



OpenLab ChemStation

## Hardware and Software Requirements

# Notices

## Document Information

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## Software Revision

This guide is valid for revision LTS 01.11 of Agilent OpenLab ChemStation.

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## In this Guide...

This document details the minimum network, hardware and software settings required to successfully work with revision LTS 01.11 of OpenLab ChemStation.

It contains information on ChemStation Workstations, Analytical Instrument Controllers, and on the OpenLab Shared Services Server.

Unless stated otherwise, these requirements apply to both the Value Line (VL) Edition of OpenLab ChemStation and the full OpenLab ChemStation.

**Table 1** Terms and abbreviations used in this document

Term	Description
AIC	Agilent's Analytical Instrument Controller
ChemStation	OpenLab ChemStation
Control Panel	OpenLab Control Panel
Microsoft Control Panel	Part of the Microsoft Windows operating system
LTS	Long-term Support

## **1 Hardware Requirements**

This chapter contains the hardware requirements for the different components of a ChemStation system.

## **2 Software Requirements**

This chapter contains the software requirements for the different components of a ChemStation system.

## **3 Network Requirements**

This chapter describes the network requirements that must be met in order to support the environmental computing needs.

## **4 Software Compatibility**

In this Chapter you learn about compatibility during upgrade, details on mixed configurations in distributed systems, and to other Agilent software.

## **5 Licensing**

This chapter details on Licensing aspects.

## **6 System Preparation Tool**

The System Preparation Tool (SPT) checks and applies Windows settings on your machine.

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# 1

## Hardware Requirements

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This chapter contains the hardware requirements for the different components of a ChemStation system.

Depending on the type of installation, you may need different hardware components. For more details on the components in each topology, see [“System Topologies”](#) on page 56.

## PC Recommendations

### ChemStation Workstations

**Table 2** Minimum recommended hardware configuration (ChemStation workstations)

Item	HW requirements
Processor speed (CPU)	3 GHz Dual Core
Physical memory (RAM)	4 GB (Windows 10, single instrument) 8 GB (Windows 10, multi-instrument or MSD) 8 GB (Windows 11)
Hard disc	160 GB, SSD recommended (20 GB for the software plus disk space for data, see "Disk Space" on page 13)
Graphic resolution	17": 1280x1024 resolution (SXGA) (recommended: 19", 1440 x 900) Scalings other than 100% are not supported. High resolution (e.g., 1920x1080) settings are not recommended.
Removable media	USB Port
Pointing device	Required, no support for touchscreen functionality
Network	100/1000 LAN <sup>1</sup>
Printer	High capacity laser jet printer, e.g. HP Laserjet M507dn
Operating System	see "Stand-Alone Workstation or Networked Workstation" on page 17

<sup>1</sup> A second LAN interface is recommended to isolate the instrument's data traffic.



## ChemStation AIC

**Table 3** Minimum recommended hardware configuration for ChemStation AIC

Item	HW requirements
Processor speed (CPU)	Single Processor with 6 cores, 1.8 GHz or 2x Quad Core 1.8 GHz
Physical memory (RAM)	24 GB
Hard disc	2x 250 GB, SSD recommended (20 GB for the software plus disk space for data, see “Disk Space” on page 13)
Graphic resolution	17": 1280x1024 resolution (SXGA) <sup>1</sup>
Removable media	USB Port
Pointing device	Required, no support for touchscreen functionality
Network	100/1000 LAN <sup>2</sup>
RS-232 port	1 serial port required if instruments are using RS-232 communication. See instrument specifications for details.
Operating System	see <a href="#">Table 8</a> on page 19

<sup>1</sup> For installation, administration, and failover mode.

<sup>2</sup> A second LAN interface is recommended to isolate the instrument's data traffic.

## ChemStation Client

**NOTE**

For troubleshooting purposes, it is highly recommended to have at least one Agilent ChemStation bundle PC operating as a ChemStation client. This PC should be kept as a reference to identify client PC hardware-related display and performance problems.

**Table 4 Minimum hardware configuration for ChemStation clients in a Distributed System**

Item	HW requirements
Processor speed (CPU)	3 GHz Dual Core
Physical memory (RAM)	4 GB minimum 8 GB recommended with co-existent software
Hard disc	160 GB
Graphic resolution	17": 1280x1024 resolution (SXGA) (recommended: 19", 1440 x 900) Scalings other than 100% are not supported. High resolution (e.g., 1920x1080) settings are not recommended.
Removable media	USB Port
Pointing device	Required, no support for touchscreen functionality
Network	100/1000 LAN
Operating System	See "Client in a Distributed System" on page 20

## Shared Services Server

**Table 5** Minimum hardware requirements for a Shared Services Server

Item	HW requirements
Processor speed (CPU)	3 GHz Dual core
Physical memory (RAM)	12 GB (64-bit)
Hard disc	160 GB
Network	100/1000 mbps

## Dedicated Servers

For the server-based products (e.g. OpenLab Shared Services Server, ChemStation AIC), Agilent recommends using dedicated servers to avoid conflicts with other applications and optimize performance. Consult with your Agilent support representative to decide which hardware and topology is appropriate for your needs.

In case of OpenLab ECM 3.x systems, separate OpenLab Shared Services servers are required per ECM Account.

## Number of Instruments

### ChemStation Workstation

There is a limit to the number of instruments (for example, GCs, LCs or CEs) that can be concurrently controlled by an ChemStation workstation:

- GC, LC (2D): 4 instruments
- LC (3D): 2 instruments
- CE: 2 instruments
- LC/MS, CE/MS: 1 instrument

Each instrument may consist of several modules, as in the case of Agilent modular LC systems. The recommended maximum number of modules depends on the types of modules and the exact configuration. Agilent recommends to not exceed a maximum of 18 modules (12 standard modules plus 6 CAN-slave modules such as valves or UIB interfaces). See the Configuration Guide (CDS\_CS\_configure.pdf) for more detail.

