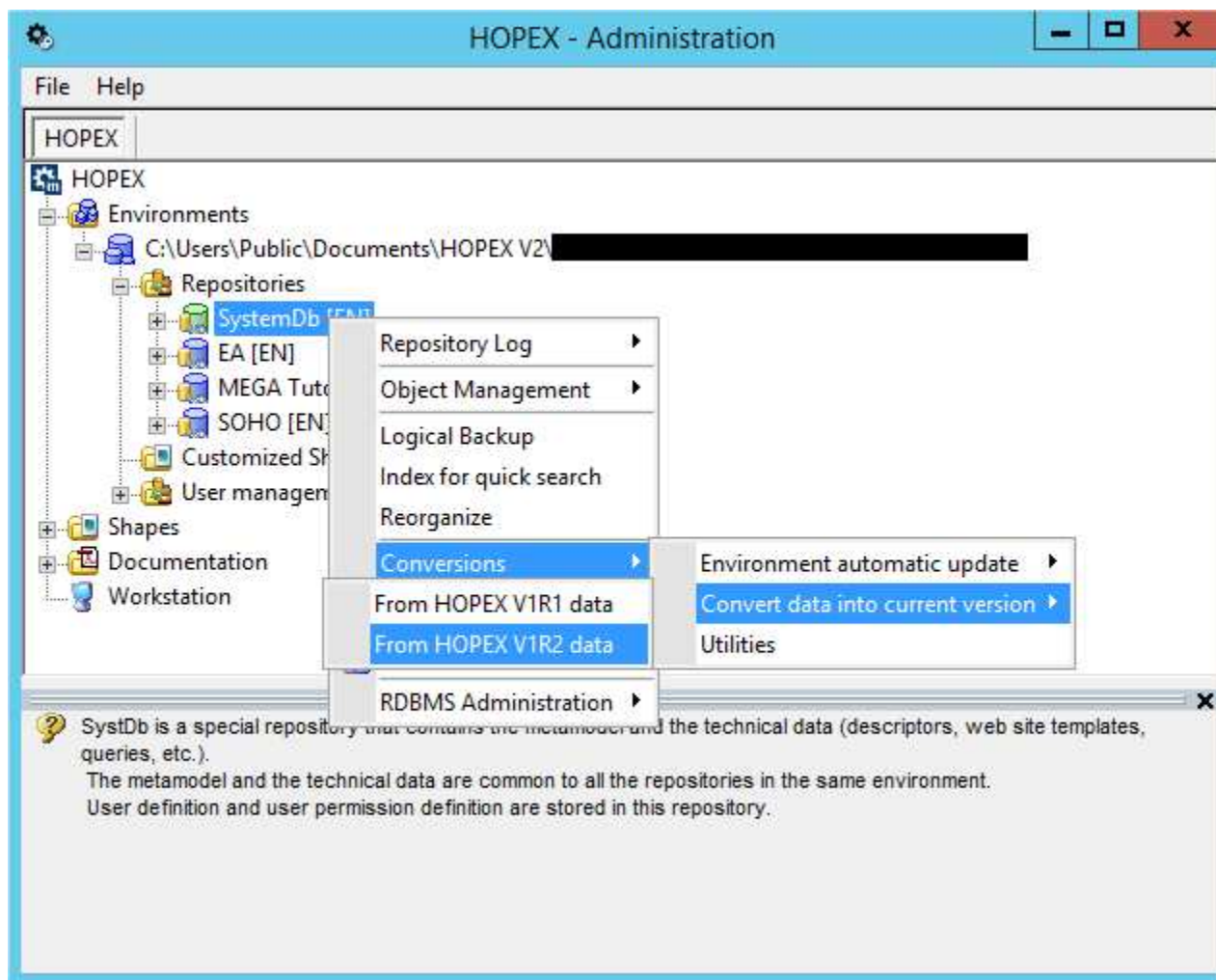
In Hopex V2, generated documents of new environments are automatically converted to the RTF format.

However, the format of Reports documents was MS Word.

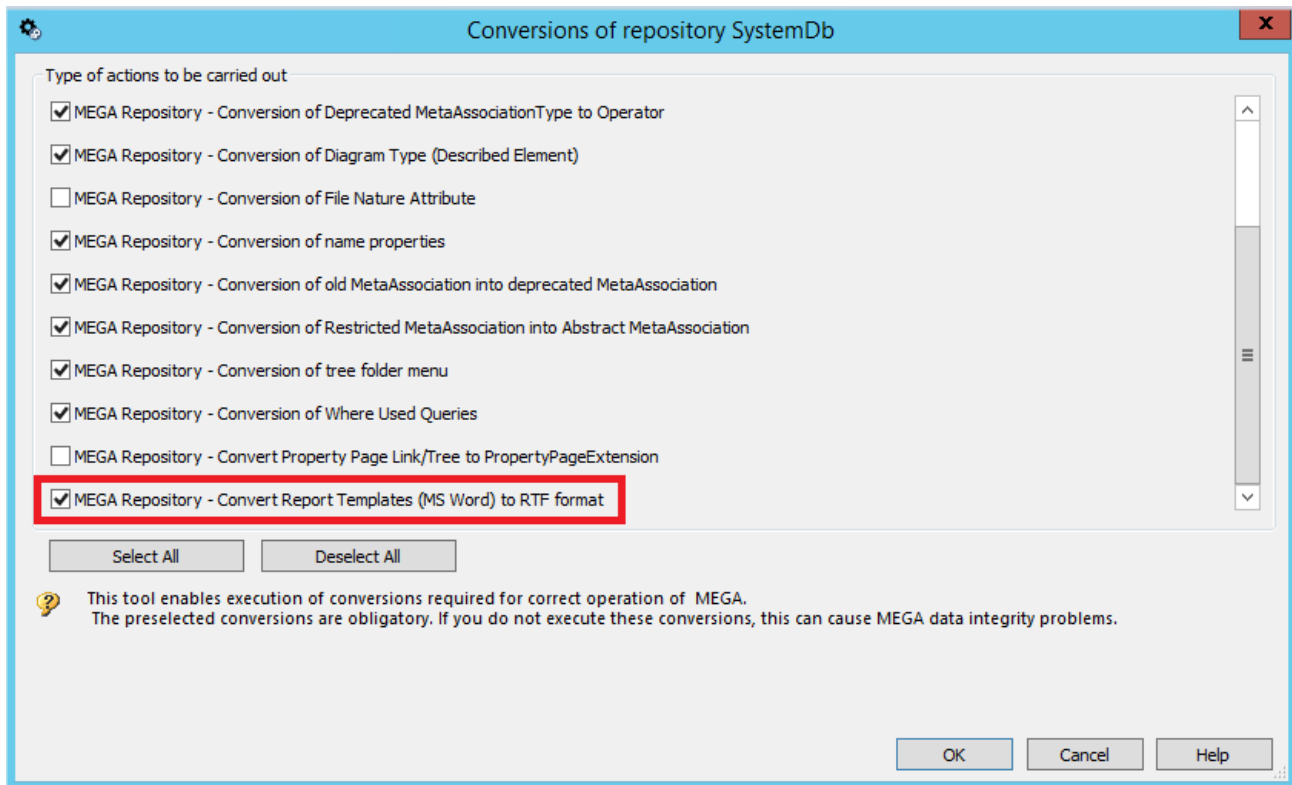
So if you are performing a migration from a source that still has this MS Word format, you must follow the below steps, in order to use documents on the Web Front-End.

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:

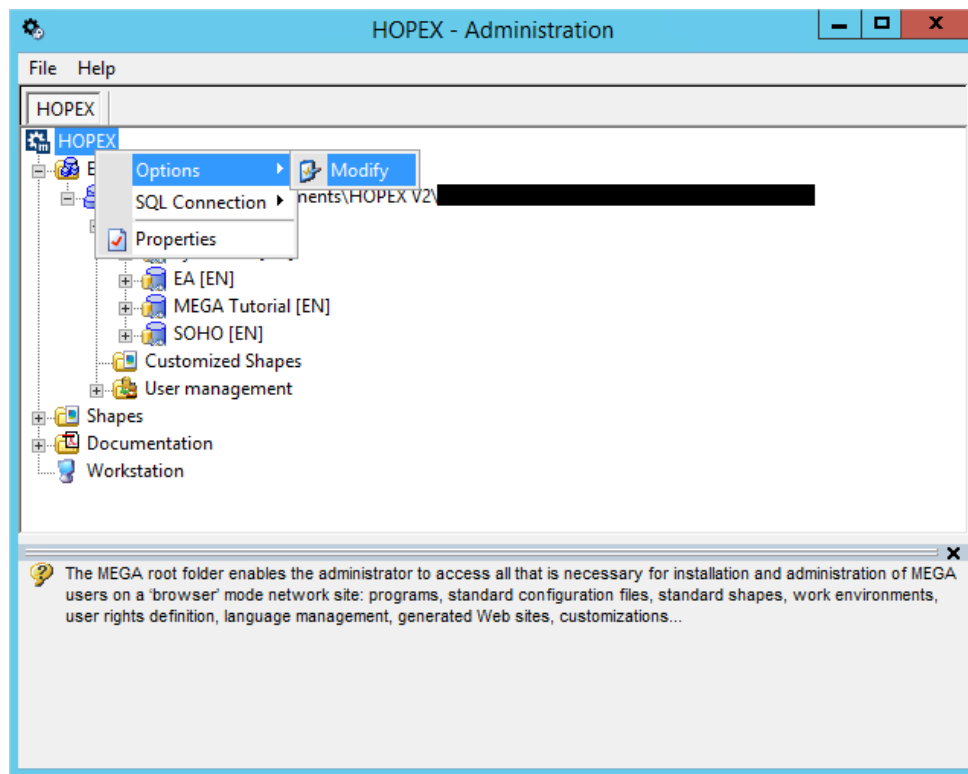


This is the last possible conversion called "MEGA Repository - Convert Report Templates (MS Word) to RTF Format", that is checked by default:



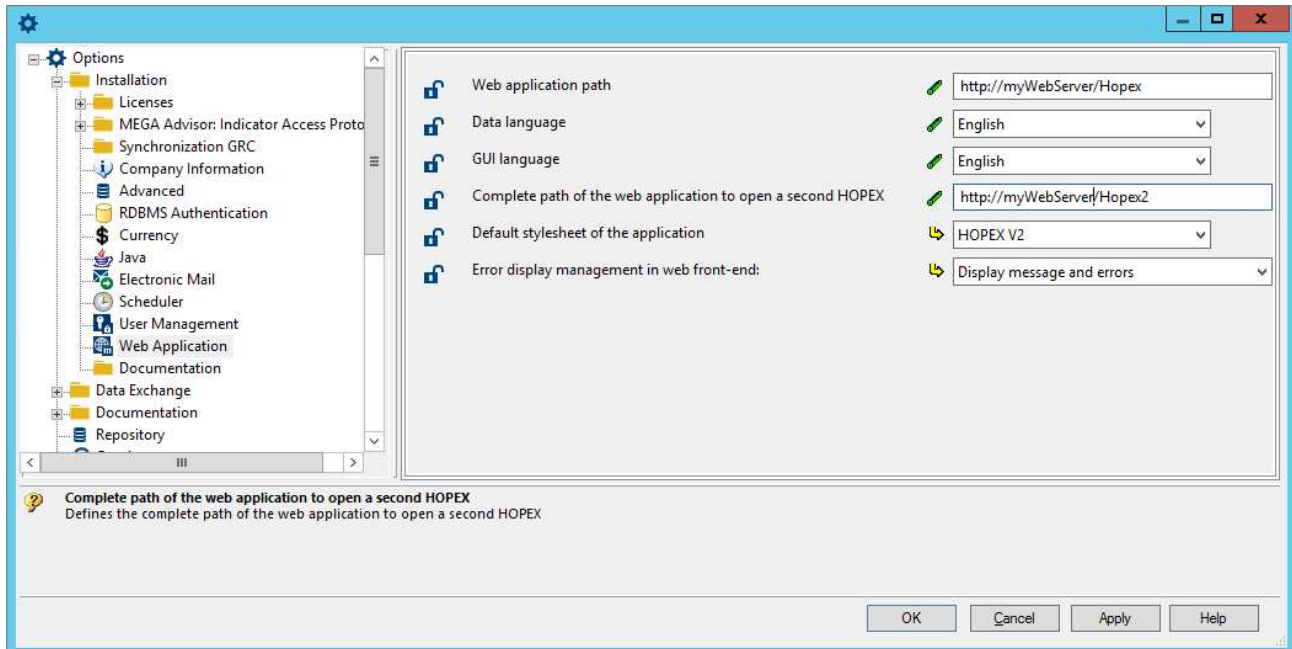
## Required options configuration

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

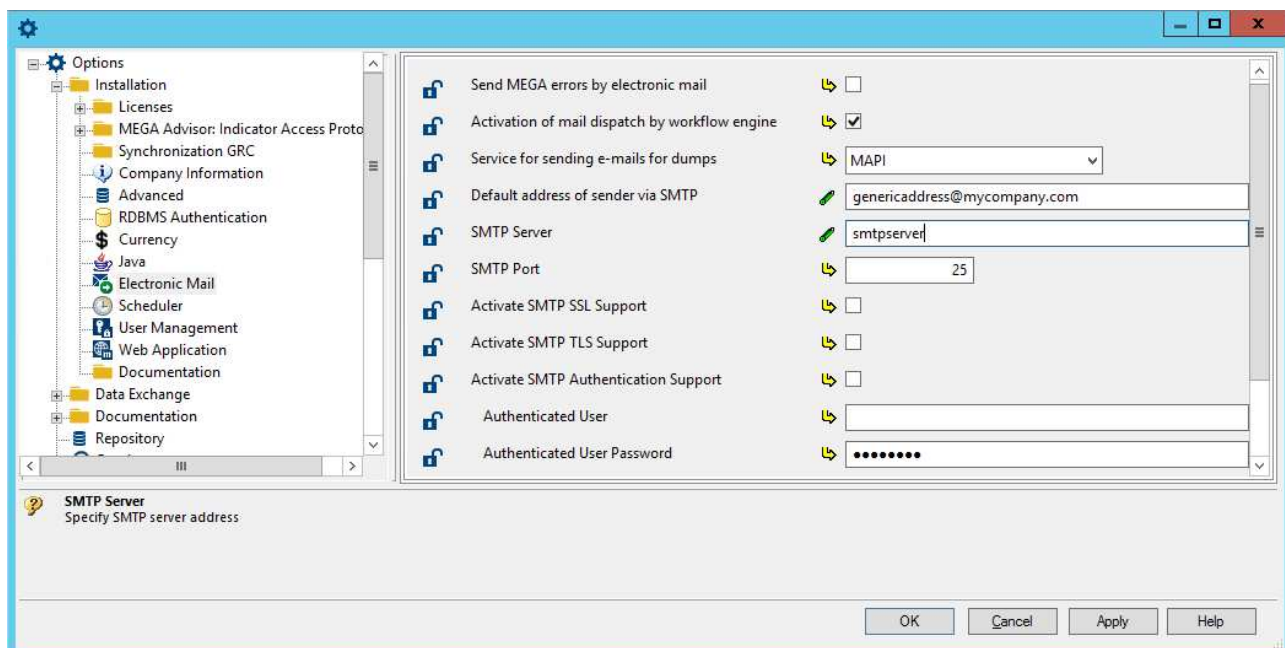


The following options are required for MEGA HOPEX Web front-end to operate:

- 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:

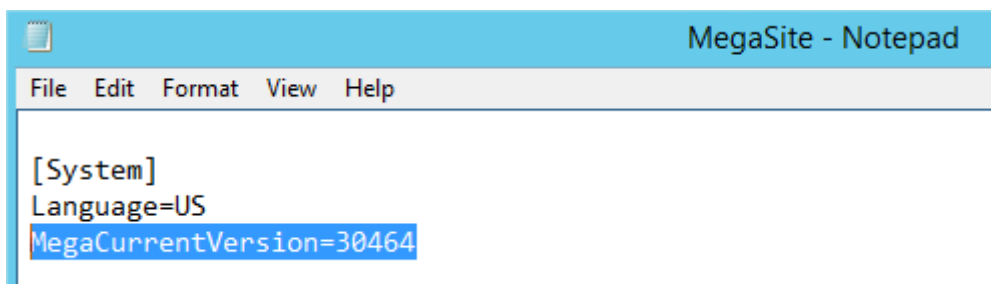


- In the Installation > Electronic mail folder:
  - Default address of sender via SMTP
  - SMTP Server
  - Any SMTP configuration (port, SSL, authentication, etc.) required by your infrastructure



In V2, please note that your MegaSite.ini will contain the version number. So if you upgraded a V1R2 version to a V2 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.

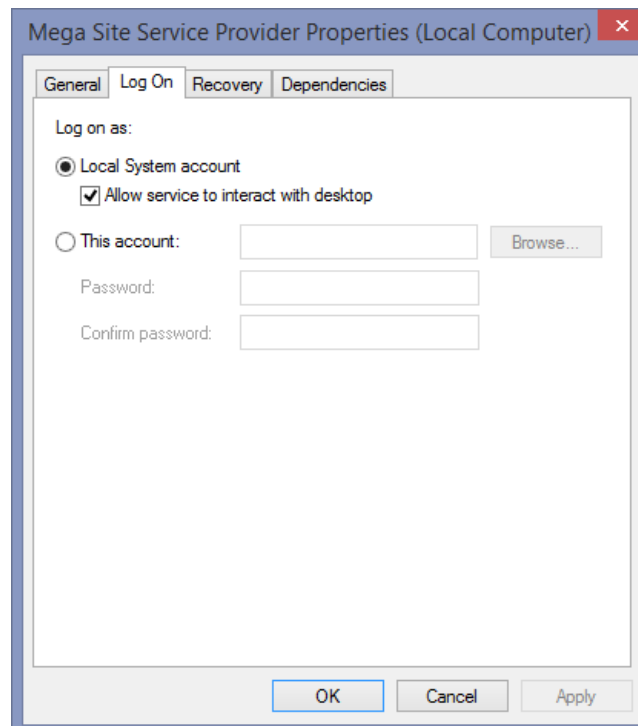
The verbose mode activation includes two steps:

- Registry update
- Mega Server Supervisor: « verbose mode » activation
  - ➔ To deactivate this configuration, see Disabling the verbose mode p. 47.

## 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. 12).
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:



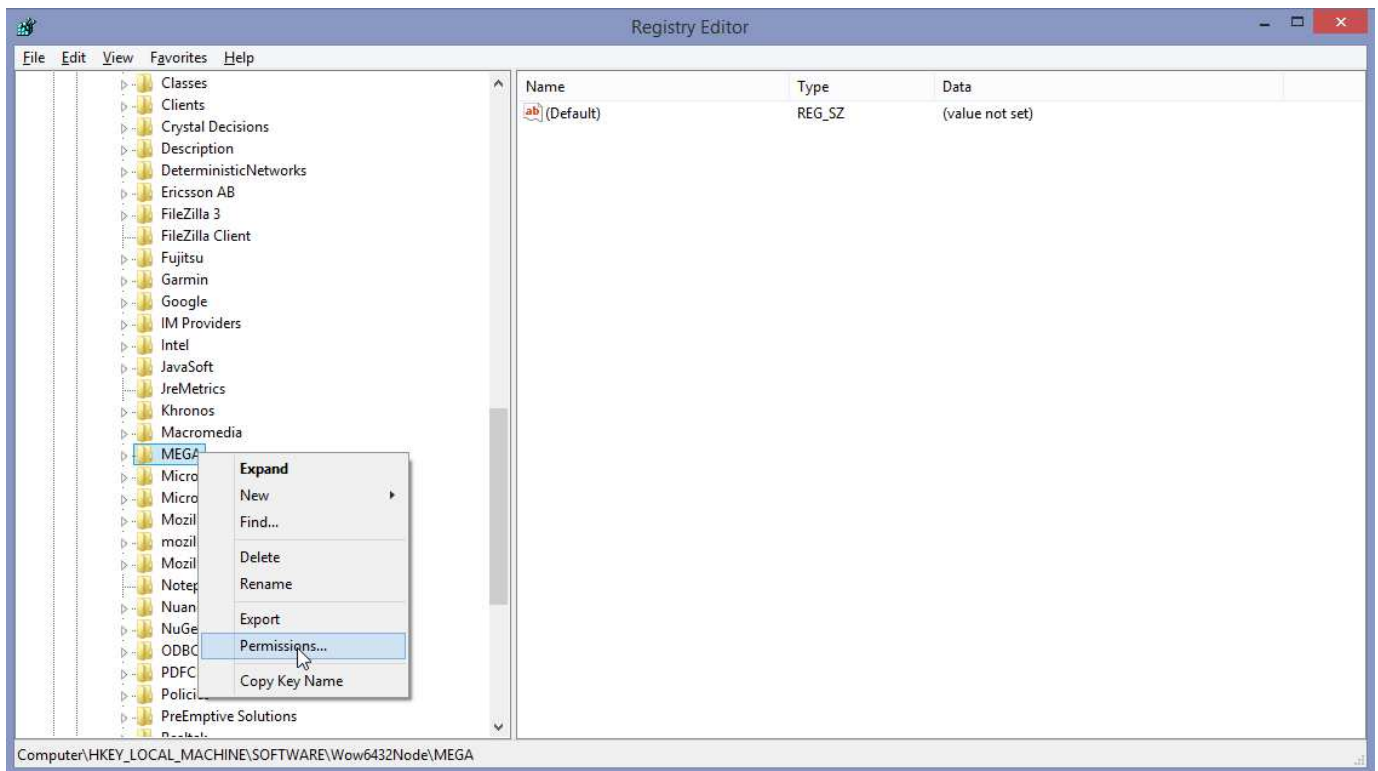
If it is « Local System », you do not need to update the registry for that service, only for the impersonate user.

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*

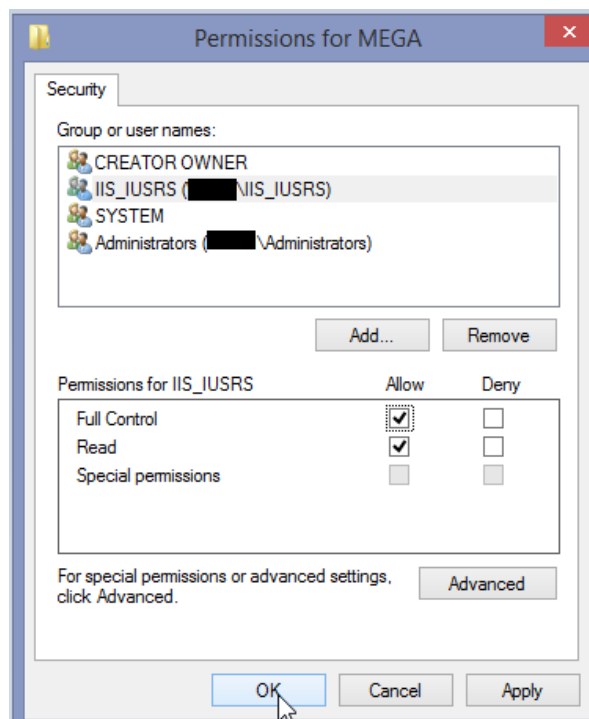
*Right-click the key and select **Permissions**.*



- 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".

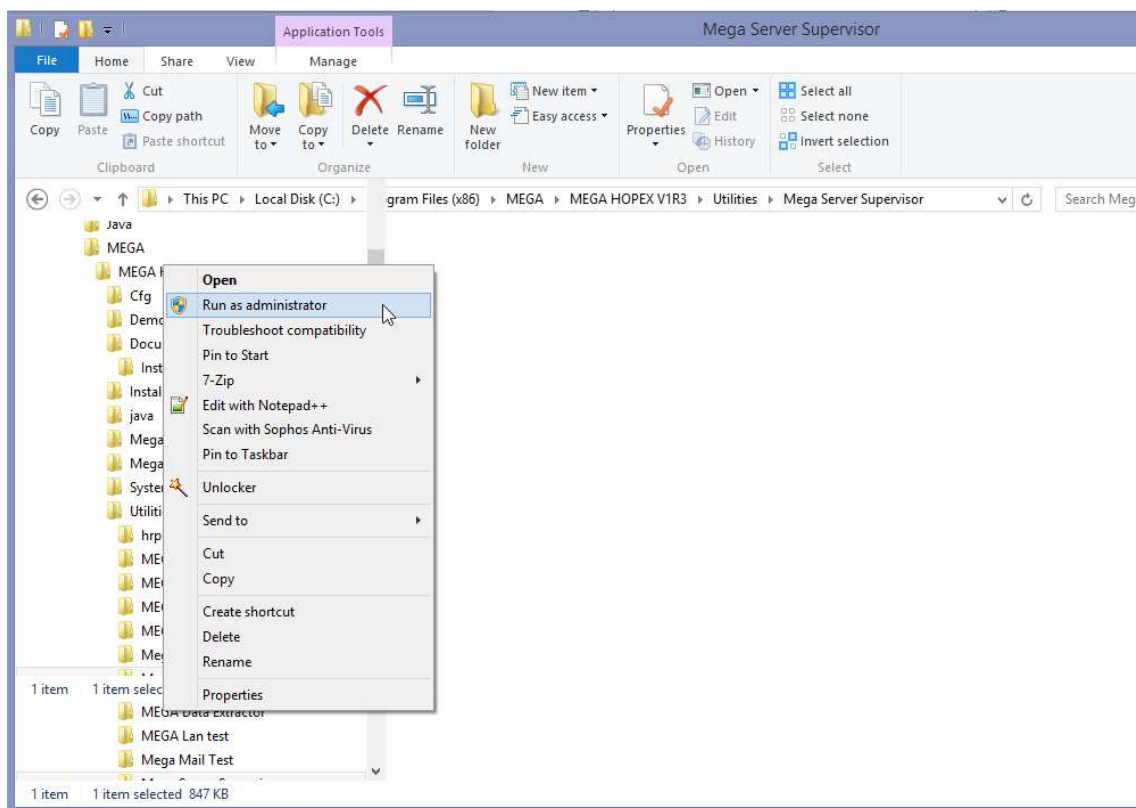
- e. Allow: "Full Control" and "Read".



- f. Apply and close the registry.

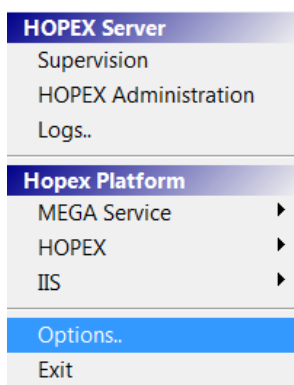
## Mega Server Supervisor: « verbose mode » activation

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**.

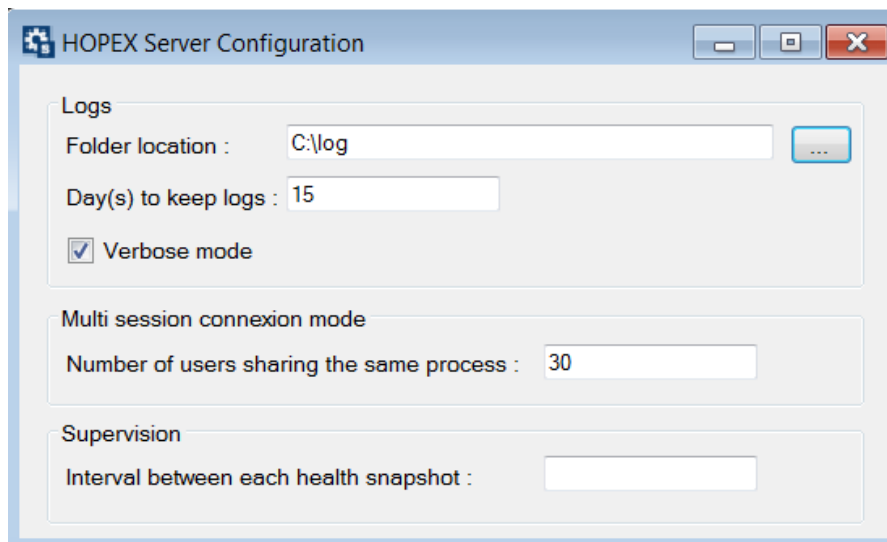


The **MEGA Server Supervisor** icon  appears in the system tray of your workstation.

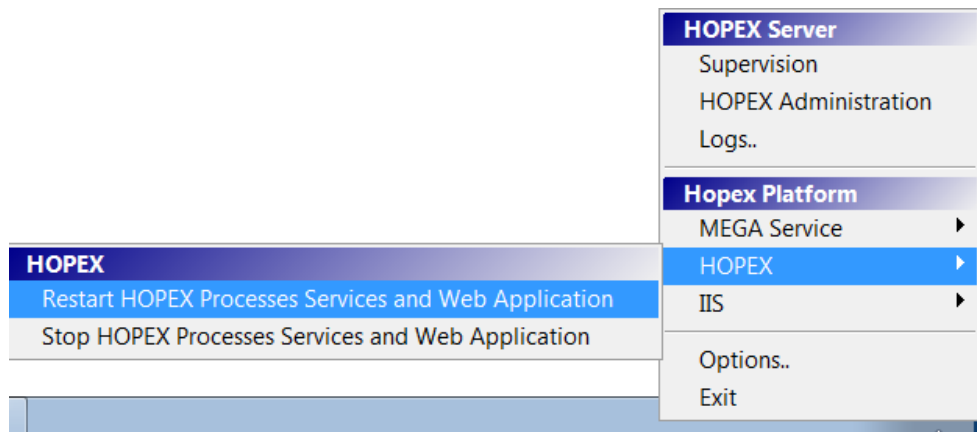
3. Right-click the icon and select **Options**.



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. 46 and clear **Verbose mode**.
2. Restart the application to take the modification into account.

## WHAT'S NEXT?

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You have successfully installed MEGA HOPEX Web Front-end.

You should now personalize your setup.

The two main steps are:

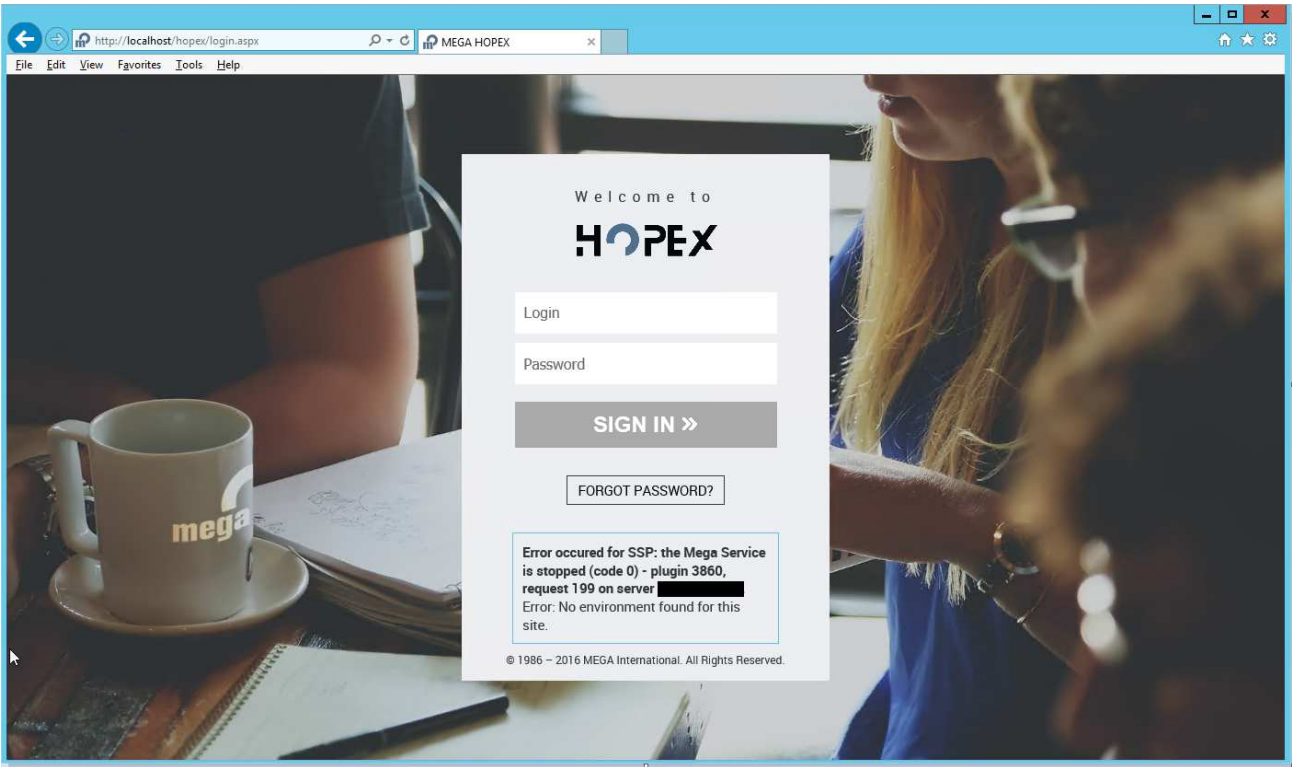
- Setting up an RDBMS environment
- Configuring authentication

Refer to Mega administration documentation.

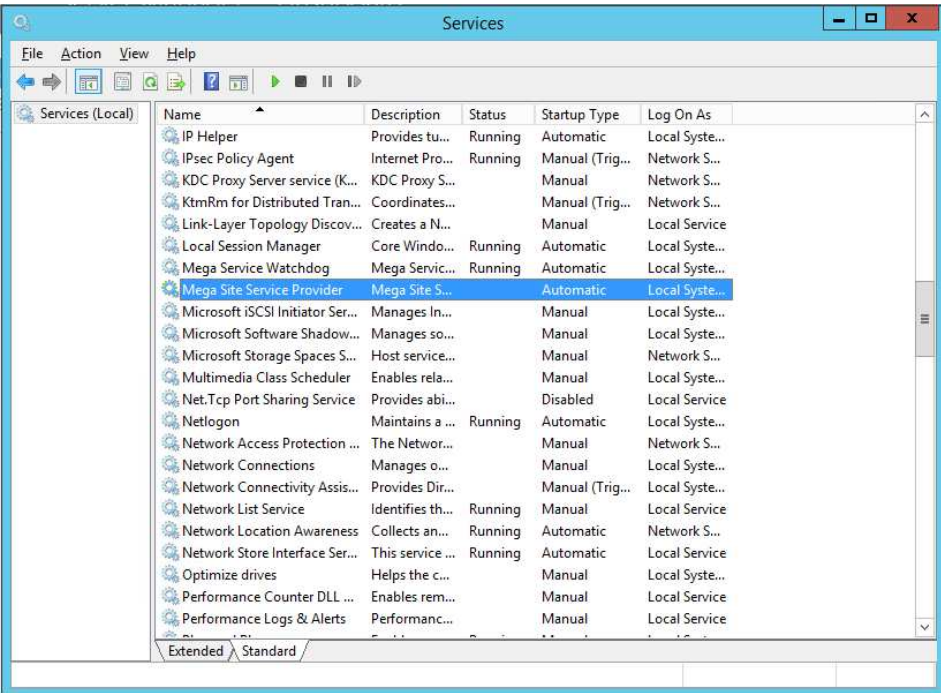
# TROUBLESHOOTING

## 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 Site Service Provider is running using the Services administration tool:



If it is not running, check that its startup is « Automatic » and Start the service.

