

Windows Front-End Architecture Overview HOPEX V2 EN



CONTENTS

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 (Standalone deployment).

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

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

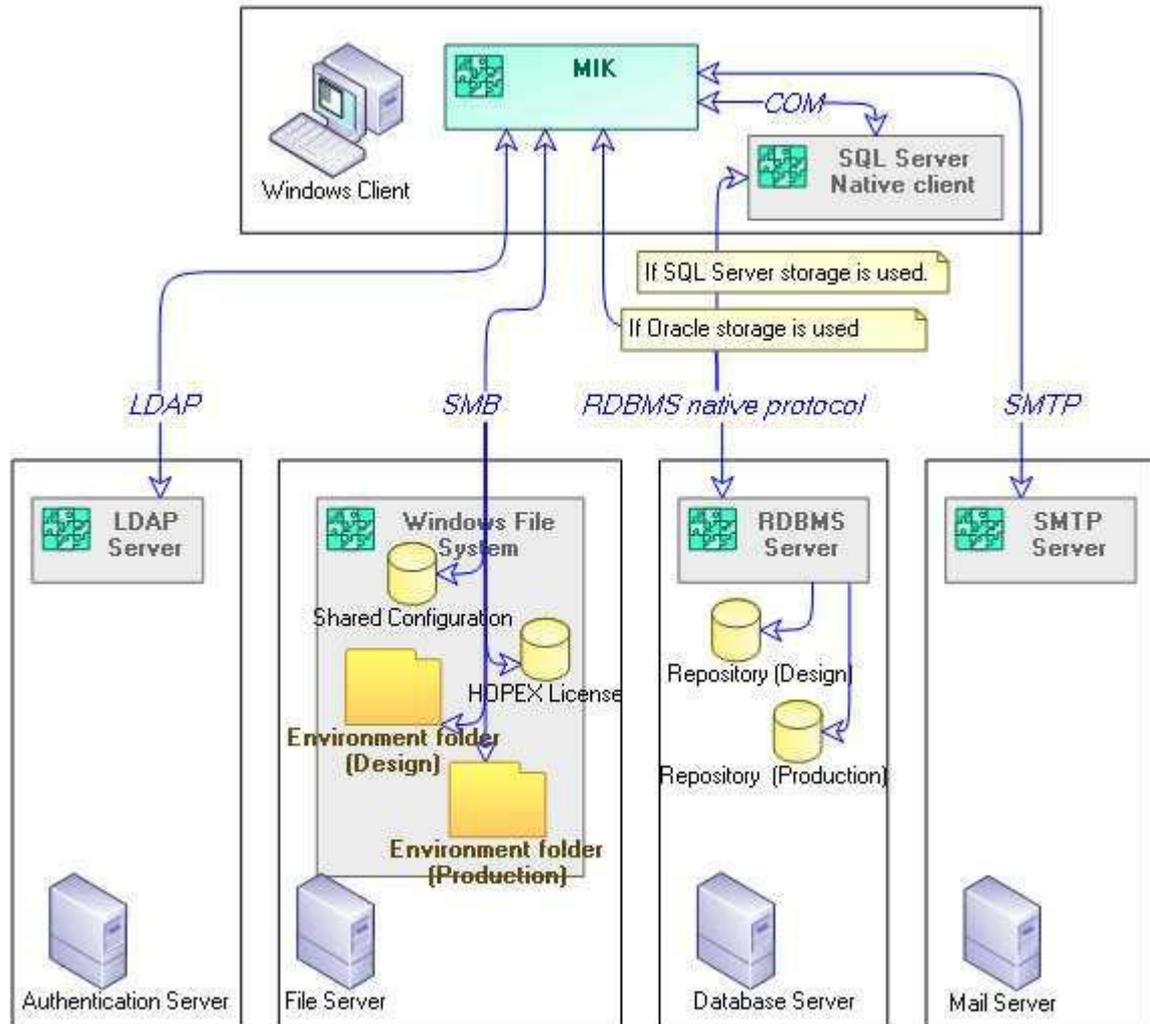
Other deployment models – For specific requirements, other deployment models are possible. For further information, contact your sales representative.