#### NOTE

Interactive data reprocessing is not recommended when acquiring data in a three- or four-instrument configuration on a workstation or an AIC at full load (for example, 7–10 2D instruments).

On a ChemStation VL Workstation, you can configure 1 GC or 1 LC with specific modules. For details on the configurable modules, please refer to the *Supported Instruments and Firmware Guide*.

### ChemStation AIC

There is a limit to the number of instruments (for example, GCs, LCs or CEs) on a ChemStation AIC. The instrument capacity (number of configurable instruments) per AIC depends on the type of instrument configured. Work with your Agilent representative to ensure your system is configured sufficiently for your projected number of users, concurrent sessions, instruments, and load. ChemStation supports instruments and modules connected via LAN.

There is no limit to the number of AICs in a distributed system.

## Disk Space

Disk space requirements should be adjusted based on the number and type of instruments and archival periodicity. Agilent recommends providing enough disk space for one year of lab operation, in addition to the operating system and OpenLab ChemStation requirements

**Table 6** Typical expected file sizes

	Run time	Description	Expected data size
2D data	60 min	10 Hz, 2 channel data	~600 KB
3D data	60 min	10 Hz, 5 channel data, plus spectra at 1 nm resolution from 200 to 400 nm	~30 MB
LC/MS data	60 min	Scan mode	~30 MB



## 2

# Software Requirements

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This chapter contains the software requirements for the different components of a ChemStation system.

## General Software Requirements

The following software is needed to operate the ChemStation or one of its components.

Software	Notes
PDF reader	<p>A PDF Reader is required to view site prep or administrative reports, to use the Report Viewer Feature, or to view the documentation (<b>Start &gt;All programs &gt;Agilent Technologies &gt;Documentation and Learning</b>).</p> <p>Provided with this revision: Adobe Acrobat Reader 2020</p> <div style="background-color: #cccccc; padding: 5px; text-align: center;"><b>NOTE</b></div> <p>If an older version of Acrobat Reader (lower than 2020) or a Reader version from the <i>DC Continuous</i> track is installed on your system, you must uninstall it first. Otherwise, the installation would result in an Acrobat Reader version that pushes automatic updates on a regular basis.</p>
PDF writer	<p>Installation by ChemStation core component installer: PDF XChange 6.0</p>
Web browser	<p>Microsoft Edge</p> <p>A web browser must be installed to open the <b>Documentation and Learning</b> page. It is also required by content management systems as a content browser.</p>

## Power Management and Screen Savers

In general, screen savers should not be used together with the ChemStation. Simple screen savers such as blank screen may be used. OpenGL screen savers must not be used.

Screen savers can cause undue loading of the CPU that may result in the loss of data from the GC during high data collection periods. Translucent windows themes can cause graphic artifacts in various ChemStation screens like Online Plot or Data Analysis. To avoid these effects, disable the taskbar transparency in the Windows color settings.

Advanced power management features of the PC BIOS must be disabled for systems that have to perform instrument control and data acquisition.

Disable any Energy Save features for any Energy Star compliant PC to prevent the loss of data during high data collection periods. Problems may also be exhibited by I/O error with the instruments. I/O errors will result in the loss of data. They can be found in the log book.

## Co-Residence with UV-Vis ChemStation Software

ChemStation for GC, LC, CE, A/D, CE/MS, and LC/MS, revisions C.01.xx are not supported for co-execution or co-installation with Agilent ChemStation for UV-visible Spectroscopy.



## Operating Systems

### Language Compatibility

Localized versions of ChemStation are supported on localized language versions of Windows operating systems. ChemStation User interfaces are displayed in the language of the Windows operating system for the following languages:

- English
- Chinese
- Japanese

Non-localized instrument drivers are supported; They will appear in English even when running localized versions of OpenLab ChemStation.

Customized locale settings might be required for Non-Agilent drivers. Please check the localization statement in the driver documentation.

### Stand-Alone Workstation or Networked Workstation

Table 7 Supported Operating Systems for ChemStation Workstations

Operating System or .NET	C.01.07 SR1/SR2	C.01.07 SR3/SR4	C.01.08	C.01.09	C.01.10	LTS 01.11
Windows 11 Pro /Enterprise	✗	✗	✗	✗	✗	✓ 21H2
Windows 10 Pro /Enterprise	✗	✓	✓	✓	✓ 21H2 21H1 20H2 2004 1903 <sup>2</sup> 1909 1809 1903 <sup>2</sup> 1809 1803 <sup>1</sup> 1709 1703 1607 1511	✓ 21H2

**Table 7 Supported Operating Systems for ChemStation Workstations**

Operating System or .NET	C.01.07 SR1/SR2	C.01.07 SR3/SR4	C.01.08	C.01.09	C.01.10	LTS 01.11
Windows 10 Enterprise LTSC or LTSB <sup>3</sup>	✗	✓	✓	✓ 2019 (1809) 2016 (1607) 1507	✓ 2019 (1809) 2016 (1607) 1507	✓ 21H2
Windows 8 Enterprise or Professional	✓ 8.1	✓ 8.1	✗	✗	✗	✗
Windows 7, 64 bit, Enterprise or Professional <sup>1</sup>	✓ SP1	✓ SP1	✓ SP1	✓ SP1	✓ SP1	✗
Windows 7 SP1, 32 Enterprise or Professional <sup>1</sup>	✓ SP1	✓ SP1	✗	✗	✗	✗
.NET Framework						6.0
		4.6.1 and 3.5.1 SP1 <sup>4</sup>	4.7.1 and 3.5.1 SP1 <sup>4</sup>	4.7.1 and 3.5.1 SP1 <sup>4</sup>	4.8 and 3.5.1 SP1 <sup>6</sup> 4.7.2 and 3.5.1 SP1 <sup>6</sup>	5.0 <sup>7</sup> 4.8 3.5.1 SP1 <sup>6</sup>
		4.5.2 and 3.5.1 SP1 <sup>4</sup>	4.6.1 and 3.5.1 SP1 <sup>4,5</sup>	4.6.1 and 3.5.1 SP1 <sup>4,5</sup>		

<sup>1</sup> Adobe Acrobat Reader version 17.011.30138 with Windows 7 Professional or Windows 10 1803 Enterprise: You need to deactivate "Protected Mode" in Acrobat Reader.

