Agilent

Agilent OpenLab Server and OpenLab ECM XT

Hardware and Software Requirements Guide

Notices

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Software Revision

This guide is valid for the 2.7 revision of the Agilent OpenLab Server and OpenLab ECM XT program until superseded.

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1 Hardware, Software, and Network Requirements

This document describes the minimum hardware, software, and network requirements for supporting Agilent OpenLab Server or OpenLab ECM XT. The information provided here applies to both products unless specified otherwise.

CAUTION

Hardware requirements vary depending on many factors. Always review your requirements with your Agilent representative before purchasing or configuring any hardware.

Hardware

OpenLab Server/ECM XT is used to store data from different types of instruments. OpenLab Server/ECM XT can be deployed as a one of the following systems:

- 1-server all-in-one system (**Figure 1** on page 6)
- 2-server system, with the database hosted on a separate machine (**Figure 2** on page 6)
- 4-server system (**Figure 3** on page 7), consisting of:
  - 1 server with Content Management and Shared Services
  - 1 Database server
  - 1 Index server
  - 1 file server
- Scalable system (**Figure 4** on page 7), consisting of:
  - 3 Content Management servers
  - 1 Index server
  - 1 Database server
  - 1 Windows file server or NAS that meets the hardware requirements
  - 1 load balancer

Choice of topology depends on a number of factors. Talk to your Agilent Representative about which server topology is best suited for your environment.

NOTE

The following diagrams are conceptual representations of the system topology. They are not intended to represent the topology's network architecture.

Figure 1. OpenLab Server/ECM XT all-in-one system architecture

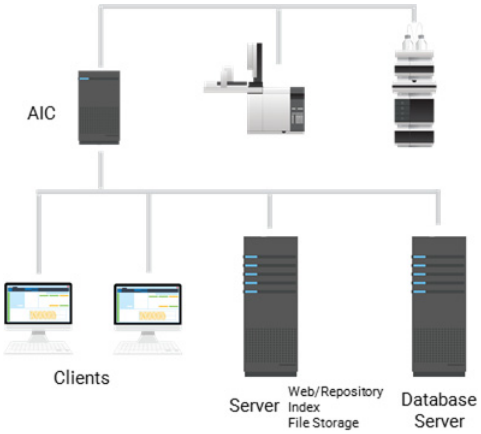

Figure 2. Two-server system architecture

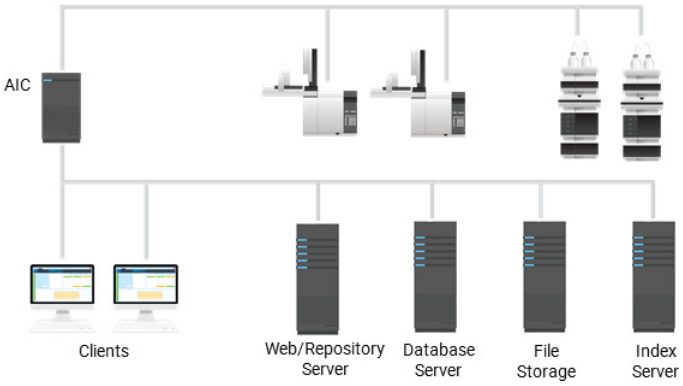

Figure 3. Four-server system architecture

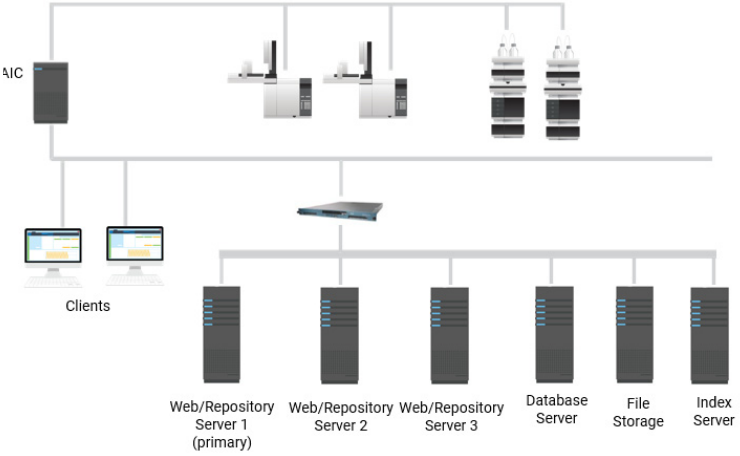

Figure 4. Scalable-system architecture

CAUTION

The following recommended hardware specifications are for reference purposes. The hardware specifications should be adjusted based on the actual use pattern in the lab.

For example, if a lab acquires larger files as compared to those listed for a typical use pattern, consider adding more disk storage or using an external NAS system for storing files.

Always consult with your Agilent representative to determine the actual hardware required for your needs.

NOTE

For better performance, use solid state drives (SSD) for the hard drives specified in the following tables.

Minimum hardware for OpenLab Server/ECM XT topologies

Table 1. Minimum hardware for an all-in-one system

NOTE

OpenLab Basic server is available only with the small system all-in-one configuration.