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

** Above concurrent 50 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

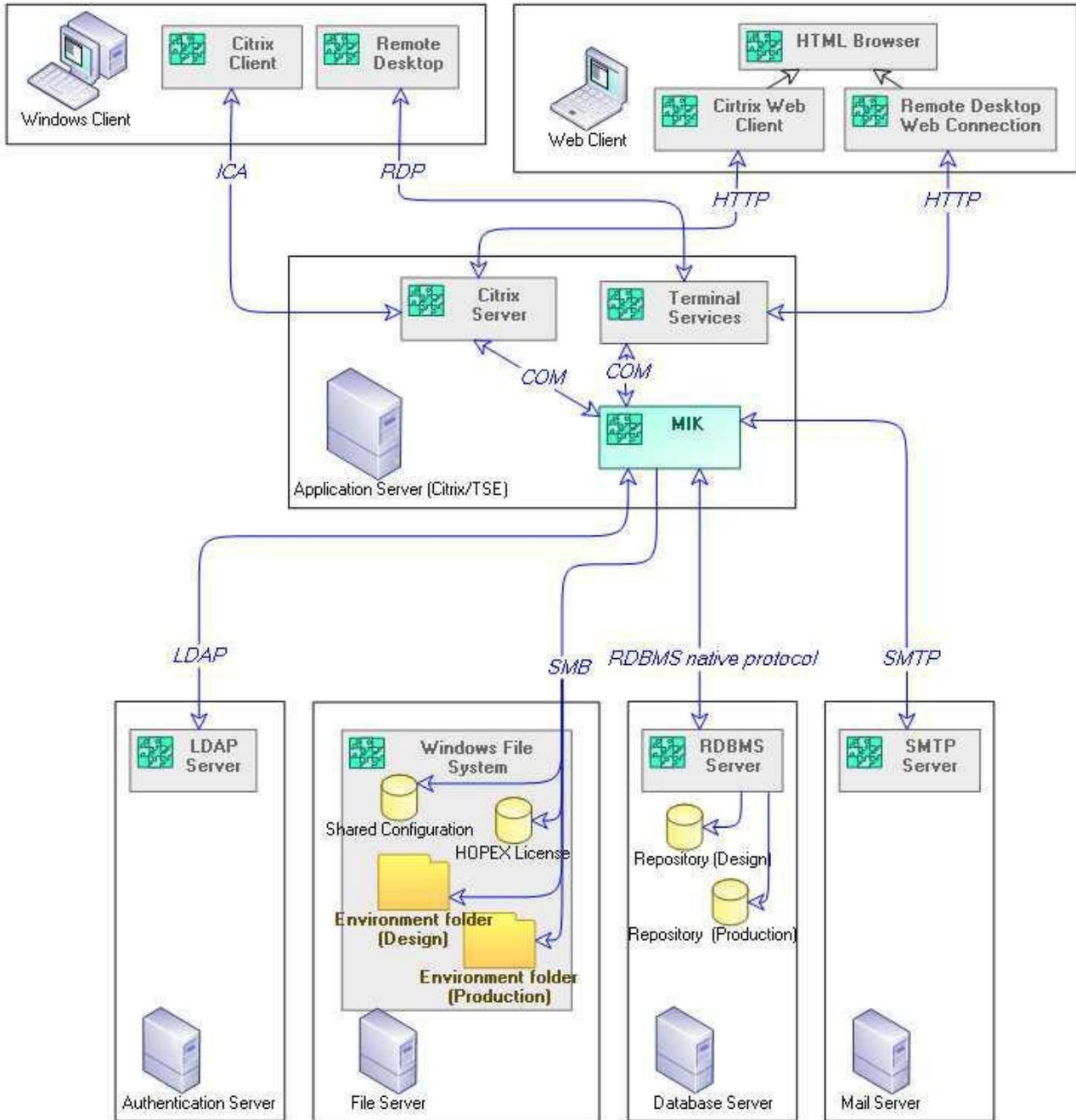
There is one MIK (running instance of HOPEX Kernel) per workstation running Windows Front-End.



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

Windows Client

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

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

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

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

Citrix Client/Remote Desktop Client

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

Application Server (Citrix Server/Terminal Server)

Server System	See also requirements for Citrix Presentation Server or Citrix XenApp
Application Server Layer	<p>TSE on Windows Server 2012</p> <p>TSE on Windows Server 2012 R2</p> <p>Citrix XenApp 7.x For 2012 R2</p> <p>Visual C++ Redistributable for Visual Studio 2015 (1)</p>
Additional Software	<p>Adobe Reader: 10.0 or higher</p> <p>SQL Server Native client 11.0 (SQL Server 2012) If data is stored in SQL Server</p> <p>Note that Internet Explorer (2) is required.</p>
Hardware	<p>Processor</p> <p>2 cores minimum per group of 15 users</p> <p>3-4 cores recommended per group of 15 users</p> <p>RAM</p> <p>1 GB minimum for the Terminal Server system and for the Citrix system</p> <p>Per concurrent modeller user</p> <p>600 MB intensive use</p> <p>300 MB low use</p> <p>Resolution</p> <p>65000 colors minimum.</p> <p>Disk space</p> <p>4 GB for HOPEX Kernel</p> <p>5 GB recommended per environment (caches)</p> <p>500 MB recommended for logs</p>