<sup>2</sup> With 1903 the Net.TCP Port Sharing Service must be enabled by running the PowerShell command "Enable- WindowsOptionalFeature -online -All -FeatureName WCF-TCP-Activation45"

<sup>3</sup> Long Term Servicing Channel: see <https://docs.microsoft.com/en-us/windows/whats-new/ltsc/>

<sup>4</sup> Required by master installer, Site Prep Report, Shared Services GC instrument drivers, ECM 3.4 and 3.5 API wizard

<sup>5</sup> Windows 7 only

<sup>6</sup> Required by Shared Services, 35900E instrument drivers, ECM 3.4 and 3.5 API wizard

<sup>7</sup> no WCF support

## Analytical Instrument Controller (AIC)

Table 8 Supported Operating Systems and .Net for ChemStation AICs

Component	C.01.07 SR3/SR4	C.01.08	C.01.09	C.01.10	LTS.01.11
Windows Server 2019	✗	✗	✗	✓ <sup>1</sup>	✓
Windows Server 2016 Standard or Datacenter	✗	✗	✓	✓	✗
Windows Server 2012 R2 <sup>2</sup> Standard or Datacenter	✓	✓	✓	✓	✗
Windows Server 2008 R2 SP1 Enterprise or Standard	✓	✗	✗	✗	✗
.NET Framework	4.5.2 and 3.5.1 SP1 <sup>3</sup>	4.6.1 and 3.5.1 SP1 <sup>3</sup>	4.7.1 and 3.5.1 SP1 <sup>3</sup>	4.8 and 3.5.1 SP1 <sup>4</sup> 4.7.2 and 3.5.1 SP1 <sup>4</sup>	6.0 5.0 4.8 3.5.1 SP1 <sup>4</sup>
TLS-1.2 support	✗	✗	✗	✗	✓

<sup>1</sup> C.01.10 Update 3 is recommended when working with built-in user accounts and default password length policies of Windows 2019.  
Note: For installation of a Shared Services server v3.4 or higher use the OpenLab CDS 2.5 (or higher) installation media

<sup>2</sup> With Windows hotfix KB2999226

<sup>3</sup> Required by master installer, Shared Services and LC and GC instrument drivers

<sup>4</sup> Required by Shared Services, 35900E instrument drivers, ECM 3.4 and 3.5 API wizard

## Client in a Distributed System

Table 9 Supported Operating Systems for ChemStation Clients

Operating System or .NET	C.01.07 SR1/SR2	C.01.07 SR3/SR4	C.01.08	C.01.09	C.01.10	LTS 01.11
Windows 11 Pro / Enterprise	✗	✗	✗	✗	✗	✓ 21H2
Windows 10 Pro / Enterprise	✗	✓	✓	✓	✓	✓ 21H2
					2004 1909 1903 <sup>2</sup> 1809 1803 <sup>1</sup>	
		1607 1511	1803 <sup>1</sup> 1709 1703 1607 1511	1903 <sup>2</sup> 1809 1803 <sup>1</sup> 1709 1703		
Windows 10 Enterprise LTSC or LTSB <sup>34</sup>	✗	✓	✓	✓	✓	✓ 21H2
		1507	1507	2019 (1809) 2016 (1607) 1507	2019 (1809) 2016 (1607) 1507	
Windows 8 Enterprise or Professional	✓ 8.1	✓ 8.1	✗	✗	✗	✗
Windows 7, 64-bit, Enterprise or Professional <sup>1</sup>	✓ SP1	✓ SP1	✓ SP1	✓ SP1	✓ SP1	✗
Windows 7, 32-bit Enterprise or Professional <sup>1</sup>	✓ SP1	✓ SP1	✗	✗	✗	✗
Windows Server 2019	✗	✗	✗	✗	✓	✓
Windows Server 2016	✗	✗	✗	✓	✓	✗
Windows Server 2012 R2	✗	✓	✓	✓	✓	✗

**Table 9 Supported Operating Systems for ChemStation Clients**

Operating System or .NET	C.01.07 SR1/SR2	C.01.07 SR3/SR4	C.01.08	C.01.09	C.01.10	LTS 01.11
Windows Server 2008	✓	✓	✗	✗	✗	✗
.NET Framework		4.6.1 and 3.5.1 SP1 <sup>5</sup>	4.7.1 and 3.5.1 SP1 <sup>5</sup>	4.7.1 and 3.5.1 SP1 <sup>5</sup>	4.8 and 3.5.1 SP1 <sup>7</sup> 4.7.2 and 3.5.1 SP1 <sup>7</sup>	6.0 5.0 <sup>8</sup> 4.8 3.5.1 SP1 <sup>5</sup>
Remote desktop protocol		4.5.2 and 3.5.1 SP1 <sup>5</sup>	4.6.1 and 3.5.1 SP1 <sup>5,6</sup>	4.6.1 and 3.5.1 SP1 <sup>5,6</sup>	8.1	8.1 Supported

<sup>1</sup> Adobe Acrobat Reader version 17.011.30138 with Windows 7 Professional or Windows 10 1803 Enterprise: You need to deactivate "Protected Mode" in Acrobat Reader.