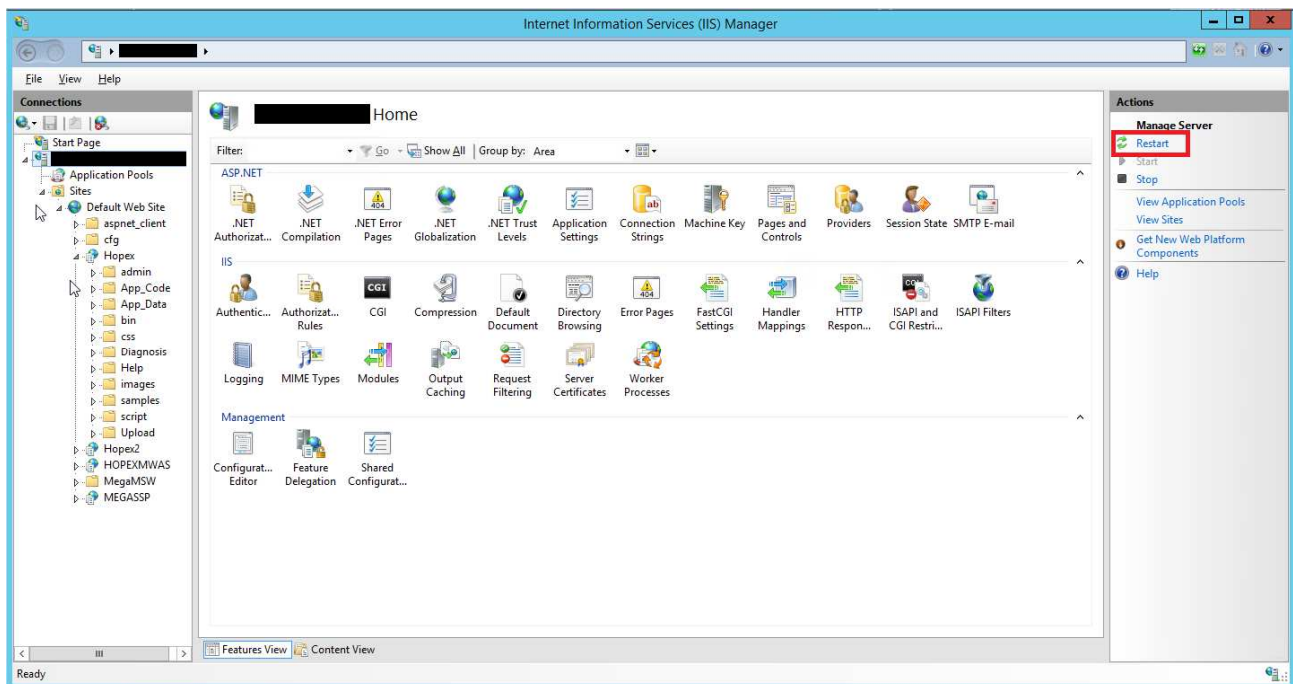
If it is running, restart the service.

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

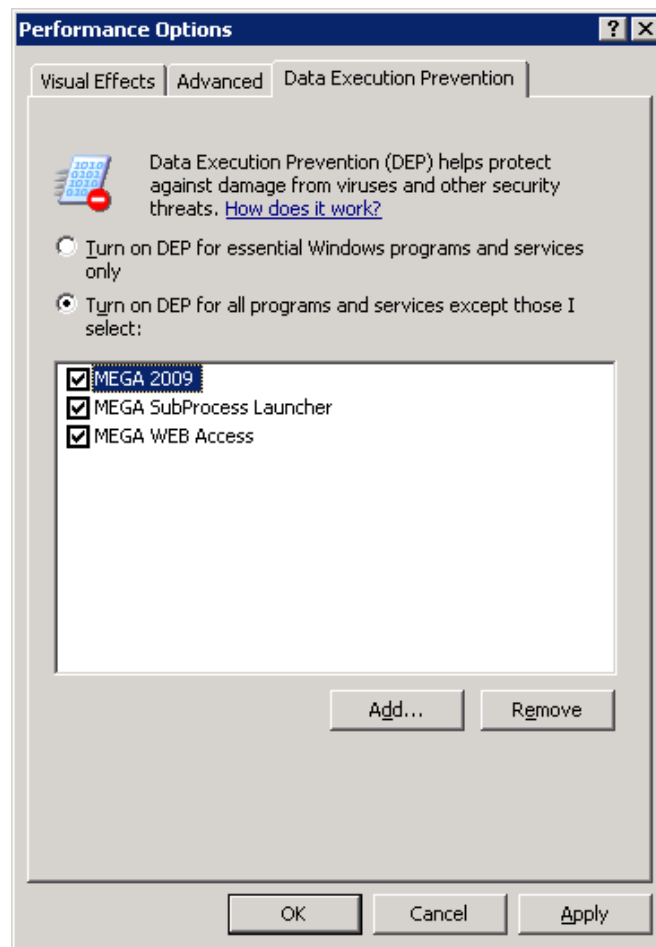
In rare cases, it might be necessary to disable “Data Execution Prevention (DEP)” for MEGA programs.

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.

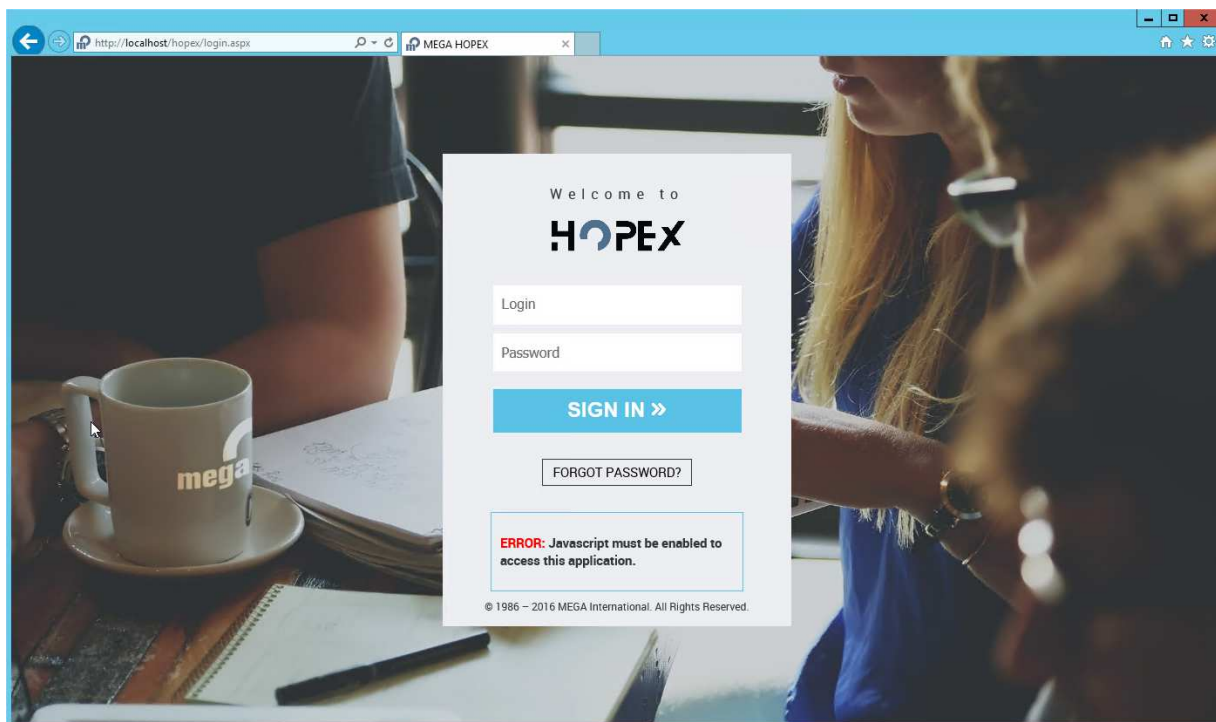
You can either turn on DEP only for essential Windows programs and services, or add exceptions for the following Mega programs (default installation locations):

- C:\Program Files (x86)\MEGA\MEGA HOPEX V2\System\mgwspro.exe
- C:\Program Files (x86)\MEGA\MEGA HOPEX V2\System\mgwmapp.exe
- C:\Program Files (x86)\MEGA\MEGA HOPEX V2\System\mgwmwas.exe



## Loosening Internet Explorer Security Settings

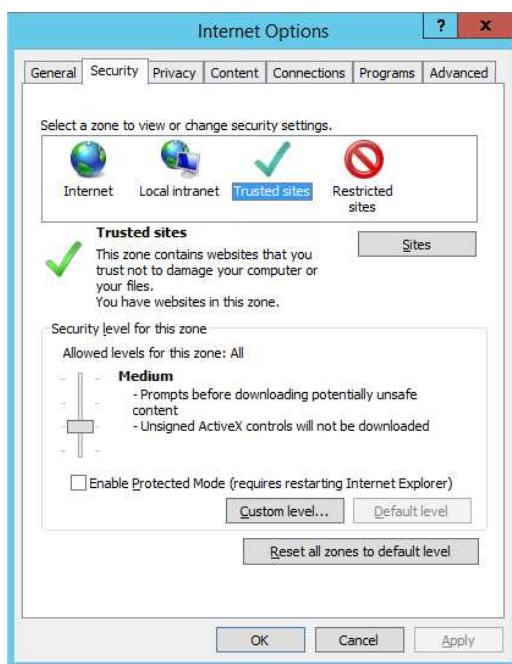
Although default browser security settings on client machines are sufficient for using the MEGA Web Application, some computers, especially servers, might have stricter security policies. For instance, they might prevent the execution of JavaScript, on which the MEGA Web Application relies.



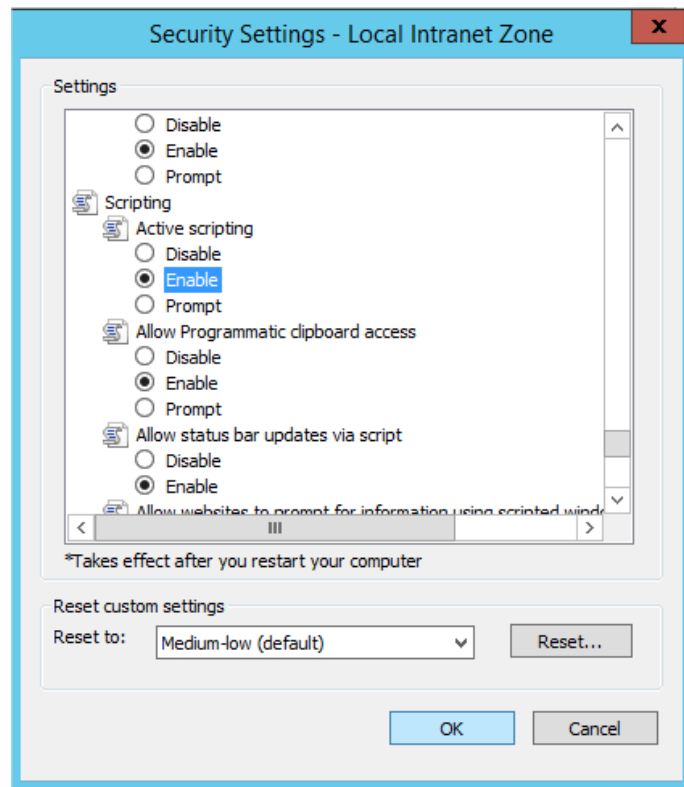
To fix this issue, follow the steps below:

### 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"

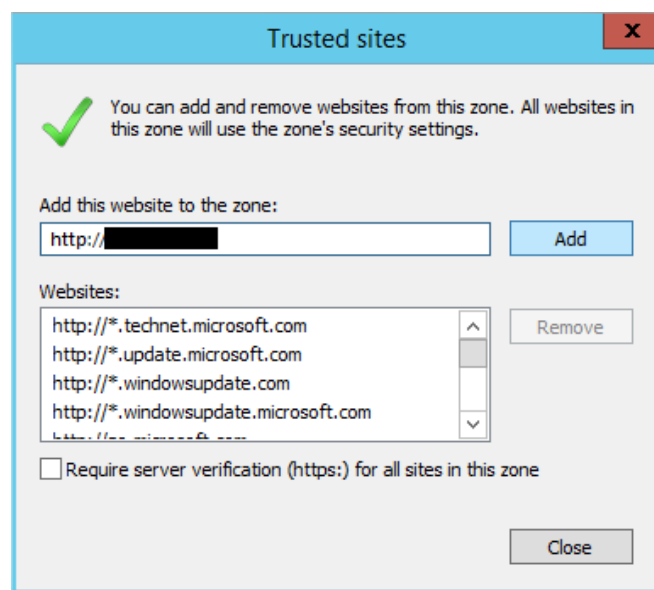


#### 4. Enable "Active Scripting"



#### odeStep 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



## Windows Front-End Architecture Overview HOPEX V2 EN

# CONTENTS

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## Summary

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

This document only applies to HOPEX V2.

It does not describe:

- How to perform installations (see installation documentation).
- How to install corrective patch (see how to upgrade CP documentation).
- How to manage installations (see administrator manuals).
- How product 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.

## 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"><li>• Windows clients (presentation and business logic). There are as many clients as end user workstations.</li><li>• Database server (data).</li></ul> A shared configuration folder is used.
Citrix/TSE deployment	Large deployment, reduced bandwidth	3-tiers architecture: <ul style="list-style-type: none"><li>• Client (presentation).</li><li>• Application server (business logic).</li><li>• Database server (data).</li></ul> 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	

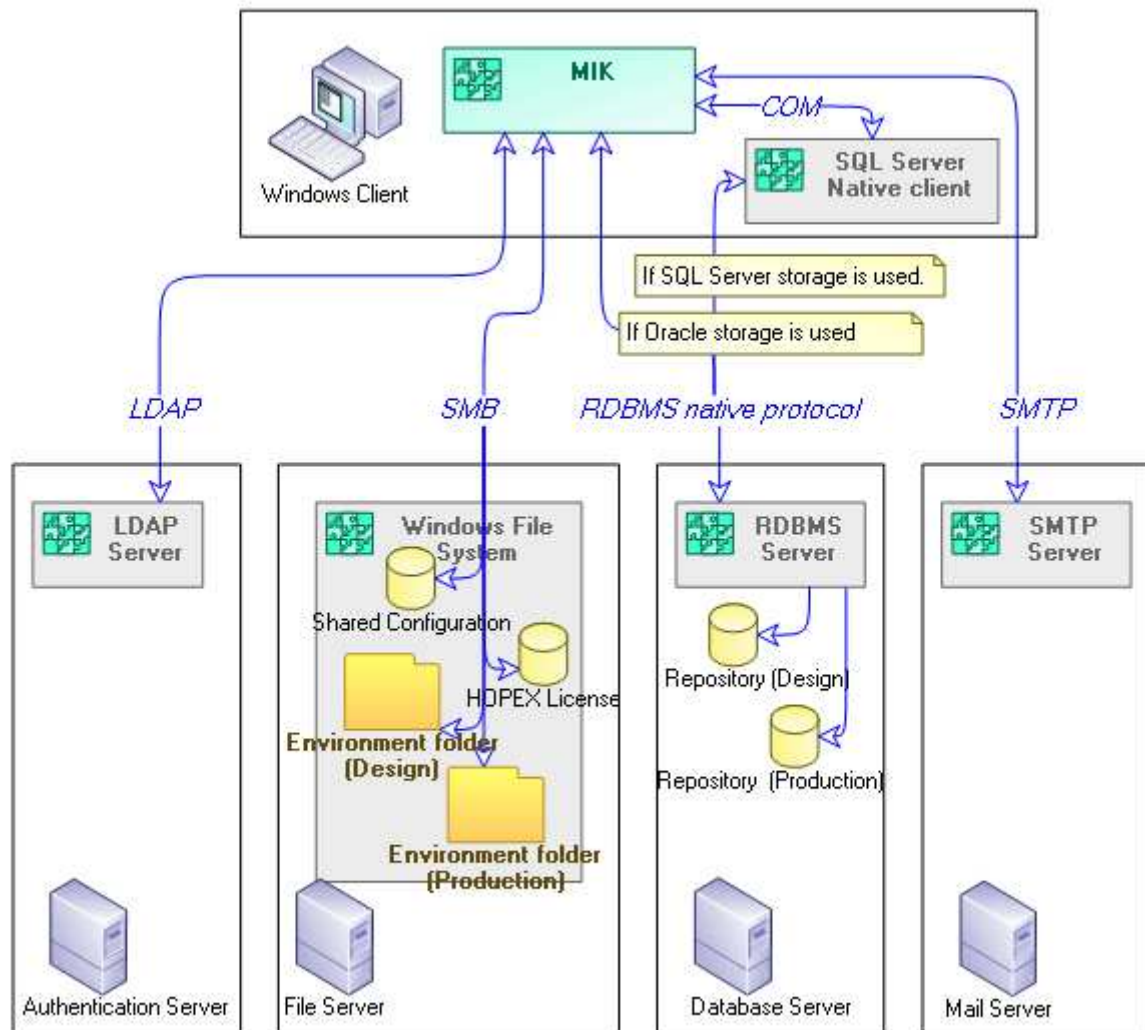
**Other deployment models** – For specific requirements, other deployment models are possible. For further information, contact your sales representative.

\* 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.

## Standard Deployment

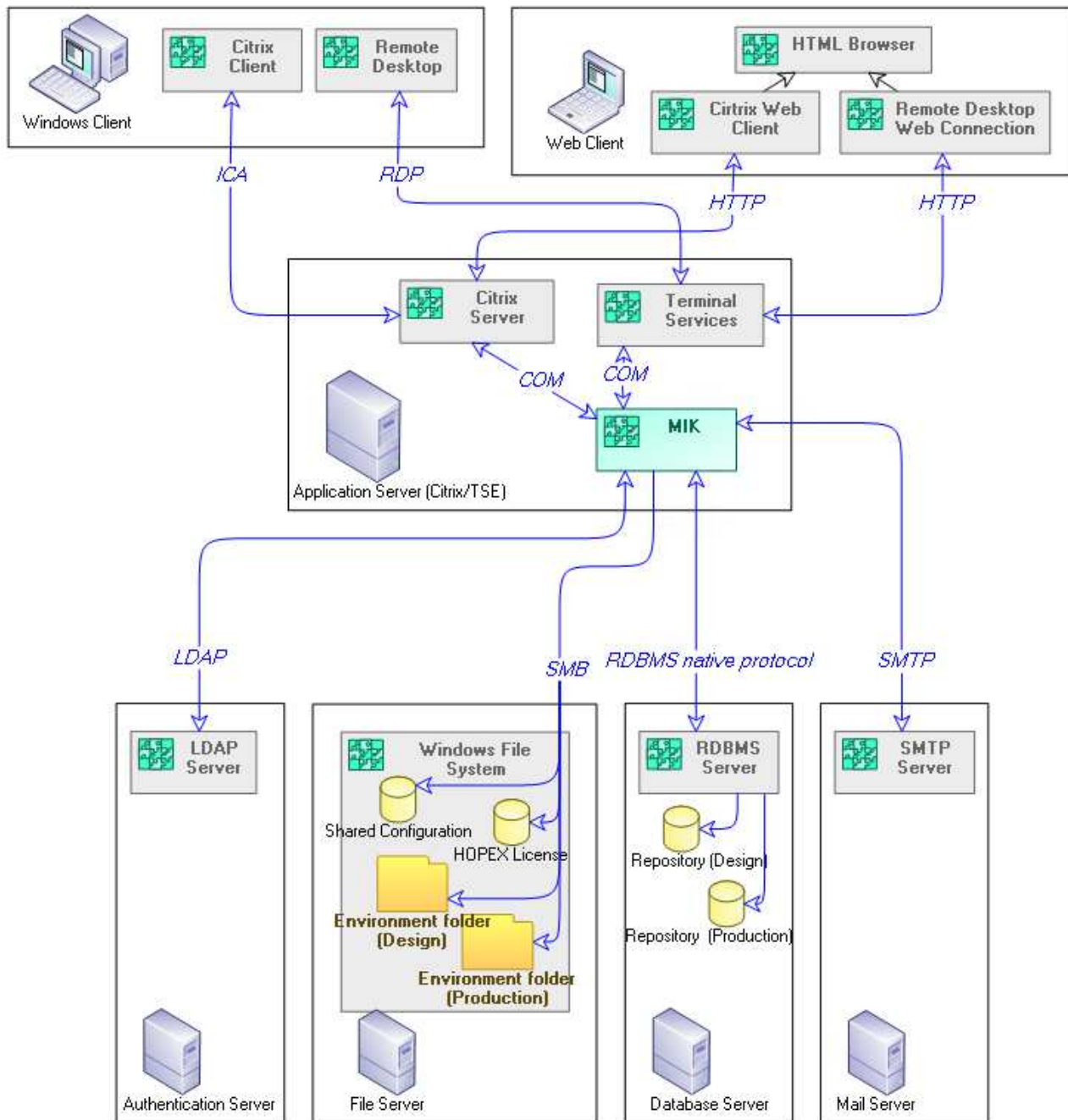
There is one MIK (running instance of HOPEX Kernel) per workstation running Windows Front-End.



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.

## 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.

## DEPLOYMENT REQUIREMENTS

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### Windows Client

<b>Client System</b>	Windows 8 (32-bit or 64-bit) Windows 8.1 (32-bit or 64-bit) Windows 10.0 (32-bit or 64-bit) <b>Visual C++ Redistributable for Visual Studio 2015 (1)</b>
<b>Additional Software</b>	<b>PDF reader:</b> Adobe reader 10.0 or higher recommended RTF/DOC/DOCX reader XLS/XLSX reader <b>SQL Server Native client 11.0 (SQL Server 2012, SQL Server 2014, SQL Server 2016)</b> If data is stored in SQL Server Note the Internet Explorer (IE) is required (2).
<b>Hardware</b>	<b>Processor</b> multi-core <b>RAM</b> 2 GB minimum 4.0 GB or higher recommended <b>Resolution and colors</b> 16 M colors Screen resolution 800 x 600 minimum 1024 x 768 or better recommended <b>Disk space</b> 4 GB for HOPEX Kernel 5 GB recommended per environment (caches) 50 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. IE 9.0 is required, IE 11.0 is recommended.

### File Server

<b>Server System</b>	Windows Server 2012 SP2 Windows Server 2012 R2 Windows Server 2016 For other file systems a specific study is necessary
----------------------	--

<b>Hardware</b>	<p><b>Processor</b> See hardware requirements of the system.</p> <p><b>RAM</b> See hardware requirements of the system, 1 GB recommended.</p> <p><b>Disk space</b> 5 GB recommended per HOPEX Environment (environment folder).</p> <p><b>Select superior quality components for disks and disk controller cards.</b></p>
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### Citrix Client/Remote Desktop Client

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

### Application Server (Citrix Server/Terminal Server)

<b>Server System</b>	See also requirements for Citrix Presentation Server or Citrix XenApp
<b>Application Server Layer</b>	<p>TSE on Windows Server 2012 TSE on Windows Server 2012 R2 TSE on Windows Server 2016 Citrix XenApp 7.x For 2012 R2 Citrix XenApp 7.x For 2016 <b>Visual C++ Redistributable for Visual Studio 2015 (1)</b></p>
<b>Additional Software</b>	<p><b>Adobe Reader:</b> 10.0 or higher <b>SQL Server Native client 11.0 (SQL Server 2012)</b> If data is stored in SQL Server Note that Internet Explorer (2) is required.</p>

<b>Hardware</b>	<p><b>Processor</b>  2 cores minimum per group of 15 users  3-4 cores recommended per group of 15 users</p> <p><b>RAM</b>  1 GB minimum for the Terminal Server system and for the Citrix system  Per concurrent modeller user  600 MB intensive use  300 MB low use</p> <p><b>Resolution</b>  65000 colors minimum.</p> <p><b>Disk space</b>  4 GB for HOPEX Kernel  5 GB recommended per environment (caches)  500 MB recommended for logs</p>
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- (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. IE 9.0 is required, IE 11.0 is recommended.

## Database server

<b>Server System</b>	see RDBMS requirements
<b>RDBMS</b>	Oracle Database Server 12 SQL Server 2012 SQL Server 2014 SQL Server 2016
<b>Disk space</b>	<b>Data:</b> 2 GB minimum per system database 1 GB minimum per data repository 1 GB minimum for business documents Refer to the separate article 'RDBMS Repository Installation guide HOPEX V2'.
<b>Hardware</b>	<b>RAM:</b> a specific study is required. Refer to the separate article 'RDBMS Repository Installation guide HOPEX V2'. <b>CPU:</b> see hardware requirements of the RDBMS.

## COMMUNICATION

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### Between MIK and File Server (file access, license access)

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

(1) For GBMS storage.

### Between Citrix client and Citrix Server

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

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

### Between Citrix web client and Citrix Server

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

### Between Remote Desktop Client and Remote Desktop Services

<b>Protocol</b>	Remote Desktop Protocol (RDP)
<b>Port</b>	UDP/TCP 3389 (MS WBT Server)
<b>Network bandwidth</b>	100 Kbit/s or higher full duplex

<b>Network latency</b>	100 Ms maximum*
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### Between Remote Desktop Web Client and Remote Desktop Services

<b>Protocol</b>	HTTP
<b>Port</b>	UDP/TCP 80 (HTTP)
<b>Network bandwidth</b>	100 Kbit/s or higher full duplex
<b>Network latency</b>	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 V2').

### Between MIK and Database server (Oracle, SQL Server)

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

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

### Between MIK and mail server

<b>Protocol</b>	SMTP
<b>Port</b>	25 by default, configurable

### Between MIK and Document server (file access)

<b>Protocol</b>	SMB/CIFS
<b>Port</b>	UDP/TCP 138 UDP/TCP 137 UDP/TCP 139 UDP/TCP 445

## Between MIK and LDAP Server

<b>Protocol</b>	LDAP
<b>Port</b>	TCP 389 by default (2)

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

## Administration tools

Several administration tools can be used:

Administration tool	Component	Tasks
Administration Console	Win32 (Administration.exe)	Data storage management (environment, repositories, stored procedures) Functional administration (user, permissions, workspaces, LDAP configuration, import/export...)
Must user 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

Reference:

- See online documentation, HOPEX Administration

## 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 V2 File extension: *.*	Folders of HOPEX core programs

## Authentication

Windows Front-End uses standard authentication.

Authentication models	Description	Comment
Standard authentication	The authentication process is managed within the HOPEX Platform. Users are declared explicitly in the HOPEX Environment.	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
Standard authentication (Autonomous)	System database	Encrypted, hashed

Standard authentication (Active Directory)	Active Directory	According to directory specifications
Standard authentication (LDAP)	LDAP directory	

Reference:

- See online documentation, Authentication in HOPEX.

## 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.

## 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.

- Authentication in HOPEX.
- Profiles.
- Managing Data Writing Access.
- Managing Data Reading Access.

## 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	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	Create one Oracle user per data repository or

Storage	Mapping	Comment
	user/schema A system database is a user/schema	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. <b>Protocol SMB 2.0 is not supported and must be disabled.</b> GBMS storage is not supported for data repository or system database with size higher than 4 GB.

Note that RDBMS storage can be mandatory for certain products and the bundles including such products.

Reference:

- Article 'RDBMS Repository Installation guide HOPEX V2'
- See online documentation, Products.

## 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, Managing Business Documents.

## 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)	%userprofile%\AppData\Local\Mega C:\Users\myuser\AppData\Local\Mega
MEGASETTINGS.INI	User settings	%userprofile%\AppData\Roaming\Mega Ex: C:\Users\c\AppData\Roaming\Mega
MEGAWKS.INI	Workstation settings	%userprofile%\AppData\Roaming\Mega Ex: C:\Users\myuser\AppData\Roaming\Mega

(1) location can be configured

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

When using Windows Front-End, each end user must have:

- A personal 'application data' folder where he or she can read, write and delete data
- A personal 'local settings' folder where he or she can read, write and delete data
- A personal 'temporary' folder where he or she can read, write and delete data.

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.

## 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 V2'.

## Multi-language

Windows Front-End enables to work with multiple languages.

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.

## 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

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.

## 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

- Managing repositories
- Managing logfiles
- Optimizing Repository Access Performance.

## Regular administration tasks

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

Task	Machine involved	Comment
Environment compilation	Application server	To build system cache. System updates are impossible during compilation
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
Information about fragmentation and statistics	Database server	Generates a technical report regarding physical indexing (statistics gathering)
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

## Reporting

There are three main categories of reports:

Category	Native format	conversion format	Comment
Report DataSet	HTML	XLS, XLSX, PDF	Generated from a Report DataSet Definition According to the Report DataSet Definition considered, certain conversion format may not be available.
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 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 DataSet Definition
- HOPEX Power Studio, HOPEX Studio - Report Studio
- HOPEX Power Studio, Customizing Reports (MS Word)

## 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.

## Services and running processes

No service is created on the application server.

Several processes can run on the application server:

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)

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

## Supervision

The HOPEX platform enables system monitoring.

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

The HOPEX Server Supervisor utility includes a supervision page (basic viewer for limited volume). A WMI probe enables to supervise HOPEX from standard tools supporting WMI (a specific integration is required).

## 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 V2\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 V2\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 V2\Cache\Compiled data	1-5 MB	Cache of images. Cannot be disabled. Updated dynamically at runtime.

(1) For one HOPEX environment

## 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 V2\Documentation

Language codes:

EN : English

IT: Italian

FR: French

DE: German

\* will be available a few months after the initial release

## FAQs

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### **Is Windows 7.0 SP1 (32-bit or 64-bit) still supported?**

With HOPEX V2, Windows 7.0 is supported but not recommended as support end date as passed. See <https://support.microsoft.com/en-en/lifecycle>

### **Is Windows Server 2008 (32-bit or 64-bit) still supported?**

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

### **Is Windows Server 2008 R2 still supported?**

With HOPEX V2, Windows Server 2008 R2 is supported as file server and application server but not recommended as support end date as passed. See <https://support.microsoft.com/en-en/lifecycle>

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

With HOPEX V2, Citrix XenApp 6.x is supported as application server but not recommended as support end date as passed.

### **Is Windows Server 2016 supported?**

Windows Server 2016 is supported with HOPEX V2 CP04 and higher CP.

### **Is Oracle Database Server 11 still supported?**

With HOPEX V2, Oracle Database Server 11 is supported as database server and file server but not recommended as support end date as passed.

### **Is SQL Server 2008/2008 R2 still supported?**

With HOPEX V2, SQL Server 2008/2008 R2 is supported as database server and file server but not recommended as support end date as passed.

### **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 recommended. Note that:

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

### **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.

### 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 V2 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 V2'.

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

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

### 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.

**If the size of a repository in GBMS storage format exceeds 4 GB, it is highly recommended to switch to RDBMS storage (Oracle, SQL Server).**

## 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"> <li>Managing HOPEX environments.</li> <li>Managing HOPEX repositories.</li> <li>Managing HOPEX users.</li> <li>Managing HOPEX profiles.</li> </ul> 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.
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"> <li>Server 'iba.company.com'</li> <li>Server '192.888.777.666'</li> <li>Server 'SQL02'</li> </ul>
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.

Term	Definition
Environment, HOPEX Environment	<p>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.</p> <p>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.</p>
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
Fast Cgi Plugin	HOPEX component used for communication direct communication between .IIS and HOPEX Kernel component (C++) without .NET.
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."
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...
IIS (Microsoft Internet Information Services)	Microsoft technology. Web Server Platform enabling the execution of web applications.

Term	Definition
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"> <li>Managing web user connections.</li> <li>Managing caches.</li> </ul> Used for HOPEX Web Front-end
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.
MWAS (HOPEX), MWAS	One of the two core HOPEX components of the web application together with the SSP component. It runs on the web application server (one per server). In a cluster installation there can be several web application servers (MWAS nodes) but only one SSP server. MWAS manages web sessions when web users login to or logout to the HOPEX (IIS) application. At runtime, MWAS is both a process mgwmwas and a process mgwmapp. MWAS instantiates different MIK (process mgwspro), depending on interactions of the end-users login to the HOPEX (IIS) application. MWAS (HOPEX) is installed with the program feature 'MEGA Web Access for hopex'.
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.

Term	Definition
Product, HOPEX Product	<p>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.</p> <p>Product portfolio covers mainly all the Enterprise Architecture offering existing in versions prior to HOPEX.</p> <p>Examples of products: HOPEX Business Data, HOPEX Database Builder, HOPEX IT Architecture...</p>
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	<p>Consistent definition of GUI and permissions for a business role. It makes it easier to manage HOPEX user (options, permissions, license, web desktop...)</p> <p>Each HOPEX Solution provides different profiles. HOPEX products use a generic profile (Enterprise Architect).</p>
Program features	<p>Installation component selected during the installation of software (setup).</p> <p>Examples for HOPEX setup:</p> <ul style="list-style-type: none"> <li>• HOPEX (IIS)</li> <li>• MEGA Software <ul style="list-style-type: none"> <li>◦ Administration Program</li> <li>◦ Utilities</li> <li>◦ Documentation...</li> </ul> </li> </ul>
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)	<p>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).</p> <p>The client side is called Remote Desktop Client (formerly called Terminal Services Client).</p> <p>The server side is called Remote Desktop Services (formerly called Terminal Services).</p>
Repository, HOPEX Repository, data repository	<p>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.</p> <p>A HOPEX Repository belongs to a HOPEX Environment.</p>
Role, Business Role	<p>A business role is the function of a person in the business meaning</p> <p>Ex: Audit director, Auditor, Application portfolio manager...With HOPEX platform, it is implemented by a profile.</p>
Scalability	Scalability is the ability of a system to continue to function well when it is changed in size or volume.
Server farm	<p>Collection of server machines usually maintained by an enterprise to accomplish server needs far beyond the capabilities of one machine.</p> <p>Synonym: server cluster</p>
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

Term	Definition
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.
SSP	One of the two HOPEX core components of the web application together with the MWAS component. It runs on the SSP server (one per server). In a cluster installation there can be several web application servers (MWAS nodes) but only one SSP server. Within a HOPEX installation, SSP is a central component that accesses to shared information and provides internal services (authentication, supervision, scheduler...). SSP operates at two levels: core SSP and environments SSP.
SSP server, SSP application server	IIS Web server running the SSP component. It hosts the (IIS) application 'MegaSSP' and usually the HOPEX environments and the HOPEX license.
SSP, core SSP	HOPEX core component of the SSP. It runs on the SSP server (one or several per server). When started by a Windows service (Mega Site Service Provider), it instantiates one MIK (called environment SSP) per HOPEX environment. It then routes calls to appropriate environment SSP (orchestration) in particular for authentication. Core SSP also provides the supervision service. At runtime, core SSP is both a process mgwssp and a process mgwmapp.
SSP, Environment SSP	HOPEX Component providing services for a HOPEX environment. It is instantiated by the core SSP. It runs on the SSP server (one or several per server). Most services are managed though a job scheduler: indexing, alert management... At runtime, environment SSP is a process mgwspro.
Storage Format, HOPEX Storage Format	Typology of storage formats for a data repository or a system repository: <ul style="list-style-type: none"> <li>• Oracle (RDBMS, Oracle).</li> <li>• SQL Server (RDBMS, SQL Server).</li> <li>• GBMS (MEGA DBMS, proprietary format kept for compatibility).</li> </ul>
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"> <li>• A HOPEX directory (definition of users/roles/profiles).</li> <li>• A set of templates of deliverables.</li> <li>• A metamodel definition.</li> </ul>
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.
Web Client	Machine playing the client role on the internet.
Web Server	Machine playing the server role on the internet.