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

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

Server System	see RDBMS requirements
RDBMS	Oracle Database Server 12 SQL Server 2012 SQL Server 2014
Disk space	Data: 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'.
Hardware	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

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

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

(1) For GBMS storage.

Between Citrix client and Citrix Server

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

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

Between Citrix web client and Citrix Server

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

Between Remote Desktop Client and Remote Desktop Services

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

Network latency	100 Ms maximum*
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Between Remote Desktop Web Client and Remote Desktop Services

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

* For a ping of 5 KB (It is recommended to use the hrping utility. Refer to the separate article 'RDBMS Repository Installation guide HOPEX V2').

Between MIK and Database server (Oracle, SQL Server)

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

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

Between MIK and mail server

Protocol	SMTP
Port	25 by default, configurable

Between MIK and Document server (file access)

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

Between MIK and LDAP Server

Protocol	LDAP
Port	TCP 389 by default (2)

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

INSIDE

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

Standard authentication (LDAP)	LDAP directory	specifications
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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 user/schema A system database is a	Create one Oracle user per data repository or system database with specific privileges. Install and schedule stored procedures per data

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

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

location can be configured

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

For HOPEX Environment used by an active project

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)

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

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

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 SP2 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 not yet supported with HOPEX V2. It will be supported in a future version, release or CP.

Is Oracle 13 supported?

Oracle 13 is not yet supported with HOPEX V2. It will be supported in a future version or release.

Is SQL Server 2016 supported?

Oracle 13 is not yet supported with HOPEX V2. It will be supported in a future version or release.

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"> • Managing HOPEX environments. • Managing HOPEX repositories. • Managing HOPEX users. • Managing HOPEX profiles. Win32 component (Administration.exe)
Application server	Server playing the application server role.
Authentication	Authentication defines whether the user exists and if it can connect to the software (for example a web site).
Availability	A measure of a computer system's ability to maintain services despite hardware or software failures. A highly available system delivers services to clients a high percentage of the time.
Bandwidth	Rate of data transfer. Usually measured in KBit/s or GBit/s.
Cluster	A group of independent computer systems, referred to as nodes, working together as a unified computing resource
Concurrent license	License where products or bundles are programmed in concurrent mode. Example: 5 concurrent accesses users for 10 possible users
Database Server	A database server is a machine providing database services to other machines. In this document the database server is a machine running relational database management systems. A database server can host one or several instances. Example: <ul style="list-style-type: none"> • Server 'iba.company.com' • Server '192.888.777.666' • Server 'SQL02'
DBA (DB Administrator)	Person that ensures an operational and effective functioning of a database server.
Dedicated license	License assigned to a particular user. It cannot be shared.
Directory, services	Directory (Document Management System), Document Management
DMS (Document Management System), Document Management	Software application for organizing information about a computer network's users and resources.
Document Repository	System used to track and store electronic documents
Documentation Server	Group of documents within a document server.
Domain User	Server hosting a Document Management System.
End-user	User in Active Directory (Microsoft product).
Environment folder, HOPEX Environment folder	Person that uses a product.
Environment, HOPEX	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.
	A HOPEX Environment is a working area, storing data of a user

Term	Definition
Environment	<p>group. Within a HOPEX Environment, a set of data repositories share within a system database a metamodel definition, users and profiles. An environment is thus made of a single system database and of one or multiple data repositories.</p> <p>Workspace for a group of HOPEX users. A HOPEX Environment references a system database 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 database 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.
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"> Managing web user connections. Managing caches. 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 determines various permissions (profile, reading access, writing access...). The list of users (Person (System)) that belong to the

Term	Definition
	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"> • HOPEX (IIS) • MEGA Software <ul style="list-style-type: none"> ○ Administration Program ○ Utilities ○ Documentation...
RDBMS Server	Relational Database server. With HOPEX platform, core data is saved in database instance of SQL Server or Oracle.
Remote Desktop (client, services, protocol)	Remote Desktop is a Microsoft technology that allows a use to access applications and data on a remote computer over a network. It is based on Remote Desktop Protocol (RDP). The client side is called Remote Desktop Client (formerly called Terminal Services Client). The server side is called Remote Desktop Services (formerly called Terminal Services).
Repository, HOPEX Repository, data repository	A HOPEX Repository is a database hosting HOPEX data compliant with a metamodel definition. It contains objects with attributes, and associations between objects. Storage format (GBMS, Oracle, and SQL Server) is defined when creating the repository. 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.