<sup>2</sup> With 1903 the Net.TCP Port Sharing Service must be enabled by running the PowerShell command "Enable- WindowsOptionalFeature -online -All -FeatureName WCF-TCP-Activation45"

<sup>3</sup> For LTSB, see <https://docs.microsoft.com/en-us/windows/release-health/release-information>

<sup>4</sup> For LTSC (Long Term Servicing Channel): see <https://docs.microsoft.com/en-us/windows/whats-new/ltsc/>

<sup>5</sup> Required by master installer, Site Prep Report, Shared Services GC instrument drivers, ECM 3.4 and 3.5 API wizard

<sup>6</sup> Windows 7 only

<sup>7</sup> Required by Shared Services, 35900E instrument drivers, ECM 3.4 and 3.5 API wizard

<sup>8</sup> no WCF support

## OpenLab Shared Services Server

Shared Services is a set of administrative services that control, for example, the security policy and the central configuration of OpenLab Software, and is accessed through the Control Panel.

### NOTE

In case there are multiple versions available, the OpenLab ChemStation installer checks for the installed server version and installs the client version matching the server version. If the server is newer, you will get a warning concerning a potential incompatibility. In this case refer to the compatibility information provided in section “[Shared Services Compatibility](#)” on page 42.

The following requirements are valid for a standalone Shared Services Server, that may be used for Networked Workstations or in a Distributed System with CDS or ChemStation clients.

**Table 10 Operating Systems compatible with OpenLab Shared Services server**

OpenLab Shared Services version		3.4	3.5	3.6
Operating System	Windows Server (64 bit) Standard or Enterprise	2016 <sup>1</sup>	2019 2016 <sup>1</sup>	2019 <sup>1,2</sup>
.NET (64 bit)	.NET Framework <sup>3</sup>	4.7.2 or higher 3.5.1	4.7.2 or higher 3.5.x	4.7.2 or higher 3.5.x

<sup>1</sup> An in-place upgrade from Windows Server 2016 to 2019 is supported with Openlab Shared Services version 2.3 or higher.

<sup>2</sup> If you want to upgrade an Openlab Shared Services server that is connected to OpenLab ECM, and you want to keep a Windows Server 2016 R2 system: Use the OpenLab CDS installation media to upgrade the OpenLab Shared Services server.

<sup>3</sup> Both Frameworks are required. 4.x will be installed by the OpenLab installer if needed

Agilent OpenLab Shared Services manage information using a database. For compatibility see [Table 11](#) on page 23. The database is created and configured automatically during the OpenLab Shared Services server installation.

Upgraded systems are supported with their existing database. On environments with more than ten instruments, upgrade SQLServer Express to a supported version for improved performance.

**Table 11 OpenLab Shared Services server compatibility with Databases**

OpenLab Shared Services version	2.1 / 2.2	2.3 /3.0	3.2	3.4	3.5	3.6
MS SQL Server Standard or Enterprise (64 bit)	2014 2012 R2 SP2	2014 2012 R2 SP2	2017 2016 SP2 2014 SP2 2012 R2 SP4	2019 2017 2016 SP2 2014 SP2	2019 2017 2016 SP2 2014 SP2	2019 2017 2016 SP2
Oracle (64 bit)	12c R1	12c R2 12c R1	12c R2 12c R1	18c 12c R2	18c 12c R2	19c
PostgreSQL (64 bit)	9.3	10.3 9.4.4 9.3	10.3 9.3	12.2 11.5 10.3	13.1 12.2 11.5 10.5	14.1

**NOTE**

Agilent strongly recommends that you store database files and transaction logs (when applicable) on physically exclusive hard drives.

## VMWare Support

Though Agilent has been testing and is confirming the reliability of ChemStation on VMWare Agilent doesn't support issues in conjunction with this platform. Customers using this technique must provide their own properly trained and adequately skilled personnel.

Workstations and Clients may be virtualized using VMWare vSphere 6.x.

When using virtual machines as instrument controllers, confirm that the virtual network connection allows access to other system components with no routing between instruments and the instrument controller.

Virtualization of instrument controllers introduces a risk to data buffering functions for the system. In the event of a network failure, the connection to the instrument will be severed and acquisitions in progress will fail. To avoid this scenario use physical instrument controllers.

Strictly adhere to the ChemStation requirements. They also apply to virtual machines.

Further settings are recommended. For additional information, refer to the technical note 5994-3609EN, *Virtualizing OpenLab CDS Client/Server Systems*.





# 3

## Network Requirements

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This chapter describes the network requirements that must be met in order to support the environmental computing needs.

## Introduction

OpenLab ChemStation systems rely on network infrastructure in order to support the communication between various system nodes. This communication is based on standard TCP/IP protocols. In order to provide optimum performance and uptime, the network must meet design criteria for available bandwidth, IP address assignment, name resolution and appropriate isolation of the lab subnet from the corporate network.

## Network Isolation

Agilent recommends that Client/Server systems are isolated from network environments that experience frequent failures due to faulty switching, viruses, or worms. If network isolation is not possible, it is recommended that you reconfigure the machines and disconnect them from the problematic network until these issues can be resolved.

On an isolated network, name resolution services must be hosted by a separate machine to enable proper communications between system components by name. An isolated network is physically completely isolated so that no LAN switch connections on the network are shared with the corporate network infrastructure. [Figure 1](#) on page 27 shows a simple client/server topology with OpenLab ChemStation. In this example, the connection highlighted in red prevents isolation of the system.