Hardware*	Small system†	Medium system	Large system‡
Processor	1 × CPU - 2.6 GHz or higher Minimum of 8 vCPU**	2 × CPU - 2.6 GHz or higher Minimum of 16 vCPU‡	2 × CPU - 2.6 GHz or higher Minimum of 16 vCPU‡
Minimum Ram	16 GB	24 GB	48 GB
Disk (OS and software)	2 × (100 GB 7.2k rpm RAID 1)	2 × (300 GB 15k rpm RAID 1)	2 × (600 GB 15k rpm RAID 1)
Disk (Data)††	2 × (100 GB 7.2k rpm RAID 1)	3 × (500 GB 7.2k rpm RAID 5)	3 × (1 TB 7.2k rpm RAID 5)
Network	1 GB	1 GB	1 GB
Operating System‡‡ and Database	Windows Server 2016, 2019, or 2022 PostgreSQL 14.x SQL Server 2016, 2017, or 2019 Note: Oracle is not supported.	Windows Server 2016, 2019, or 2022 PostgreSQL 14.x SQL Server 2016, 2017, or 2019 Note: Oracle is not supported.	Windows Server 2016, 2019, or 2022 PostgreSQL 14.x SQL Server 2016, 2017, or 2019 Note: Oracle is not supported.

* Agilent recommends a server dedicated to OpenLab Server/ECM XT as the host machine.

† Basic Server license is only supported on a small system. Basic Server can support a maximum of 4 configured instruments.

‡ Up to 70 concurrent users. A session is any type of active connection: user connections, logical instrument connections, application connections (for example, CDS Data Analysis, Import Scheduler, CDS Acquisition).

** A vCPU is a logical CPU (each vCPU is a thread of Intel or an AMD core). For example, a single quad core CPU can contain 8 threads.

†† The recommended disk space for these systems was estimated based on four years of use with 300 logical instruments. The actual disk size required should be calculated based on planned use patterns. For better performance, use a solid state drive (SSD).

‡‡ See **"Operating systems"** on page 14 for details.

NOTE

For servers with an Agilent LC/TOF or Agilent LC/Q-TOF mass spectrometer using MassHunter Networked Workstation, use the Medium system specification with the following modifications:

- 24 GB of RAM is a minimum amount
- Disk (Data): 5 x (2 TB 7.2K rpm Raid 5)

Table 2. Minimum hardware for a 2-server solution

Hardware*	OpenLab Server/ECM XT Server	Database Server
Processor	2 × CPU – 2.6 Ghz or higher Minimum of 16 vCPU†	2 × CPU – 2.6 Ghz or higher Minimum of 16 vCPU†
Minimum Ram	32 GB	32 GB
Disk (OS and software)	2 × (300 GB 15k rpm RAID 1)	2 × (300 GB 15k rpm RAID 1)
Disk (Data)‡	5 × (1 TB 7.2k rpm RAID 5)	2 × (100 GB RAID 1) – Transaction logs 3 × (300 GB 15k rpm RAID 5) – Actual data Separate disks for storing data and transaction /redo logs is recommended.**
Network	1 GB	1 GB
Operating System	Windows Server 2016, 2019, or 2022††	Check database operating system requirements. For SQL Server, the enterprise version is recommended.

* Agilent recommends a server dedicated to OpenLab Server/ECM XT as the host machine.

† A vCPU is a logical CPU (each vCPU is a thread of Intel or an AMD core). For example, a single quad core CPU can contain 8 threads.

‡ The recommended disk space for these systems was estimated based on four years of use with 300 logical instruments. The actual disk size required should be calculated based on planned use patterns. In an OpenLab ECM XT server, this disk is for OpenLab ECM XT index files. In a Database server, this disk is for database files.

** Refer to the database vendor documentation for additional configuration information.

†† See **"Operating systems"** on page 14 for details.

NOTE

Servers with an Agilent LC/TOF or Agilent LC/Q-TOF mass spectrometer using MassHunter Networked Workstation should use the following modification:

Disk (Data): 5 x (2 TB 7.2k rpm RAID 5)

Table 3. Minimum hardware for a 4-server solution

Hardware*	Content Management Server	Index Server††	Database Server	File Server
Processor	2 x CPU – 2.6 Ghz or higher Minimum of 16 vCPU†	2 x CPU – 2.6 Ghz or higher Minimum of 8 vCPU†	2 x CPU – 2.6 Ghz or higher Minimum of 16 vCPU†	1 x CPU – 2.6 Ghz or higher Minimum of 8 vCPU†
RAM	24 GB‡	32 GB	32 GB	8 GB
Disk (OS and Software)	2 x (150 GB 15k rpm RAID 1)	2 x (150 GB 15k rpm RAID 1)	2 x (150 GB 15k rpm RAID 1)	2 x (150 GB 15k rpm RAID 1)
Disk (Data)**	Not Applicable	3 x (300 GB 15k rpm RAID 5)	2 x (150 GB RAID 1) – Transaction logs 3 x (300 GB 15k rpm RAID 5) – Database data Separate disks for storing data and transaction /redo logs is recommended.††	5 x (2 TB 7.2k rpm RAID 5)
Network	1GB	1 GB	1 GB	2 GB‡‡
Operating System	Windows Server 2016, 2019, or 2022	Windows Server 2016, 2019, or 2022	Check Database Operating System requirements. For SQL Server, use the enterprise version.	Windows Server 2016, 2019, or 2022

* Agilent recommends a server dedicated to OpenLab Server/ECM XT as the host machine.

† A vCPU is a logical CPU (each vCPU is a thread of Intel or an AMD core). For example, a single quad core CPU can contain 8 threads.

‡ For systems to support 300 logical instruments. This value can be adjusted based on planned usage pattern.