Term	Definition
Web application server, MWAS server	IIS Web server running the MWAS component. It hosts the (IIS) application 'HOPEX' and 'HOPEXMWAS'.
Web User	User of a web application. It may either be authenticated by the web server (IIS, Apache...) or by the web application (written in PHP, ASP, JSP, ASP.NET...). The authentication defines whether the user exists and if it can connect to the Web site.
Web.config	Configuration file of an IIS application. The file web.config of the IIS application 'HOPEX' contains key parameters for the web application.
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. 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.
Service watchdog	HOPEX Component that monitors SSP and MWAS nodes in cluster deployment. It sends to the SSP information regarding MWAS nodes availability in particular to run scheduled jobs. It is started by a Windows service 'Mega Service Watchdog'.

## Windows Front-End Installation Guide HOPEX V2 EN

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## 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 V2.

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 product 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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# INSTALLATION ON STAND-ALONE MACHINE

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## 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.

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 V2 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.
- Internet Explorer 9.0 or higher is installed.

## 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).
- 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]  
ClusterRoot=

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

See Post installation scenarios section p. 10.

## COMMON CONFIGURATION

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

### Checking the HOPEX License

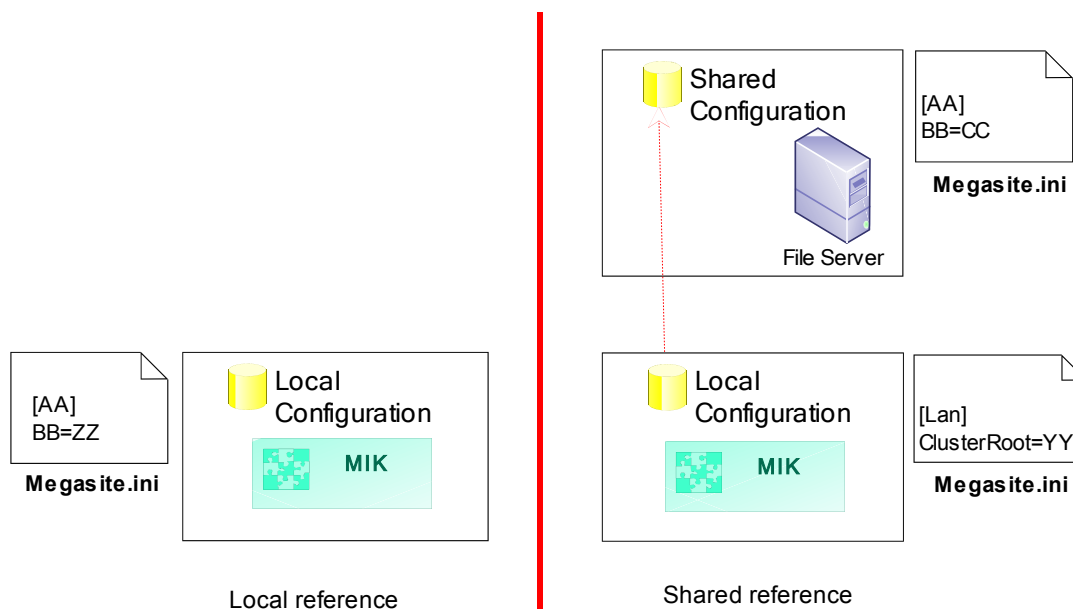
Consult your sales representative to obtain a license. You will get a license file and instructions to install it.

License type	Requirement
Must license (.must)	<ul style="list-style-type: none"><li>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.</li><li>The must license folder must be accessible with <b>full control</b> to all Windows users that should share this configuration.</li><li>If you want to configure smarter permissions, consult the FAQs section p. 23.</li></ul>
Elf license (.elf)	<ul style="list-style-type: none"><li>It should be installed in a shared folder. Example: folder \\server001\Apps\Licenses containing the file License-000002.elf</li><li>The Elf license file must be accessible with at least <b>read access</b> to all Windows users that should share this configuration.</li></ul>

For more details about HOPEX license, see the article 'Must License Installation Guide HOPEX V2 EN'.

### 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 (ClusterRoot=YYY), a different configuration files (Megasite.ini) is read in the shared folder.

#### Procedure:

- Create and share a folder that will contain configuration files (Example: \\hopex\data\config).
- 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.
- If you want to configure smarter permissions, consult the FAQs section p. 23.
- 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.

## 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 V2.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.

## 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 V2.msi:

```
<path of msixec.exe> /package "<Folder of the HOPEX MSI file>\HOPEX V2.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>"
```

Element	Comment
/package "<Folder of the HOPEX MSI file>\HOPEX V2.msi"	Required. To specify the path of the .msi file. Ex: \\Srv001\Master\HOPEX\DISK1\HOPEX V2.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="<configuration folder>"	Optional (empty by default). To set a shared configuration for the installation Ex: "\\mega\data\config"
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
_00_MEGA_HOPEX_API	Optional with HOPEX Web Front-End. Required only to deploy web services.

_00_MEGA_HOPEX_API_MWAS	Optional with HOPEX Web Front-End. Required only to deploy web services.
-------------------------	--

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)

## 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 V2 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 V2\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.

## 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.

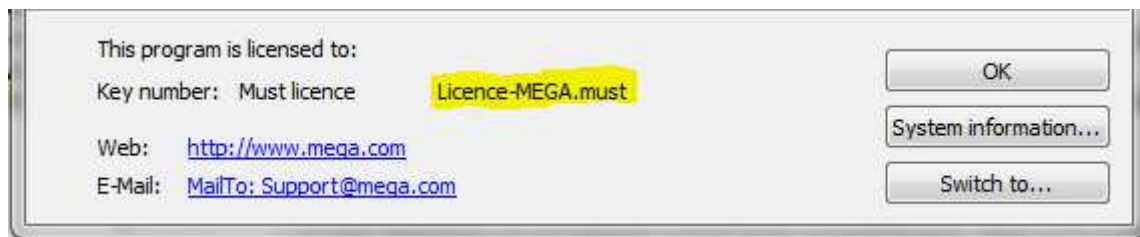
A HOPEX Environment and a HOPEX Repository are required. If no environment or repository is available at this step, see the section 'Installing a test environment' in this document.

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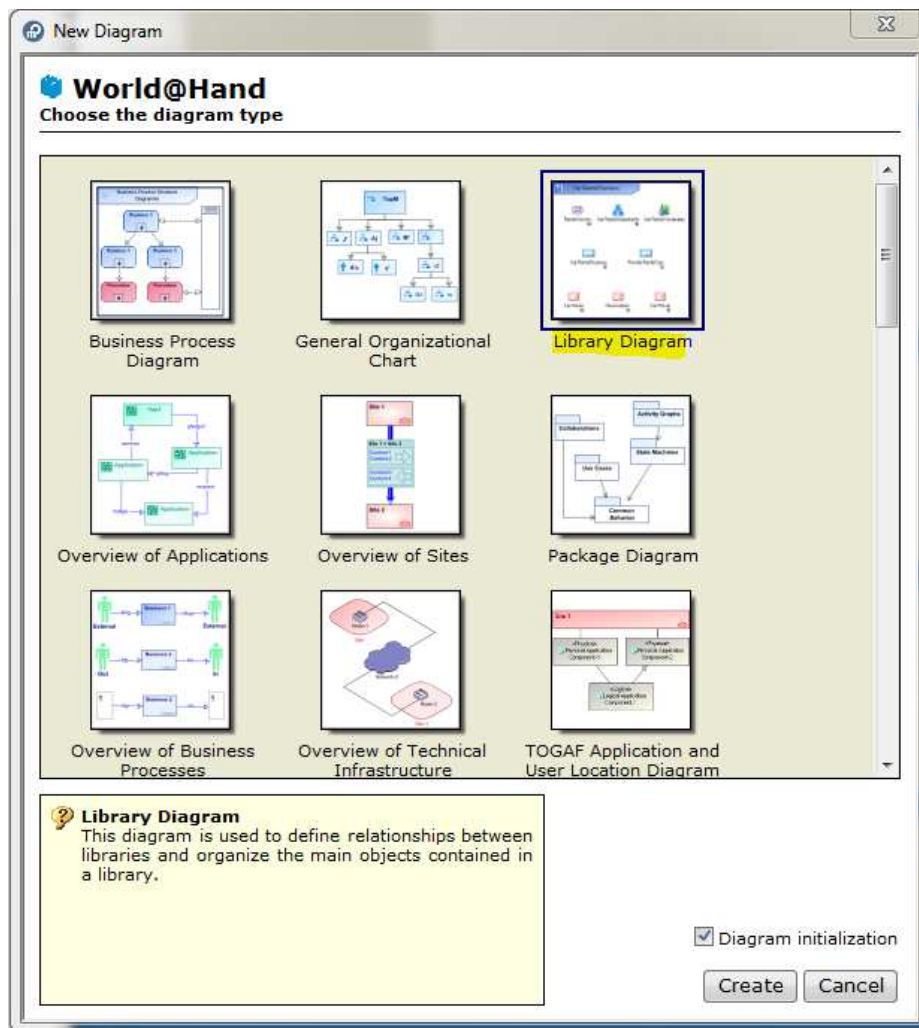
Scenario	Steps
<b>Scenario #1</b> <ul style="list-style-type: none"> <li>• Check license</li> <li>• Connection to Administration console</li> </ul>	<ul style="list-style-type: none"> <li>• Run Administration.exe. A window 'HOPEX - Administration' is displayed</li> <li>• Click the menu help &gt; About HOPEX A window 'About HOPEX' is displayed</li> <li>• 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></li> <li>• Select the test environment Ex: xx\<b>TestEnvironment</b>.</li> <li>• R click &gt; Open</li> <li>• In the window Identification, enter the identifier <b>System</b> (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></li> <li>• Click the menu File &gt; Exit.</li> </ul>
<b>Scenario #2</b> <ul style="list-style-type: none"> <li>• Connection to Windows Front-End</li> <li>• Check dispatch</li> </ul>	<ul style="list-style-type: none"> <li>• Run HOPEX.exe.</li> <li>• In the window 'Connection to HOPEX', enter the identifier <b>Mega</b> (no password) and click 'OK'. A window 'HOPEX' is displayed</li> <li>• Select a repository Ex <b>TestRepository</b></li> <li>• Select the profile '<b>Enterprise Architect</b>' and click 'OK'. The desktop is loaded <i>If the desktop is displayed, test is a success. Otherwise, test is a failure.</i></li> <li>• Click the menu View &gt; Navigation Window &gt; Home A tab 'Home' is displayed</li> <li>• Select the library 'MEGA' (icon of open blue book)</li> <li>• Right-click New &gt; Sub-library and confirm creation</li> <li>• Click the menu File &gt; Exit and answer 'Yes' to the question 'Do you want to dispatch modifications?'</li> <li><i>If the object is created and the dispatch is correct, test is a success. Otherwise, test is a failure.</i></li> </ul>

<p><b>Scenario #3</b></p> <ul style="list-style-type: none"> <li>Check creation of diagram</li> </ul>	<ul style="list-style-type: none"> <li>Run HOPEX.exe.</li> <li>In the window 'Connection to HOPEX', enter the identifier <b>Mega</b> (no password) and click 'OK'. A window 'HOPEX' is displayed</li> <li>Select a repository Ex <b>TestRepository</b></li> <li>Select the profile '<b>Enterprise Architect</b>' and click 'OK'. The desktop is loaded</li> <li>Click the menu View &gt; Navigation Window &gt; Home A tab 'Home' is displayed</li> <li>Select the library 'MEGA' (icon of open blue book)</li> <li>Right-click New &gt; Sub-library and confirm creation</li> <li>For this Library object, right-click New &gt; Diagram. A wizard called 'New diagram' is displayed. <ul style="list-style-type: none"> <li>Check that it is possible to select 'Library diagram' and to click 'Create' (1). A diagram will be created.</li> </ul> </li> <li>Click the menu File &gt; Exit and answer 'Yes' to the question 'Do you want to dispatch modifications?'</li> </ul> <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 &gt; Diagram' and set 'Diagram creation interface' to 'Menu (Compatibility mode)' (3) as a work-around. See also the <a href="#">Embedded Internet Explorer</a> section p. 37.</i></p>
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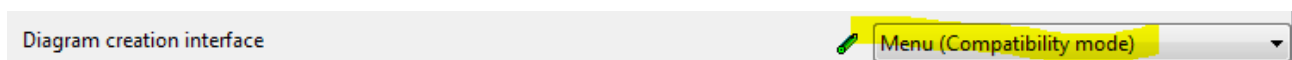
(1) Check the type and name of the license in the bottom of the page



(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)'.



# INSTALLATION ON MULTIPLE MACHINES

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## 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 V2 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.
- Internet Explorer 11.0 or higher is installed.
- SQL Server Native client installed if SQL Server storage is used.

## 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 V2.msi
/passive
/levw "C:\tmp\ScriptInstall.log"
SELECTED_LANGUAGE="1033"
ADDLOCAL="ALL"
ALLUSERS="1"
REMOVE="_00_HOPEX_IIS_Register,_00_MEGA_HOPEX,_00_MEGA_HOPEX_MWAS,_00_MEGA
_SITE_SERVICE_PROVIDER,_00_MEGA_HOPEX_API,_00_MEGA_HOPEX_API_MWAS"
INSTALLDIR="C:\Program Files (x86)\MEGA\HOPEX V2"
CLUSTERDIR="\\mega\data\config"
```

### 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 V2.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).
- The local configuration file (Megasite.ini) contains the reference of the shared configuration folder.

Example:

[LAN]

ClusterRoot=\\mega\data\config

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

See Post installation scenarios section p. 10.

# INSTALLATION IN CITRIX/TSE DEPLOYMENT

---

## 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.
- Internet Explorer 9.0 or higher is installed.

## 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 V2.msi
/passive
/levw "C:\tmp\ScriptInstall.log"
SELECTED_LANGUAGE="1033"
ADDLOCAL="ALL"
ALLUSERS="1"
REMOVE="_00_HOPEX_IIS_Register,_00_MEGA_HOPEX,_00_MEGA_HOPEX_MWAS,_00_MEGA
_SITE_SERVICE_PROVIDER,_00_MEGA_HOPEX_API,_00_MEGA_HOPEX_API_MWAS"
INSTALLDIR="C:\Program Files (x86)\MEGA\HOPEX V2"
CLUSTERDIR="\\mega\data\config"
```

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 V2.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.

## 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).
- The local configuration file (Megasite.ini) contains the reference of the shared configuration folder.

Example:

[LAN]

ClusterRoot=\\mega\data\config

## 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"><li>• Publish HOPEX.exe for each end-user expected to run Windows Front-End.</li><li>• Publish Administration.exe for each end-user expected to run the Administration Console.</li><li>• Publish licensing.exe for each end-user expected to configure MEGA Must licenses</li></ul>
Type of application	Publish as ' <b>Application</b> ' rather than 'Server desktop' or 'Content'. Select application type ' <b>Accessed from a server</b> '. 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 ' <b>Allow only one instance of application for each user</b> '
Audio	Do not check ' <b>Enable legacy audio</b> '
Screen resolution	For the parameter ' <b>Session windows size</b> ', select '1024 x 768' minimum
Colors	For the parameter ' <b>Maximum color quality</b> ', 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

## 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	<b>Scenario #1</b> <ul style="list-style-type: none"><li>• Check license</li><li>• Connection to Windows Administration console</li></ul> <b>Scenario #2</b> <ul style="list-style-type: none"><li>• Connection to Windows Front-End</li></ul>

		<ul style="list-style-type: none"> <li>• Check dispatch</li> </ul>
Server02	User02 on domain02 allowed to login on Server02	<b>Scenario #1</b> <ul style="list-style-type: none"> <li>• Check license</li> <li>• Connection to Windows Administration console</li> </ul> <b>Scenario #2</b> <ul style="list-style-type: none"> <li>• Connection to Windows Front-End</li> <li>• Check dispatch</li> </ul> <b>Scenario #3</b> <ul style="list-style-type: none"> <li>• Connection to Windows Front-End</li> <li>• Check creation of diagram</li> </ul>
...	...	...

See Post installation scenarios section p. 10.

# 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 V2.

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

Ex: upgrade from HOPEX V2 CP1.0 to HOPEX V2 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 'Mega Site Service Provider' and 'Mega 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.

## 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>	See variable ClusterRoot of file Megaenv.ini. Ex [LAN] ClusterRoot=\\mega\data\config
No	Megasite.ini	Cfg folder of HOPEX installation.	By default: C:\Program Files (x86)\MEGA\HOPEX V2\Cfg

## 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 V2 Cpx.msp:**

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

Example:

```
C:\WINDOWS\system32\msiexec.exe /update "\\Srv001\CP\HOPEX\HOPEX V2 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).

# REMOVING HOPEX PROGRAMS

---

## 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 'Mega Site Service Provider' and 'Mega Service Watchdog' to 'Disabled' and to stop the IIS Web site.

Pre-requisites:

- Stop SSP service (Windows Service 'Mega Site Service Provider' and 'Mega 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 V2'
- Confirm uninstallation.

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

## 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 V2.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 V2.msi" /passive /levw "C:\tmp\ScriptInstall.log"
```

### Result for each machine:

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

## Uninstalling SQL Server Native client

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

## FAQs

---

### 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.

### 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 V2\Install\vc\_dedist

It is recommended to run vc\_redist.x86.exe as an Administrator.

### Why is it necessary to install 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".

### 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 V2.msi" /passive /levw "C:\tmp\ScriptInstall.log"
```

Understanding the logfile generated by this command requires an expertise.

### 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>

## **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 V2 EN'.

## **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.

## 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"> <li>• Managing HOPEX environments.</li> <li>• Managing HOPEX repositories.</li> <li>• Managing HOPEX users.</li> <li>• Managing HOPEX profiles.</li> </ul> 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.
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"> <li>• Server 'iba.company.com'</li> <li>• Server '192.888.777.666'</li> <li>• Server 'SQL02'</li> </ul>
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, services	Directory services
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.

Term		Definition
Environment, HOPEX Environment	HOPEX	<p>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.</p> <p>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.</p>
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
Fast Cgi Plugin		HOPEX component used for communication direct communication between .IIS and HOPEX Kernel component (C++) without .NET.
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."
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: MEGA 2009, HOPEX V1R1, HOPEX V1R2, HOPEX V1R3, HOPEX V2...
IIS (Microsoft Internet Information Services)		Microsoft technology. Web Server Platform enabling the execution of web applications.

Term	Definition
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"> <li>Managing web user connections.</li> <li>Managing caches.</li> </ul> Used for HOPEX Web Front-end
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.
MWAS (HOPEX), MWAS	One of the two core HOPEX components of the web application together with the SSP component. It runs on the web application server (one per server). In a cluster installation there can be several web application servers (MWAS nodes) but only one SSP server. MWAS manages web sessions when web users login to or logout to the HOPEX (IIS) application. At runtime, MWAS is both a process mgwmwas and a process mgwmapp. MWAS instantiates different MIK (process mgwspro), depending on interactions of the end-users login to the HOPEX (IIS) application. MWAS (HOPEX) is installed with the program feature 'MEGA Web Access for hopex'.
MySQL client library	MySQL client library is a MySQL technology. It is a client side for a MySQL database server. For HOPEX Windows Front-End, it is installed with HOPEX Programs: no installation is required on the Windows client.
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

Term	Definition
	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. Example of product: 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 Solutions 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"> <li>• HOPEX (IIS)</li> <li>• MEGA Software <ul style="list-style-type: none"> <li>◦ Administration Program</li> <li>◦ Utilities</li> <li>◦ Documentation...</li> </ul> </li> </ul>
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. 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)

Term	Definition
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.
SSP	One of the two HOPEX core components of the web application together with the MWAS component. It runs on the SSP server (one per server). In a cluster installation there can be several web application servers (MWAS nodes) but only one SSP server. Within a HOPEX installation, SSP is a central component that accesses to shared information and provides internal services (authentication, supervision, scheduler...). SSP operates at two levels: core SSP and environments SSP.
SSP server, application server	IIS Web server running the SSP component. It hosts the (IIS) application 'MegaSSP' and usually the HOPEX environments and the HOPEX license.
SSP, core SSP	HOPEX core component of the SSP. It runs on the SSP server (one or several per server). When started by a Windows service (Mega Site Service Provider), it instantiates one MIK (called environment SSP) per HOPEX environment. It then routes calls to appropriate environment SSP (orchestration) in particular for authentication. Core SSP also provides the supervision service. At runtime, core SSP is both a process mgwssp and a process mgwmapp.
SSP, Environment SSP	HOPEX Component providing services for a HOPEX environment. It is instantiated by the core SSP. It runs on the SSP server (one or several per server). Most services are managed though a job scheduler: indexing, alert management... At runtime, environment SSP is a process mgwspro.
Storage Format, HOPEX Storage Format	Typology of storage formats for a data repository or a system repository: <ul style="list-style-type: none"> <li>• Oracle (RDBMS, Oracle).</li> <li>• SQL Server (RDBMS, SQL Server).</li> <li>• GBMS (MEGA DBMS, proprietary format kept for compatibility).</li> </ul>
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"> <li>• A HOPEX directory (definition of users/roles/profiles).</li> <li>• A set of templates of deliverables.</li> <li>• A metamodel definition.</li> </ul>
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 case, users are saved in the system repository.

Term	Definition
	Technically, it is the association of a Person (System) with a Login.
Web Client	Machine playing the client role on the internet.
Web Server	Machine playing the server role on the internet.
Web application server, MWAS server	IIS Web server running the MWAS component. It hosts the (IIS) application 'HOPEX' and 'HOPEXMWAS'.
Web User	User of a web application. It may either be authenticated by the web server (IIS, Apache...) or by the web application (written in PHP, ASP, JSP, ASP.NET...). The authentication defines whether the user exists and if it can connect to the Web site.
Web.config	Configuration file of an IIS application. The file web.config of the IIS application 'HOPEX' contains key parameters for the web application.
Windows Front-End	Windows Front-End is a Microsoft Windows based program accessing 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. 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 enabled to scheduler execution of various jobs. It is used by various feature (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.
Service watchdog	HOPEX Component that monitors SSP and MWAS nodes in cluster deployment. It sends to the SSP information regarding MWAS nodes availability in particular to run scheduled jobs. It is started by a Windows service 'Mega Service Watchdog'.

## APPENDIX

### 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.

### 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	

### 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 <sup>1</sup>

Event smarter permission can be defined. See the article 'Must License Installation Guide HOPEX V2 EN'.

### 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

<sup>1</sup> By default, user files and token files are set as 'Not visible'.

## 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

## Permissions for HOPEX installation folders

File	Location	Administrator rights	User rights
*.*	<Installation folder> and subfolders (Documentation, Install, java, Mega_Std, System, Utilities) Main programs	Update and delete	Read
*.*	<Installation folder>\Cfg	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.

## 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. <ul style="list-style-type: none"> <li>If the repository is stored in the GBMS storage format (default), each HOPEX Repository consists of 4 files (.EMA, .EMB, .EMS, EMV).</li> <li>If the repository is stored in Oracle, each HOPEX Repository consists of 2 files (. EMV, .EMO) and files on the database server.</li> <li>If the repository is stored in SQL Server, each HOPEX Repository consists of 2 files (. EMV, .EMQ) and files on the database server.</li> </ul>	Update and delete	Update <b>no</b> delete
*.*	<Environment folder>\Db\<Repository>\<Approve> Default folder for reports (MS Word) detached from HOPEX. This folder can be configured.	Update and delete	Update and delete
*.*	<Environment folder>\Db\<Repository>\Document Default folder reports (MS Word). This folder can be configured.	Update and delete	Update and delete
*.*	<Environment folder>\Db\<Repository>\<Repository>.Lock Folder of data repository locks for GBMS storage. One	Update and delete	Update and delete

File	Location	Administrator rights	User rights
	file (.EMK) per lock placed. These files can be created and deleted during use of HOPEX		
*.*	<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 delete and	Update and delete
*.*	<Environment folder>\Db\<Repository>\<Repository>.Transactions Folder of private workspace for data repositories (for GBMS storage only) and repository backup logfile. 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 delete and	Update and delete
*.*	<Environment folder>\Db\<Repository>\USER and sub-folders Personal folders of the users.	Update delete and	Update and delete
*.*	<Environment folder>\Db\<Repository>\WORK and sub-folders Working folder for administration of repository.	Update delete and	Update and delete
*.*	<Environment folder>\Intranet Default root folder for static HTML page generation.	Update delete and	Update and delete
*.*	<Environment folder>\Mega_user Folder containing customized resources (.MGS, .DOT files)	Update delete and	Read
*.*	<Environment folder>\SysDb Folder of system repository. It consists of 4 files (SystemDb.ema, SystemDb.emb, SystemDb.ems, SystemDb.emv)	Update delete and	Update <b>no</b> 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 delete and	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 delete and	Update and delete
*.*	<Environment folder>\SysDb\SystemDb.Transactions Folder of private workspaces for system repository (for GBMS storage only) and repository backup logfile. 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 delete and	Update and delete
*.*	<Environment folder>\SysDb\USER and sub-folders Folder of user reports (<user code>.TXT)	Update delete and	Update and delete
*.*	<Environment folder>\SysDb\WORK and sub-folders Working folder for administration of system repository.	Update delete and	Update and delete

## 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 V2.msi"
/passive
/levw "C:\tmp\ScriptInstall.log"
SELECTED_LANGUAGE="1033"
ADDLOCAL="ALL"
ALLUSERS="1"
INSTALLDIR="C:\Program Files (x86)\MEGA\HOPEX V2"
IS_NET_API_LOGON_USERNAME_HOPEX="<mydomain>\<myuser>"
IS_NET_API_LOGON_PASSWORD_HOPEX="<mypassword>"
```

#### 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 'Mega Site Service Provider' is installed
- IIS application 'MegaSSP' is installed.
- IIS application 'Hopex' is installed.
- IIS application 'Hopex2' is installed.
- IIS application 'HOPEXMWAS' is installed.

With horizontal deployment, there are

- One machine running SSP (SSP Server)
- One or several machine(s) running Web Front-end and MWAS but not SSP (HOPEX Web Application Server nodes)

### Recommended command line for SSP Server:

```
C:\WINDOWS\system32\msiexec.exe
/package "\\Srv001\Master\HOPEX\DISK1\HOPEX V2.msi"
/passive
/levw "C:\tmp\ScriptInstall.log"
SELECTED_LANGUAGE="1033"
ADDLOCAL="ALL"
REMOVE="_00_MEGA_HOPEX,_00_MEGA_HOPEX_MWAS,_00_MEGA_HOPEX_API,_00_MEGA_
HOPEX_API_MWAS"
ALLUSERS="1"
INSTALLDIR="C:\Program Files (x86)\MEGA\HOPEX V2"
MSSPDIR="C:\inetpub\wwwroot\MegaSSP"
```

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 'Mega Site Service Provider' is installed
- IIS application 'MegaSSP' is installed

### Recommended command line HOPEX Web Application Server nodes:

```
C:\WINDOWS\system32\msiexec.exe
/package "\\Srv001\Master\HOPEX\DISK1\HOPEX V2.msi"
/passive
/levw "C:\tmp\ScriptInstall.log"
SELECTED_LANGUAGE="1033"
ADDLOCAL="ALL"
REMOVE="_00_MEGA_SITE_SERVICE_PROVIDER"
ALLUSERS="1"
INSTALLDIR="C:\Program Files (x86)\MEGA\HOPEX V2"
HOPEXDIR="C:\inetpub\wwwroot\HOPEX"
HOPEXMWAS="C:\inetpub\wwwroot\HOPEXMWAS"
IS_NET_API_LOGON_USERNAME_HOPEX="<mydomain>\<myuser>"
IS_NET_API_LOGON_PASSWORD_HOPEX="<mypassword>"
```

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).
- IIS application 'HOPEX' is installed.
- IIS application 'HOPEXMWAS' is installed.

## List of program features displayed in the setup wizard

Program feature	Comment	Installation feature (internal)
HOPEX (IIS)	Installs IIS application 'HOPEX' and 'HOPEX2' in IIS	_00_MEGA_HOPEX
Register MEGA HOPEX in IIS server of machine	Complete registration of HOPEX (IIS) Check it if HOPEX (IIS) is checked	_00_HOPEX_IIS_Register
MEGA Site Service Provider	Installs SSP component/service	_00_MEGA_SITE_SERVICE_PROVIDER
MEGA Web Access for Hopex	Installs IIS application 'HOPEXAPI'	_00_MEGA_HOPEX_MWAS
HOPEX API	Installs IIS application 'HOPEXAPI'	_00_MEGA_HOPEX_API
MEGA Web Access for Hopex API	Installs IIS application 'HOPEXAPIMWAS'	_00_MEGA_HOPEX_API_MWAS
MEGA Software	Install the HOPEX Programs	MEGA
Administration Program	Installs a launcher Administration.exe in the root folder	Administration.exe
MUST License Management Program	Installs a launcher licensing.exe in the root folder	Licensing.exe
Utilities	Installs utilities in a folder '\\Utilities'	See table below
MEGA Documentation	Installs documentation in PDF format	Documentation
Debugging files	Installs additional files for debugging purpose	MEGA.DebugSymbol

## 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.

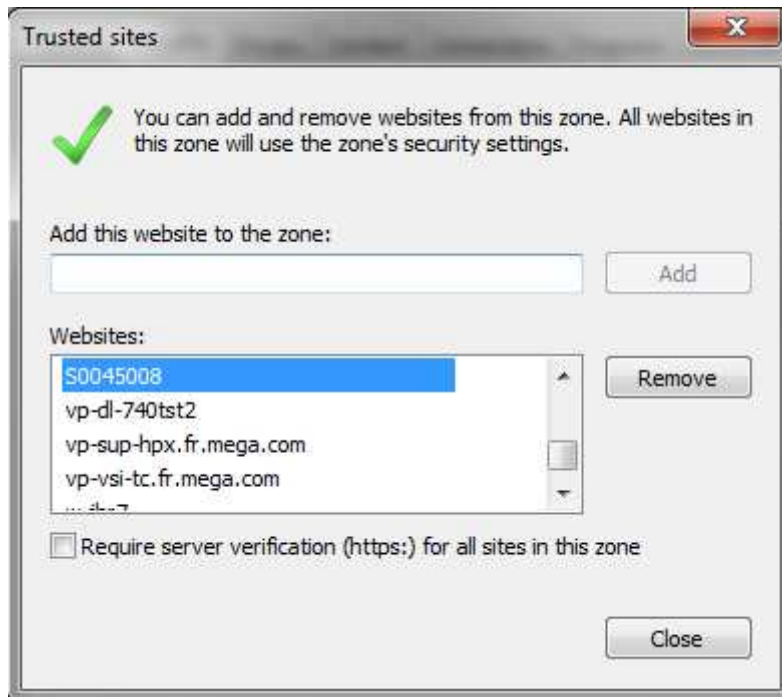
If features are not running as expected (ex: creation of diagram), it is recommended to configure trusted sites in Internet Explorer **as follows**:

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).

## Complete list of installation features

Installation feature (internal)	Comment	Target folder	Install Level
Administration.exe	Installs Administration.exe	INSTALLDIR	100
Data.Extractor	Installs MEGA Data Extractor utility	INSTALLDIR\Utilities\MEGA Data Extractor	300
Documentation	Installs documentation	INSTALLDIR\Documentation	200
EnvComparator	Installs MEGA Customisation Analyser utility	INSTALLDIR\Utilities\MEGA Customisation Analyser	300
Install	Installs the folders 'Advance Reporting', 'Compatibility Tools', 'Doors', 'Languages'	INSTALLDIR\Install	200
Install.DBMS	Install RDBMS related resources	INSTALLDIR\Install\RDBMS client	200
Install.Licenses	Installs the folder 'Licenses'	INSTALLDIR\Install\Licenses	200
Install._GR	Installs the _GR files, Upgrade files, preinstalled SystemDb (GBMS), predefined system business documents	INSTALLDIR\Install	200
Licensing.exe	Install Licensing.exe	INSTALLDIR	100
MEGA	Installs HOPEX.exe, binary files and resources (folders 'java', 'Mega_std', 'System' and '\Utilities\Solution Pack')	INSTALLDIR	100
MEGA.DebugSymbol	Install PDB files (optional)	INSTALLDIR\System	600
Optional.File	Installs optional .mol files	INSTALLDIR\Mega_Std	200
Optional.Moka_Reference	Installs MOKA related resources	INSTALLDIR\Mega_Std\Moka Reference	200
RDBMS_Diagnostic	Installs RDBMS Diagnostic tool	INSTALLDIR\Utilities\RDBMS Diagnostic	300
System.FlexGrid	Redistributable file system Microsoft FlexGrid	%systemroot%	100
System.GDIplus	Redistributable file system Microsoft GDI +	%systemroot%	100
System.MSXML	Redistributable file MS XML3	%systemroot%	100
System.Redist	Redistributable file system	%systemroot%	100
System.Scripting56	Redistributable file system Windows Scripting Host 5.6	%systemroot%	100
System.VB6	Redistributable file system VB6 Runtime	%systemroot%	1
System.VC10	Redistributable file system VC10	%systemroot%	1
System.VC8	Redistributable file system VC8	%systemroot%	100
System.WData	Redistributable file system WebData std library	%systemroot%	100

Installation feature (internal)	Comment	Target folder	Install Level
Test.Utilities	Installs utilities: HOPEX Server Supervisor utility, RDBMS Diagnostics...	INSTALLDIR\Utilities	300
Utilities	Installs utilities and resources: MEGA Mail Test utility, transport order (Solman)	INSTALLDIR\Utilities	300
_00_HOPEX_IIS_Register	Registers IIS application 'HOPEX' in IIS	<registry>	900
_00_MEGA_HOPEX	Installs IIS application 'HOPEX' and 'HOPEX2' in IIS	IISROOT\wwwroot\HOPEX	400
_00_MEGA_HOPEX_MWAS	Installs IIS application 'HOPEXMWAS' in IIS Installs service 'Mega Service Watchdog'	IISROOT\wwwroot\HOPEXMWAS IISROOT \wwwroot\MegaMSW <registry>	400
_00_MEGA_SITE_SERVICE_PROVIDER	Installs IIS application 'MegaSSP' in IIS Installs services 'Mega Site Service Provider and 'Mega Service Watchdog'	IISROOT\wwwroot\MegaSSP <registry>	400
_00_MEGA_HOPEX_API	Installs 'HOPEX API	IISROOT\wwwroot\HOPEXAPI	400
_00_MEGA_HOPEX_API_MWAS	Install ' MEGA web Access for HOPEX API '	IISROOT\wwwroot\HOPEXAPIMWAS	400

Installation features with installation level lower than or equal to 300 are enabled by default in the installation wizard (custom installation).