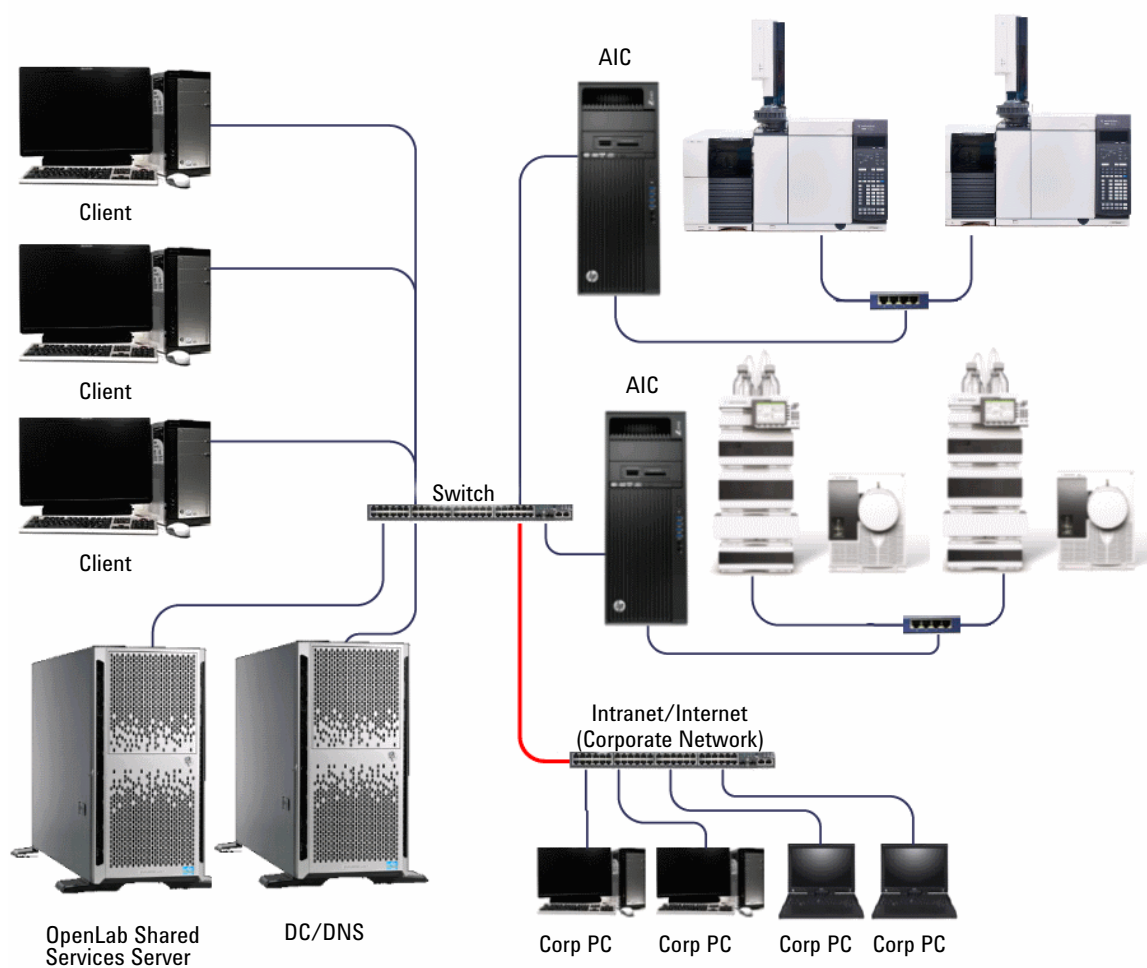


Figure 1 Sample client/server topology: Network Isolation

## Databases

For systems configured to use a database external to the OpenLab Shared Services Server, the network separation between the database and the Shared Services Server must be minimized for best performance. The database and shared services server should be physically connected to the same switch for optimal performance.

## LAN Connectivity

When using LAN communications to connect workstations or instrument controllers to an instrument, use one of these methods:

- Directly connect the instrument using a crossover CAT-5 (or higher quality) cable
- Connect via an isolated switch (see “[Network Isolation](#)” on page 26) using standard CAT-5 (or higher quality) network cabling
- Use professional switches only instead of consumer products as those often do not provide the enhanced protocol features for performance optimization

LAN communication hardware should be 100/1000 mbps speed capable. Do *not* team LAN cards for instrument communications.

## LAN Power Management

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

Windows may be set to turn instruments/components off to save power while sleeping or hibernating. To change this setting:

- 1 In the Microsoft Control Panel, open the **Network and Sharing Center**<sup>1</sup>.
- 2 Select **Change adapter settings**. Right-click **Local Area Connection >Properties >Configure**.
- 3 Select the **Power Management** tab.
- 4 Clear the **Allow the computer to turn off this device to save power** check box.

<sup>1</sup> View the items by icon to see a list of all items.

## Firewall Settings

Following is a list of ports used by the ChemStation. These ports are required to be opened in order for the OpenLab software applications to communicate. The ports for ChemStation are programmed into the Windows Advanced Firewall for the active profile during installation. The exception to this is some of the instrument communication ports. These ports must be configured on other software/hardware firewalls being used. The ports for Oracle, SQL Server and PostgreSQL databases and ECM are not configured by the installation. Depending on your firewall configuration this list may not be all inclusive of the configurations that are required for the software to function correctly. In addition, many applications contact a server on the listed (listener) port but transfer information using a dynamically allocated port.

A domain service user account is also required for inter-server communication. It is required that this account be set explicitly to have local Administrative privileges on the OpenLab CDS Shared Services, ECM, and OpenLab servers. In some cases it may also be required to have local Administrative privileges on the clients.

### ChemStation Workstation, AIC, or Client

Please see the [Table 13](#) on page 31 and [Table 14](#) on page 32 for ports used for instrument communication.