** Disk space is estimated based on 4 years of usage with 300 logical instruments. The actual disk space needs to be adjusted based on planned usage patterns. In an OpenLab ECM XT server, this disk is for OpenLab ECM XT index files. In a Database server, this disk is for database files. In a Windows file server, this disk is for OpenLab ECM XT content store.

†† Note: For better performance, use solid state drives (SSD). For Index server, SSDs are recommended for indexed content.

‡‡ Network teaming

Table 4. Minimum recommended hardware for servers in an OpenLab Server/ECM XT scalable system

Hardware*	Content Management server	Index server‡‡	Database server†	File server
CPU	2 x CPU – 2.6 Ghz or higher Minimum of 16 vCPU‡	2 x CPU – 2.6 Ghz or higher Minimum of 8 vCPU‡	2 x CPU – 2.6 Ghz or higher Minimum of 16 vCPU‡	1 x CPU – 2.6 Ghz or higher Minimum of 8 vCPU‡
Memory	24 GB**	32 GB	64 GB	8 GB
Disk (OS and Software)	2 x (150 GB 15k rpm RAID 1)	2 x (150 GB 15k rpm RAID 1)	2 x (150 GB 15k rpm RAID 1)	2 x (150 GB 15k rpm RAID 1)
Disk (Data)††	Not Applicable	3 x (300 GB 15k rpm RAID 5)*	2 x (150 GB RAID 1) – Transaction logs 3 x (300 GB 15k rpm RAID 5) – Database data Separate disks for storing data and transaction /redo logs is recommended.‡‡	5 x (2 TB 7.2k rpm RAID 5)
Network	1 GB	1 GB	1 GB	2 GB***
Operating System†††	Windows Server 2016, 2019, or 2022	Windows Server 2016, 2019, or 2022	Check database operating system requirements. For SQL Server, the enterprise version is recommended.	Windows Server 2016, 2019, or 2022
Load Balancer	Gigabit capability network load balancer with support for session persistence, layer 4 and layer 7 load balancing and SSL offloading			

* Agilent recommends a server dedicated as the host machine.

† Refer to the database vendor documentation for additional configuration.

‡ A vCPU is a logical CPU (each vCPU is a thread of Intel or an AMD core). For example, a single quad core CPU can contain 8 threads.

** For system to support 300 logical instruments. Value can be adjusted based on planned use pattern.

†† Disk space is estimated based on 4 years of use with 300 logical instruments. The actual disk space needs to be adjusted based on planned use pattern. In an OpenLab Server/ECM XT Index server, this disk is for OpenLab Server/ECM XT index files. In a Database server, this disk is for database files. In a Windows server, this disk is for OpenLab Server/ECM XT content store.

‡‡ For better performance, use a solid state drive (SSD). SSD is recommended for the Index Server.

*** Network teaming

††† See **"Operating systems"** on page 14 for details.

Minimum hardware for ECM XT Add-ons

Table 5. Minimum recommended hardware for an Import Scheduler server

Hardware	Minimum hardware
Processor	2 GHz or higher
Minimum Ram	8 GB, recommended 16 GB
Hard Disk	Minimum free space for installation: 500 GB Minimum free space for file cache: 250 GB

Table 6. Minimum recommended hardware for an Import Services client machine

NOTE

Import Services is typically installed on the primary application client machine; for example, the CDS client.

Hardware	Minimum hardware
Processor	2 GHz or higher
Minimum Ram	8 GB
Hard Disk	100 GB

Table 7. Minimum hardware requirements for PDF Metadata Extraction

Hardware	Minimum hardware
Processor	2 GHz or higher
Minimum Ram	8 GB
Hard Disk	100 GB

Software

Operating systems

NOTE

Agilent supports the currently supported versions at release, per the **Windows lifecycle fact sheet**. Agilent expects, but cannot guarantee, that newer minor product versions from other software vendors will be compatible.

Table 8. Supported operating systems

Component	Type	Revision	Support Statement Supported unless stated otherwise
Windows 10 Pro*	64-bit	20H2 or greater	ECM XT add-on clients only
Windows 10 Enterprise*	64-bit	20H2 or greater	ECM XT add-on clients only
Windows 11 Pro	64-bit	21H2	ECM XT add-on clients only
Windows 11 Enterprise	64-bit	21H2	ECM XT add-on clients only
Windows Server 2016 (Standard, Data Center)	64-bit	1607 or greater	
Windows Server 2019 (Standard, Data Center)	64-bit	1809 or greater	
Windows Server 2022 (Standard, Data Center)	64-bit		Requires OpenLab Server 2.7 Update 06 or higher
Mac OS		10.15	Catalina OS Content Browser only

* For information on support of Windows 10 LTSC/LTSB for OpenLab CDS, see FAQ at **https://www.agilent.com/en/product/software-informatics/analytical-software-suite/chromatography-data-systems/openlab-cds#support**.

Databases

Table 9. Supported databases

Component	Type	Revision	Support Statement Supported unless state otherwise
SQL Server 2016 SP 2	64-bit	CU 17 or higher	Standard or Enterprise
SQL Server 2017	64-bit	CU 24 or higher	Standard or Enterprise
SQL Server 2019	64-bit	CU 10 or higher	Standard or Enterprise
PostgreSQL	64-bit	14.x	
Oracle	64-bit	19c	

Other software

Install the following software on any supported operating system before installing OpenLab Server/ECM XT components.