## RDBMS Repository Installation Guide

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## Summary

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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 V2**.

# Generalities

---

## Supported Versions of RDBMS

MEGA has qualified some versions of RDBMS for HOPEX V2. Those versions can be found in the following documents (depending on your type of deployment):

- Web Front-End Architecture Overview HOPEX V2 EN
- Windows Front-End Architecture Overview HOPEX V2 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, and 2014 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
```

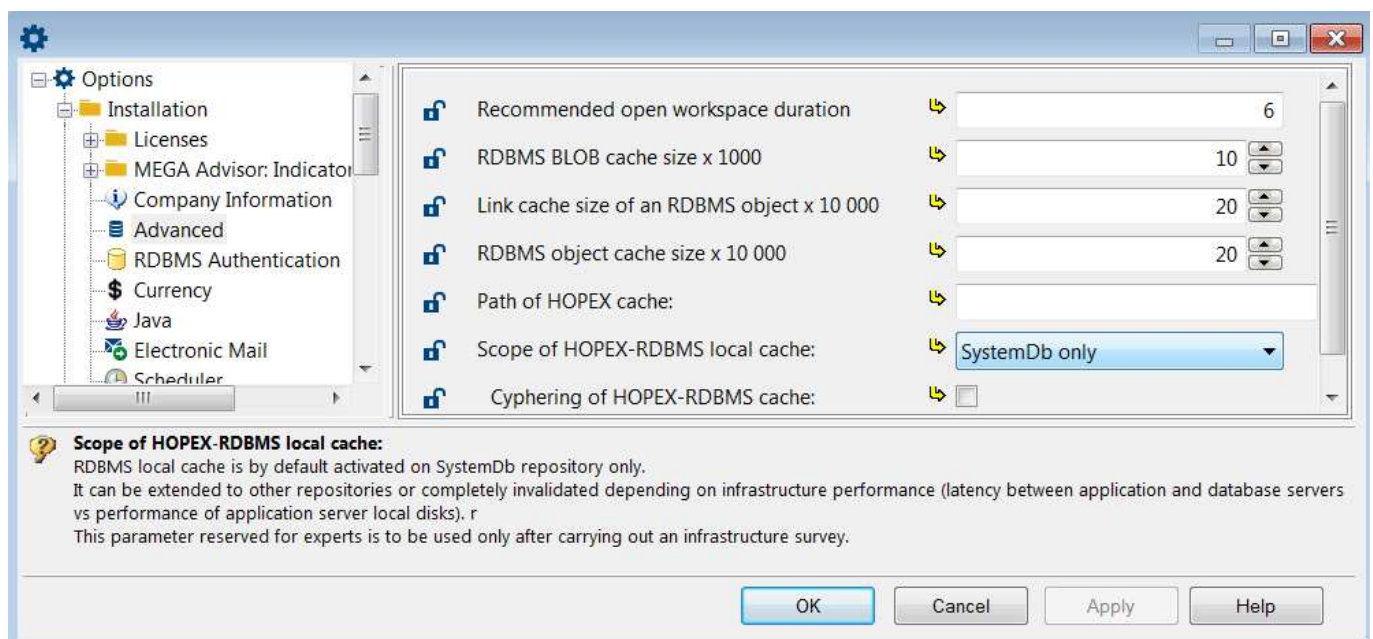
If the value returned for **"RTTs of replies in ms/avg"** (0.535 in the example) is higher than 1 ms, contact MEGA. See hrPING help for details on this command.

## 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 V2\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 V2\Demonstration\_RDBMS**

the demonstration cache folder name will be:

```
C:\ProgramData\MEGA\HOPEX V2\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 V2” 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, 2 connections to Oracle are open (1 for the SystemDb and 1 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, 2 connections to SQL Server are open (1 for the SystemDb and 1 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:

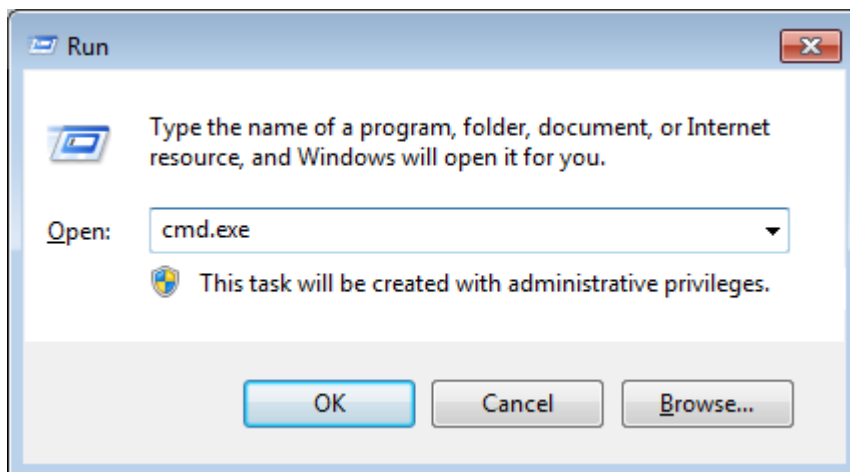
```
< HOPEX Installation Path>\Utilities\RDBMS Diagnostic\
```

## How to run it

This utility (*mj\_rdbms.jar*) needs the content of the folders that are located at the same level as it is for working ("Files", "Oracle", and "SqlServer").

**To run the RDBMS Diagnostic Utility:**

1. Open a command window (cmd.exe)



2. Change the current directory to "<HOPEX installation Path>\Utilities\RDBMS Diagnostic".  
Enter:

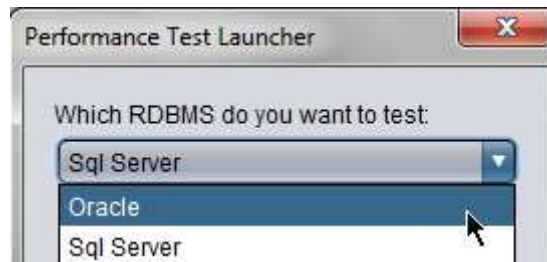
```
cd < HOPEX installation Path>\Utilities\RDBMS Diagnostic
```

3. Launch the RDBMS Diagnostic utility using the java.exe binaries provided under the java directory embedded with HOPEX installation.

Enter:

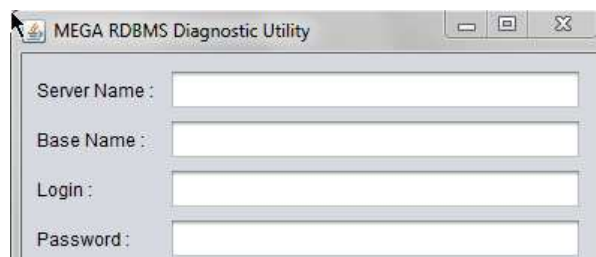
```
< HOPEX installation Path>\java\jre\bin\java.exe -jar mj_rdbms.jar
```

4. Select your RDBMS target.

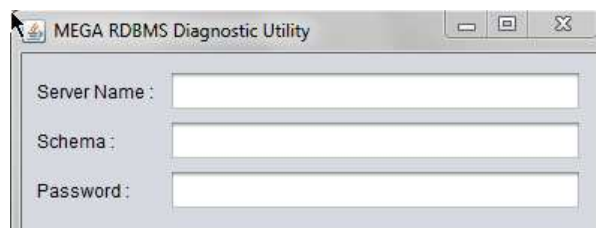


5. Enter the connection information to the RDBMS storage that is the target for hosting the HOPEX data:

- a database name for SQL Server



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



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 2<sup>nd</sup> 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)

Select 'UTF8..' as national character set (parameter
NLS_NCHAR_CHARACTERSET=UT8
```

### 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'
```

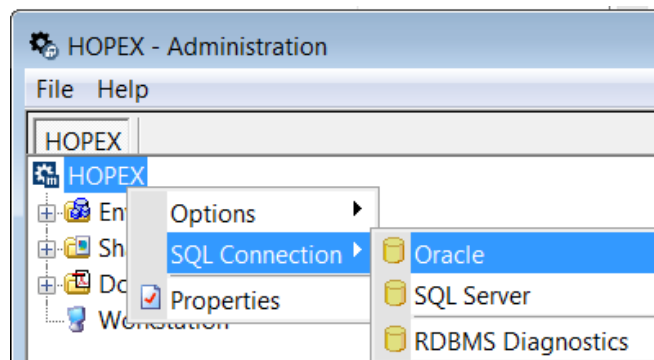
**Purpose:** calculate the number of distinct queries that can be put in the *Oracle statement cache*. To learn more about this mechanism, see [Oracle documentation](#).

## 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:**

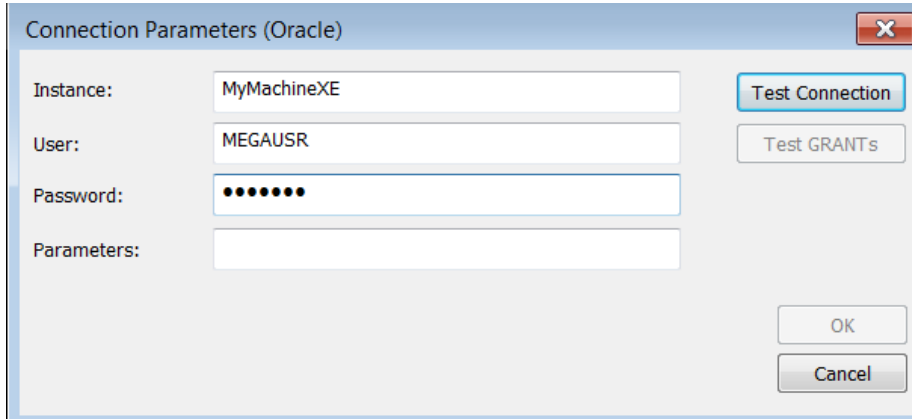
(DESCRIPTION = (ADDRESS = (PROTOCOL = TCP)(HOST = <DB server Id>)(PORT = <listener port number>)) (CONNECT\_DATA = (SERVER = DEDICATED) (SERVICE\_NAME = <Oracle instance name>)))

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.



**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

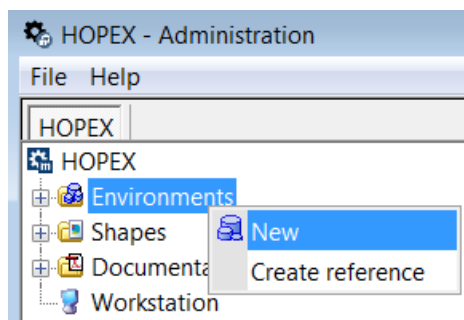
The environment creation mainly consists in creating a SystemDb repository where MetaModel definitions are stored.

### Prerequisite:

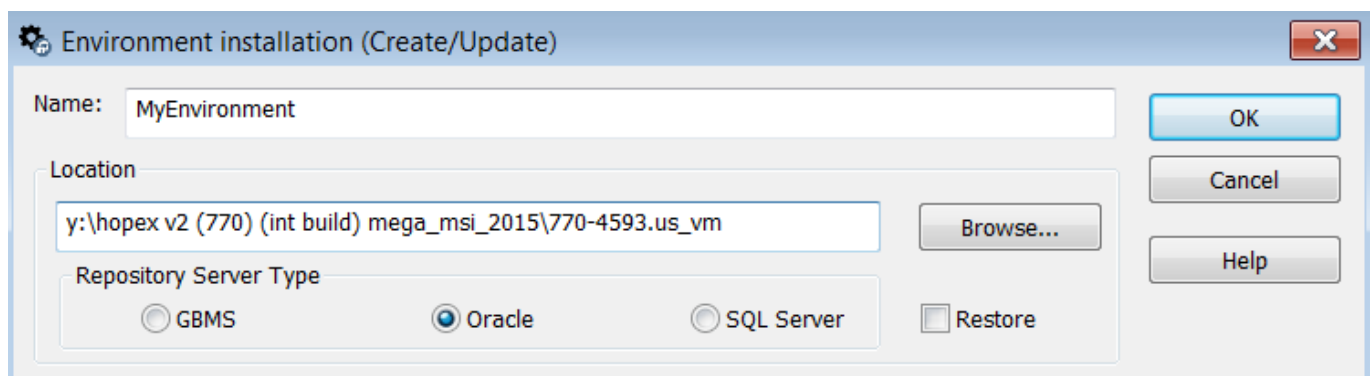
- Identify the SQL connection parameters (RDBMS instance, user and password).
- Identify the location of the environment folder on the file server.
- Verify that the Oracle database was created with the appropriate encoding (NLS\_CHARACTERSET= AL32UTF8).

### To create an environment:

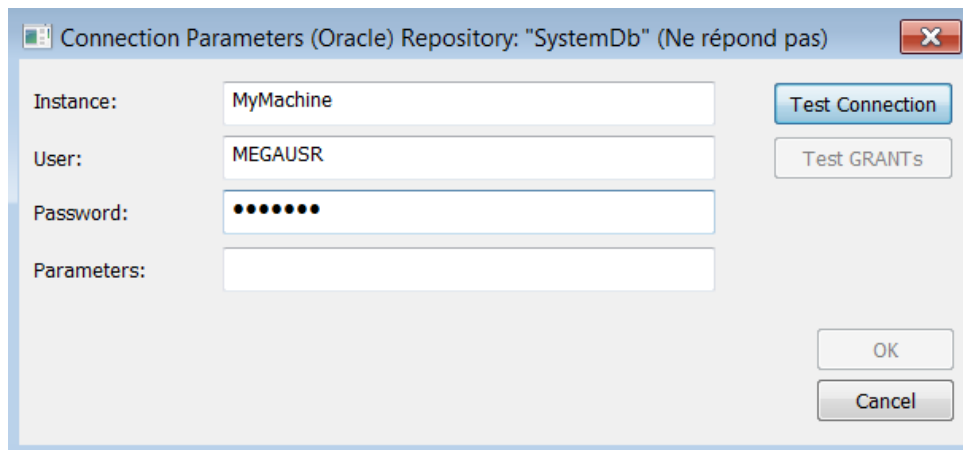
1. Start HOPEX **Administration.exe**.
2. Right-click the **Environments** folder and select **New**.



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).

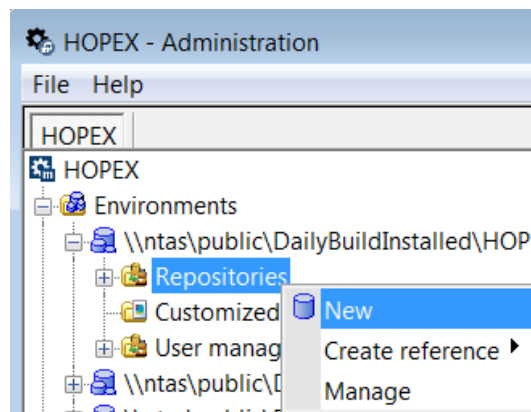
# Creating a Repository

## Prerequisite:

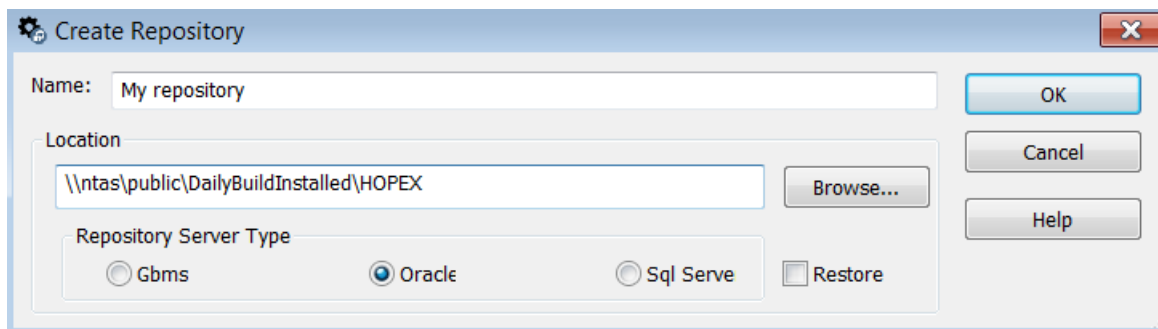
- You can create the repository in the same Oracle User's Schema as that of the SystemDb, however, **it is strongly recommended you isolate each HOPEX repository in a separate Oracle User's Schema especially for keeping the database administration simpler.**
- Verify that the Oracle database was created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

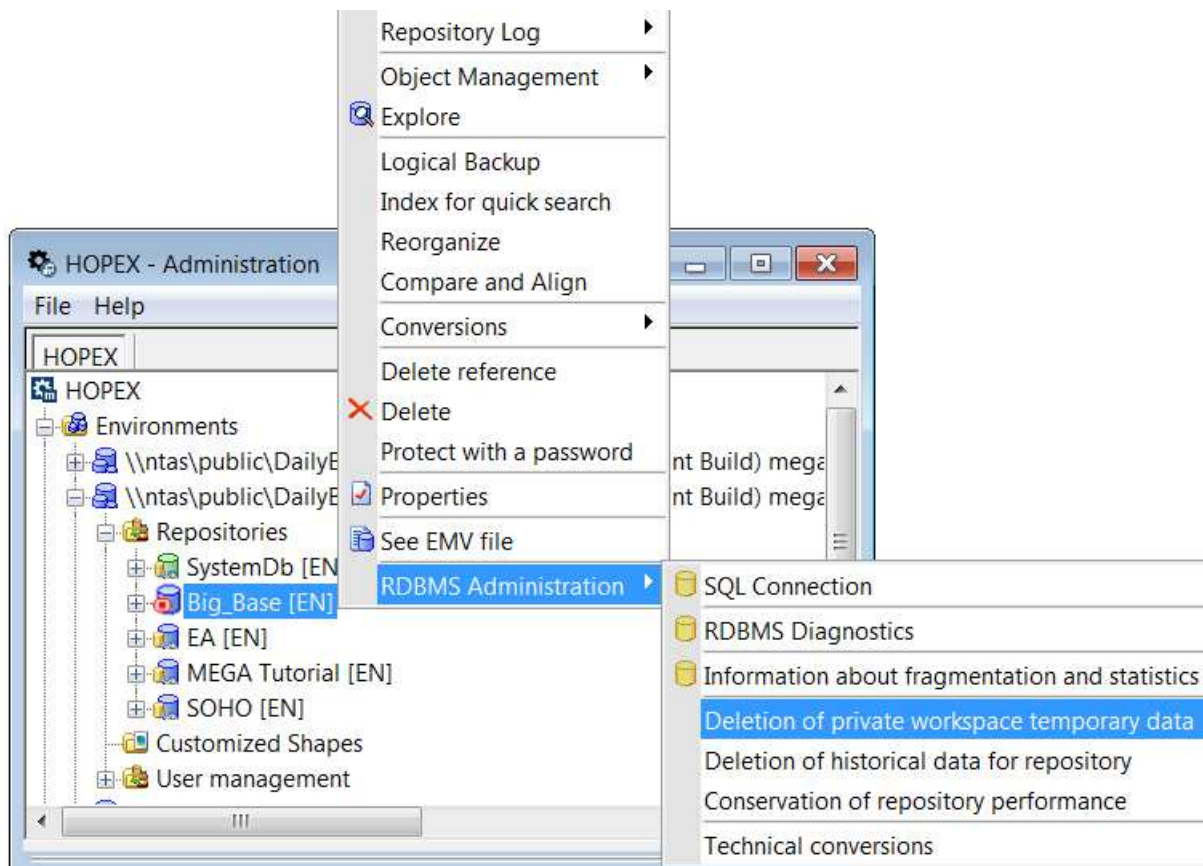
## HOPEX Private Workspaces Cleanup

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.

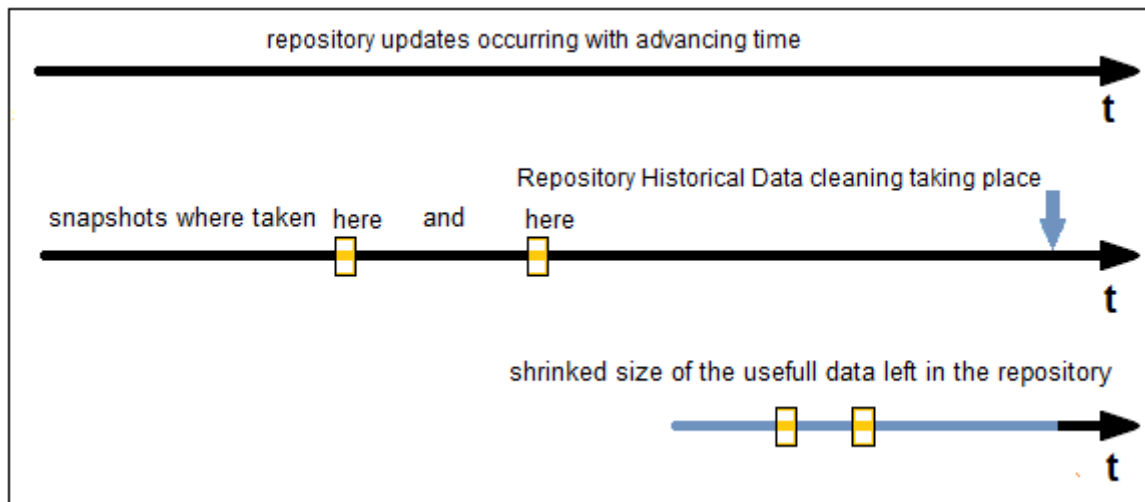
### Before cleaning Historical Data

Historical data are used in the Repository Snapshot mechanism. See HOPEX Collaboration Manager > Snapshots > Repository Snapshots > Managing Repository Snapshots: **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.

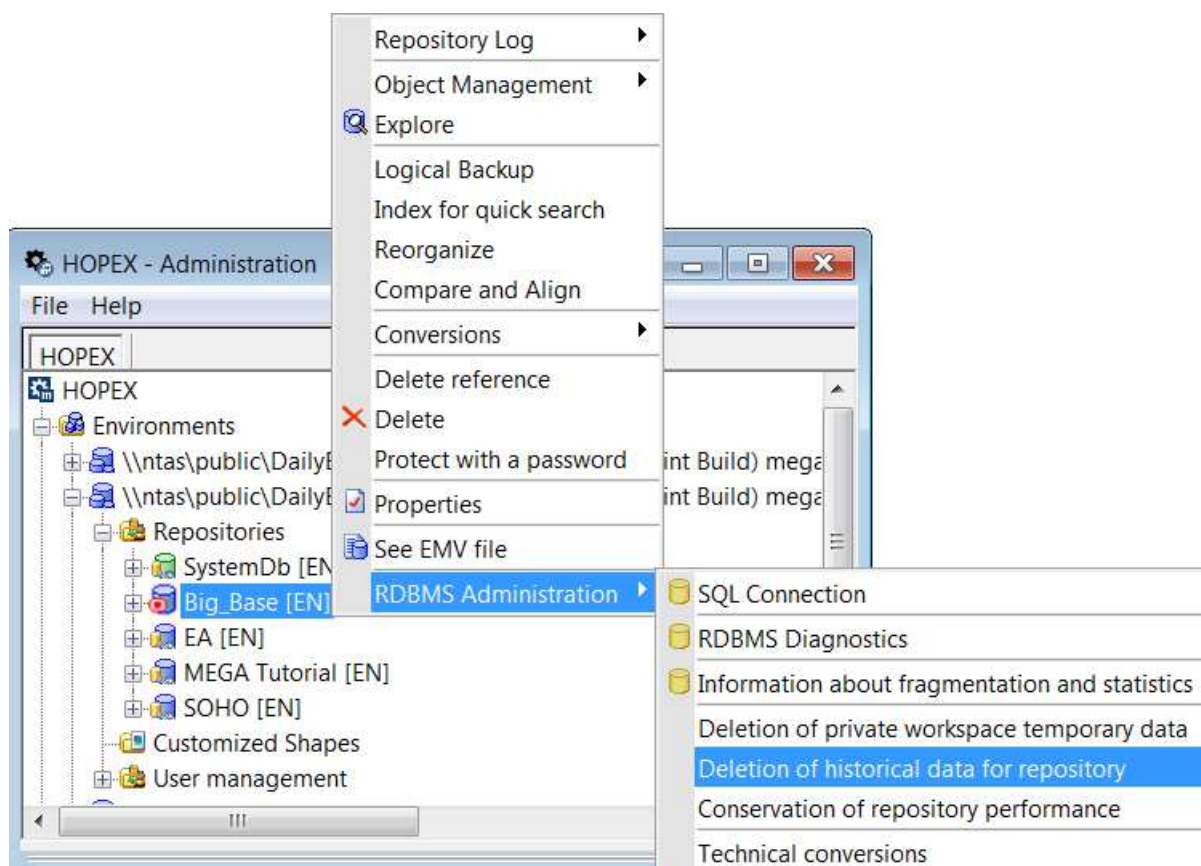
In this case, the data corresponding to the repository state for the Snapshot(s) is saved and it is thanks to this saving that special features will be available within this repository regarding this data.

## 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.

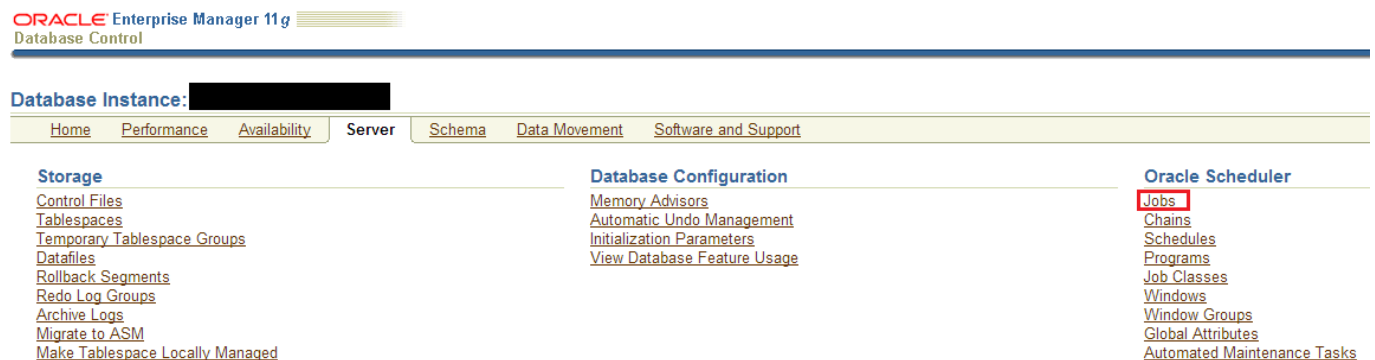


## Batching Cleanup procedures for Oracle

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]

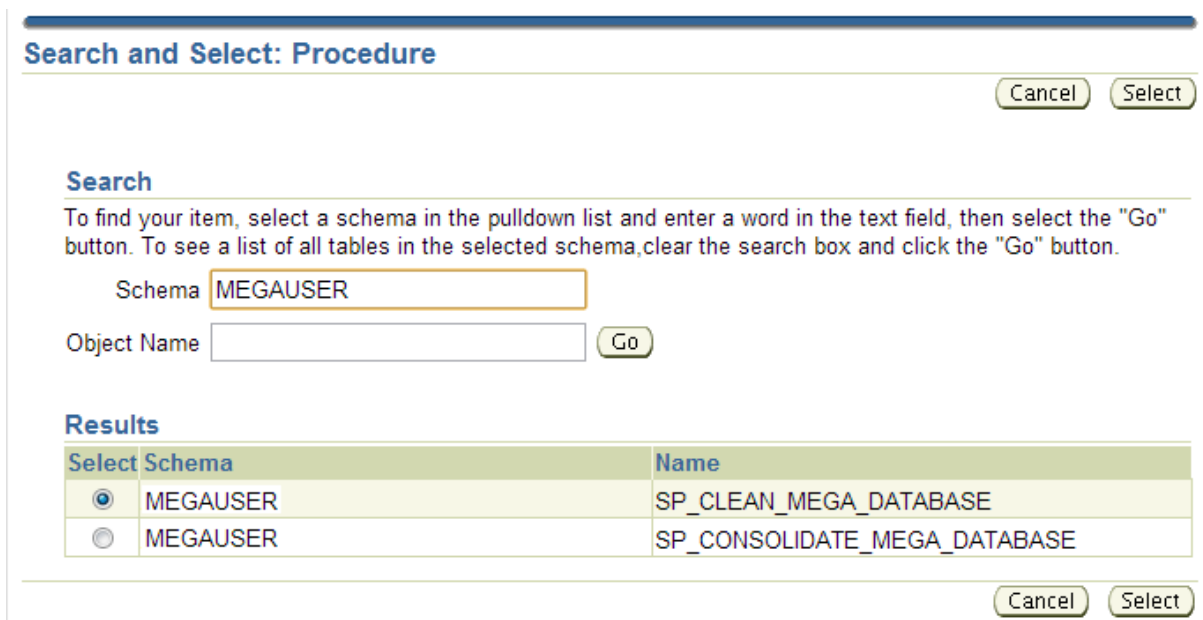
Home Performance Availability **Server** Schema Data Movement Software and Support

**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'

[Delete](#) [Add Another Row](#)

- Schedule its execution for running every night

<a href="#">General</a>	<a href="#">Schedule</a>	<a href="#">Options</a>
Schedule Type <input type="text" value="Standard"/>		
Time Zone <input type="text" value="(UTC+01:00) Paris"/> 		
<b>Repeating</b>		
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.

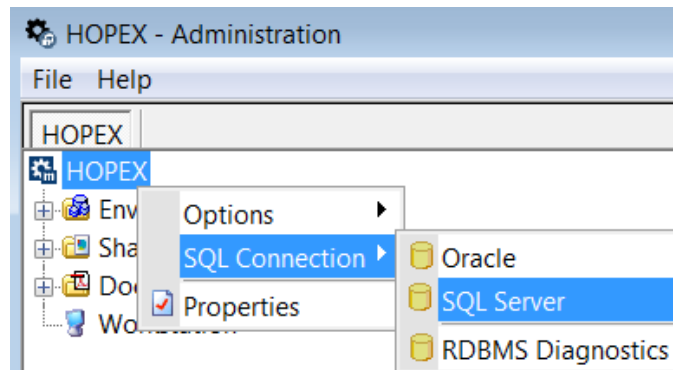
The Windows users **should not** have the "db\_creator" server role.

## Defining a HOPEX SQL Server Connection

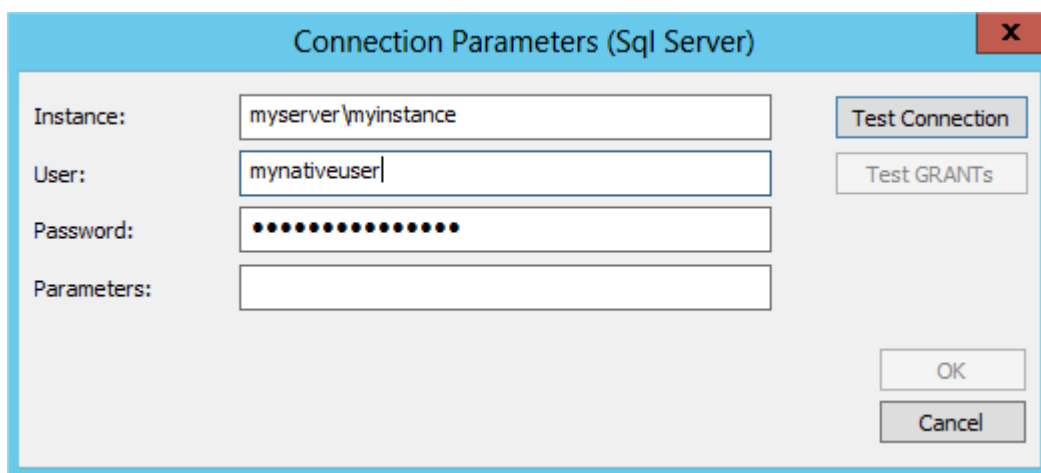
An "SQL Connection" menu is available in the HOPEX Administration program at different levels (site, environment, and repository) if the license contains the Repository Storage (SQL Server) product.

### Procedure with a native SQL account

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

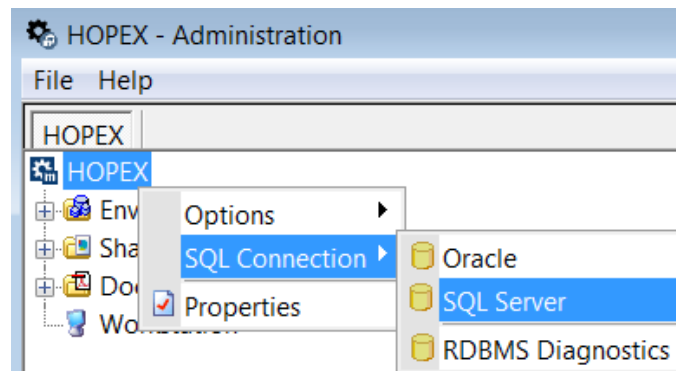


3. Enter the connection parameters.
  - o **Instance:** <machine network name>\<SQL Server instance name> (1)  
Example for a standalone installation with SQL Express: MyMachine\SQLEXPRESS
  - o **User:** user enabled to access/update SQL Server
  - o **Password:** password of the user enabled to access/update SQL Server
4. Click **Connection Test** to check the connection parameters.



### Procedure when using Windows authentication

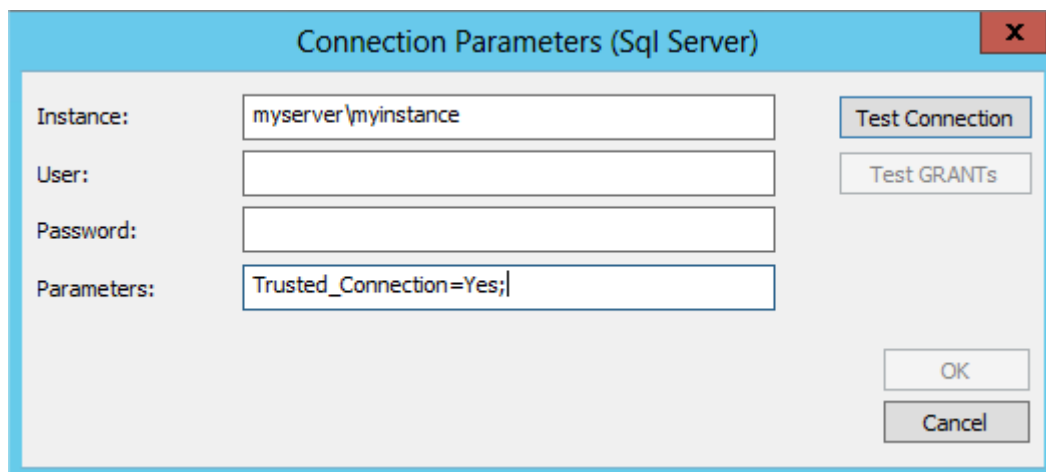
1. Start HOPEX **Administration.exe**.
2. Right-click HOPEX (the root of the administration tree) and select **SQL connection > SQL Server**.