**Table 12 ChemStation Workstation, AIC, or Client**

Protocol	Port	System	Description
TCP, UDP	53	AICs, Workstations, Clients	DNS
TCP	80	AICs, Workstations, Clients	HTTP
TCP	443	AICs, Workstations, Clients	HTTPS
TCP	445	AICs, Workstations, Clients	Server Message Block (SMB)
TCP	2886	AICs, Workstations, Clients	OpenLab Automation Services
TCP	3389	AICs, Clients	Microsoft RDP
TCP	3424	AICs, Workstations, Clients	OpenLab Diagnostics Tools
TCP	5002	AICs, Workstations, Clients	Network Assessment Tool (NAT)
TCP	6570	AICs, Workstations, Clients	OpenLab Licensing Support (Flexera)
TCP	6577	AICs, Workstations, Clients	OpenLab Shared Services
TCP	6624	AICs, Workstations, Clients	OpenLab REST API
TCP	7000	AICs, Workstations, Clients	Network Assessment Tool (NAT)
TCP	8080	AICs, Workstations, Clients	OpenLab Licensing Support (Flexera)
TCP	8084	AICs, Workstations, Clients	OpenLab Licensing Support (Flexera)
TCP	(8085-8090)	AICs, Workstations, Clients	OpenLab Licensing alternates
TCP	8090	AICs, Workstations, Clients	OpenLab License web UI
TCP	9753	AICs, Workstations, Clients	Messaging communication
TCP	(11121-11141)	AICs, Workstations, Clients	Agilent Compliance Engine (ACE)
TCP	22943	AICs, Workstations, Clients	Network Assessment Tool (NAT)
TCP	(27000-27009)	AICs, Workstations, Clients	OpenLab Licensing Support (Flexera)

### Agilent Instruments

**Table 13** Instruments - Inbound Rules

Protocol	Port	Remote System	Description
TCP, UDP	20	AIC, Workstation	(FTP) GC MSD Firmware installation (SQ 597*, Triple-Quad 70**)
TCP	21	AIC, Workstation	
TCP	22	AIC, Workstation	(SFTP) Firmware installation & SmartCard Trace for some instruments (e.g. 7000 series GC-Triple-Quad, 7200A GC-QTOF)
TCP, UDP	23	AIC, Workstation	(Telnet) GC MSD Firmware installation (SQ 597*, Triple-Quad 70**)
UDP	69	AIC, Workstation	(TFTP) Required for communication with legacy instruments (Jet Direct Cards)
TCP	111, 1004, 1007, 1024-1026	AIC, Workstation	LC/MS instrument communication GC MSD instrument communication
TCP	2883-2886 3068, 3071	AIC, Workstation	GC MSD instrument control (5975, 5973 MSD) (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 (597* MSD): Slick protocol
TCP	8194	AIC, Workstation	PAL3, data subscription
TCP	9001, 9002	AIC, Workstation	Instrument communication (GC, LC)
TCP	9100	AIC, Workstation	Instrument communication (GC, LC, 35900)
TCP	9101, 9110	AIC, Workstation	Instrument communication (GC, LC)
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	AIC, Workstation	PAL XT communication
TCP	61001	AIC, Workstation	Instrument utilities

**Table 13** Instruments - Inbound Rules

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

**Table 14** Instruments - Outbound Rules

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

### Dynamic Ports

**Dynamic Ports:** used for temporary communications between clients. The ports used depend on the operating system in use and are configurable. See the operating system documentation for more information.

### Additional Settings for Distributed Systems

For information on the ports used by the data backends, refer to the respective requirements guides.



## Domain Requirements

Domains support the flow of information and user access rights across machines in the network. This means that all machines within the Networked or Distributed OpenLab ChemStation system must reside within the same domain or have the appropriate cross domain trusts to allow name based communications between all components in the system. In the case of a workstation installation, domains are only relevant if you are using a Windows domain-based authentication model or the number of Networked Workstations is bigger than five. In this case the workstation or client must always be able to communicate with domain components in order to function as expected.

Installing OpenLab ChemStation will apply network exceptions to the Windows firewall under the domain profile to result in a functional system. The components necessary to support ChemStation on a domain are:

- *Domain controller* – broadcasts the domain name and negotiates access to machines.
- *Domain name server (DNS)* – maintains records of what hostnames 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**

The domain name server (DNS) must be able to resolve the IPv4 address of all instrument controllers and instruments. Any unresolved instrument controller or instrument will disrupt the functionality of OpenLab resulting in errors or delays. IPv6 is not supported and must be deactivated.

**NOTE**

ChemStation components may not be installed on the same machine as the domain controller.

The domain components above host a variety of 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 solutions. These include settings for:

- Lookup zones and hostnames
- Group and security policies
- Subnet masks and Virtual LANs
- IP reservation (static or DHCP)

## Environments with Proxy Servers

The servers in your environment (for example: Shared Services server, license server) must be accessible via http or https in the network. If you use proxy servers, make sure that accessing the servers is possible. If required, adjust the proxy settings.

### Important Notes

- TCP/IP networking is required for all products.
- WANs (wide area networks) are not supported.



## 4

# Software Compatibility

Mixed Environments with ChemStation and OpenLab CDS 36

Configurations with OpenLab ECM 39

Configurations with OpenLab Server / OpenLab ECM XT 40

Other Supported Agilent Software 41

Shared Services Compatibility 42

Backward Compatibility During Upgrade 44

In this Chapter you learn about compatibility during upgrade, details on mixed configurations in distributed systems, and to other Agilent software.

## Mixed Environments with ChemStation and OpenLab CDS

OpenLab ChemStation and OpenLab CDS are supported in mixed environments when connected to a shared storage. All Analytical Instrument Controller (AICs) and Clients of the chromatography data systems need to be compatible with the server product hosting the OpenLab Shared Services.

Each distributed system may be on its own native client-side version of Shared Services for AIC and Client installs. The client-side Shared Services version for ChemStation may be different from the one for OpenLab CDS. As long as the products or the Shared Services are compatible with the same version of the data management product they can be mixed: see [“Shared Services Compatibility”](#) on page 42.