Table 10. Supported browsers

Component	Type	Revision	Support Statement Supported unless state otherwise
Microsoft Chromium Edge	64-bit	As shipped with the supported Windows 10 or 11	
Google Chrome	64-bit	40 or higher	

Table 11. .NET requirements

Component	Type	Revision	Support Statement Supported unless state otherwise
.NET Framework	64-bit	3.5 and 4.x	.NET framework version determined by OpenLab Platform
.NET Core	64-bit	3.1.x	Installed by default
	64-bit	5.x and 6.x	Installed by default

Table 12. Antivirus

NOTE

The listed antivirus software has been tested and is recommended. However, the support is not limited to these antivirus software products. Each product may have specific language requirements and support.

Component	Type	Support Statement Supported unless state otherwise
Symantec Endpoint Protection	64-bit	
Trend Micro	64-bit	
Microsoft Defender	64-bit	
McAfee	64-bit	

Table 13. Tested virtualization software

NOTE

The software supports operating system virtualization (also known as hardware virtualization). Virtualization was tested as shown in Table 13. Basic machine and processing requirements listed in this guide do not change when virtualizing your machine. Other virtualization software may be used as long as it supports the required operating system and provides the required resources. Contact your Agilent representative for information on virtualization software not listed here.

Component	Type	Revision	Support Statement Supported unless state otherwise
VMware vSphere	64-bit	7.x and 8.x	
Hyper-V for Windows Server	64-bit	As shipped with Windows Server 2016, Windows Server 2019, or Windows Server 2022	Additional hardware may be required to improve system performance.

Table 14. Office and other application requirements

Component	Type	Revision	Support Statement Supported unless state otherwise
Adobe Acrobat Classic	32-bit	2017	Adobe Acrobat is required only when using the PDF Metadata Extraction plug-in.
Adobe Acrobat	32-bit	DC	To install Acrobat Standard DC 32-bit use the following link https://helpx.adobe.com/acrobat/kb/acrobat-dc-downloads.html. Choose 'Acrobat Standard DC installer' for Windows. Follow the instructions from Adobe provided. All other links, for example, links from a user account, install unsupported 64-bit format.
Office 2019	64-bit	2019	Required for use of the "Edit in Microsoft Office" feature.
Office 365	64-bit		Required for use of the "Edit in Microsoft Office" feature.

Software specifications for ECM XT Add-ons

ECM XT Add-on components consist of the following:

- Import Scheduler
- Import Services
- PDF Metadata Extraction

NOTE

Import Scheduler with Empower supports Empower 3 FR5.

Table 15. ECM XT add-ons supported operating systems

	Component	Type	Revision*	Support Statement Supported unless state otherwise
Windows	Windows 10 Pro	64-bit	20H2 or greater	Active Windows 10 releases at time of release
	Windows 10 Enterprise	64-bit	20H2 or greater	Active Windows 10 releases at time of release
	Windows 11 Pro	64-bit	21H2	Active Windows 10 releases at time of release
	Windows 11 Enterprise	64-bit	21H2	Active Windows 10 releases at time of release
	Windows Server 2016 (Standard, Data Center)	64-bit	1607 or greater	
	Windows Server 2019 (Standard, Data Center)	64-bit	1809 or greater	
	Windows Server 2022 (Standard, Data Center)	64-bit		Requires OpenLab Server 2.7 Update 06 or higher
Browser	Microsoft Chromium Edge	64-bit	As shipped with Windows 10	
	Google Chrome	64-bit	40 or higher	
PDF Applications	Adobe Acrobat Classic	32-bit	2017	Classic Version
	Adobe Acrobat	32-bit	DC	Continuous Version

* Typical software industry practice is to maintain compatibility in all new minor versions, and, when possible, in major versions.

Licensing

OpenLab Server/ECM XT uses Flex-Net Publisher for the distribution and tracking of license entitlements. This software is installed with the OpenLab Server/ECM XT components.

Virtual machines

OpenLab Server/ECM XT can be run on a virtual machine hosted by hardware virtualization. Virtualization was tested using VMWare vSphere and Hyper-V for Windows Server. Other virtualization software may be used as long as it supports the required operating system and provides the required resources. The virtual machine must meet the OpenLab Server/ECM XT hardware and software requirements.

For instructions on how to install, configure, and optimize a virtual machine, see the documentation for your virtualization software. Consider the following when optimizing for your particular environment:

- Dedicated resources allocated to the OpenLab Server/ECM XT server (the resource requirements are the same as those of physical machines)
- Potential performance overhead by using the virtual infrastructure

Notes:

- Do not take a snapshot on systems running data acquisition from instruments. Take snapshots only when the system is idle.
- Using a Windows Server virtual machine with the network interface card (NIC) teaming feature is not recommended. With this configuration, OpenLab Server/ECM XT cannot retrieve the MAC address of a network team interface. If you must use this configuration, an extra virtual network adaptor is needed to which the OpenLab Server/ECM XT license can bind.
- Each license is based on the MAC address of the network interface card, being physical or virtual. If you are planning to use NIC teaming for the OpenLab Server/ECM XT server, it is recommended that you use the teaming configuration tool from the vendor of the network interface card.
- To prevent OpenLab CDS licensing issues when using Microsoft Hyper-V, disable the (default) dynamic MAC address.