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;"

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



## 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 “Database 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 “Database Creation Mode” select “Use existing database”.
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 **Grants test** 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 "Database Creation Mode" select "Create Database".
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 **Database Creation Mode** select "Use existing database".
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.

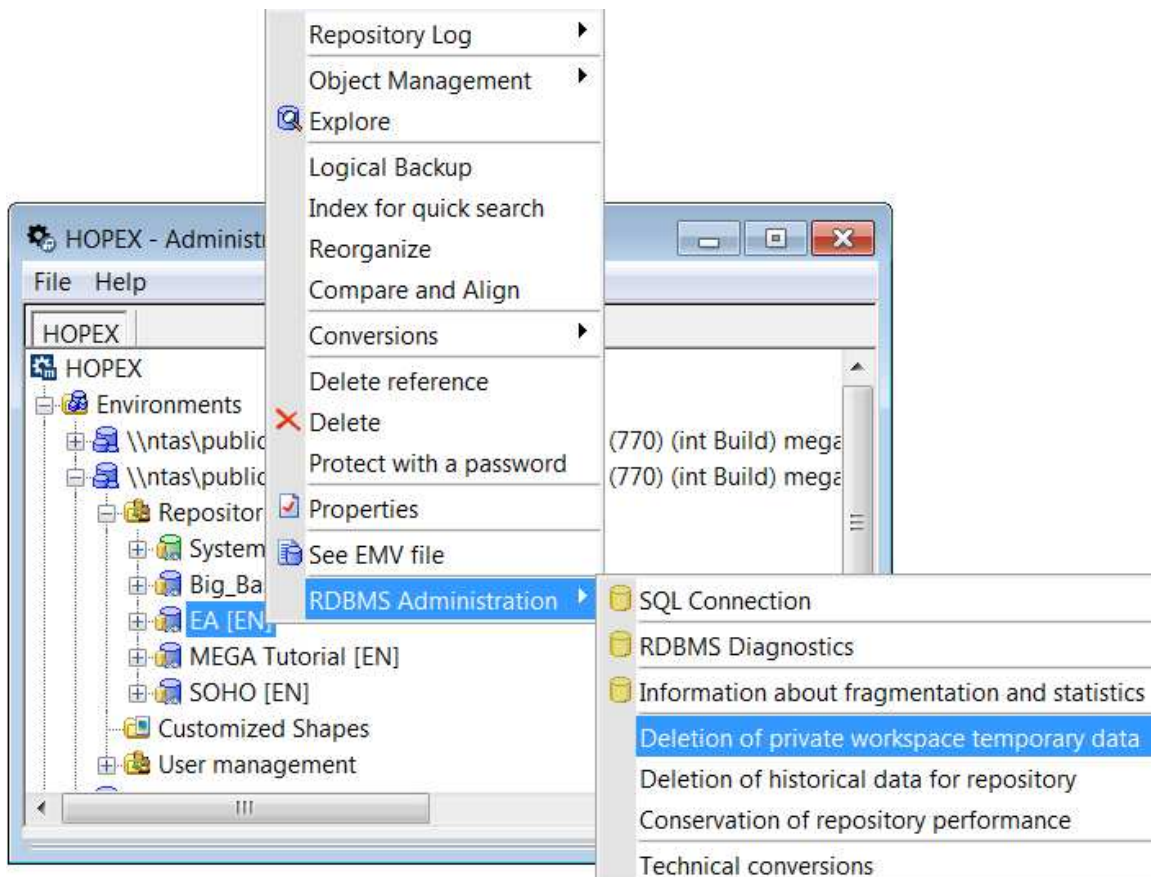
### Installing the procedure

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

1. Right-click your HOPEX repository and select **RDBMS Administration > Deletion of 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.



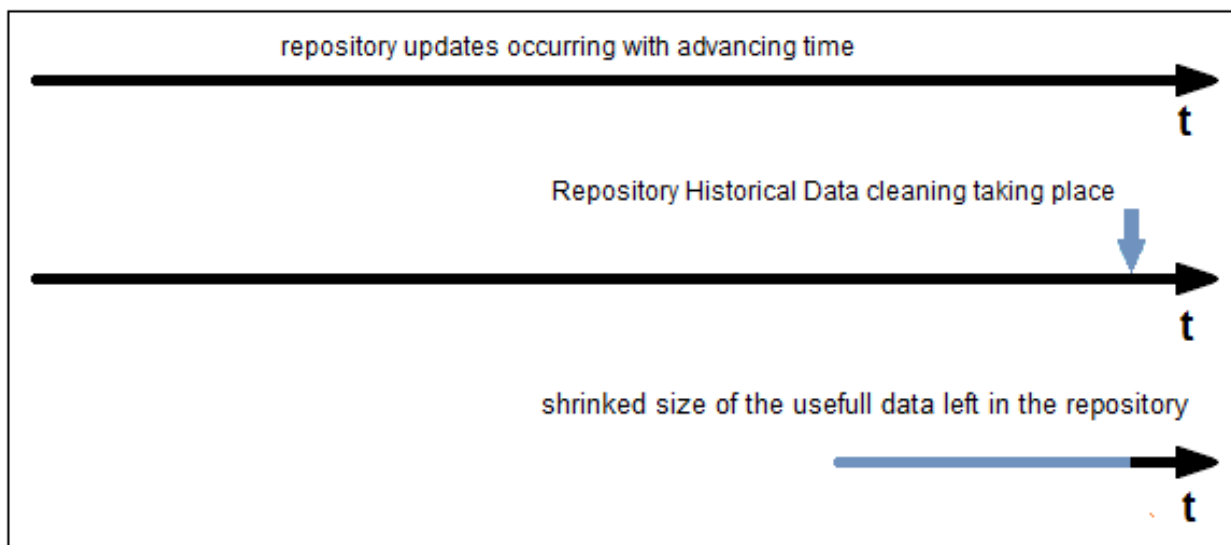
## HOPEX Historical Data Cleanup

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.

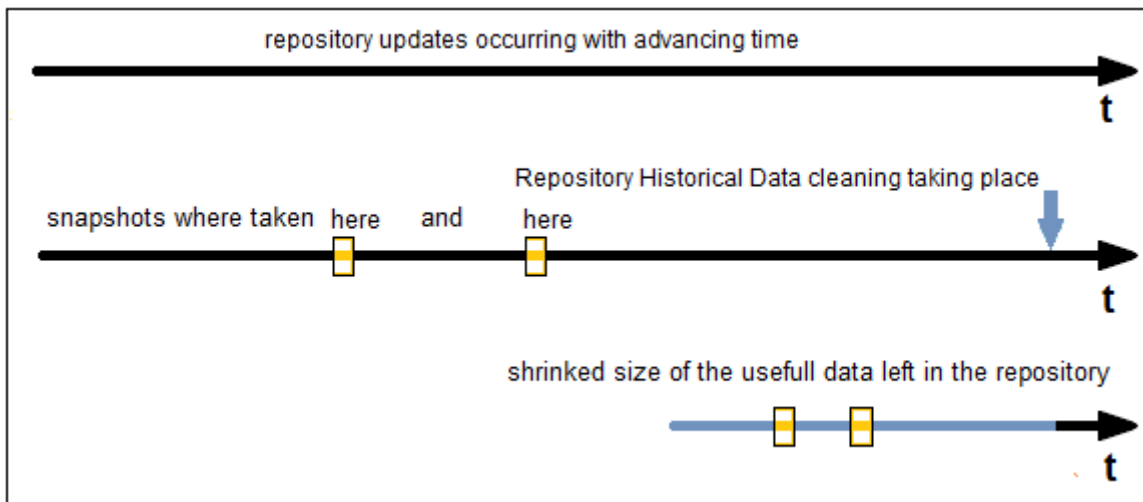
### Before cleaning Historical Data

Historical data are used in the Repository Snapshot mechanism. See HOPEX Collaboration Manager > Snapshots > Repository Snapshots > Managing Repository Snapshots: **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.

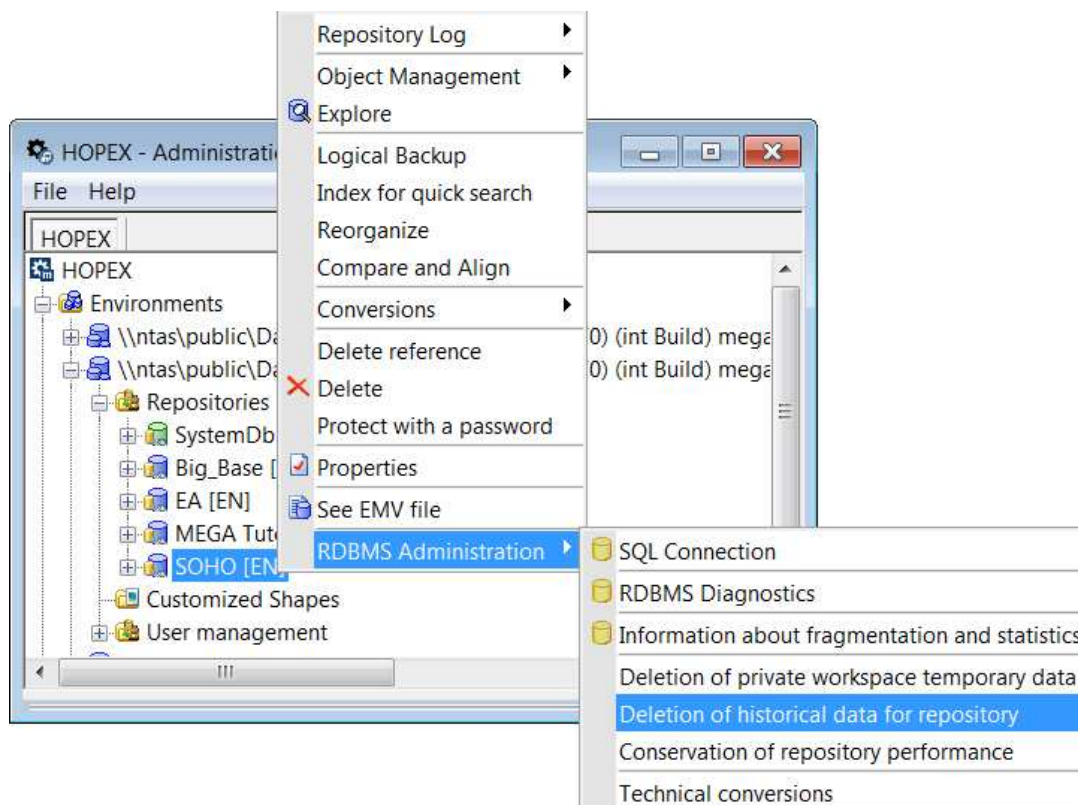
In this case, the data corresponding to the repository state for the Snapshot(s) is saved and it is thanks to this saving that special features will be available within this repository regarding this data.

## 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 > 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.



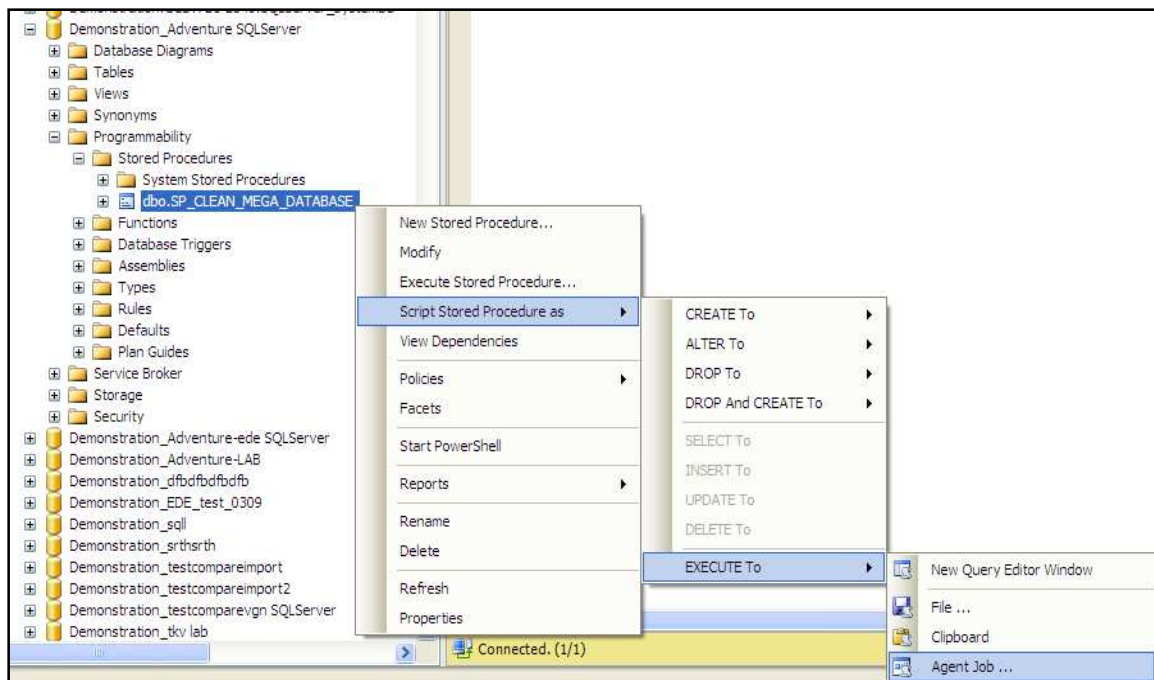
## Batching Cleanup procedures for SQL Server

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.

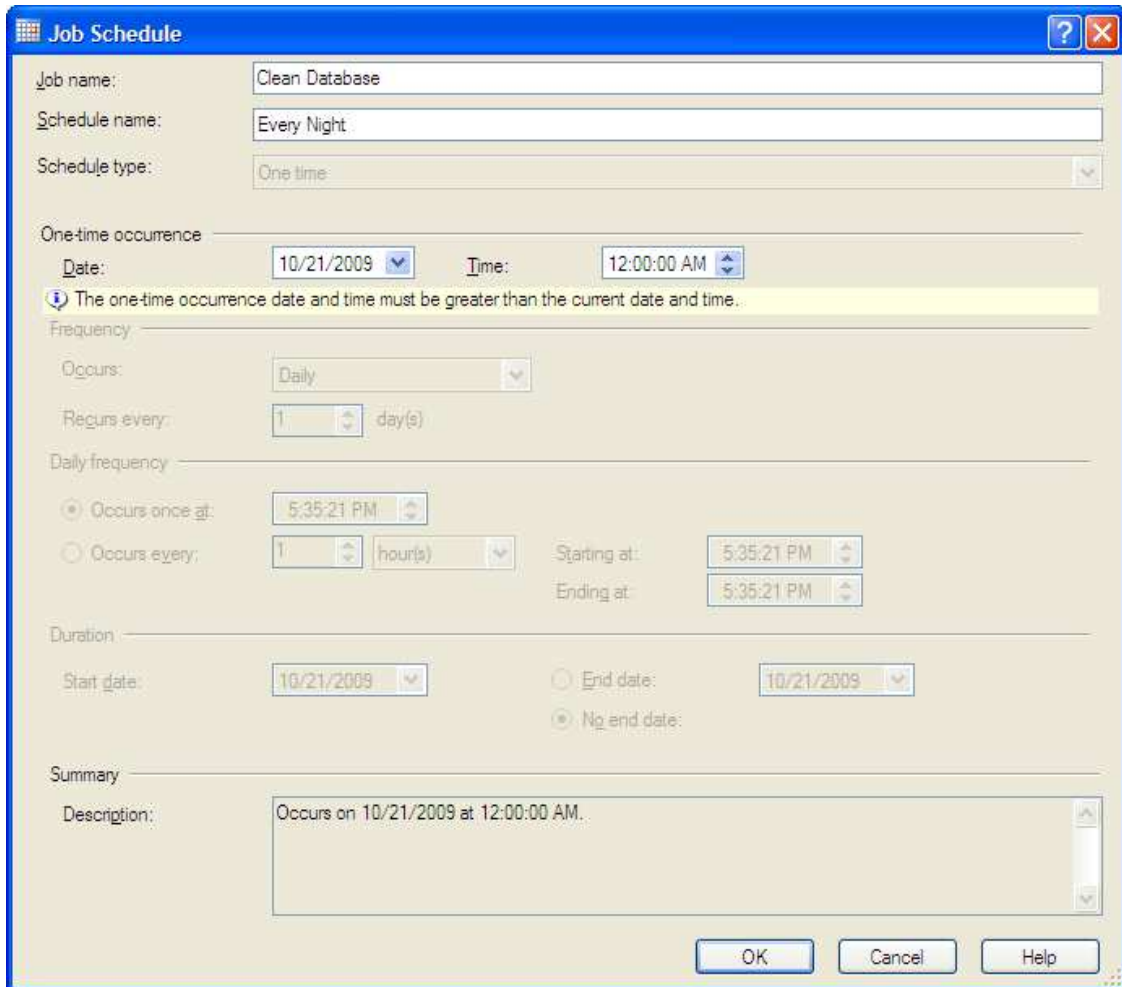
1. Using **SQL Server Management Studio**, find the SQL Server database that corresponds to the HOPEX repository for which you want to batch the stored procedure.

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.



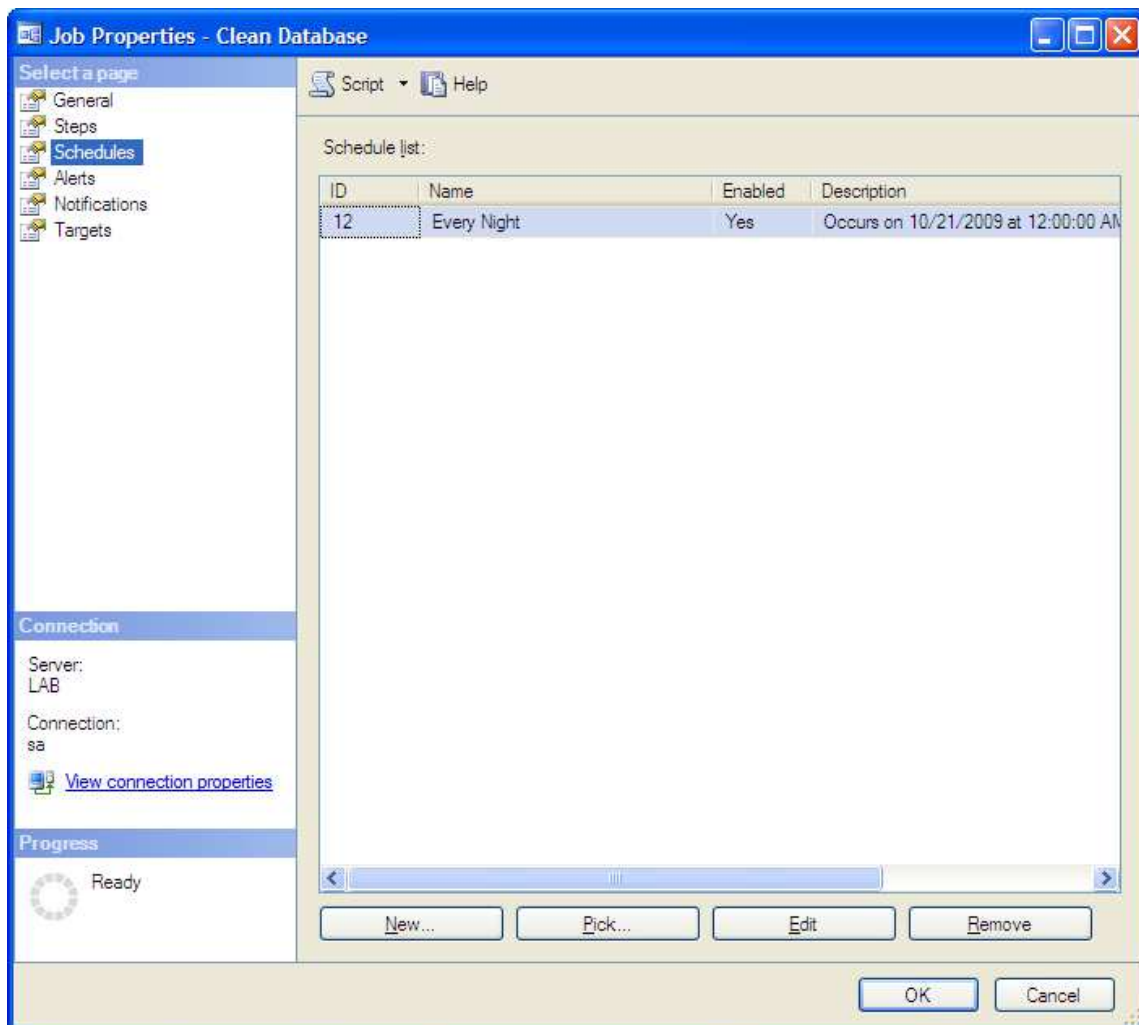
The image shows a 'Job Schedule' dialog box with the following fields and options:

- 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: Every Night Jobs in Schedule

Schedule type: Recurring Enabled

One-time occurrence

Date: 10/21/2009 Time: 12:00:00 AM

Frequency

Occurs: Daily

Repeats every: 1 day(s)

Daily frequency

☒ Occurs once at: 12:00:00 AM

☐ Occurs every: 1 hour(s)

Starting at: 5:36:57 PM

Ending at: 5:36:57 PM

Duration

Start date: 10/21/2009

☐ End date: 10/21/2009

☒ No end date:

Summary

Description: Occurs every day at 12:00:00 AM. Schedule will be used starting on 10/21/2009.

OK Cancel Help

## 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?

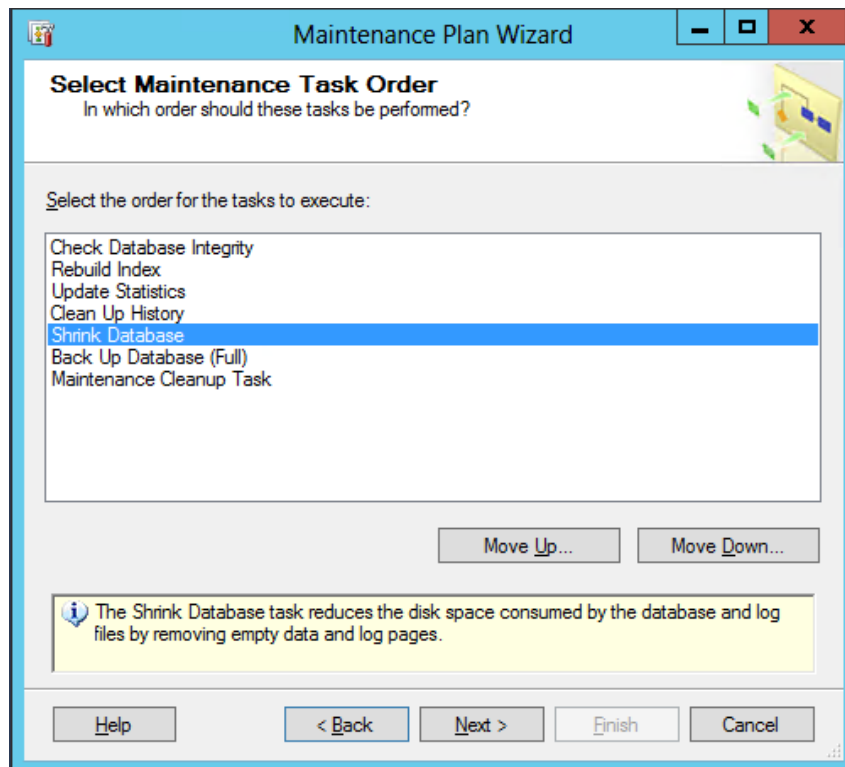
Select one or more maintenance tasks:

- ☒ 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

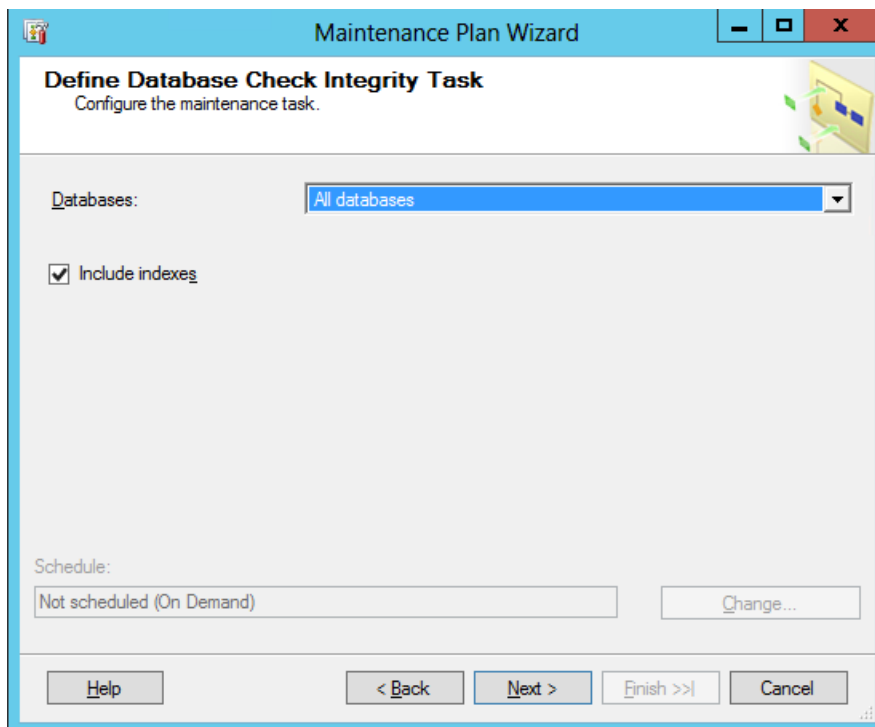
The Check Database Integrity task performs internal consistency checks of the data and index pages within the database.

[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:

The screenshot shows the 'Maintenance Plan Wizard' window, specifically the 'Define Rebuild Index Task' step. The window has a blue title bar with the text 'Maintenance Plan Wizard' and standard Windows window controls. Below the title bar, the main area is titled 'Define Rebuild Index Task' with the subtitle 'Configure the maintenance task.' and a small icon of a folder with arrows. The configuration options are as follows:

- Databases:** A dropdown menu set to 'All user databases'.
- Object:** An empty dropdown menu.
- Selection:** An empty dropdown menu.
- 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:** A text box containing 'Not scheduled (On Demand)' and a 'Change...' button.

At the bottom of the window, there are five buttons: 'Help', '< Back', 'Next >', 'Finish >>', and '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:

**Maintenance Plan Wizard**

**Define Maintenance Cleanup Task**  
Configure the maintenance task.

Delete files of the following type:

- ☒ Backup files
- ☐ Maintenance Plan text reports

File location:

- ☐ Delete specific file
- ☒ Search folder and delete files based on an extension

File name:  ...

Folder:  ...

File extension:

☒ Include first-level subfolders

File age:

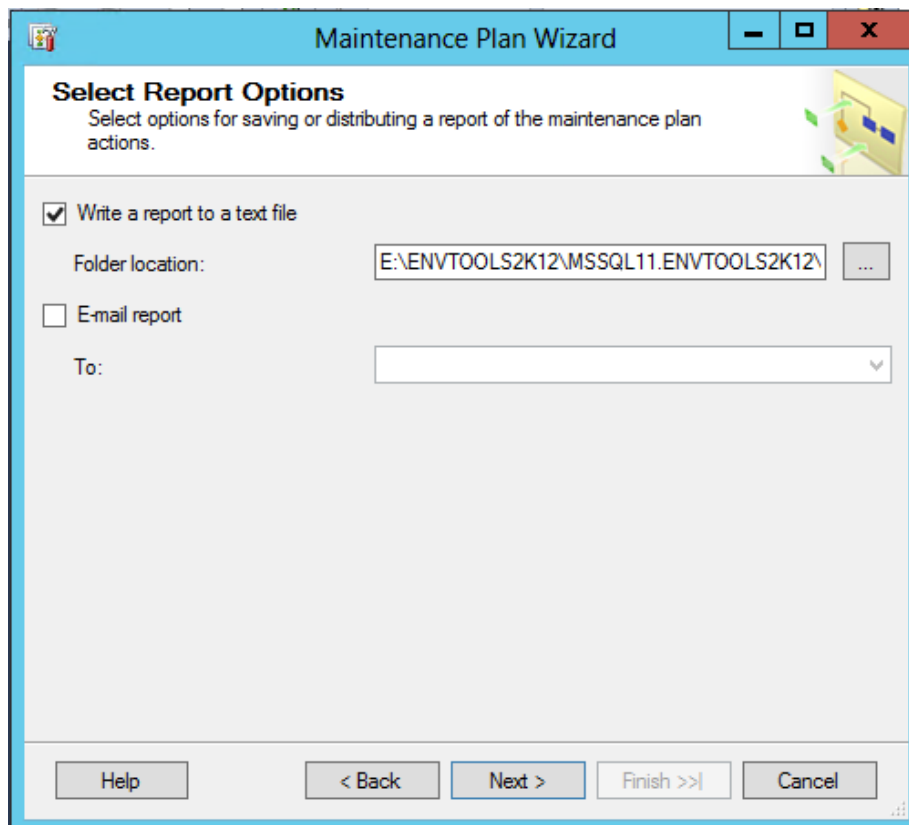
☒ Delete files based on the age of the file at task run time

Delete files older than the following:

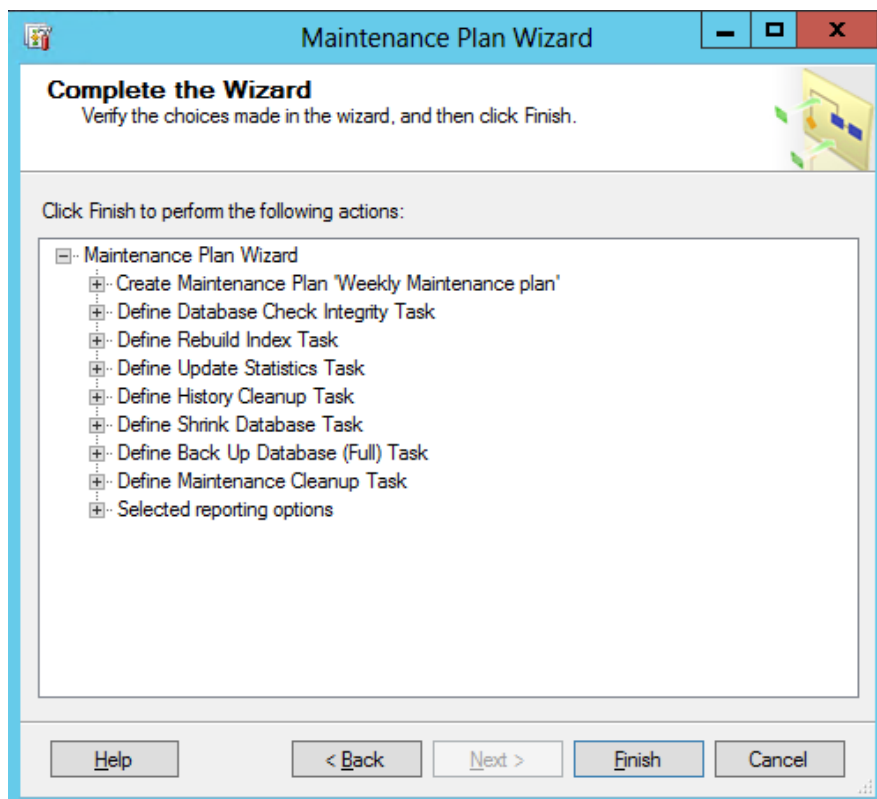
2  Week(s)

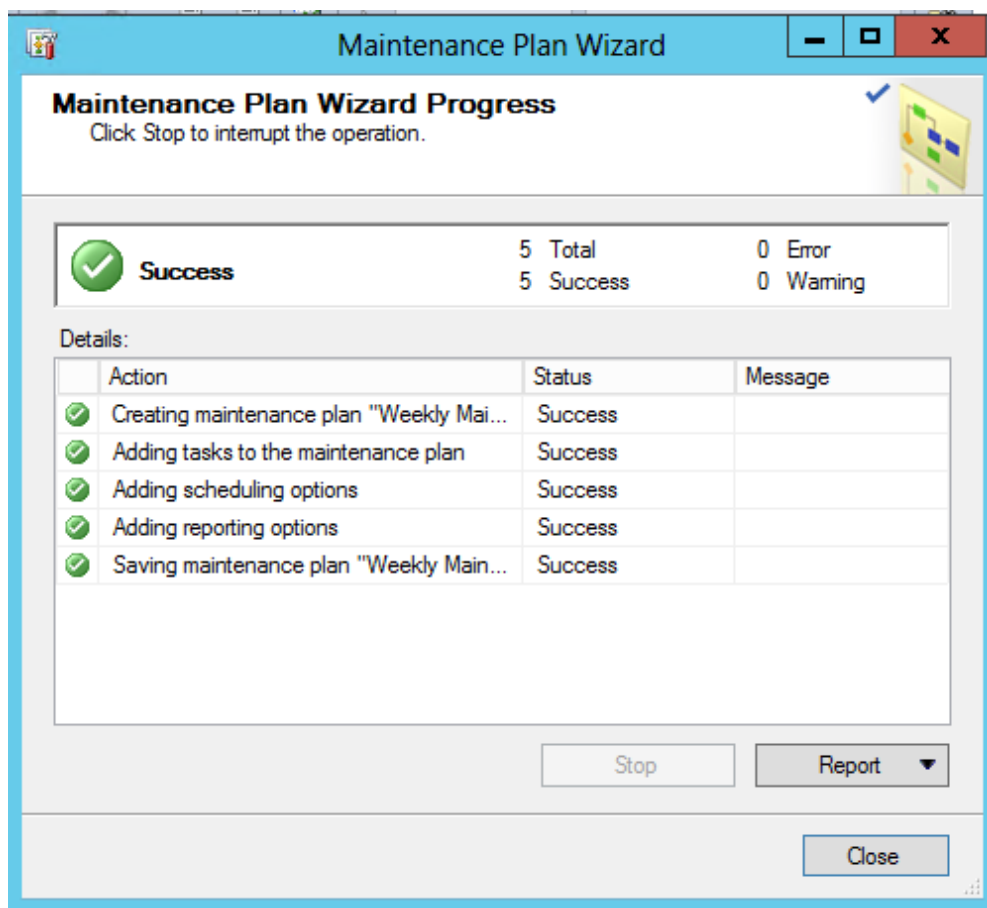
Schedule:

12. Keep the default :



13. Click **Finish** to create the maintenance plan, and the SQL Server job:





# HOPEX RDBMS repositories specific administration actions

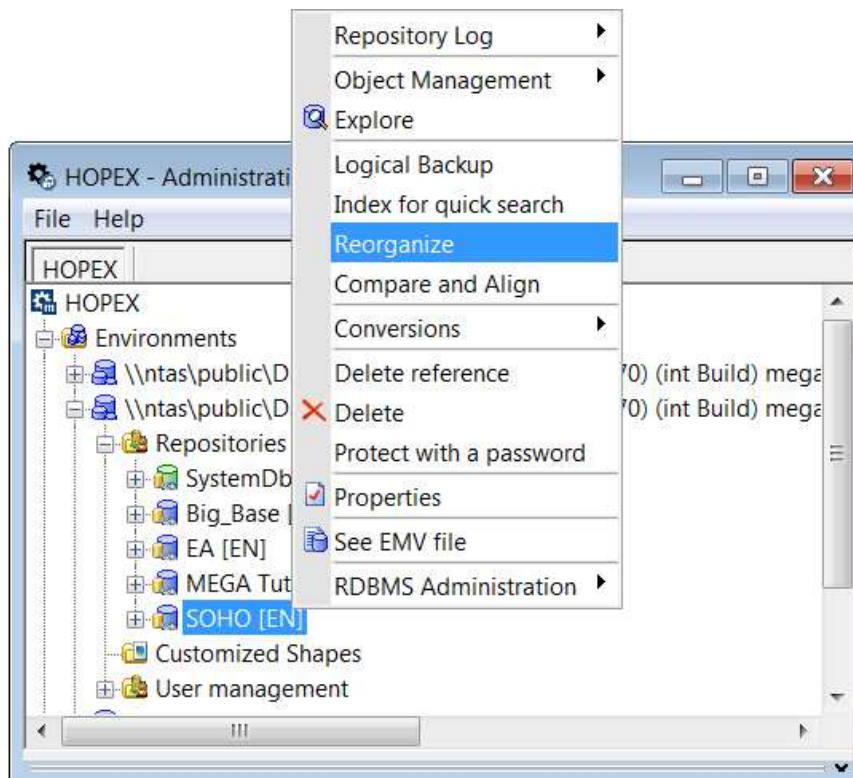
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## Migrating Your Data from One Storage Support to Another

### General procedure:

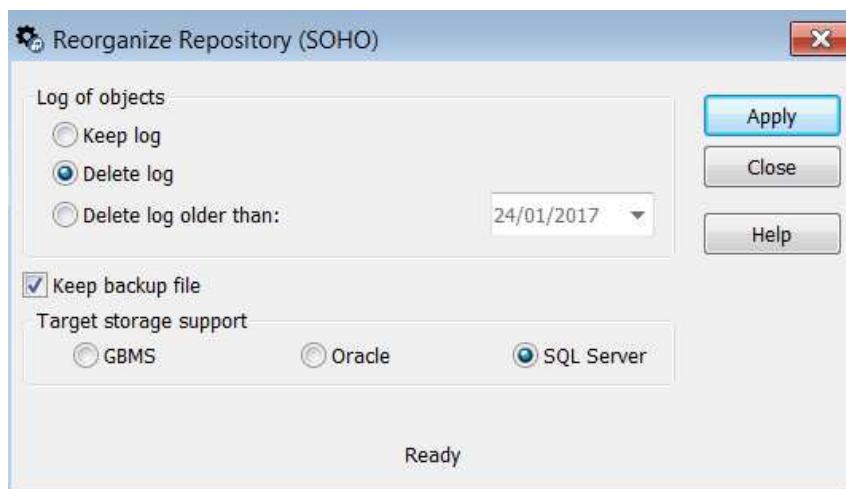
1. Start HOPEX **Administration.exe**.
2. Connect to the environment containing the repositories to be migrated.
3. Expand the **Repositories** folder.
4. Right-click a repository and select **Reorganize**.