Term	Definition
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 mgwmap.
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 database: <ul style="list-style-type: none"> • Oracle (RDBMS, Oracle). • SQL Server (RDBMS, SQL Server). • GBMS (MEGA DBMS, proprietary format kept for compatibility).
System Administrator	Person that ensures an operational and effective functioning of a computer system or network
System database, system repository, systemdb	A system database contains data shared between all data repositories within an environment. It contains at least: <ul style="list-style-type: none"> • A HOPEX directory (definition of users/roles/profiles). • A set of templates of deliverables. • A metamodel definition.
UNC (Universal Naming Convention)	A UNC address is a shared folder that has a unique address on the network
User, HOPEX User	User account in a HOPEX Environment. The user can be declared in HOPEX or declared in a directory service and replicated in HOPEX. In all case, users are saved in the system database. Technically, it is the association of a Person (System) with a Login.

Term	Definition
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'.

Web Front-end Architecture Overview HOPEX V2 EN

CONTENTS

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.

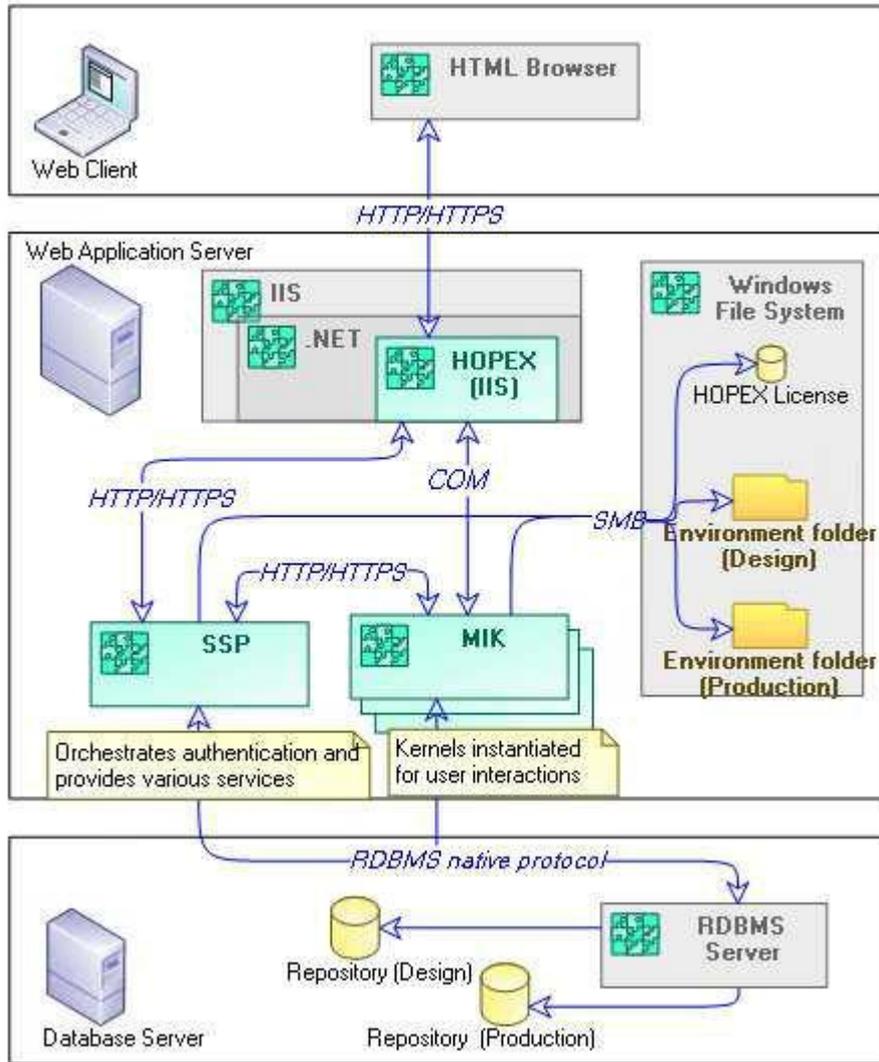
DEPLOYMENT TYPES

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

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

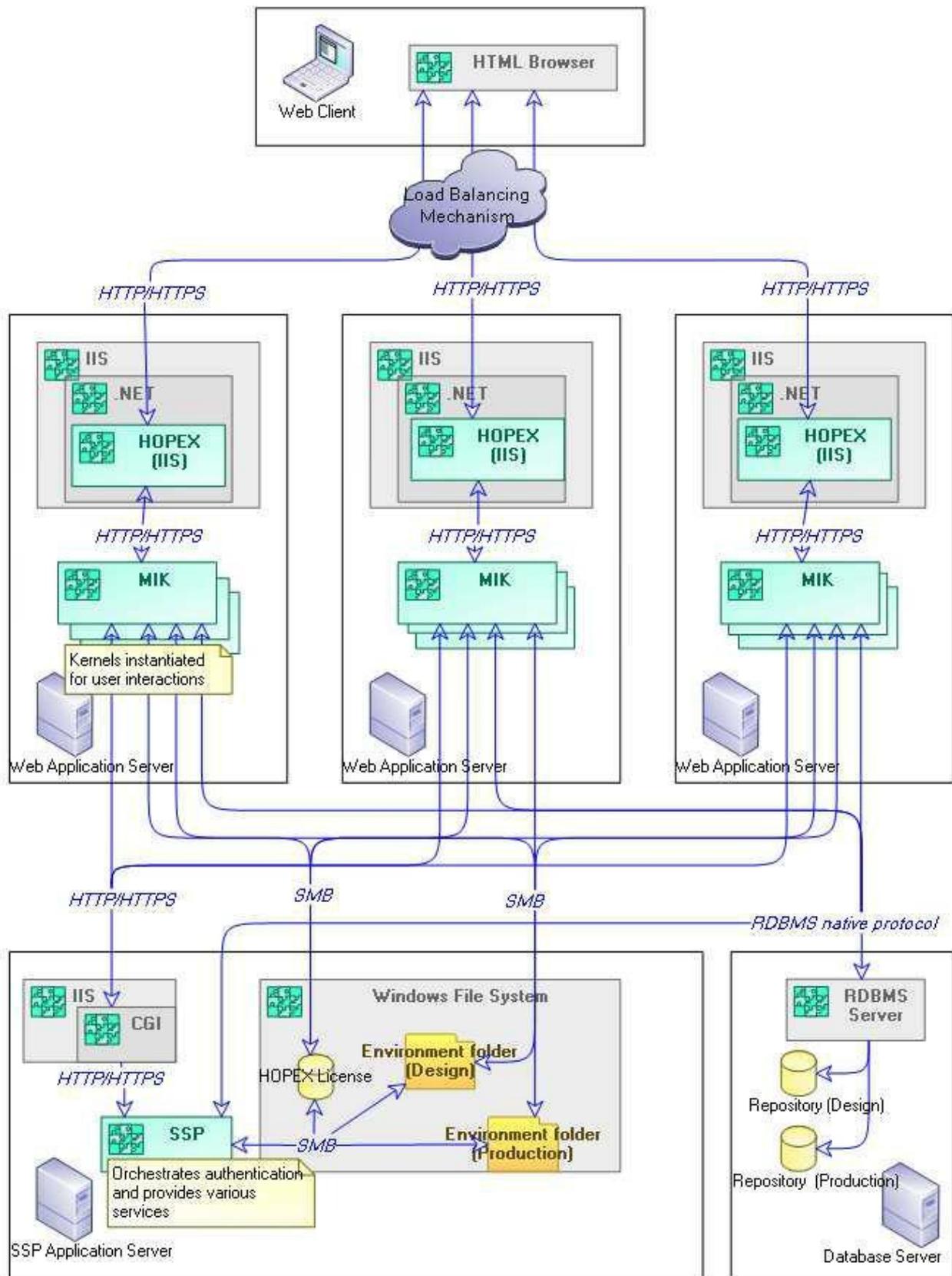
Other deployments – For specific requirements, other deployments are possible. For further information, contact your sales representative.