Language compatibility

The OpenLab Server/ECM XT Installer and Content Management user interfaces are displayed in the language of the Windows operating system for the following languages:

- English

- Chinese
- Japanese
- Brazilian Portuguese

OpenLab Control Panel supports the following languages:

- English
- Chinese
- Japanese
- Brazilian Portuguese
- Russian

The OpenLab Server/ECM XT Add-ons are supported in the following languages:

- English
- Chinese
- Japanese
- Brazilian Portuguese

All OpenLab Server/ECM XT programs support the use of localized data files.

Test Services (QualA) are supported in the following languages:

- English
- Chinese
- Japanese
- Brazilian Portuguese

Cloud Support

OpenLab CDS with ECM XT can run in an Amazon Web Services (AWS) or Azure cloud environment, where OpenLab ECM XT is configured as the secured repository for OpenLab CDS. AWS China and Azure China are not supported. A Software Maintenance Agreement (SMA) is required. For details on supported configurations and how to deploy ECM XT in a cloud environment, contact your local Agilent representative.

Network

OpenLab Server/ECM XT uses standard TCP/IP protocols to communicate between the server and client computers. For optimum performance, the network must meet the design criteria for available bandwidth, IP address assignment, name resolution, and appropriate isolation of the lab subnet from the corporate network.

TCP/IP networking is required for all products. Wide Area Networks (WANs) are not supported.

LAN communications

Communication method

Connect OpenLab Server/ECM XT clients to the OpenLab Server/ECM XT server with an isolated switch using standard CAT-5E network cabling.

Use 100/1000 mbps speed capable LAN communication hardware.

LAN power management

Avoid data capture or transfer interruptions in your data acquisition system by making LAN communication cards available for instrument and system component communications.

Windows may be set to turn instruments and components off to save power while sleeping or hibernating.

To change the setting:

1. Go to **Windows > Control Panel > Network Connections > Local Area Network Properties**.
2. Select the **Power Management** tab.
3. Uncheck **Allow the computer to turn off this device to save power**.

Requirements for a compliant system

If you intend to use your system in a compliant environment, check the following settings related to time synchronization:

- Your network must have a time synchronization service to make sure that all systems are using a consistent and valid time.
- To ensure that users cannot change the time on a client system, users must not operate using an administrator account. This is important as the client time is used during buffered activity logging during network outages.

Firewall settings

If you are using a third-party firewall or antivirus software on the network where OpenLab Server/ECM XT is installed, open these firewall ports to allow communication between the system components of OpenLab Server/ECM XT.

The OpenLab Server/ECM XT installer will automatically open these ports on an enabled Windows firewall during installation.

The following terms are used in the table:

CM: Content Management

OLSS: OpenLab Shared Services

DCS: Data Collection Service

CertSvc: Certificate Service

ATS: Audit Trail Service

DR: Data Repository

NOTE

Ports in **bold** are required in secure systems.

NOTE

Ports listed for v2.6 and earlier are only required for compatibility with older clients.

OpenLab Server and OpenLab ECM XT

Inbound rules

Table 16 OpenLab Server/ECM XT firewall settings: inbound rules

	v2.7 or higher		v2.6 or earlier			
Application	**Protocol**	**Port**	**Protocol**	**Port**	**Remote System**	**Notes/Description**
CM Server[1]	FTP	21	FTP	21	Any	[Optional] Only if FTP service is turned on for OpenLab Server. By default it is off.
OpenLab Reverse Proxy (Apache HTTPD)	HTTP	:80 /	HTTP	:80 /	Any	OpenLab Reverse Proxy
OpenLab Reverse Proxy (Apache HTTPD)	HTTPS	:443 /	HTTPS	:443 /	Any	OpenLab Reverse Proxy
OLSS Diagnostics	HTTPS	443	TCP	3424	Clients, AICs, Server	Used for collecting diagnostics logs
Content Management PostgreSQL Server	**TCP**	**5432**	**TCP**	**5432**	Alfresco	For database access **Required for secure system on PostgreSQL systems**
DR PostgreSQL Server	TCP	5433	TCP	5433	DR Services	Required for Sample Scheduler Desktop or configuration Database port (Firewall rule is applied during installation of DR) Used by all internal and external applications + services, which connect against DR/PG: DCS, Audit Trail Service, Test Services (aka QualA), Mercury
CM Server[1]	**TCP**	**5701**	**TCP**	**5701**	Scalable Servers	OpenLab Server Scalable between the nodes.
DCS[2]	HTTPS	:443/ openlab/ dcs	HTTPS	52088	Any	Data Collection Service Legacy Port (ChemStation and CDS 2.4 and earlier)

Table 16 OpenLab Server/ECM XT firewall settings: inbound rules (continued)