**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:

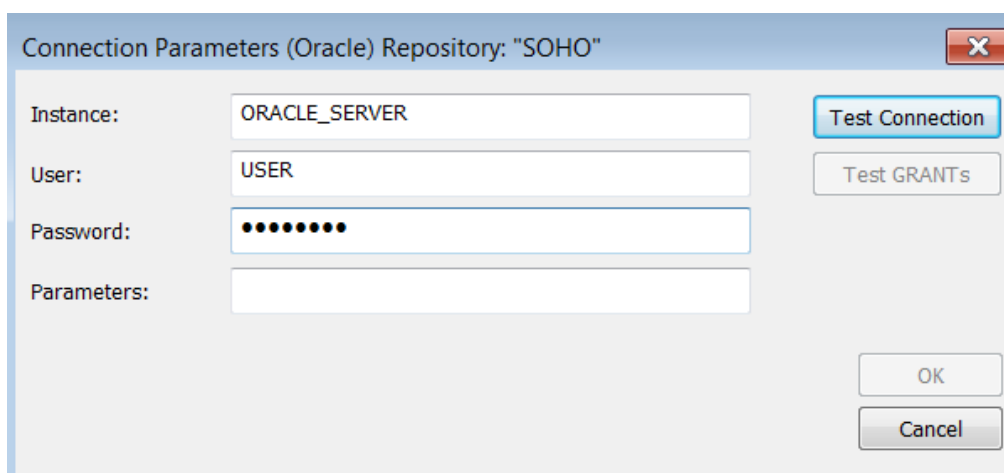
- **GBMS:**

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: "SOHO"

Instance: VP-DL-770INT2\SQLEXPRESS

User: MEGAUSR

Password: ••••••••

Parameters:

Repository creation mode

☒ Create database

☐ Use existing SQL Server database

Test Connection

Test GRANTS

OK

Cancel

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 Sql Server concerning a HOPEX Database 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.

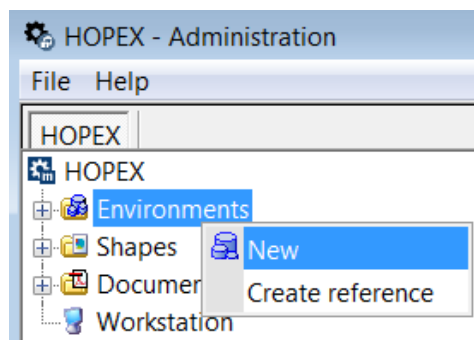
In such a situation, since the repository folder contains files indicating the way to reach the data and on which database server it can be found, the data could be considered lost from the HOPEX point of view.

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.

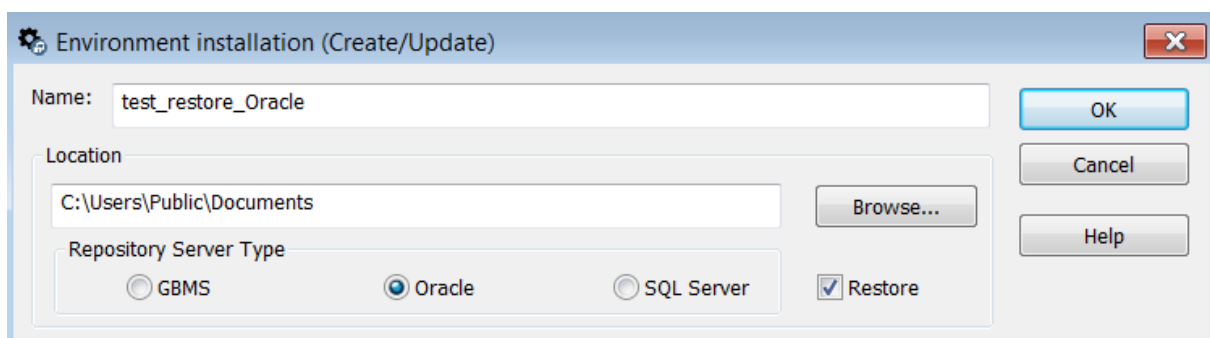
This method can also be used for duplicating an environment from a production infrastructure to a test infrastructure (or vice versa). For doing so, all the repositories (including the SystemDb) must be duplicated first in the RDBMS. The restoration can then be done on the duplicates repositories, starting with the SystemDb.

### Restoring an environment (SystemDb repository)

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

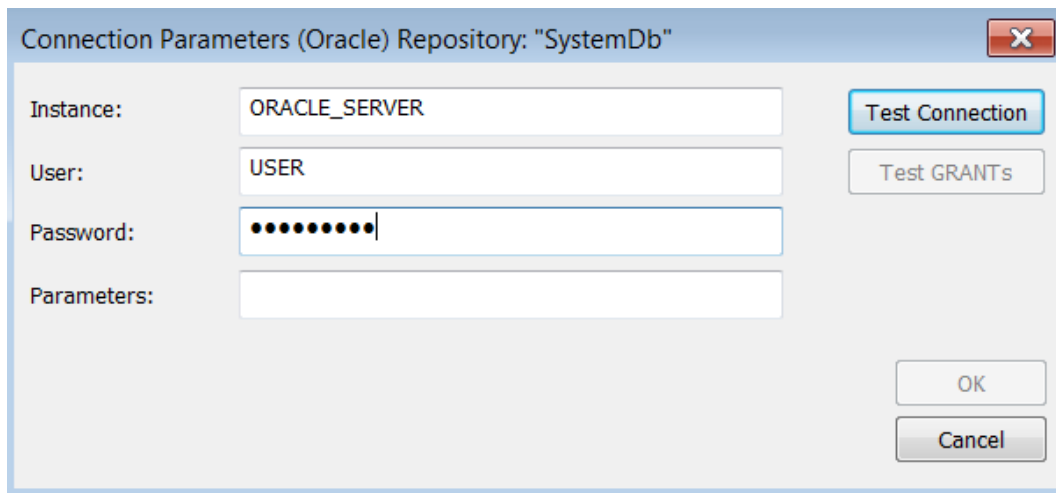


3. In **Name**, enter the name of the environment that is to be restored (the exact same name as the one used for the first creation).
4. Select **Restore**.



5. Click **OK**.

- Specify the connection parameters for accessing the RDMS where the HOPEX -yet-unreachable data is located.



- Click **Test Connection**.

The test must be successful for the process to continue.

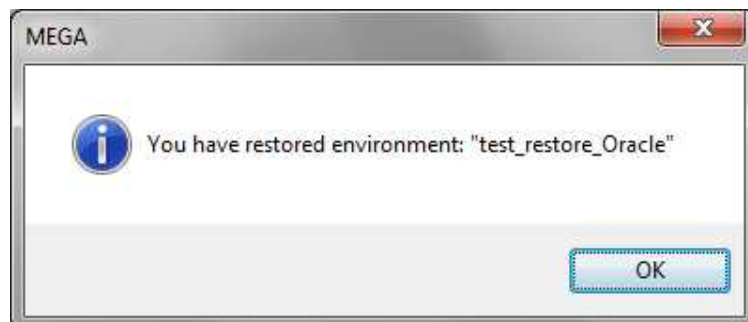
- Click **Test GRANTS**.

The test must be successful for the process to continue.

- Click

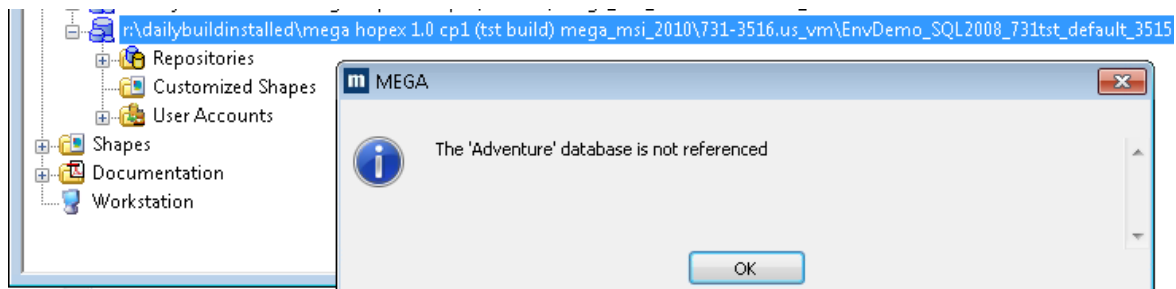
The SystemDb repository is restored.

**OK.**



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.

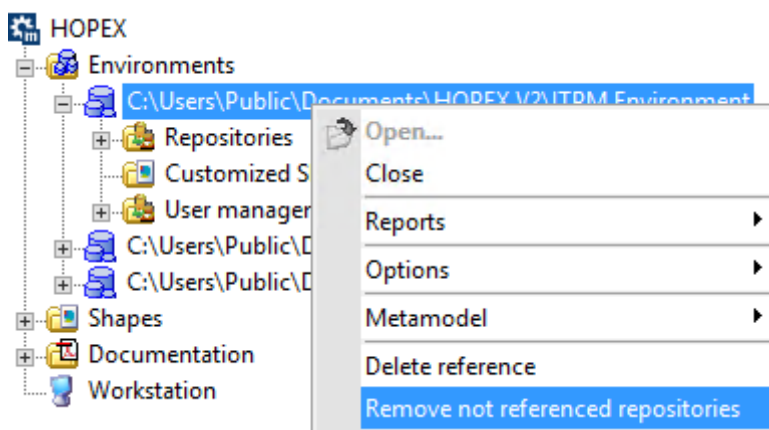
At this point, if you open the environment that was just restored, you will see the following warning message: "The <repository name> is not referenced").



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



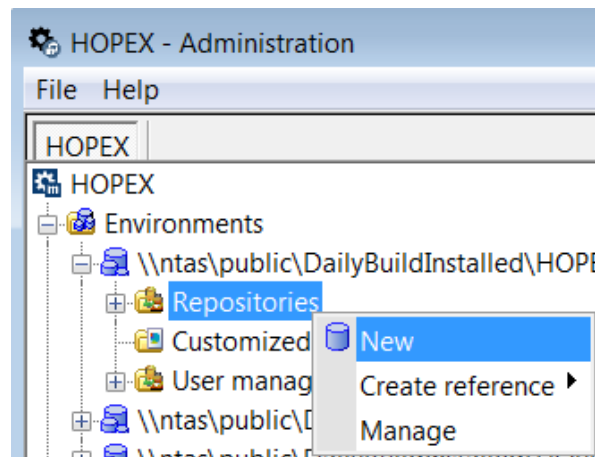
- DO NOT use **Remove not referenced repositories** if the environment is in use somewhere else as it will delete the references to the repositories there too !
- Use it only on an environment that is a physical copy on the RDBMS storage side.
- Be carefull that the repositories also must be restored 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

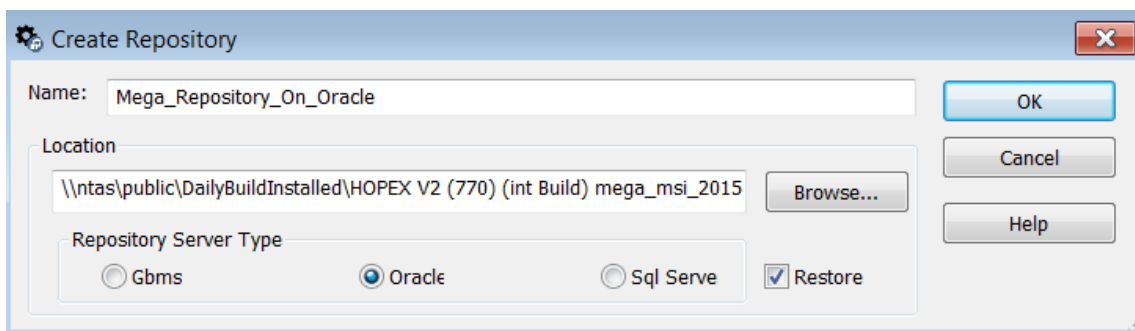
**Note: A repository can only be restored within an environment that has the same name as the one in which the repository was originally created. An environment with the same name can be recreated before restoring the repository in it or the actual environment can be restored beforehand.**

**To restore a data repository:**

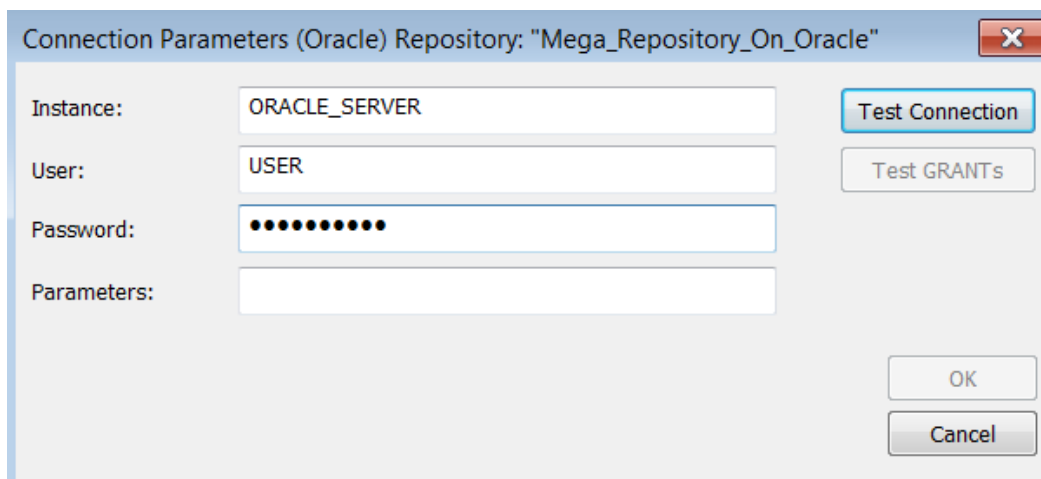
1. Start HOPEX **Administration.exe**.
2. Connect to the environment in which you want to restore the repository
3. Right-click the **Repositories** folder and select **New**.



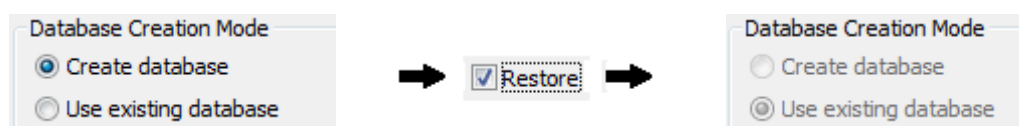
4. In **Name**, enter the name of the repository that is to be restored (the exact same name as the one used for the first creation).
5. Select **Restore**.



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**.

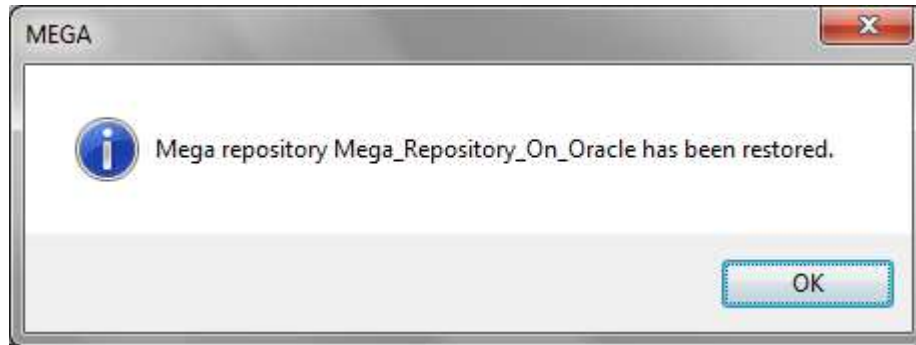
The test must be successful for the process to continue.

9. Click **Test GRANTS**.

The test must be successful for the process to continue.

10. Click **OK**.

The repository is restored.

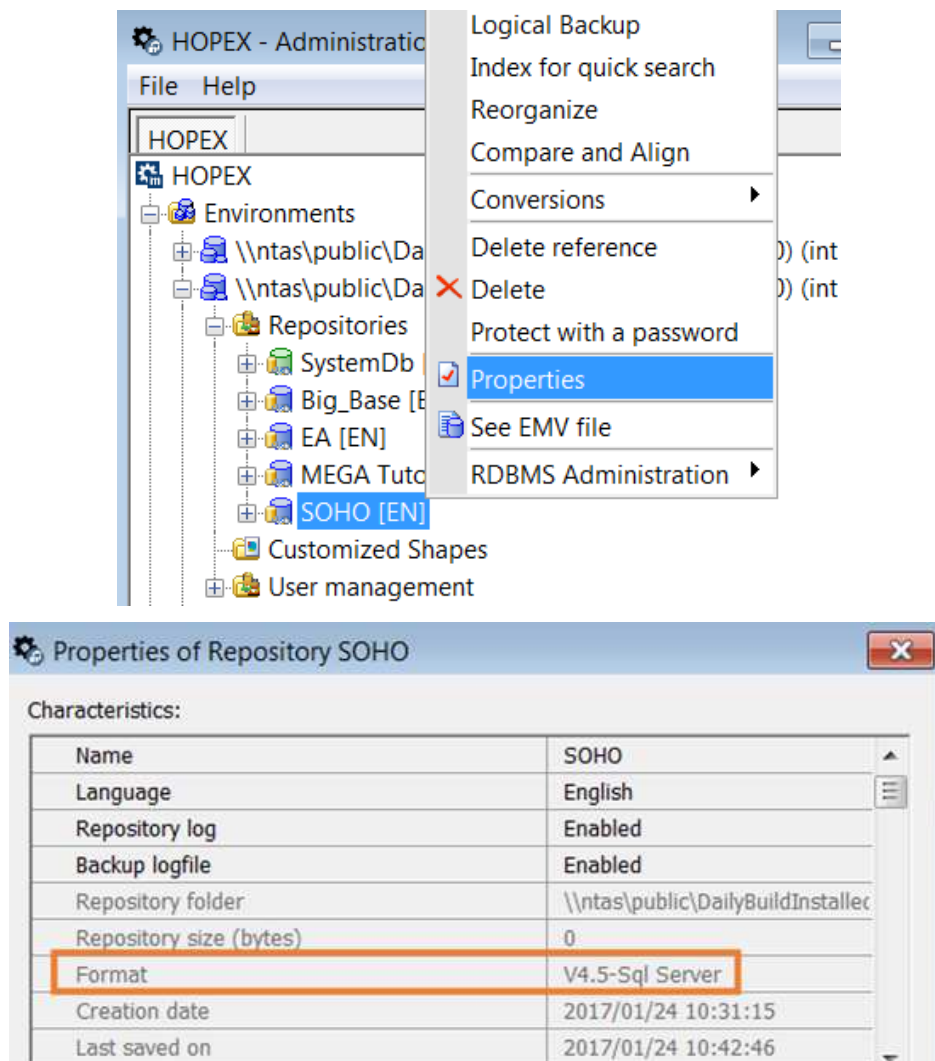


## Handling of HOPEX RDBMS repositories specific internal format

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**.

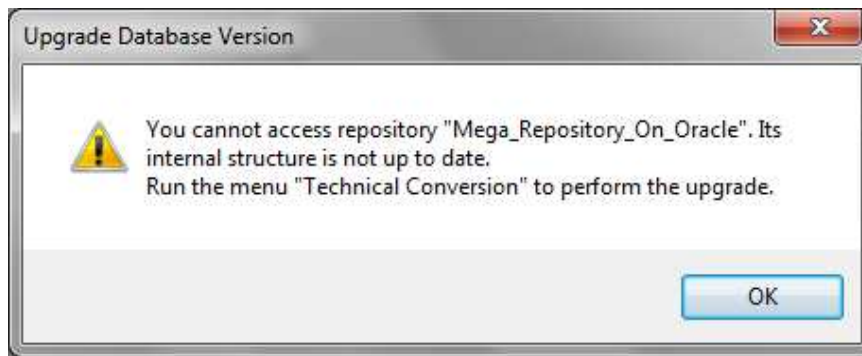


When upgrading your HOPEX installation (applying a Cumulative Patch or migrating your data from a HOPEX SP version to the next one), there might be some modifications leading to a new **internal format** version.

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.

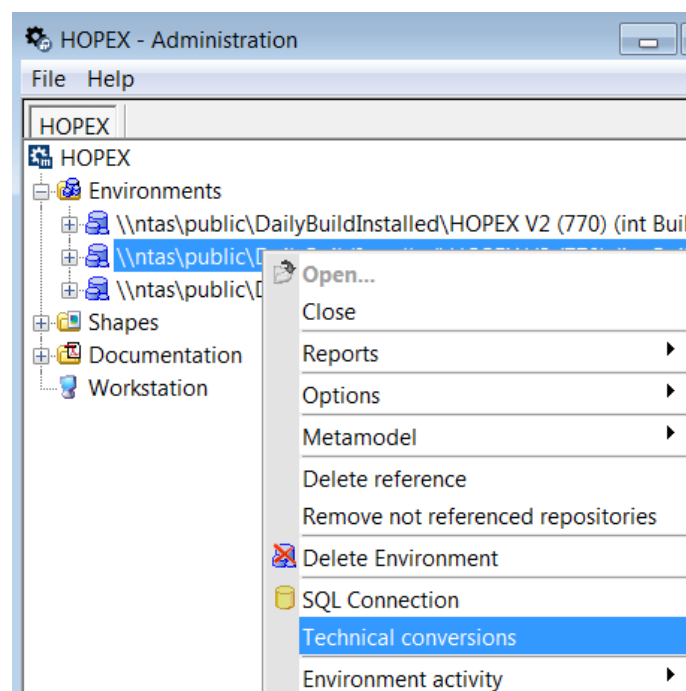
When you need to upgrade the **internal format** version, you are prompted to do it with the following window:



**Note: The technical conversion of the repositories of the environment must be done before upgrading to the environment:**

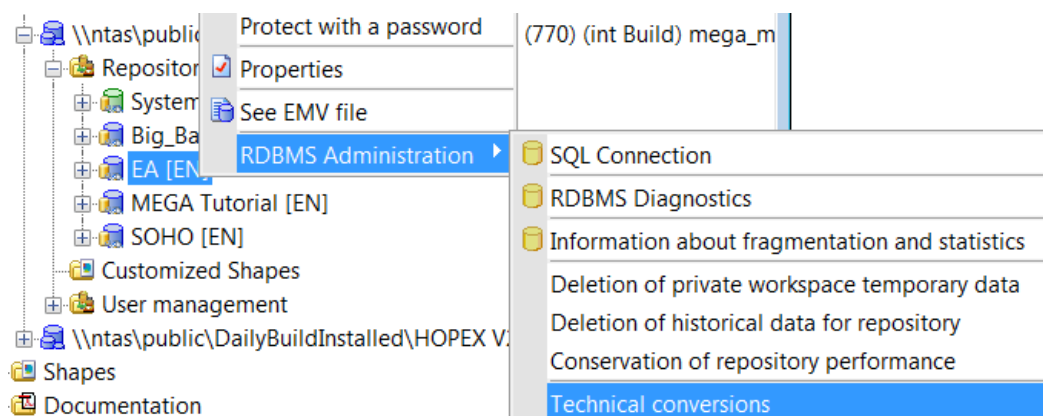
1. Apply the technical conversion on the SystemDb:

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.

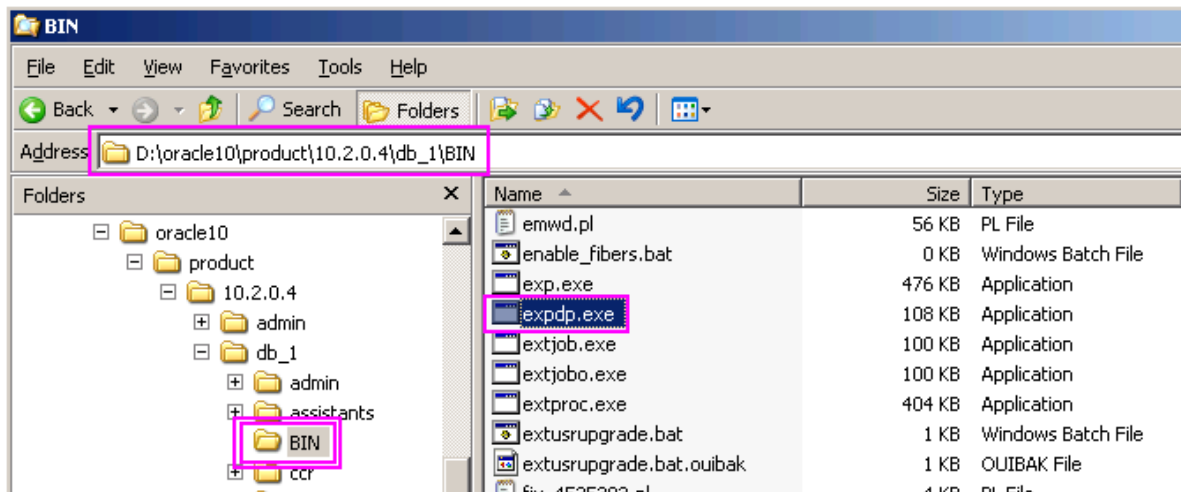


Note that data exported with EXP cannot be imported with IMPDP and vice versa.



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

Copyright (c) 2003, 2007, Oracle. All rights reserved.

Connected to: Oracle Database 10g Release 10.2.0.4.0 - Production
Starting "SYSTEM"."SYS_EXPORT_SCHEMA_01": system/*****@TEST DIRECTORY=DATA_P
UMP_DIR DUMPFILE=MEGA_REPOSITORIES_EXPORT_SYSTEMDB_AND_MEGATUTORIAL.DMP LOGFILE=
MEGA_REPOSITORIES_EXPORT_SYSTEMDB_AND_MEGATUTORIAL.DMP.LOG SCHEMAS=ORASCHEMA,ORA
SCHEMASYS
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

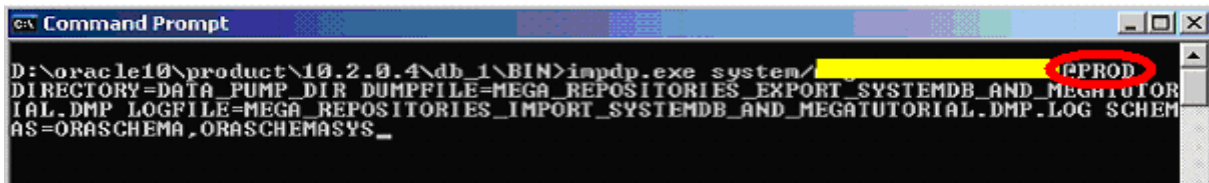
#### Prerequisite:

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:

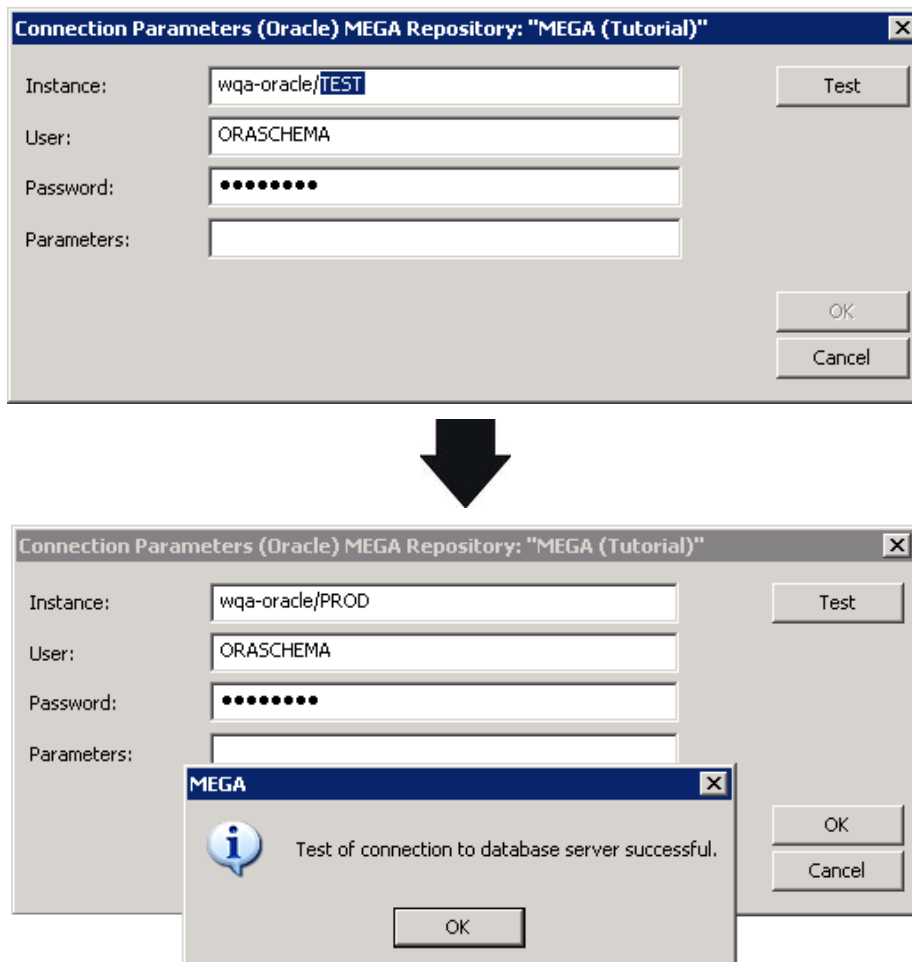
```
Command Prompt
D:\oracle10\product\10.2.0.4\db_1\BIN>
D:\oracle10\product\10.2.0.4\db_1\BIN>impdp.exe system/ [redacted] @PROD
DIRECTORY=DATA_PUMP_DIR DUMPFILE=MEGA_REPOSITORIES_EXPORT_SYSTEMDB_AND_MEGATUTOR
IAL.DMP LOGFILE=MEGA_REPOSITORIES_IMPORT_SYSTEMDB_AND_MEGATUTORIAL.DMP LOG SCHEM
AS=ORASCHEMA,ORASCHEMASYS 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"><li>• Server 'iba.company.com'</li><li>• Server '192.888.777.666'</li><li>• Server 'SQL02'</li></ul>
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>

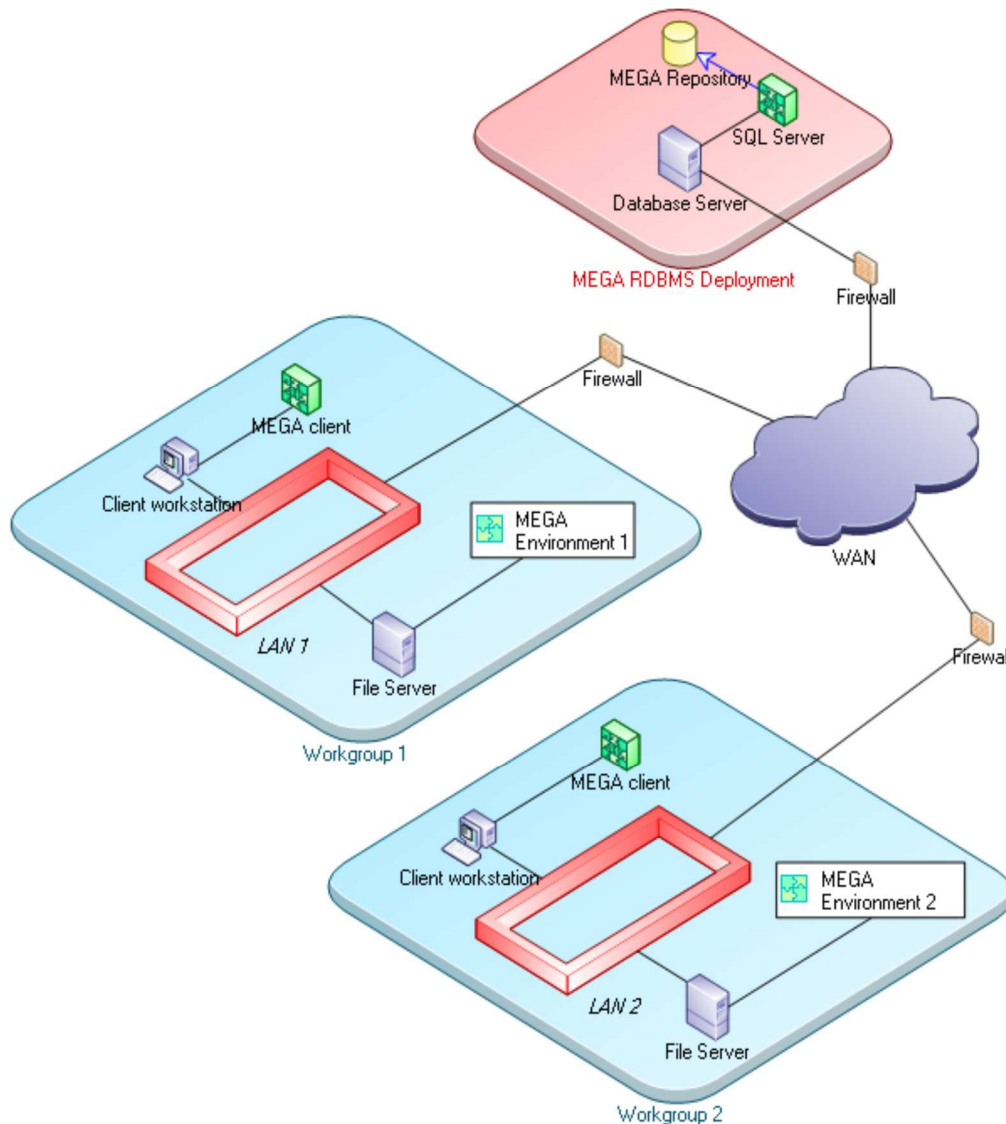
Term	Comment
Repository	<p>A repository is a structured collection of data.</p> <p>A HOPEX repository is a collection of HOPEX data. Data is structured in relation to a metamodel. Object names are often unique within the repository or with a namespace of the repository.</p>
Schema	<p>A schema object 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><b>It is strongly recommended to isolate each HOPEX Repository in a separate Oracle schema (User Repositories AND SystemDb repository)</b></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"> <li>○ GBMS: storage in HOPEX historical DBMS</li> <li>○ Oracle: storage in Oracle DBMS</li> <li>○ SQL Server: storage in SQL Server DBMS</li> </ul>
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.

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## CONTENTS

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This article describes the technical configurations necessary for installing the HOPEX Must technology license and the installation procedures. An appendix addresses problems you may encounter during installation.

It applies to HOPEX V2.

It applies to the following front-ends of the HOPEX platform:

- HOPEX Web Front-end.
- Windows Front-end.

## OVERVIEW

---

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.

The list of available services varies with the front-end:

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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).

## MUST LICENSE UTILITY

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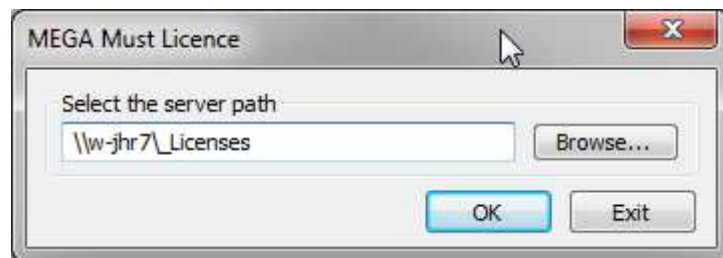
A launcher **licensing.exe** is installed in the root folder of the HOPEX installation. It is a shortcut to the program **mgwusrmng.exe** located in the 'System' folder of the HOPEX installation.

### 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.

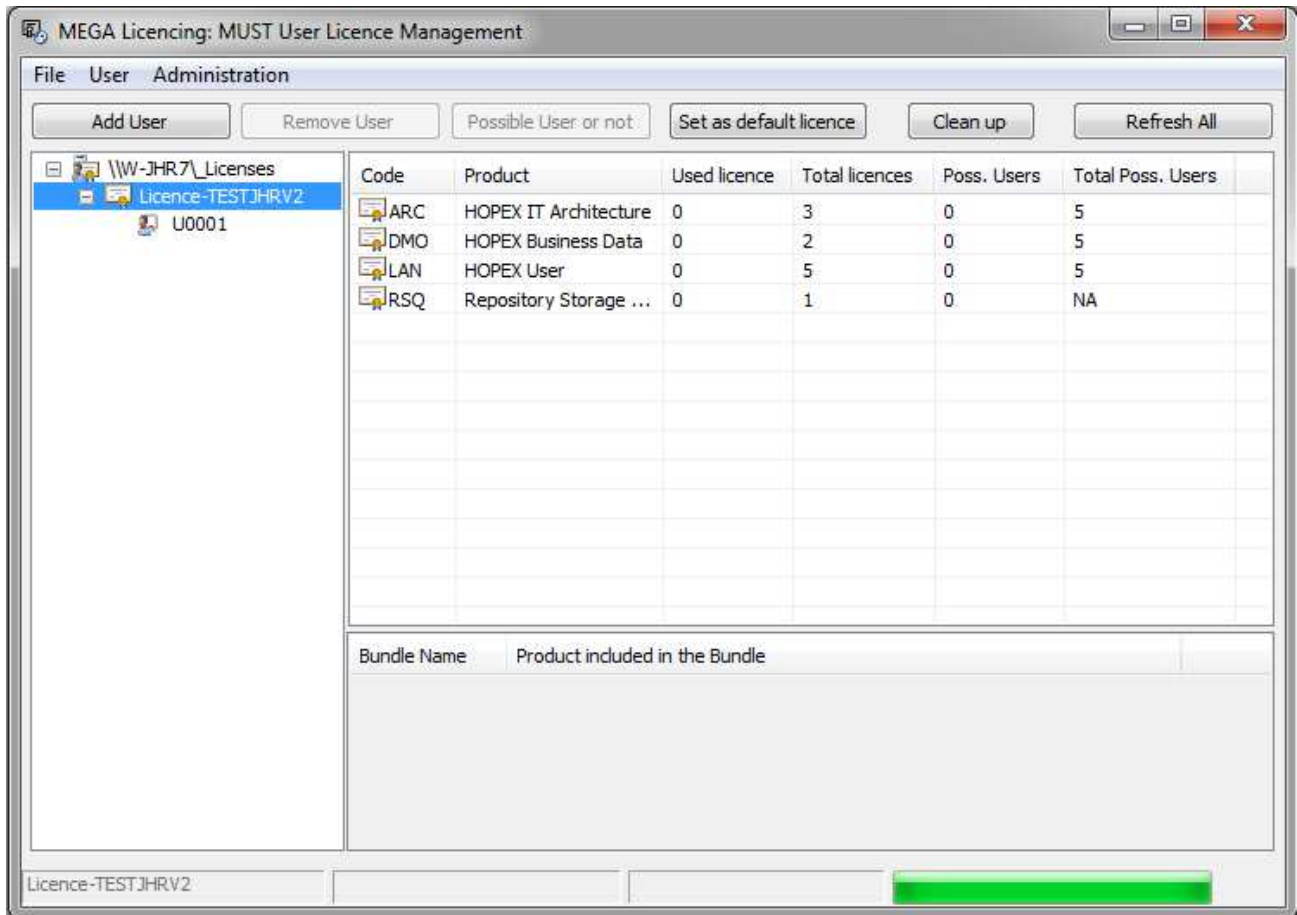
#### Select server path window



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).

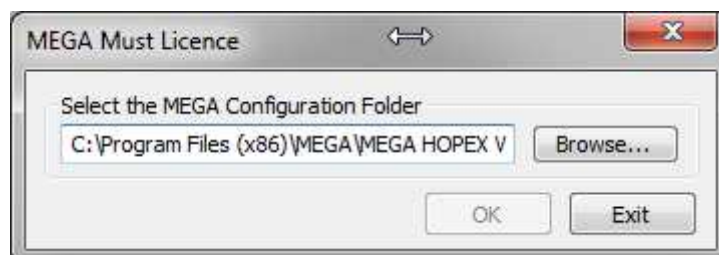
The license status is displayed in the left pane:

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.

## 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.

### 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.

### Choosing a machine to host the Must license folder

List of requirements:

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- 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

## 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.

## Sending the UNC address of the license folder

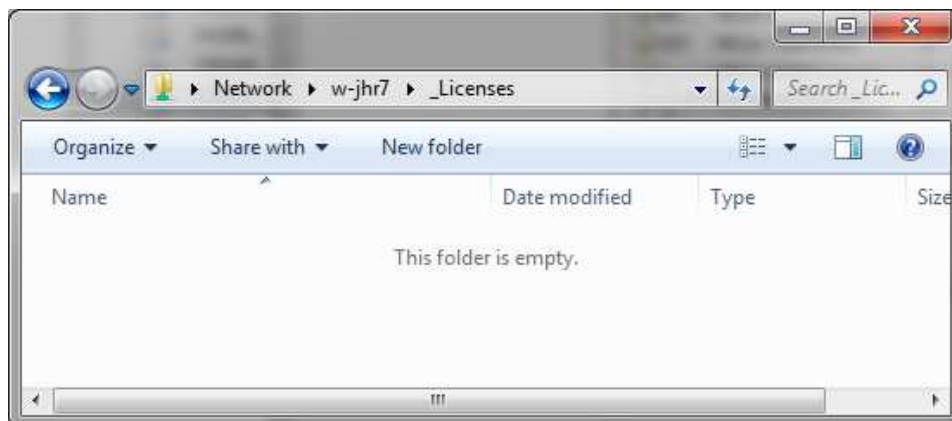
Prerequisite:

- 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.



## Installing a Must license file

Prerequisites:

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- 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:

- With Windows explorer, select the folder matching the UNC.
- Copy the .must file sent by MEGA Sales Administration to this folder.

Results:

- The Must license is installed.

## 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:

- Run the Must license utility.
- In the menu, select File > 'Update config'.
- Click the 'Browse' button.
- 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.

## 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:

- Browse the shared configuration folder.
- Edit the file Megasite.ini.
- 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.

## 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:

- With Windows explorer, select the folder matching the UNC.
- Remove the .must file from this folder.

### Results:

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- The Must license is uninstalled.

## 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:

- Run the **licensing.exe** utility as **Administrator**.
- Select the server path where the license is saved.
- Select the license in the left tree.
- Right-click > **Reset License** configuration.
- Confirm reset.

This will:

- Delete the possible user configuration.
- Delete the token files.
- Delete the file Router.ini

## 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:

- Run the **licensing.exe** utility as **Administrator**.
- Click on the menu Administration > **Convert**.
- 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 U001@Domain02=Licence-T0002 U002@Domain01=Licence-T0001	[User/Licence] U001=Licence-T0001 U002=Licence-T0001  [Router] Version=2

## 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
HOPEX 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.

## CONFIGURATION AND MONITORING PROCEDURES

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The following procedures apply to all front-ends.

### 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:

- Run the Windows Administration Console.
- Open the environment.
- Select the folder 'User Accounts > Users'.
- Right-click > Manage.
- In the tab 'Logins', select the login of the user requested.  
Ex: select the login 'Mega' for the login holder 'Mega'
- Right-click > Properties.
- 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.

## 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 extension.

Ex: if the file is 'License-T0002.must', the licence name is 'License-T0002'.

## 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

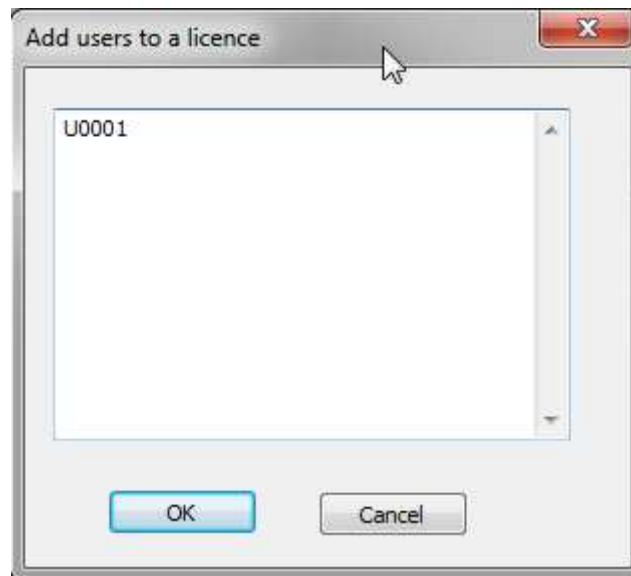
#### Prerequisites:

- 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:

- Run the Must license utility.
- Select the license folder.

- Select the license to be configured. Ex: License-T0001.
- 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:**

- Run the Must license utility.
- Select the license folder.
- Select the license to be configured. Example: License-T0001.
- Select the login of the user to be removed.
- Click the 'Remove user' button.

**Results:**

- The user is no longer displayed in the left pane below the license.

## 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.

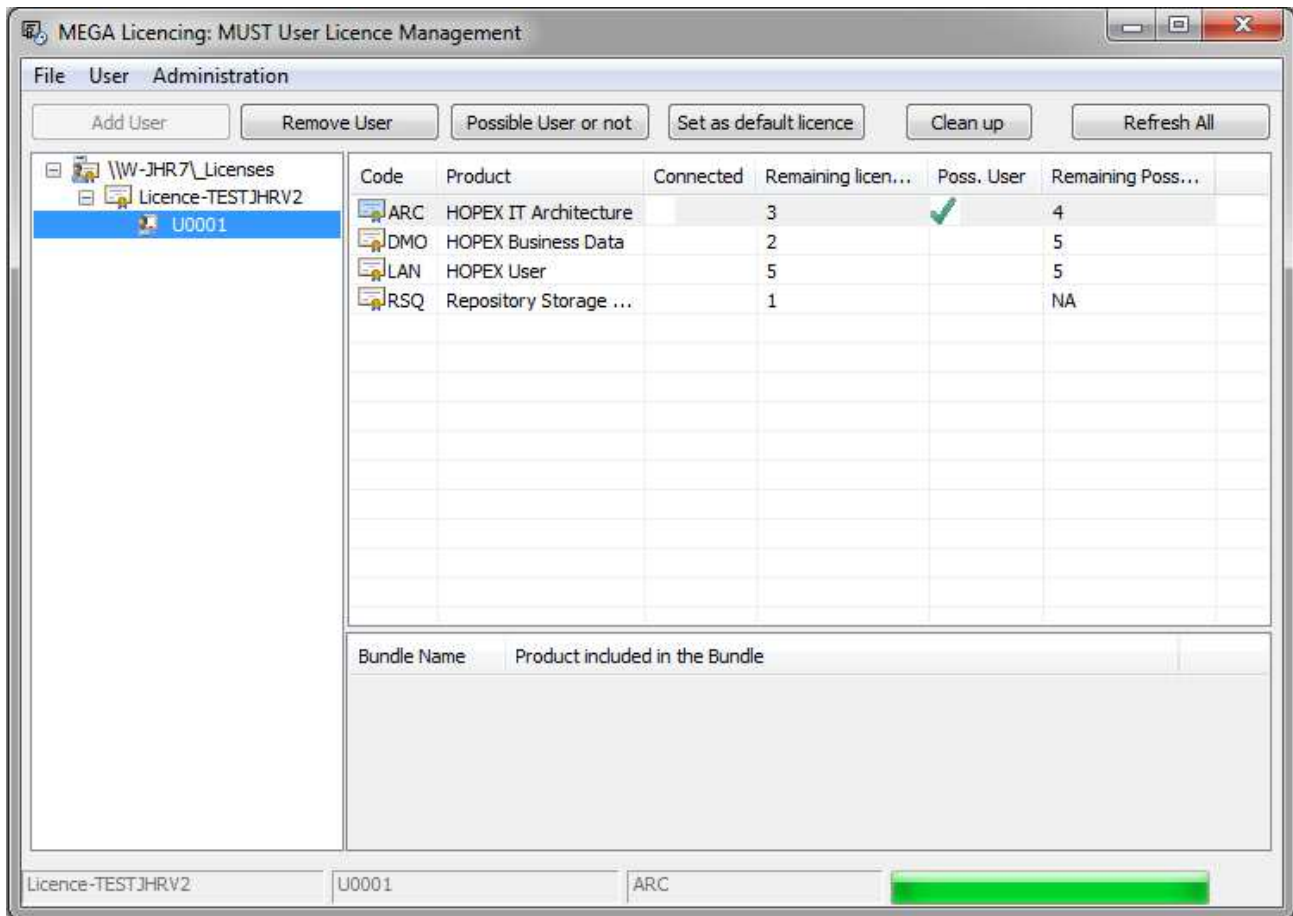
**Procedure:**

- Run the Must license utility.
- Select the license folder.
- Select the license to be configured.
- Select the product to be configured.
- Select the user to be set as a possible user of the product.
- Click the 'Possible user or not' button.

**Results:**

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- 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:

- Run the Must license utility.
- Select the license folder.
- Select the license to be configured.
- Select the product to be configured.

- Select the user to be removed as a possible user of the product.
- 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:

- Run the Must license utility **as Administrator**.
- Select the license folder.
- Select the license to be configured.
- 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).

### 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.

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- A HOPEX installation is available and configured for Must licenses.

Procedure:

- Run the Must license utility.
- Select the license folder.
- Select the license to be monitored.
- Select the user or the product to be monitored.
- Read the top right pane, column 'Connected'.

## CONFIGURING SEVERAL LICENSING MODES

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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 **dedicated** mode

Command line parameters will be used to control user tokens (LAN 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 also 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.

### Configuration with concurrent mode (floating mode)

#### Check .Must licence

A product LAN\_F must be programmed in concurrent mode.

Other products must be programmed in concurrent mode.

This can be checked in the licence file description: the second digit equals 0.

Ex:

ARC\_F=2 ; 0                      Programmed in concurrent mode

DMO=3 ; 0                      Programmed in concurrent mode

SUP=1 ; 1                      Programmed in dedicated mode

LAN=1 ; 1                      Programmed in dedicated mode  
LAN\_F=4 ; 0                    Programmed in concurrent mode

Note that the extension \_F is conventional (except for LAN\_F). DMO is programmed in concurrent mode although it is not called DMO\_F.

### **Enable extended mode in megasite.ini.**

In megasite.ini add the following line in the section [Must licence].

```
[Must licence]
```

```
LAN_F=1
```

### **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,ARC\_F,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.

## Configuration with dedicated mode

### Check .Must licence

A product LAN\_D must be programmed in dedicated mode.

Other products must be programmed in dedicated mode.

This can be checked in the licence file description: the second digit equals the first one.

Ex:

ARC\_D=2 ; 2                      Programmed in dedicated mode

SUP=2 ; 2                      Programmed in dedicated mode

DMO=2 ; 5                      Programmed in shared mode

LAN=5 ; 10                      Programmed in shared mode

LAN\_D=4 ; 4                      Programmed in dedicated mode

Note that the extension \_D is conventional (except for LAN\_D). SUP is programmed in concurrent mode although it is not called SUP\_D.

### Enable extended mode in megasite.ini.

In megasite.ini add the following line in the section [Must licence].