Standalone Deployment



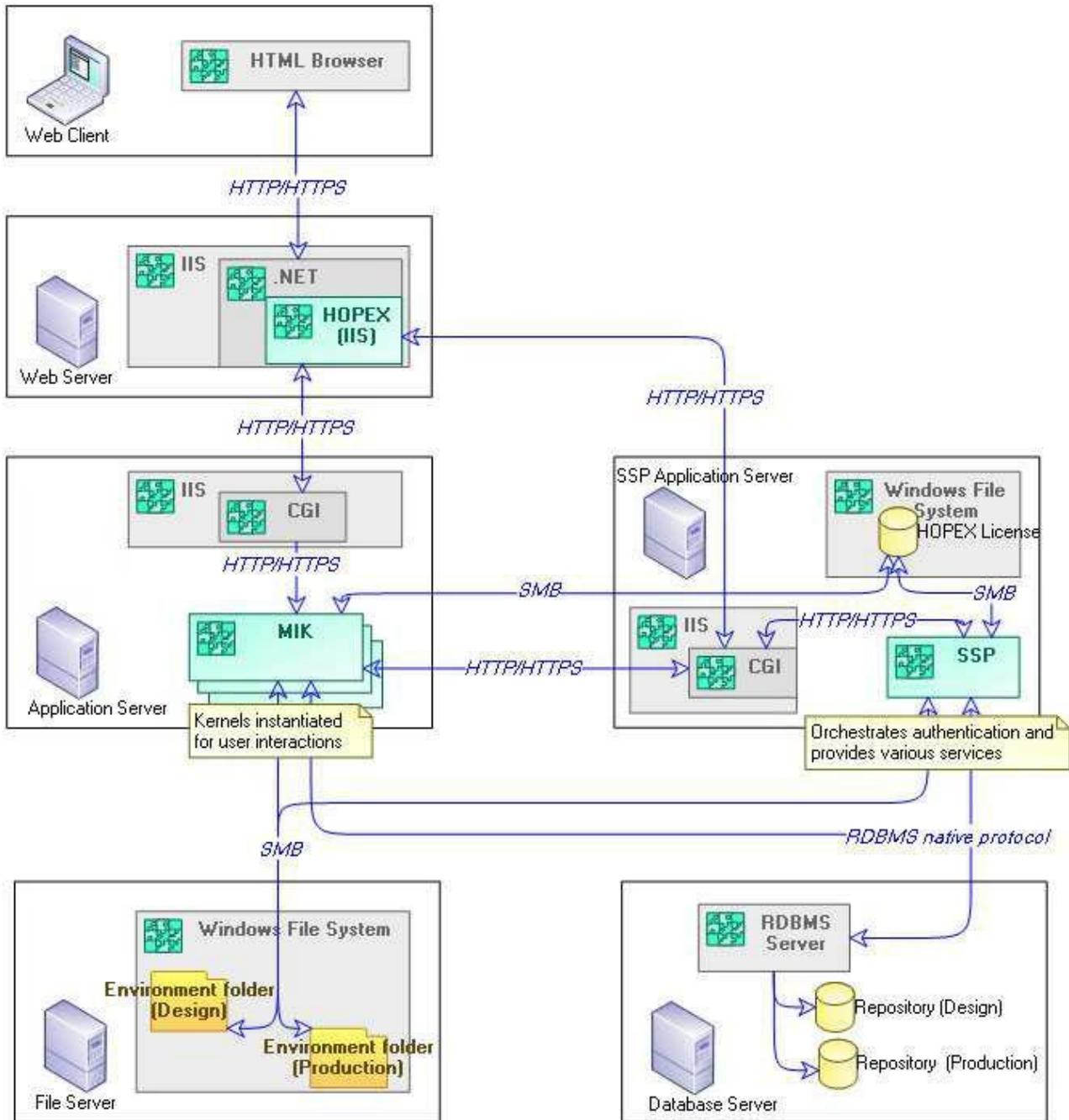
To facilitate readability, different elements have not been displayed (authentication server, mail server, SQL Server Native client required for SQL Server storage).