	v2.7 or higher		v2.6 or earlier			
Application	**Protocol**	**Port**	**Protocol**	**Port**	**Remote System**	**Notes/Description**
	HTTP	6328 (used by ECM XT)	HTTP	6328 (used by ECM XT)	ECM XT Server (may or may not be remote), ChemStation	
OLSS Server	**TCP**	**6570**	**TCP**	**6570**	Clients, AICs	OpenLab Licensing (Flexera) Server
	HTTPS (WCF)	443	TCP (WCF)	6577	Clients, AICs	OpenLab Shared Services WCF APIs
			HTTP	6624	Clients, AICs, Others	Legacy Shared Services REST API Legacy Licensing Support service REST API
	HTTPS	443, 8084	TCP	8084	Clients, AICs	Licensing API
	HTTP	**8090 8098 8099**	**HTTP**	**8085-8099**	Clients, AICs	OpenLab Licensing view-only web UI (Flexera). Default is 8090. Other ports may be used if 8090 is in use.
	TCP	**27000-27009**	**TCP**	**27000-27009**	Clients, AICs	OpenLab Licensing (Flexera) Server
OLSS Server (REST API)	**HTTP**	**6625**	**HTTP**	**6625**	Clients, AICs	As of 2.7, called only by OpenLab Installer Shared Services REST API (SSL Termination) Licensing Support service REST API (SSL Termination)
	HTTPS	443	HTTPS	443	Clients, AICs	Shared Services REST API Licensing Support service REST API
CM Server[1]	HTTP	localhost: 8006	TCP	8006	Internal for CM	Content Management server
CM Server[1]	**HTTPS**	**8443**	**HTTPS**	**8443**	CM and Index Server	OpenLab Server website and REST APIs for index service **Required for secure system on 4-server and scalable only**
CM Search Service[3]	**HTTPS**	**8983**	**HTTPS**	**8983**	Index Server	Search Service (Index Server) **Required for secure system on 4-server and scalable only**
CM Server[1]	HTTP	localhost: 9083	HTTP	9083	Internal (accessed via Reverse Proxy only)	OpenLab Server website and REST APIs

Table 16 OpenLab Server/ECM XT firewall settings: inbound rules (continued)

	v2.7 or higher		v2.6 or earlier			
Application	**Protocol**	**Port**	**Protocol**	**Port**	**Remote System**	**Notes/Description**
Test Services (QualA) Web Site & REST APIs	**HTTPS**	**:443/testservices/ :443/openlab/ca**	**HTTPS**	**9092**	**Any**	Test Services (QualA) Web Service hosts REST APIs and Web site on this port. The port number can be changed using QualA Config tool. As of 2.7 the Test Services are registering with Reverse Proxy to use ports 80 and 443.
Test Services (QualA) Central Management Service	HTTPS	:443/openlab/testservicesserver/	HTTPS	:52088/openlab/testservicesserver/	Any	Central Management Service manages scheduling and email notifications for Test Services
Reverse Proxy Configuration Service[4]	HTTP	12876	HTTP	12876	Internal (accessible on localhost only)	Reverse Proxy Configuration Service hosts REST APIs to configure the Reverse Proxy Server (by programmatically modifying the configuration file). Currently, this modifies the Apache HTTPD server. Disabled after installation.
DCS[2] CertSvc[5] ATS OLSS Server	**HTTPS** **HTTPS**	**:443/openlab/dcs** **openlab/certservice/**	**HTTPS** **HTTPS**	**52088** **52088**	**Any**	Data Collection Service • Not required for secure systems. Certificate Service • Not required in a secure configuration for incoming traffic. • **Required for internal communication on secure systems.** Audit Trail Service • Not required for secure systems. Sample Scheduler Webserver **All:** **Required in secure systems for backwards compatibility with older clients/servers**

Table 16 OpenLab Server/ECM XT firewall settings: inbound rules (continued)

	v2.7 or higher		v2.6 or earlier			
Application	**Protocol**	**Port**	**Protocol**	**Port**	**Remote System**	**Notes/Description**
RabbitMQ Server	TCP	5671, 15671, 4369	TCP	5671, 15671, 4369	Any Any Server, Clients	AMQP Ports (https) RabbitMQ Management UI (https) Peer discovery service (used by RabbitMQ nodes and CLI tools) **Required in secure systems where application requires RabbitMQ**.
Sample Scheduler Webserver, Orchestrator, DB-Management	**HTTPS**	**443**	**HTTPS**	**52088**	**Any**	

1 C:\Program Files (x86)\Agilent Technologies\OpenLAB Data Store\tomcat\bin\tomcat8.exe

2 C:\Program Files\Agilent Technologies\OpenLab Data Collection Server\Bin\DataCollectionService.exe

3 C:\Program Files (x86)\Agilent Technologies\OpenLAB Data Store\java\bin\java.exe

4 C:\Program Files (x86)\Agilent Technologies\OpenLab Reverse Proxy Configuration Service\ConfigurationService\Agilent.OpenLab.ReverseProxy.ConfigurationService.exe

5 No program configured in Windows Firewall - exe path is: C:\Program Files\Agilent Technologies\OpenLab Certificate Service\ Bin\Agilent.OpenLab.CertService.CertServiceCore.exe

Outbound rules

Table 17 OpenLab Server and OpenLab Server/ECM XT firewall settings: outbound rules

Application	Protocol	Port	Remote System	Description
OLSS Server	TCP	25	Email Server	If email server uses a different port or uses secure ports, the destination port will be different.
	TCP/UDP	53	DNS Server	DNS
	TCP/UDP	67, 68	DHCP Server	DHCP or BootP
	TCP	137–139	NetBios WINS	For NetBios/Name resolution for NT Share
OLSS Server	TCP	389	LDAP Server	LDAP
	TCP	445	NAS/Share Server	Server Message Block (SMB). Used for storage on a remote NAS share
CM Server, OLSS	TCP	1433	SQL Server	Only when using MS SQL Server. Configurable.
CM Server, OLSS	UDP	1434	SQL Server	Only when using MS SQL Server. UDP.
CM Server, OLSS	TCP	1521	Oracle Server	Only when using Oracle Server. Configurable.
OLSS Server	TCP	3268	LDAP Server	Global Catalog LDAP
OLSS Server	TCP	3269	LDAP Server	Global Catalog LDAP SSL
CM Server, OLSS	TCP	5432	PostgreSQL Server	Only when using external PostgreSQL Server. Configurable.