```
[Must licence]
```

```
LAN_F=1
```

### 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,ARC\_D'

Note that it is not required to quote all product codes programmed in concurrent mode in the command line. Here SUP, is not quoted because it is assigned to a specific login/profile.

Reminders:

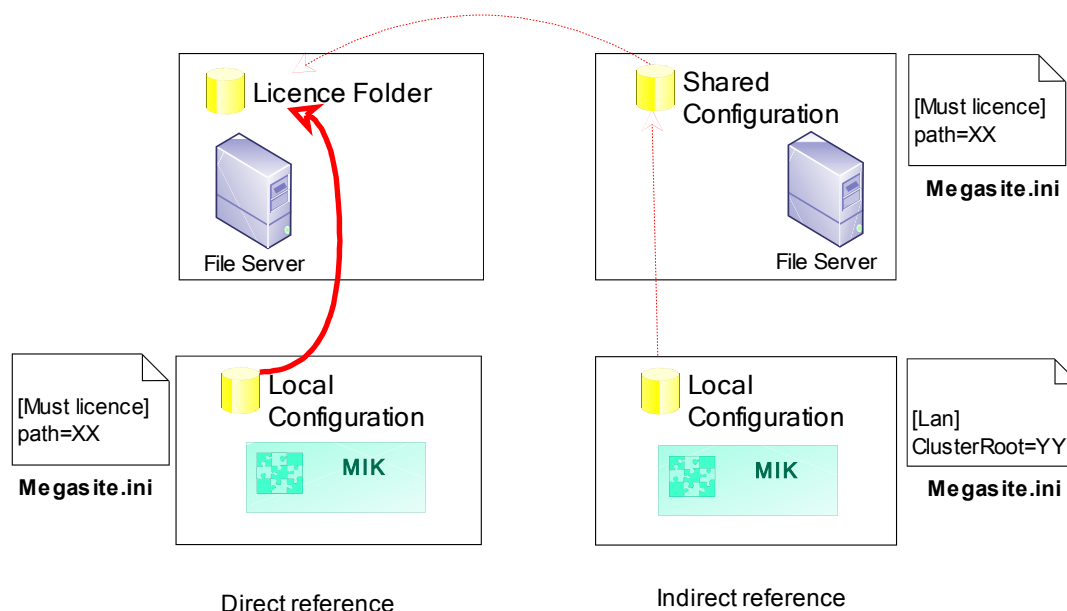
- It is recommended to configure command line for profiles rather than for logins

- 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.

## License deployment model

Two types of references can be used:

References	Extract of Megasite.ini (example)	Comment
Direct reference	[Must licence] Path=\\server001\Apps\Licenses	The Must license folder (\\server001\Apps\Licenses) is configured in the file Megasite.ini of the HOPEX Installation
Cluster reference	[Lan] ClusterRoot=\\mega\data\config	The file Megasite.ini of the HOPEX installation refers to a shared configuration folder (\\mega\data\config) 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 (megasite.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.

## 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	Yes	Yes (2)	One token per Product One token LAN	Yes
Administration.exe	Yes	Yes (2)	One token LAN One token SUP	No
HOPEX.exe with HOPEX Power Studio (MTS2)	Yes	Yes (2)	One token LAN One token MTS2	Yes
API component (3)	Yes	Yes (2)	One token per Product One token LAN	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	Storage product checked (1)	Web Front-end product (2)	Tokens requested	Comm and line considered
---------	----------------------	-----------------------------	---------------------------	------------------	--------------------------

HOPEX Product (multi front-end)	Yes	Yes	No	One token per Product One token LAN	Yes
HOPEX Product (controlled multi front-end)	Yes	Yes	Yes	One token per Product One token LAN	Yes
HOPEX Solution	Yes	Yes	No	One token per Solution One token LAN	Yes
HOPEX Explorer portal	Yes	Yes	No	One token HEXP	No
SSP component	Yes	No	No	No token (3)	-

(1) RSQ or RSO

(2) ANW

(3) 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.

## 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.

## Connection process

The connection process proceeds as follows:

- The system determines the appropriate license file for user U0001.
- The system determines the command line set for U0001 (list of token requests).
- For each product token requested in the command line that can login to this Front-end:
  - The system determines if U0001 can be a possible user, given the number of possible users available:
    - If 'Yes', U0001 becomes a possible user and the connection process can continue.
    - If 'No', U0001 cannot become a possible user. The connection process will stop with a warning.
  - The system determines if U0001 can log in, given the number of tokens available:
    - If 'Yes', U0001 logs in.
    - If 'No', U0001 cannot log in. However, U0001 is still set as a possible user.
- If no command line is set, one token is request for each product of the license that can login to this Front-end.

When working with the Must license, it is important to distinguish between the following notions of users:

- **User connected to a product (token):** a login set as a possible user is currently connected to the HOPEX using a Must license.
  - Example: user U0001 is connected to the HOPEX Logical Data product with the Must license located on \\Srv002\License\HOPEX\License-001.must.
- **Possible user of a product:** a login was set as a possible user (candidate) of a product for a license file. This configuration is mandatory for dedicated licenses and is generally recommended. This does not mean that a token is always available for this product.
  - Example: users U0001, U0002 and U0003 are possible users for the HOPEX Logical Data product with the Must license located on \\Srv002\License \HOPEX\License-001.must.
- **User assigned to a license:** a login is explicitly assigned to a specific license file. This configuration is recommended. If several license files are used, this configuration is mandatory to decide which license is used by the user. A user can only be assigned to one license at most.
  - Example: user U0001 of is configured to use the Must license located on \\Srv002\License\HOPEX\License-001.must.

## Token distribution

The Must network license offers concurrent access to different HOPEX products. Its behavior varies with several elements:

- How (dedicated or shared) products are programmed.
- If/how possible users are configured.
- How many license files exist.
- If a command line (/RW, /RO) is specified for users.

Several scenarios based on are described below for comprehension.


In these scenarios, the changes regarding product HOPEX User (LAN), Repository Storage (SQL Server) (RSQ) or Repository Storage (Oracle) (RSO) are not detailed.

### Use case1: shared network licenses without configuration

Typical example: all products are configured as shared, possible users are not configured beforehand, 1 license file, command line is empty for users. Possible users of the tokens are not identified beforehand for products.

License-001.must definition:

- HOPEX IT Architecture (ARC): 3 tokens for 4 possible users (not configured)

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- HOPEX Risk Mapper (ERML): 2 tokens for 5 possible users (not configured)
- HOPEX Logical Data (DMO): 1 token for 2 possible users (not configured)
- HOPEX User (LAN): 6 tokens for 12 possible users (U0001, U0002... U0012).
- Repository Storage (SQL Server) (RSQ): enabled

#### Notes:

- Explicit configuration of possible users is not mandatory but recommended. Otherwise, the system will set this information itself: the first user requesting a token for a product becomes a possible user for the product.
- Users are only able to log on to the requested products if tokens are available for these products.

#### Scenario:

- User U0045 tries to log in. As the command line is empty, a token is requested for each product of the license. U0045 becomes a possible user for ARC, ERML and DMO. As tokens are available, U0045 can log in to ARC, ERML and DMO.
- User U0038 tries to log in. As the command line is empty, a token is requested for each product of the license. U0038 becomes a possible user for ARC, ERML and DMO. As no tokens are available for DMO, U0038 can login to ARC and ERML.
- User U0045 logs out. U0045 is still a possible user for ARC, ERML and DMO. 1 token is freed for each of the ARC, ERML and DMO products.
- User U0003 tries to log in. As the command line is empty, a token is requested for each product of the license. U0003 becomes a possible user for ARC and ERML but cannot be a possible user for DMO because U0045 and U0038 are 2 possible users. As tokens are available, U0003 can log in to ARC and ERML.
- User U0038 logs out and tries to log in again. As a token is now available for DMO, U0038 can now log in to ARC, ERML and DMO.
- User U0064 tries to log in. As the command line is empty, a token is requested for each product of the license. U0064 becomes a possible user for ARC and ERML but cannot be a possible user for DMO because U0045 and U0038 are 2 possible users. U0064 can log in to ARC and ERML.

### **Use case2: dedicated network licenses**

Typical example: all products are configured as dedicated, possible users are not configured beforehand, 1 license file, command line is empty for users. All users of the tokens are identified for products.

#### License 002.must definition:

- HOPEX IT Architecture (ARC): 3 tokens for 3 possible users (U0001, U0002, U0003)
- HOPEX Logical Data (DMO): 2 tokens for 2 possible users (U0001, U0002)

- HOPEX Power Supervisor (SUP): 1 token for 1 possible user (U0001)
- HOPEX User (LAN): 6 tokens for 10 possible users (U0001, U0002... U0010).
- Repository Storage (SQL Server) (RSQ): enabled

Notes:

- Configuration of possible users is mandatory.
- Configured users are always able to log in to the requested products.

Scenario:

- User U0001 tries to log in. As the command line is empty, a token is requested for each product of the license. U0001 is configured as a possible user for ARC, PRO and SUP. As tokens are available for ARC, PRO and SUP, U0001 can log in to ARC, PRO and SUP.
- User U0002 tries to log in. As the command line is empty, a token is requested for each product of the license. U0002 is configured as a possible user for ARC and PRO. As tokens are available for ARC and PRO, U0002 can log in to ARC and PRO.
- User U0003 tries to log in. As the command line is empty, a token is requested for each product of the license. U0003 is configured as a possible user for ARC. As a token is available for ARC, U0003 can log in to ARC.
- User U0064 tries to log in. As the command line is empty, a token is requested for each product of the license. As no possible user seats are available, U0064 can be a possible user for ARC, PRO and SUP and cannot log in.

### Use case3: shared network licenses


Typical example: all products are configured as shared, possible users are not configured beforehand, 1 license file, command line is empty for users. Possible users of the tokens are identified for products.

License 003.must definition:

- HOPEX IT Architecture (ARC): 3 tokens for 4 possible users (U0001, U0002, U0003, U0004)
- HOPEX Logical Data (DMO): 2 tokens for 5 possible users (U0001, U0002, U0003, U0004, U0005)
- HOPEX Power Supervisor (SUP): 1 token for 2 possible users (U0001, U0002)
- HOPEX User (LAN): 6 tokens for 12 possible users (U0001, U0002... U0012).
- Repository Storage (SQL Server) (RSQ): enabled

Notes:

- Configuration of possible users is not mandatory provided there is only one license file or a default licence is configured.

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- Configured users are only able to log in to the requested products if tokens are available for these products.

#### Scenario:

- User U0001 tries to log in. As the command line is empty, a token is requested for each product of the license. U0001 is configured as a possible user for ARC, DMO and SUP. As tokens are available for ARC, DMO and SUP, U0001 can log in to ARC, DMO and SUP.
- User U0002 tries to log in. As the command line is empty, a token is requested for each product of the license. U0002 is configured as a possible user for ARC, DMO and SUP. As tokens are available for ARC and DMO, U0002 can log in to ARC and DMO.
- User U0003 tries to log in. As the command line is empty, a token is requested for each product of the license. U0003 is configured as a possible user for ARC and DMO. As a token is available for ARC, U0003 can log in to ARC.
- User U0004 tries to log in. As the command line is empty, a token is requested for each product of the license. U0004 is configured as a possible user for ARC and DMO. As no tokens are available for ARC or DMO, U0004 cannot log in.
- User U0005 tries to log in. As the command line is empty, a token is requested for each product of the license. U0005 is configured as a possible user for DMO. As no tokens are available for DMO, U0005 cannot log in.
- User U0006 tries to log in. As no possible user seats are available, U0006 cannot be a possible user for ARC, DMO and SUP and cannot log in.

### **Use case4: Windows Administration Console**


#### Typical example:

#### License 004.must definition:

- HOPEX IT Architecture (ARC): 3 tokens for 4 possible users (U0001, U0002, U0003, U0004).
- HOPEX Logical Data (DMO): 2 tokens for 5 possible users (U0001, U0002, U0003, U0004, U0005).
- HOPEX Power Supervisor (SUP): 1 token for 2 possible users (U0001, U0002).
- HOPEX User (LAN): 6 tokens for 10 possible users (U0001, U0002...U0010).
- Repository Storage (SQL Server) (RSQ): enabled;

As recommended, a specific administration login 'adminlogin' is configured to avoid using the default administration login 'system'.

#### Notes:

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- Configuration of possible users is not mandatory provided there is only one license file or a default licence is configured.
- If the default administration login 'system' is used instead of specific administration login 'adminlogin', tokens will be create for 'system'.

Scenario:

- The administrator user runs Administrtation.exe. No token is requested.
- The administrator user opens the environment with 'adminlogin'. A token is requested for 'LAN' and 'SUP'. 'adminlogin' is configured as possible user for these products. No token is requested for ARC, DMO.
- The administrator user closes the environment. His tokens requested for 'LAN' and 'SUP' are released. 'adminlogin' is still configured as possible user for these products.

### **Use case5: HOPEX Explorer**

Typical example:

License 005.must definition:

- HOPEX IT Architecture (ARC): 3 tokens for 4 possible users (U0001, U0002, U0003, U0004).
- HOPEX Logical Data (DMO): 2 tokens for 5 possible users (U0001, U0002, U0003, U0004, U0005).
- HOPEX Power Supervisor (SUP): 1 token for 2 possible users (U0001, U0002).
- HOPEX Explorer (HEXP): 10 tokens for 20 possible users (U0001, U0002... U0020).
- Repository Storage (SQL Server) (RSQ): enabled.
- HOPEX User (LAN): 1 token (minimum)

Two logins 'hopexlogin01' and 'hopexlogin02' are configured with a HOPEX explorer role or profile (Explorer reader, Explorer writer)

Notes:

- Configuration of possible users is not mandatory provided there is only one license file or a default licence is configured.

Scenario:

- A first user tries to log in to HOPEX Web Front-end with login 'hopexlogin01'. A token is requested for 'HEXP'. 'hopexlogin01' is configured as possible user for this product. No token is requested for ARC or DMO.

- A second user tries to log in to HOPEX Web Front-end with login 'hopexlogin02'. A token is requested for 'HEXP'. 'hopexlogin02' is configured as possible user for this product. No token is requested for ARC or DMO.
- The first user logs out of HOPEX Web Front-end with login 'hopexlogin01'. His token 'HEXP' is released. 'hopexlogin01' is still configured as possible user for this product.
- The second user logs out of HOPEX Web Front-end with login 'hopexlogin02'. His token 'HEXP' is released. 'hopexlogin02' is still configured as possible user for this product.

### **Use case5: configuration with several licensing modes**

Typical example:

License 006.must definition:

- HOPEX IT Architecture (ARC\_F) in concurrent mode: 2 tokens for any possible user.
- HOPEX Logical Data (DMO) in concurrent mode: 3 tokens for any possible user.
- HOPEX Power Supervisor (SUP) in dedicated mode: 1 token for 1 possible users (U0001).
- HOPEX User (LAN) in dedicated mode: 1 token for 1 possible users (U0001).
- HOPEX User (LAN\_F) in concurrent mode: 4 token for any possible user.
- Repository Storage (SQL Server) (RSQ): enabled

Command ligne for profile 'Architect'

/RW'LAN\_F,ARC\_F,DMO'

Scenario:

- A first user tries to log in to HOPEX with profile profile 'Architect'. A token is requested for LAN\_F, ARC\_F and DMO. User can login to LAN\_F, ARC\_F and DMO. No token is requested for SUP and LAN.
- A second user tries to log in to HOPEX with profile profile 'Architect'. A token is requested for LAN\_F, ARC\_F and DMO. User can login to LAN\_F, ARC\_F and DMO. No token is requested for SUP and LAN.
- A third user tries to log in to HOPEX with profile profile 'Architect'. A token is requested for LAN\_F, ARC\_F and DMO. User can login to LAN\_F and DMO. No token is requested for SUP and LAN.
- At any time, user U0001 can login to Windows Administration Console. A token is requested and used for SUP.

## FAQS AND TROUBLESHOOTING

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### 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.

### How can I secure configuration of the HOPEX Must licence?

If you do not want to configure systematically full control, to 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: <a href="#">\\server001\Apps\Licenses\License-001</a> and subfolders	Modify	Modify <sup>1</sup>

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)

### 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.

---

<sup>1</sup> By default, user files and token files are set as 'Not visible'.

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.

### **How can I get a log of license connections?**

Supervision logs contain informations regarding connection and disconnection. However, this is technical information and MEGA does not provide a report to consolidate and display this information.

### **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.

### **How can I get the assignment of users to licenses?**

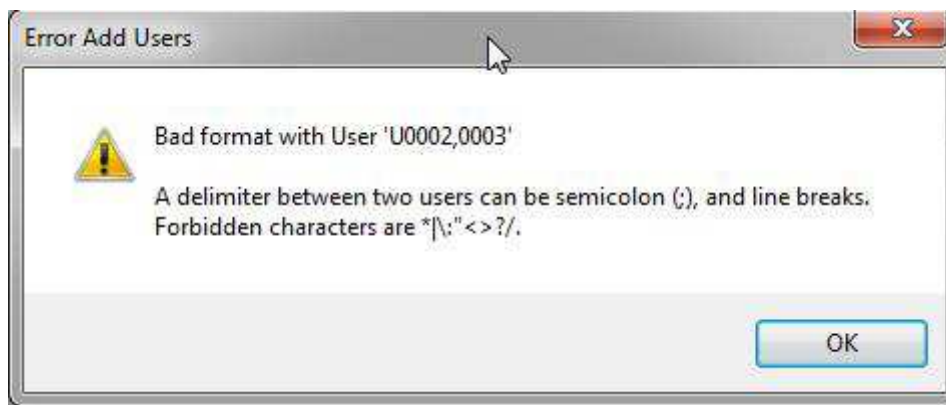
No report is available. You can consult the Must license utility (left pane) or read the Router.ini file.

### **How can I get the assignment of possible users to product?**

No report is available. Consult the Must license.

### **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.



### **How can I get the list of logins of users?**

No report is available. Consult the Windows Administration Console (Administration.exe).

### **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 login 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.

## 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:

- Run the Must license utility.
- Select the license folder.
- Select the license to be monitored in the left pane.
- Select a user for this license.
- Configure possible users of the different products in the top right pane:
  - Select the products to be configured.
  - Click the 'Possible User or not' button.
- Select another user in the left pane: the same list of products is selected.
- Click 'Possible User or not': the same configurations are replicated on the products selected.

## Can I mix shared and dedicated modes?

Yes. Note that modes are set at the product level.

## Is my license shared or dedicated?

To check the licensing mode,

- Open the .Must license file with a text editor such as Notepad
- Analyse configuration: the mode depends on the combination of 2 digits

<Licence Product>=T ; U

Where

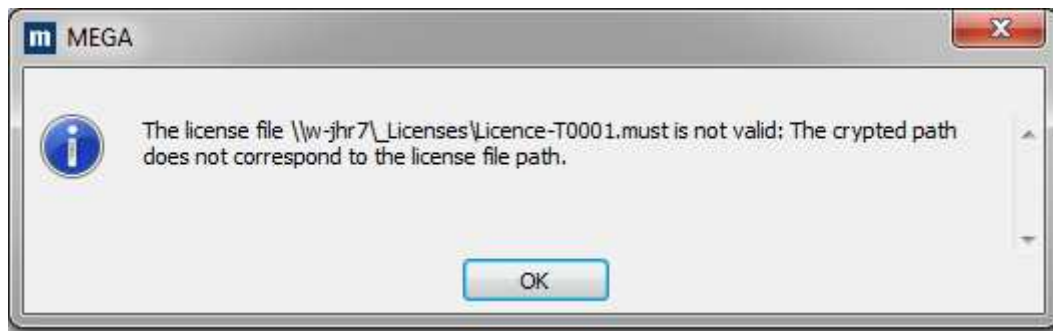
T: tokens

U: users

Licensing mode	Example
Dedicated mode (T=U)	(ARC) HOPEX IT Architecture=20 ; 20
Shared mode (T< U)	(ARC) HOPEX IT Architecture=20 ; 25
Concurrent mode/floating mode (T>U, U=0)	(ARC) HOPEX IT Architecture=20 ; 0

Note that modes are set at the product level.

## 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).

## 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

## 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 ClusterRoot.

Example:

[Lan]

ClusterRoot=\\mega\data\config

**A message is displayed like You are not allowed to launch HOPEX V2 with your license file "xxxx.must". It has to 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 or HOPEX V2.

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 V2 EN

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## Summary

This document describes the procedures necessary for upgrading MEGA Data to version HOPEX V2 from HOPEX V1R2-V1R3 CP8.0 or higher CP.

**For prior version (MEGA 2009 SP5, HOPEX V1R1...), it is necessary to perform an intermediate upgrade to V1R2-V1R3 CP8.0 or higher CP.**

This document applies to version HOPEX V2 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 MEGA Data:

- Oracle.
- SQL Server.
- GBMS (not supported for Web Front-end).

It does not describe:

- System requirements and possible architectures (see architecture overview documentation).
- How to perform installations (see installation 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).

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# MAIN STEPS TO MIGRATE DATA TO HOPEX V2

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The data migration consists of several main steps:

## 1. Prepare data for migration

This step requires the source version (HOPEX V1R2-V1R3).

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 V2.

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 V2.

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.

## PREPARE UPGRADE OF DATA

### Check metamodel, locks, workspaces and workflows

In the source version (HOPEX V1R2-V1R3), for each environment:

Check	Detail
Check that the metamodel is stable	In Windows Administration Console (Administrrration.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 (Administrrration.exe), check workspaces. If a private workspace persists, dispatch or delete it.
Check that no locks persists	In Windows Administration Console (Administrrration.exe), check locks. With GBMS storage, you can delete remaining locks. With RDBMS storage (Oracle or SQL Server), you need to dispatch of delete related workspace.

### 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"><li>• If reports (MS Word) are generated from both Windows and Web Front-ends (1).</li><li>• If reports (MS Word) are generated only from Web Front-ends.</li><li>• If Report (MS Word) are generated in batch mode with Windows scheduler.</li></ul>
MS Word	Compatibility mode that can be used only if Reports (MS Word) are generated: <ul style="list-style-type: none"><li>• In interactive mode (no batch).</li><li>• From Windows Front End.</li></ul>

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).

**By default, with HOPEX V2, RTF format is used. If you need MS Word format, you should 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'.

## 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

## 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"><li>• <b>Person assignment mode:</b> a user (Person (System)) is mapped to one/several Business Roles within a data repository. Each Business Role is mapped to a Profile.</li><li>• <b>Profile mode:</b> a user (Login) is mapped to one/several Profiles within an environment</li></ul>
HOPEX V2	A unique mode called <b>Profile assignment mode</b> is available: a Person (System) is mapped to one/several Profiles within an environment. The previous modes 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 V2 as in HOPEX V1R2-V1R3.

## 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
Compatibility up to MEGA 2009	Required for compatibility with version MEGA 2009 and lower (data and system database customization)
From MEGA HOPEX 1.0	Recommended for new projects and for repository alignment (stricter control on objects). If behavior has been customized (system database customization) in version MEGA 2009, compatibility is not guaranteed. A review that may require time and expertise is necessary.

Note that 'From MEGA HOPEX 1.0' 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 behavior (namespace, navigation, extraction, protection, export, comparison...).

## Check licence

Topic	Change	Recommendation
MEGA Process BPMN edition	With HOPEX V2, MEGA Process BPMN Edition (code PMN) is replaced with HOPEX Business Process Analysis (HBPA). MEGA Process BPMN Edition (code PMN) is removed as such. No migration/conversion is required: diagrams of PMN can be edited with HBPA	Contact your sales representative
GBMS storage	With HOPEX V2, GBMS storage is not supported for Web Front-End. A licence for a RDBMS storage product is required.	Contact your sales representative

# UPGRADE DATA FROM HOPEX V1R2-V1R3

For each HOPEX environment, several steps are required:

- Check data upgrade pre-requisites.
- Upgrade the system database using environment automatic upgrade.
- Run technical conversion on system database and data repositories using RDBMS storage.
- Run conversion tools on the system database.
- Run conversion tools on the data repositories.

The procedure varies with the type of storage.

## 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).
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 'Mega' are set to 'Disabled'. Ex: Mega Site Service Provider
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, kill it.

Note that with RDBMS storage (Oracle, SQL Server), a conversion called 'Technical Conversion' is required for each data repository and for the system database.

As long as conversion is not performed for a data repository (ex: ProductionData):

- This repository is displayed as not available (red cross icon).
- A warning can be displayed such as 'You cannot access repository XXX. Its internal structure is not up to date. Run the menu "Technical Conversion" to perform the upgrade. Click 'OK' to hide this warning.

## Upgrade environment with RDBMS storage (Oracle and SQL Server)

### Procedure in version HOPEX V2:

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. Run the menu "Technical Conversion" to perform the upgrade.'
4. Click 'OK' to hide the warning.
5. Select the environment and R click > Technical Conversions.  
A window 'MEGA RDBMS Technical Conversion' is displayed.
6. Click 'OK' to confirm conversion of the systemdb repository.  
Wait until the conversion is over (it takes approximately 1 hour).  
A line 'Technical conversion completed' is displayed'.
7. Click 'Close'.
8. 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.
9. 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?
10. Click 'Yes'.  
A window 'Automatic Update' is displayed.
11. Read the text, check the option 'I have taken note of the above text' and click 'OK'.  
The processing 'environment automatic upgrade' is executed.  
Wait until the conversion is over.  
A message is displayed 'Your environment has been successfully updated.
12. Click 'OK'.
13. For each data repository:
  - a. Select the data repository (ex: MEGA (Tutorial)).
  - b. R click > Technical Conversions.  
A window 'MEGA RDBMS Technical Conversion' is displayed.
  - c. Click 'OK' to confirm conversion of the data repository.  
Wait until the conversion is over. A line 'Technical conversion completed' is displayed'.
  - d. Click 'Close'.
14. Close the environment.
15. Exit the Windows Administration Console.

## Upgrade environment with GBMS Storage

### Procedure in version HOPEX V2:

1. Start the Windows Administration Console (Administration.exe)
2. Select and open the environment to be upgraded with the login **System**
3. 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.'
4. Click 'OK'
5. A question is displayed 'Your environment requires an update for compatibility with your version of MEGA. Do you wish to run this procedure now?'
6. Read the information, check the option 'I have taken note of the above text' then click 'OK'
7. The processing 'environment automatic upgrade' is executed
8. Wait until the update is complete
9. A message is displayed like 'Your environment has been successfully updated'
10. Click 'OK'.
11. Close the environment
12. Exit the Windows Administration Console

### Running conversion tools

Before proceeding, consult the table 'Conversion details' in this document to understand if conversions are relevant in your context.

### Procedure:

1. Start the Windows Administration Console
2. Select and open the environment to be converted with the login **System**.
3. In the folder 'Repositories', select 'Systemdb'
4. R click > **Conversions > Convert data into current version** and **select From HOPEX V1R2 data.**
5. Check the appropriate conversions.  
See the table 'Conversion details', later in this document
6. Click 'OK' to trigger the conversion  
Wait until the conversion is complete
7. Close the environment
8. Select and open the environment with the login **System**
9. In the folder 'Repositories', for each data repository  
10. Select the repository
11. R click > **Conversions > Convert data into current version** and **select From HOPEX V1R2 data.**
- 12.
13. Check the appropriate conversions.  
See the table 'Conversion details', later in this document
14. Click 'OK' to trigger the conversion  
Wait until the conversion is complete
15. Exit the Windows Administration Console

## Update stored procedures

This step is mandatory for each data repository or system database using RDBMS storage (Oracle, SQL Server).

Code of existing stored procedures (created in a previous version) needs to be initialized with the HOPEX V2.

### Pre-requisite:

- Permissions to delete and create stored procedures

### Procedure:

In HOPEX installation:

- Start the Windows Administration Console (Administration.exe)
- Select and open the environment with the identifier **system** (no password by default).
- In the folder 'Repositories', R click > Manage: a window 'Manage repositories' is displayed.
- In the list 'Action list', check both
  - Private workspace temporary data deletion
  - Repository historical data deletion
- In the list 'Repository list', check appropriated repositories.
- Click 'Execute' and wait until processing is finished.
- Close the environment.
- Exit the Windows Administration Console

Note that it is still important that the execution of all these stored procedure is scheduled (batch). Refer to the document RDBMS Repository Installation guide HOPEX V2 to get the complete list.

# COMPLETE UPGRADE OF DATA

## 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 V2.  
Note that certain Solution Pack do not exist any longer:

Executable	Comment
Audit.exe	Solution Pack provided in HOPEX V1R2-V1R3 for HOPEX Internal Audit. Not used with HOPEX V2.
Compliance.exe	Solution Pack provided in HOPEX V1R2-V1R3 for HOPEX Regulatory Compliance. Not used with HOPEX V2.
ERM.exe	Solution Pack provided in HOPEX V1R2-V1R3 for HOPEX Enterprise Risk Management. Not used with HOPEX V2.
ICM.exe	Solution Pack provided in HOPEX V1R2-V1R3 for HOPEX Internal Control. Not used with HOPEX V2.
ITGRC.exe	Solution Pack provided in HOPEX V1R2-V1R3 for HOPEX IT Risk Management. Not used with HOPEX V2.
ITPM.exe	Solution Pack provided in HOPEX V1R2-V1R3 for HOPEX IT Portfolio Management. Not used with HOPEX V2.

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.

## Review important options

This section applies if the source version is HOPEX V1R2. Otherwise (source version is HOPEX V1R3), you can skip it.

## Definition of path of MetaAssociation

According to decision taken before migration (see sooner in this document), verify the value the option 'Definition of path of MetaAssociation'.

## Automatic Session Timeout

From HOPEX V1R2-V1R3, a feature 'Automatic Session Timeout' is enabled by default for both Windows Front-End and Web Front-End. Once enabled:

- Authentication is required after a period of inactivity
- Application closes after a period inactivity.

It is possible to configure or disable this feature. See the environment options (group 'Workspace, 'Automatic Session Timeout').

## Risk modeling

Several options related to risk are available:

Group of options	Option
Business Process and Architecture Modeling	Risk modeling MEGA 2009 (*)
	Risk modeling HOPEX
Compatibility > Others	Risk properties compatibility MEGA 2009

(\*) previously named 'Risk modeling'.

Here are recommendations according to the methodology chosen in the project

Context	Recommendation
The project does NOT use HOPEX Solutions. Before upgrading, the option 'Risk modeling' was checked.	Risk modeling MEGA 2009: <b>checked</b> Risk modeling HOPEX: <b>unchecked</b> Risk properties compatibility MEGA 2009: <b>checked</b> (optional)
The project uses HOPEX Solutions. Before upgrading, the option 'Risk modeling' was checked.	Risk modeling MEGA 2009: <b>unchecked</b> Risk modeling HOPEX: <b>checked</b> Risk properties compatibility MEGA 2009: <b>checked</b> (optional)
The project does NOT use HOPEX Solutions. Before upgrading, the option 'Risk modeling' was unchecked.	Risk modeling MEGA 2009: <b>unchecked</b> Risk modeling HOPEX: <b>unchecked</b> Risk properties compatibility MEGA 2009: <b>unchecked</b>

## MEGA Architecture modeling

Group of options	Option
Business Process and Architecture Modeling	Application Creation of an application environment diagram
Compatibility > Others	Exchange contracts (protocols) modeling before MEGA 2009 SP5 R7

Here are recommendations according to the methodology chosen in the project.

Context	Recommendation
The project used Application Environment Diagram before upgrading.	Application Creation of an application environment diagram: <b>checked</b> (default value for release V1R2)
The project did not use Application Environment Diagram before upgrading.	Application Creation of an application environment diagram: <b>unchecked</b> (default value for release V1R2)
The project did not use protocols	Exchange contracts (protocols) modeling before MEGA

before upgrading or intends to use one of the following products (1)	2009 SP5 R7: <b>unchecked</b>
The project did use protocols before upgrading and does not intend to use one of the following products (1)	Exchange contracts (protocols) modeling before MEGA 2009 SP5 R7: <b>checked</b>

(1) MEGA Service Design (SDE), MEGA Suite For TOGAF (TOG), MEGA System Oriented IT Architecture (SOIA)

## 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 V2 (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
/K'PRO,ARC'	/K'ARC'

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 V2 in MEGA Community, KB 00004513:

<http://community.mega.com/t5/custom/page/page-id/mega-kb-solution?sid=501D00000012hECIAy>

## Check format of report templates (MS Word)

By default with HOPEX V2,


- Standard report templates (MS Word) are installed in the format **RTF**.
- Generation mode is **RTF**.

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

### Pre-requisites:

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Use a machine where

- HOPEX V2 is installed.
- MS Word is installed (version Office 2010/2013, 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:

1. Start the Windows Administration Console (Administration.exe).
2. Select and open the environment with the appropriate login (ex: system).
3. In the folder 'Repositories', select 'Systemdb'.
4. R click > **Conversions > Utilities:**  
A list of conversions is displayed.
5. Check '**MEGA Repository - Convert Report Templates (MS Word) to RTF format**'.  
Wait until the processing is finished.
6. 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).

## 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.

### 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 workarea (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 workarea.

### 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.

## Other checking indications

If extensions were made to the metamodel, they must be reviewed with regard to the structuring rules described above. 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
Users	The implementation has changed. 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 V1R2-V1R3. 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 V1R2-V1R3. 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.
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.

## APPENDIX

### 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	Data repository	System Database	Mandatory if upgrade from HOPEX V1R2-V1R3
<b>Conversion of Standards</b> 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]	Yes	No	Yes KB 00004589
<b>Convert M-D to hours</b> This tool converts the objects of the MetaClass 'Work Mission' and 'Mission Activity' to the new format. The existing value of several MetaAttributes is multiplied by 8. This tool is implemented by a VB script macro ~I2uXLFSEIjGN[Audit V3 - Convert M-D to Hours.Method]	Yes	No	Yes KB 00004587
<b>Mapping - Performances</b> This tool deletes repository log related to mapping item. It also disables repository log for the MetaClass 'Mapping Item'. This can help reduce size and improve performances. This tool is implemented by a VB script macro ~ie(ICrKeJf1K[Mapping - Performances.Method]	Yes	No	Yes KB 00004883
<b>MEGA Repository - Alignment of Profile's name with Business Role's name</b> 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.	No	Yes	KB 00006394
<b>MEGA Repository - Conversion of Assessment Template Definition</b> 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]	Yes	No	Yes KB 00004592
<b>MEGA Repository - Conversion of Assessment Template Location</b> This utility converts Assessment Template to the new format. Location is transferred from data repository to system database Before HOPEX V2 Assessment templates are saved in data	Yes	No	Yes. KB 00006063

Conversions	Data repository	System Database	Mandatory if upgrade from HOPEX V1R2-V1R3
repository After HOPEX V2 Assessment templates are saved in systemdb			
<b>MEGA Repository - Conversion of assignments</b> 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]	Yes	No	Yes KB 00006314
<b>MEGA Repository - Conversion of assignments (Profile mode)</b> 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]	No	Yes	Yes KB 00006315
<b>MEGA Repository - Conversion of Business Documents or System Business Document</b> 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	Yes	Yes	Yes KB 00006228
<b>MEGA Repository - Conversion of Code Template related to MetaCommand</b> This tool converts code Templates connected to MetaCommand items of web desktops. Javascript code is no longer supported and is replaced with JSON code. This conversion is mandatory for systemdb repository if the source data is in version HOPEX V1R2 CP2.0 or lower CP/version. This tool is implemented by a VB script macro ~WPN1EVGsJDNS[MEGA Repository - Conversion of Code Templates Reliate With MetaCommand Macro]	No	Yes	Yes KB 00005095
<b>MEGA Repository - Conversion of Deprecated MetaAssociation instances to Generic MetaAssociation instances</b> 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	Yes	Yes	Yes KB 00006311
<b>MEGA Repository - Conversion of Deprecated MetaAssociationType to Operator</b> This tool recovers behaviors associated with deprecated MetaAssociation Types The tool is implemented by a macro ~W1X0aNWdMPs2[convert_deprecated_MetaAssociationType_to_Operator]	No	Yes	Yes KB 00006317
<b>MEGA Repository - Conversion of diagram type (described element)</b> This tool converts Diagram Types to the new format. The generic MetaClass Described Element (or System	No	Yes	Yes KB 00006316

Conversions	Data repository	System Database	Mandatory if upgrade from HOPEX V1R2-V1R3
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)]			
<b>MEGA Repository - Conversion of Mapping links</b> 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	No	Yes	Yes 00007280
<b>MEGA Repository - Conversion of name properties</b> 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.	Yes	Yes	Yes KB 00001289
<b>MEGA Repository - Conversion of old MetaAssociation into deprecated MetaAssociation</b> This tool tags old MetaAssociations as deprecated. This tool is implemented by an external script 'convert_deprecated_metaassociation.vbs'	No	Yes	Yes KB 00004238
<b>MEGA Repository - Conversion of Restricted MetaAssociation into Abstract MetaAssociation</b> Converts restrictive MetaAssociation to the new format	No	Yes	Yes KB 00007462
<b>MEGA Repository - Conversion of Restrictive MetaAssociation instances to Concrete MetaAssociation instances</b> 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.	Yes	Yes	Yes KB 00006309
<b>MEGA Repository - Conversion of tree folder menu</b> 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])	No	Yes	Yes KB 00006330
<b>MEGA Repository - Conversion of Where Used Queries</b> 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).	No	Yes	No KB 00004829
<b>MEGA Repository - Convert Property Page Link/Tree to PropertyPageExtension</b> 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]	No	Yes	Yes KB 00004586
<b>MEGA Repository - Convert Report templates (MS Word) to RTF Format</b>	No	Yes	If custom template and

Conversions	Data repository	System Database	Mandatory if upgrade from HOPEX V1R2-V1R3
<p>This tool converts Report templates (MS Word) from Word to RTF format.</p> <p>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><b>Note that MS Word is required on the machine running the conversion.</b></p>			<p>decision to user format RTF</p> <p>KB 00003499</p>
<p><b>MEGA Teamwork - Conversion of workflow instance</b></p> <p>This tool changes the location of workflow instance from system database to data repository.</p> <p>This tool is implemented by a VB script macro ~5m5flWg5KPfB[Mega TeamWork - Conversion of Workflow Instance System.Method]</p>	Yes	No	<p>Yes</p> <p>KB 00005096</p>

## Utilities details

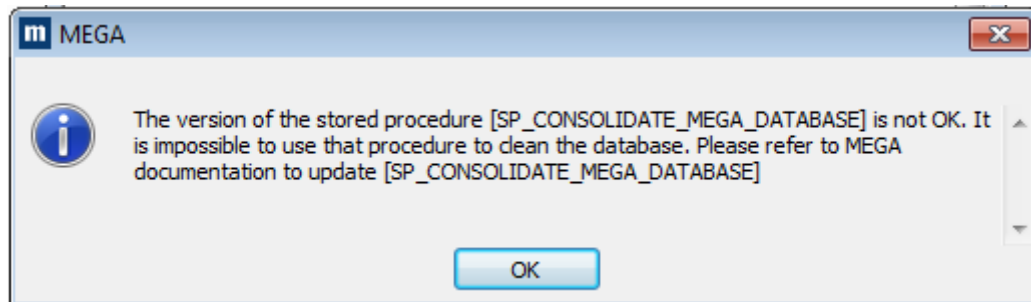
Utility	Data repository	System Database	Mandatory if upgrade from HOPEX V1R2-V1R3
<b>Diagram (drawings)</b> This tool opens, saves and closes all diagrams in the repository. Enables conversion of diagrams with drawings in MGE format. Also enables to check the status all diagrams in a repository. This 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.	Yes	Yes	Optional KB 00001270
<b>MEGA Publisher - Remove invalid MEGA templates</b> This tool removes MEGA templates or components left invalid after upgrade. This tool is implemented by a VB script macro ~jkmiN0kNBPK2[MEGA Publisher - Remove invalid MEGA templates (2009 and earlier versions)]	No	Yes	Optional KB 00003139
<b>MEGA Repository - Cleanup</b> 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]	Yes	No	Optional KB 00003321
<b>MEGA Repository - Conversion of name properties (long name)</b> This tool aligns object names with metamodel definition (long name) for certain MetaClasses. Conversion may take a significant time depending on the volume of data. This tool is implemented in C++ and cannot be customized.	Yes	No	Optional KB 00001892
<b>MEGA Repository - Conversion of Organizational Charts</b> This utility converts the nature of Organizational Chart diagrams so that they can be open with MEGA Process BPMN Edition. This tool is implemented by a VB script macro ~YgaCFMJSGPv2[Organisational Chart Conversion]	Yes	No	Optional KB 00003984
<b>MEGA Repository - Convert participants of projects</b> This tool converts participants of projects to the new format This tool is implemented by a VB script macro ~MKy3t2XCnf7U[Convert participants of projects.Method]	Yes	No	Optional KB 00006308
<b>MEGA Repository - Creation of links instances from MEGA fields</b> This tool creates impact analysis links for objects referenced by object references (MEGA fields) in texts properties. Conversion may take a significant time depending on the volume of data. This tool is implemented in C++ and cannot be customized.	Yes	Yes	Optional KB 00002005
<b>Shapes</b>	No	Yes	Optional

Utility	Data repository	System Database	Mandatory if upgrade from HOPEX V1R2-V1R3
<p>This tool updates customized shapes to the most recent format.</p> <p>Shapes located in the folder 'Mega_usr' or both installation and HOPEX environment are upgraded. This conversion is optional for the System repositories.</p> <p>This tool is implemented in C++ and cannot be customized.</p>			KB 00000362

### **Warning 'You cannot access repository "XXX". Its internal structure is not up to date. Run the menu "Technical Conversion" to perform the upgrade'**

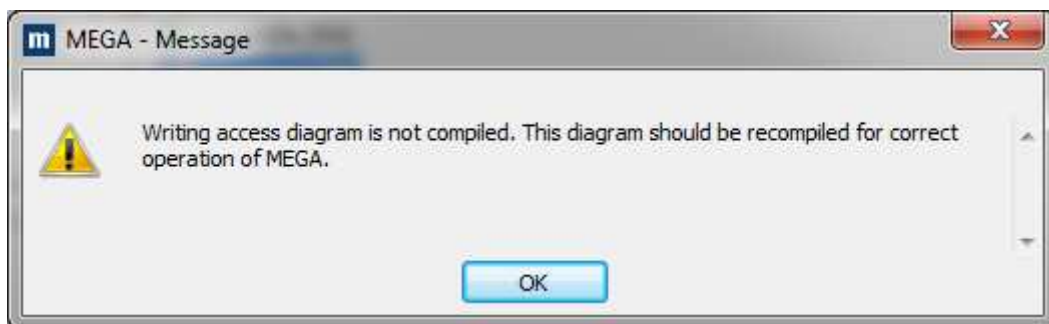
With specific version upgrades, the technical format of the repository can change. As explained, you need to run a menu technical conversion from the Administration Console. See the section 'Upgrading the system database and data repositories' earlier in this document.

### **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.

### **Warning 'Writing access diagram is not compiled...'**



Certain actions can leave the writing access diagram (ex-User diagram/Authorization diagram) 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

How to Upgrade to CP HOPEX V2 EN

# CONTENTS

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## Summary

This document describes the procedures necessary for installing a Corrective Patch for HOPEX V2

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 or a service pack (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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# FOREWORD

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## Corrective Patch

A Corrective Patch (CP) provides a consistent set of changes, mainly error fixes.

In concrete terms, a CP installation program is an .EXE file.

Example: HOPEX\_V2\_CP1.0.exe

The .EXE files provided for HOPEX Software do not allow skipping patch levels. For each patch level, the installation of an .EXE file is necessary.

For example, to upgrade from HOPEX V2 CP1.0 to HOPEX V2 CP3.0:

- Install an EXE file #1 to upgrade from HOPEX V2 CP1.0 to HOPEX V2 CP2.0.
- Install an EXE file #2 to upgrade from HOPEX V2 CP2.0 to HOPEX V2 CP3.0.
- Run the 'Environment Automatic Update' feature.

**As a consequence, verify the expected patch level is required before installing a CP.**

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.**

## UPGRADING HOPEX PROGRAMS

The CP installation program is an .EXE file.  
For example: HOPEX\_V2\_CP1.0.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	Standard deployment	Application Server where HOPEX programs are installed
Web Front-end	Cluster deployment	Each application server of the cluster where HOPEX programs are installed
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

Front-end	SSP (1)	Service IIS	HOPEX processes
Web Front-end	Yes	Application 'HOPEX' (2)	mgwmapp.exe, mgwmwas.exe, mgwspro.exe, mgwssp.exe, mgwfcgi.exe, Mega Server Supervisor.exe
Windows Front-end	No		mgwmapp.exe

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

(2) By default, an application 'HOPEX' is configured for 'Default Web Site'.

## 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 'Mega Site Service Provider' must set to 'Stopped'.  
The service 'Mega Service Watchdog' must 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\*) must be running.
7. Verify 'Control Panel > Add or Remove programs'.  
The required patch level must be installed.  
For example, HOPEX V2 CP7.0 is a requirement before installing HOPEX V2 CP8.0.

### Procedure:

For each machine:

1. Select the .EXE file of the CP.  
Example: Select HOPEX\_V2\_CP1.0.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:

- o Verify 'Control Panel > Administrative tools > Services'.  
The service 'Mega Site Service Provider' must be set back to 'Automatic' and be started.  
The service 'Mega Service Watchdog' must be set back to 'Automatic' and be started.
- o Verify 'Internet Information Services (IIS) Manager'.  
The web site hosting the IIS applications (by default it is 'Default Web Site') must be started.

### Notes:

- o 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.
- o If the expected patch level is not identified for the HOPEX programs registered on the machine, an error is displayed.

## 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 must be running.
5. Verify 'Control Panel > Add or Remove programs'.  
The required patch level must be installed.  
For example, HOPEX V2 CP7.0 is a requirement before installing HOPEX V2 CP8.0.

### Procedure:

For each machine:

1. Select the .EXE file of the CP.  
Example: Select HOPEX\_V2\_CP1.0.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**.

# UPGRADING HOPEX DATA

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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.

## Upgrade HOPEX environments

### Pre-upgrade:

- Verify that no transaction exists.

### Procedure (GBMS storage):

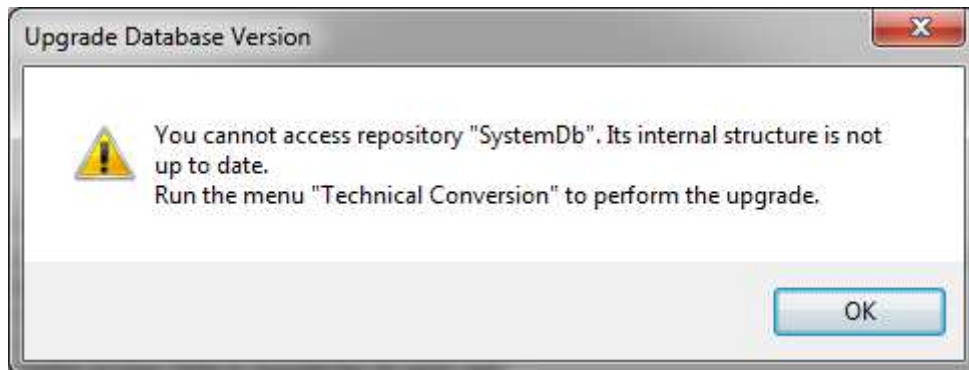
For each HOPEX environment:

1. Start the Windows Administration Console (Administration.exe).
2. Select the environment to be upgraded.
3. R click > **Open** with the identifier **System**.
4. Select the repository 'SystemDb'.
5. R click > '**Conversions > Environment automatic update > Apply**'.
6. Read the information, check the option 'I have taken note of the above text' then click 'OK'.  
The process 'Environment Automatic Upgrade' is executed.  
Wait until the upgrade is complete.  
A message like 'Your environment has been successfully updated' is displayed.
7. Click 'OK.'
8. Close the environment.
9. Exit the Windows Administration Console.

## Procedure (RDBMS storage: Oracle, SQL Server):

With RDBMS storage, the technical format of system database and data repositories may change when upgrading CP. In this case, a warning is displayed:

You cannot access repository XXX. Its internal structure is not up to date. Run the menu "Technical Conversion" to perform the upgrade.



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. Run the menu "Technical Conversion" to perform the upgrade):
  - o Select the environment in the administration tree.
  - o R click > **Technical conversions**.  
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. Run the menu "Technical Conversion" to perform the upgrade).
  - o For each data repository (ex: ProductionData)
    - Select the data repository in the administration tree.
    - R click > Technical conversions.  
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. In the folder 'Repositories', select '**Systemdb**'
8. R click > '**Conversions > Environment automatic update > Apply**'.
9. Read the information, check the option 'I have taken note of the above text' then click OK.  
The process 'Environment Automatic Upgrade' is executed.
10. Wait until the upgrade is complete. (time can vary according to CP, usually more than 30 min)  
A message like 'Your environment has been successfully updated' is displayed.
11. Click OK.
12. Close the environment.
13. Exit the Administration Console.

## 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 workarea.
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 workarea with save or dispatch.

## MUST LICENCE CONVERSION

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When upgrading from HOPEX V1R2-V1R3 CP7.0 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:

- Run the **licensing.exe** utility **as Administrator**.
- Click on the menu Administration > **Convert**.
- 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 U001@Domain02=Licence-T0002 U002@Domain01=Licence-T0001	[User/Licence] U001=Licence-T0001 U002=Licence-T0001  [Router] Version=2

## APPENDIX

### Advanced deployment

For advanced deployments (deployment automations tools...), it can be useful to get the CP 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 CP.** 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\_V2\_CP1.0.exe in C:\tmp
2. In the Startup menu, 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\_V2\_CP1.0.exe" /E  
The .MSP file is uncompressed in the current folder.

### Documentation of Changes

Several documents can be downloaded with the CP.

Document	Comment
Fix list document	It contains the list of elementary changes (mainly error corrections). It applies for the CP and previous CP (cumulative). Ex: Fix list for HOPEX V2CpX.0.htm
CP Changes document	It contains the description of functional improvements of the CP (if CP brings functional improvement). Ex: HOPEX V2 – CPX Changes.pdf
Known issues document	It contains list of elementary issues (identified and not fixed). It applies for the CP and previous CP (cumulative). Ex: HOPEX V2 – CPX Known Issues.pdf

The fix list is a table with the following columns:

Column	Definition	Example
Patch	Identifier of the CP	7.7 cp01.00
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

## FAQs

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### **After a specific CP upgrade, 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 CP, 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 > Technical conversion.
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 > Technical conversion.
3. Click OK when conversion of the systemdb repository is complete.

### **I get a message 'MetaModel and/or technical data of your environnement 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.

### **When running the menu 'Conversions > Environment automatic update', a warning says that transactions exist.**

It is not possible to upgrade the environment as long as transactions persist. If transactions should remain, cancel environment upgrade, delete remaining transactions and resume environment upgrade.

### **Why are CP provided as .EXE files from HOPEX?**

The .EXE format enables to install the CP 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.

**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.

**What is the purpose of the menu 'Conversions > Environment automatic update > Simulate'?**

This menu enables to preview the impact of the CP upgrade 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.