### NOTE

If the system includes OpenLab Server /OpenLab ECM XT the OpenLab Server is delivered with and hosts the Shared Services. Systems with OpenLab ECM require one or several Shared Services Server installations.

OpenLab ChemStation Clients/AIC of versions LTS 01.11 can be configured with OpenLab CDS with the following server products:

- OpenLab Server v2.5/OpenLab ECM XT v2.5
- OpenLab Server v2.6/OpenLab ECM XT v2.6
- OpenLab Server v2.7/OpenLab ECM XT v2.7
- OpenLab ECM 3.6 Update 4
- OpenLab ECM 3.5 Update 6

**Routine work** During routine work, use the ChemStation clients to access instruments that are controlled by a ChemStation AIC, and use OpenLab CDS clients to access instruments controlled by an OpenLab CDS AIC.

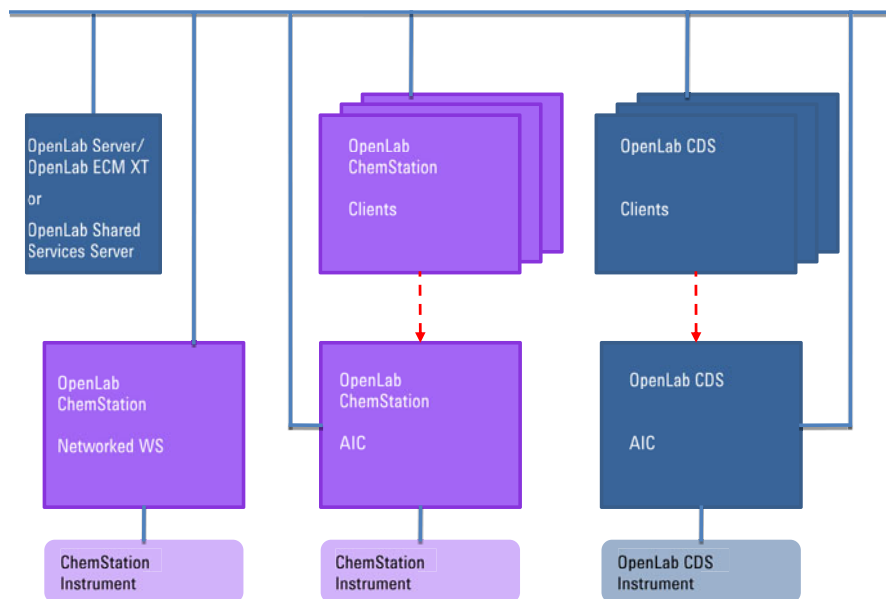
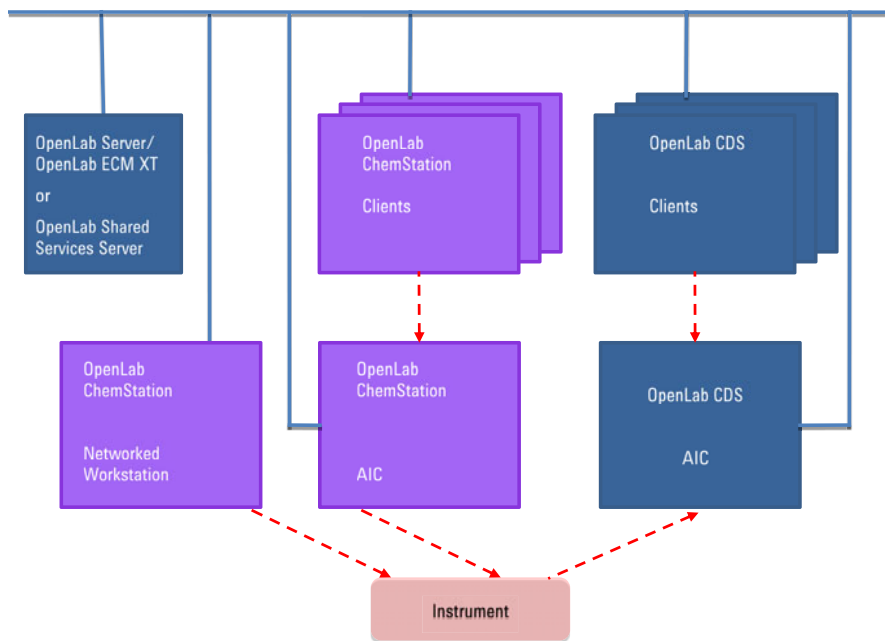


Figure 2 Routine work with OpenLab ChemStation and OpenLab CDS



**Migration** The mixed environment allows to transfer your acquisition method setpoints from OpenLab ChemStation systems to OpenLab CDS. The transfer is one-way only. After transferring, you can use the ChemStation method on OpenLab CDS. You cannot transfer acquisition methods from OpenLab CDS to OpenLab ChemStation, or process OpenLab CDS data in ChemStation.



**Figure 3** Transfer of method setpoints from OpenLab ChemStation to OpenLab CDS



- 1 Configure the same instrument on both ChemStation AIC and OpenLab CDS AIC.
- 2 Start the instrument from a ChemStation Client, and upload the acquisition method setpoints to the instrument. Close the ChemStation (a simple disconnect is not sufficient).
- 3 Start the same instrument from the OpenLab CDS Client, and download the acquisition method setpoints from the instrument. Save with a new method name.

Close the instrument connection before starting it again from a ChemStation Client.

Mixed environment require careful use, to avoid instrument access from different systems.

**CAUTION****Instrument access from different systems****The instrument may become inaccessible**

- ✓ **Always launch and close instruments from the same system. Do not launch an instrument from ChemStation and close it from OpenLab CDS, or vice versa.**

## Configurations with OpenLab ECM

Sharing of data in a mixed environment with OpenLab ChemStation LTS 01.11 AICs/clients and OpenLab CDS AICs/clients is supported. Agilent recommends to connect them to independent Shared Services servers. These can have different versions as long as they are compatible with the ECM 3.x server and with the chromatography data system clients or AICs connected to them.