ECM XT Add-ons

Table 18. ECM XT Add-ons: inbound rules

Application	Protocol	Port	Remote System	Description
Import Scheduler	HTTP	9091	Server, Services for CM	Import Scheduler communication port for Web UI and REST API
Import Scheduler	HTTPS	9093	Server, Services for CM	Import Scheduler communication port for Web UI and REST API

OpenLab CDS AICs

Inbound Rules

Table 19 OpenLab CDS AICs firewall settings: Inbound rules

	v2.7 or higher		v2.6 or earlier			
Application	**Protocol**	**Port**	**Protocol**	**Port**	**Remote System**	**Description**
OLSS Storage Client			TCP	2886	localhost	OpenLab Automation Service (Work Area, Buffered Upload)
OLSS Diagnostics	HTTPS (WCF)	443	TCP (WCF)	3424	Clients, AICs, Servers	Used for collecting troubleshooting logs
OLSS Storage Client	**HTTPS**	**443**	**HTTP**	**6628**	Clients	Remote Work Area REST API
Test Services (QualA) Web site & REST APIs	HTTPS	::443/ testservices / :443/ openlab/ca	HTTPS	9092	Any	Test Services hosts REST APIs and website on this port. The port number can be changed using the Test Services Config tool. As of 2.7 the Test Services are registering with Reverse Proxy to use ports 80 and 443.
Acquisition	**WS**	**:443/ openlab/ Acqusition Services**	**TCP (until CDS 2.5)**	**9753**	Clients	CDS 2.5 or earlier messaging communication Reverse proxy is not installed and communication is TCP based.
	WS	**:443/ openlab/ Acquisition Services/ {ID}**	**HTTPS**	**9753**	Clients	CDS 2.6 or later Messaging communication Reverse proxy is installed but dormant, so 9753 is used directly.
	HTTPS	443	HTTPS	443	Clients	CDS 2.7 or later - messaging communication Reverse proxy is installed and active; all incoming connections are routed through the proxy.
Sample Scheduler Agent	HTTPS	443	HTTPS	52088	Clients	CDS 2.7 or later - messaging communication Reverse proxy is installed and active; all incoming connections are routed through the proxy

Outbound Rules

Table 20. OpenLab CDS AICs firewall settings: Outbound rules

Application	Protocol	Port	Remote System	Description
	TCP/UDP	53	DNS Server	DNS
	TCP/UDP	67, 68	DHCP Server	DHCP or BootP
CM	TCP	80	OpenLab Server	OpenLab Server website and REST APIs
CM	TCP	443	OpenLab Server	OpenLab Server secure website and Secure REST APIs. Needed only if HTTPS is used.
OLSS Client API	HTTPS	443	OpenLab Server	OpenLab Shared Services WCF APIs
OLSS Licensing API	TCP	6570	OpenLab Server	OpenLab Licensing (Flexera) Server
Control Panel	HTTPS	443	OpenLab Server	Shared Services REST API Licensing Support service REST API
Control Panel	TCP	8084	Clients, AICs	Licensing API
Control Panel	TCP	8090, 8098,8099	OpenLab Server	OpenLab Licensing view-only Web UI (Flexera). Default is 8090. If 8090 is in use, other ports may be used.
Control Panel	TCP	27000–27009	OpenLab Server	OpenLab Licensing (Flexera) Server
OLCF Data Collection API, Data Collection Agent	HTTPS HTTP	443 6328	OpenLab Server	Data Collection Service, 6328 used as fallback only if https is not available
Sample Scheduler	HTTPS	443	OpenLab Server	Sample Scheduler, connection to Orchestrator service

See the **"Agilent instruments firewall settings: Inbound rules"** on page 33 and **"Agilent instruments firewall settings: Outbound rules"** on page 34 for additional ports that are used by an AIC to communicate with instruments. Firewalls on AICs must be configured to allow such traffic.

OpenLab CDS Clients

Inbound Rules

Table 21 OpenLab CDS Client firewall settings: Inbound rules

	v2.7 or higher		v2.6 or earlier			
Application	**Protocol**	**Port**	**Protocol**	**Port**	**Remote System**	**Description**
OLSS Storage Client			TCP	2886	localhost	OpenLab Automation Service
Control Panel	TCP	3424	TCP	3424	Clients, AICs, Servers	Used for collecting diagnostic logs.
Test Services (QualA) Service	HTTPS	9092	HTTPS	9092	Any	Test Services (QualA) Web Service hosts REST APIs and Web site on the port 9092[1]

1 It is not necessary to open this port in the firewall for the tool to work. Users can load the web UI and access REST APIs using https://localhost:9092/ from local system (client) itself. However if remote access it required, then this port should be open in firewall and users can access https://<client-fqdn>:9092/ from remote systems.

Note 1: Reverse Proxy is not available on Client systems.

Note 2: The port number can be changed using QualA Config tool.