Horizontal scaling Deployment



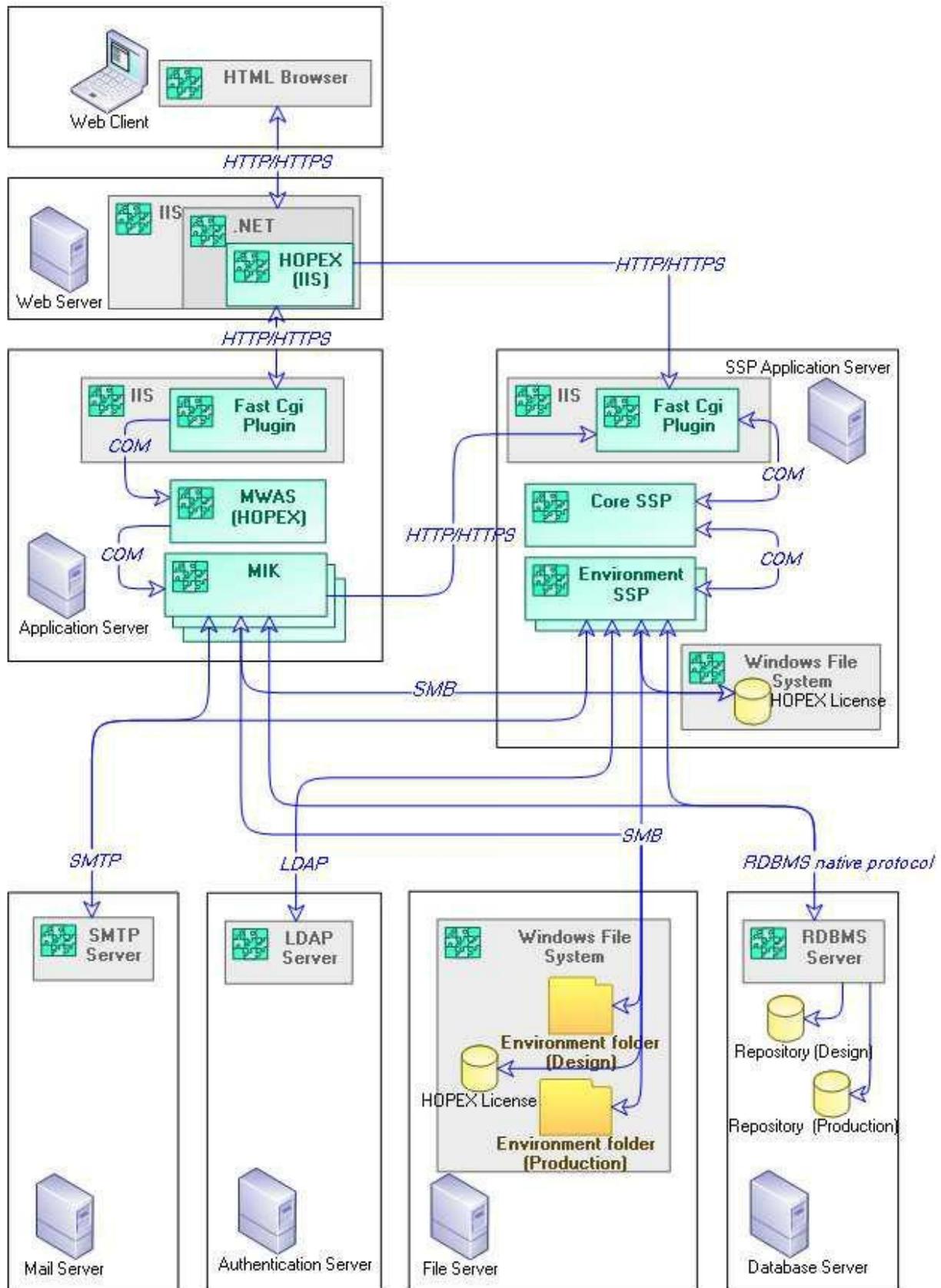
To facilitate readability, different elements have not been displayed (authentication server, document server, mail server, SQL Server Native client for SQL Server storage).

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

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

(1) Supported with minor restrictions. See FAQs section p. 22.

Application Server

Operating system	Windows Server 2012 Windows Server 2012 R2 For other systems a specific study is necessary Visual C++ Redistributable for Visual Studio 2015 (1) Supported for Microsoft Azure
Hardware	Processor Multi core RAM 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 Disk space 4 GB recommended for HOPEX Kernel 200 MB recommended for IIS applications 5 GB recommended per environment for cache 500 MB recommended for logs
Additional Software	SQL Server Native client 11.0 (SQL Server 2012, SQL Server 2014) If data is stored in SQL Server

Web Server	MS Internet Information Services 8.0 MS Internet Information Services 8.5 MS Internet Information Services 10.0
Script layer	ASP .NET .NET Framework 4.6.1 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

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

Database Server

Server System	see RDBMS requirements
RDBMS	Oracle Database Server 12 SQL Server 2012 SQL Server 2014
Disk space	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
Hardware	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

Between Web Client and Web server (Web Application Server)

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

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)

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

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'.
Default port, check the appropriate port with the database administrator.
For 30 concurrent users.