Outbound Rules

Table 22. OpenLab CDS Client firewall settings: Outbound rules

Application	Protocol	Port	Remote System	Description
	TCP/UDP	53	DNS Server	DNS
	TCP/UDP	67, 68	DHCP Server	DHCP or BootP
	TCP	80	OpenLab Server	OpenLab Server website and REST APIs
	TCP	443	OpenLab Server	OpenLab Server secure website and Secure REST APIs. Needed only if HTTPS is used.
OLSS Licensing API	TCP	6570	OpenLab Server	OpenLab Licensing (Flexera) Server
OLSS Client API	HTTPS	443	OpenLab Server	OpenLab Shared Services WCF APIs
Control Panel	TCP	8084	Clients, AICs	Licensing Support service WCF API
Control Panel	HTTP	8090, 8098,8099	OpenLab Server	OpenLab Licensing view-only Web UI (Flexera). Default is 8090. Other ports may be used if 8090 is in use.
Control Panel	TCP	27000–27009	OpenLab Server	OpenLab Licensing (Flexera) Server
Acquisition	HTTPS	443	AIC	Agilent OpenLab remote work area. Client talks to AICs on this port.
Acquisition	TCP	9753	AIC	CDS 2.5 or earlier messaging communication
	HTTPS	9753	AIC	CDS 2.6 messaging communication
	HTTPS	443	AIC	CDS 2.7 or later messaging communication
OLCF Data Collection API, Data Collection Agent	HTTPS HTTP	443 6328	OpenLab Server	Data Collection Service, 6328 used as fallback only if https is not available.
Sample Scheduler	HTTPS	443	OpenLab Server, AIC	Sample Scheduler activation check
Sample Scheduler	TCP	5433	OpenLab Server	Sample Scheduler OLDR connection (only if activated, only if OLDR configuration)

Agilent Instruments

Inbound rules

Table 23. Agilent instruments firewall settings: Inbound rules

Protocol	Port	Remote System	Description
TCP, UDP	20	AIC, Workstation	FTP is required for some instruments
TCP	21	AIC, Workstation	FTP: GC/MSD - Firmware installation (FTP). Needs to be open from PC used to do FW update to instrument.
TCP	22	AIC, Workstation	SFTP: Firmware installation & SmartCard Trace (7000 series GC-Triple-Quad, 7200A GC-QTOF)
TCP, UDP TCP	23	AIC, Workstation	(Telnet) GC MSD Firmware Installation (SQ 597*, Triple-Quad 70**) Instrument communication (LC, CE)
UDP	69	AIC, Workstation	TFTP: Required for communication with legacy instruments (Jet Direct Cards)
TCP	111, 1007, 1024–1026	AIC, Workstation	LC/MS instrument communication GC MSD instrument communication
TCP	2883–2886 3068, 3071	AIC, Workstation AIC, Workstation	GC/MSD - Instrument control (proprietary/SunRPC/TCP)
TCP	4879	AIC, Workstation	Instrument communication (headspace)
TCP	5813	AIC, Workstation	GC/MSD - Firmware installation (ICMP/Ping)
TCP	5973	AIC, Workstation	GC/MSD - Instrument control (Proprietary/SunRPC/TCP)
TCP	7972, 7973	AIC, Workstation	GC/MSD Instrument Control
TCP	8194	AIC, Workstation	PAL3, data subscription
TCP	9001, 9002	AIC, Workstation	Instrument communication (GC/LC/CE)
TCP, Licop	9100	AIC, Workstation	Instrument communication (GC/LC/CE/35900)
TCP	9101, 9110	AIC, Workstation	Instrument communication (GC/LC/CE)
TCP	10000–10020	AIC, Workstation	Instrument communication (GC 78xx, 88xx, 9000)
TCP	30718	AIC, Workstation	Instrument utilities
TCP	55055-55057	AIC, Workstation	Instrument utilities
UDP	55065	AIC, Workstation	GC MSD - Instrument Control
TCP	60000	AID, Workstation	PAL XT

Table 23. Agilent instruments firewall settings: Inbound rules (continued)

Protocol	Port	Remote System	Description
TCP	61001	AIC, Workstation	Instrument utilities
TCP	64000, 64001	AIC, Workstation	PAL3 communication
TCP	64500	AIC, Workstation	PAL3, plain socket protocol

Outbound rules

Table 24. Agilent instruments firewall settings: Outbound rules

Protocol	Port	Remote System	Description
TCP/UDP	53	DNS Server	DNS
TCP/UDP	67, 68	DHCP Server	DHCP or BootP
TCP	7980-7983	AIC, Workstation	GC MSD - Reverse Slick

Domain Guidelines

Domains support the flow of information and user access rights across machines in the network. This means that all machines within the networked OpenLab Server/ECM XT server system must reside within the same domain or have the appropriate cross domain trusts to allow name-based communications between the client and server.

NOTE

Domain naming has to be consistent with RFC-1034.

When installing the OpenLab Server/ECM XT, you must log into the machine as a domain user that is a local administrator. This allows the OpenLab installer to apply network exceptions to the Windows firewall under the domain profile resulting in a functional system. The components necessary to support OpenLab Server/ECM XT on a domain are:

- **Domain controller -** broadcasts the domain name and negotiates access to machines
- **Domain name server (DNS) -** maintains records of what host names belong to which IP on the network. This component is always required for effective components communications in networked systems.
- **Active directory -** maintains the list of users and their access rights on the domain

NOTE

OpenLab Server/ECM XT server components may not be installed on the same machine as the domain controller.

The domain components above host many services and settings that must be configured appropriately to allow communication across machines. The following services and settings will need to be configured to fit your domain. Your internal IT group is responsible for proper configuration of any custom domain solution. These include settings for:

- Lookup zones and hostnames
- Group and security policies
- Subnet masks and virtual LANs

2 Appendix

Sales and Support Assistance

Please check the following web site for your local sales and support contact:

https://www.agilent.com/en/support

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