Between Environment SSP or MIK and mail server

Protocol	SMTP
Port	25 by default, configurable

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

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

Between Environment SSP and LDAP Server

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

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

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.

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

location can be configured

Generated for the SSP application server

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 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	Co 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

For HOPEX Environment used by an active project

In particular before 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 (3)
Oracle	Cold/warm recommended (3)

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

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...) 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 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 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.

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

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 version 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 SP2 is supported as application server and file server but not recommended as support end date has passed. See <https://support.microsoft.com/en-en/lifecycle>

Is Windows Server 2016 supported?

Windows Server 2016 is not yet supported with HOPEX V2. It will be supported in a future version, release or CP.

Is Oracle 13 supported?

Oracle 13 is not yet supported with HOPEX V2. It will be supported in a future version or release.

Is SQL Server 2016 supported?

Oracle 13 is not yet supported with HOPEX V2. It will be supported in a future version or release.

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 V1R2 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"> • Managing HOPEX environments. • Managing HOPEX repositories. • Managing HOPEX users. • Managing HOPEX profiles. Win32 component (Administration.exe)
Application server	Server playing the application server role.
Authentication	Authentication defines whether the user exists and if it can connect to the software (for example a web site).
Availability	A measure of a computer system's ability to maintain services despite hardware or software failures. A highly available system delivers services to clients a high percentage of the time.
Bandwidth	Rate of data transfer. Usually measured in KBit/s or GBit/s.
Cluster	A group of independent computer systems, referred to as nodes, working together as a unified computing resource
Concurrent license	License where products or bundles are programmed in concurrent mode. Example: 5 concurrent accesses users for 10 possible users
Database Server	A database server is a machine providing database services to other machines. In this document the database server is a machine running relational database management systems. A database server can host one or several instances. Example: <ul style="list-style-type: none"> • Server 'iba.company.com' • Server '192.888.777.666' • Server 'SQL02'
DBA (DB Administrator)	Person that ensures an operational and effective functioning of a database server.
Dedicated license	License assigned to a particular user. It cannot be shared.
Directory, Directory services	Software application for organizing information about a computer network's users and resources.
DMS (Document Management System), Document Management	System used to track and store electronic documents
Document Repository	Group of documents within a document server.
Documentation Server	Server hosting a Document Management System.
Domain User	User in Active Directory (Microsoft product).
End-user	Person that uses a product.
Environment folder, HOPEX Environment folder	Folder of a HOPEX Environment. It has several subfolders such as 'Db' and 'SysDb'. It contains configuration and output files. With GBMS storage, it also contains core data files of HOPEX repositories.
Environment, HOPEX	A HOPEX Environment is a working area, storing data of a user

Term	Definition
Environment	<p>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.
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"> Managing web user connections. Managing caches. 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 determines various permissions (profile, reading access, writing access...). The list of users (Person (System)) that belong to the

Term	Definition
	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"> • HOPEX (IIS) • MEGA Software <ul style="list-style-type: none"> ○ Administration Program ○ Utilities ○ Documentation...
RDBMS Server	Relational Database server. With HOPEX platform, core data is saved in database instance of SQL Server or Oracle.
Remote Desktop (client, services, protocol)	Remote Desktop is a Microsoft technology that allows a use to access applications and data on a remote computer over a network. It is based on Remote Desktop Protocol (RDP). The client side is called Remote Desktop Client (formerly called Terminal Services Client). The server side is called Remote Desktop Services (formerly called Terminal Services).
Repository, HOPEX Repository, data repository	A HOPEX Repository is a database hosting HOPEX data compliant with a metamodel definition. It contains objects with attributes, and associations between objects. Storage format (GBMS, Oracle, and SQL Server) is defined when creating the repository. 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

Term	Definition
	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"> • Oracle (RDBMS, Oracle). • SQL Server (RDBMS, SQL Server). • GBMS (MEGA DBMS, proprietary format kept for compatibility).
System Administrator	Person that ensures an operational and effective functioning of a computer system or network
System database, system repository, systemdb	A system database contains data shared between all data repositories within an environment. It contains at least: <ul style="list-style-type: none"> • A HOPEX directory (definition of users/roles/profiles). • A set of templates of deliverables. • A metamodel definition.
UNC (Universal Naming Convention)	A UNC address is a shared folder that has a unique address on the network
User, HOPEX User	User account in a HOPEX Environment. The user can be declared in HOPEX or declared in a directory service and replicated in HOPEX. In all case, 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.

Term	Definition
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'.