OpenLab ChemStation LTS 01.11 as well as OpenLab ChemStation C.01.10 are supported with the following OpenLab ECM versions:

- OpenLab ECM 3.6 Update 4
- OpenLab ECM 3.5 Update 6

For details on the compatibility between ChemStation and OpenLab Shared Services Server versions, see [“Shared Services Compatibility”](#) on page 42.

See the OpenLab CDS guide *Configuring OpenLab CDS with OpenLab ECM* for details on configuring the Shared Services Servers and how to work with existing ChemStation data.

## OpenLab ECM Add-ons and Options

The compatibility to Add-ons 3.5 and 3.6 are not explicitly tested. However, there are no direct technical dependencies from ChemStation to the ECM add-ons. The risk that the coexistence between ChemStation and ECM add-ons fails is proven as very low. There are no issues reported throughout Agilent's installed base.

OpenLab ECM Intelligent Reporter (Client) A.02.04 or A.02.05 is not supported.

## Configurations with OpenLab Server / OpenLab ECM XT

Sharing of data in a mixed environment is supported in the following configurations:

	OpenLab Server/OpenLab ECM XT					
	2.2	2.3	2.4	2.5	2.6	2.7
ChemStation LTS 01.11	-	-	-	Yes	Yes	Yes
ChemStation C.01.10	Yes	Yes	Yes	Yes (Update 3)	Yes (Update 4)	-
ChemStation C.01.09	Yes	Yes	Yes	-	Yes (Update 2)	

### NOTE

The Shared Services Server needs to be compatible to the OpenLab ChemStation version. See ["Shared Services Compatibility"](#) on page 42

In this configuration all instruments are visible on any client or networked workstation. The data storage is provided by OpenLab Server/OpenLab ECM XT. ChemStation and OpenLab CDS environments share the same storage.



## Software Compatibility

### Other Supported Agilent Software

Use an instrument structure in the OpenLab Control Panel that helps you to distinguish the instruments.

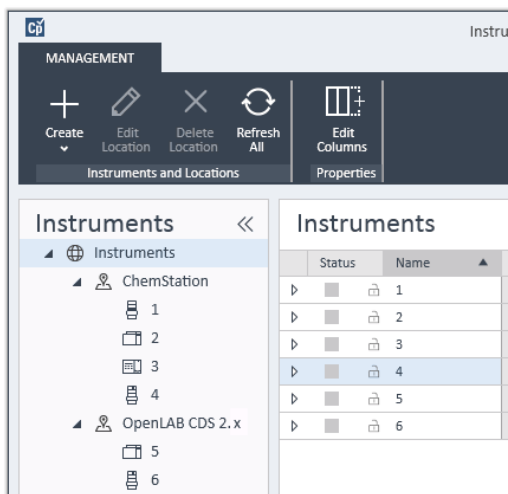


Figure 4 Instrument structure example

## Other Supported Agilent Software

OpenLab Data Analysis A.01.02 is not supported with Windows 10 or higher. Use of OpenLab Data Analysis is supported as integral part of OpenLab CDS in mixed environments.

### Compatibility to Add-on Software and Instrument Drivers

In general Agilent Add-on Software may be run on an OpenLab ChemStation PC. For details consult the respective product information.

For compatibility to Agilent and Non-Agilent instrument drivers see the separate guide *OpenLab ChemStation, Supported Instruments*.

## Shared Services Compatibility

**Table 15** Compatibility of Shared Services Server with OpenLab CDS and OpenLab ChemStation

	3.0 (2.3) <sup>1</sup>	3.2 (2.4)	3.4 (2.5)	3.5 (2.6)	3.6 (2.7)
OpenLab CDS 2.7					Y
OpenLab CDS 2.6				Y	
OpenLab CDS 2.5			Y		
OpenLab CDS 2.4		Y			
OpenLab CDS 2.3	Y				
OpenLab ChemStation LTS 01.11			Y <sup>2</sup>	Y <sup>2</sup>	Y
OpenLab ChemStation C.01.10		Y <sup>2</sup>	Y <sup>2</sup>	Y	
OpenLab ChemStation C.01.09	Y <sup>2</sup>	Y <sup>2</sup>	Y		

<sup>1</sup> Figures in brackets are the OpenLab CDS / ECM XT version Shared Services is shipped with.

<sup>2</sup> Does not apply for Workstations that shall be transformed to a Networked Workstation. See "Transform a Workstation to a Networked Workstation" in the "OpenLab ChemStation Workstation Installation and Upgrade" guide (CDS\_CS\_Install-WS.pdf).

A software update may be required to ensure the compatibility between the OpenLab shared services client component (OpenLab Control Panel) and any newer version of the OpenLab Shared Services server. After upgrading the Shared Services server of an existing Networked or Distributed environment, existing clients will be compatible with the new server.

## Software Compatibility

### Shared Services Compatibility

OpenLab Shared Services server software is included with the OpenLab CDS media, and can be installed using the OpenLab CDS installer.

For details on the configuration and how to share data refer to the manual *OpenLab CDS - Configuring OpenLab CDS with OpenLab ECM* (CDS\_v2.7\_configure-with-ECM\_en.pdf)

**Table 16 Validated OpenLab Shared Services client/server compatibility**

Shared Services client	OpenLab Shared Services Server / OpenLab Server version							
	2.0	2.1	2.2	3.0 / 2.3	3.2 / 2.4	3.4 / 2.5	3.5 / 2.6	3.6 / 2.7
3.6								Y
3.5							Y	
3.4					Y	Y		
3.2					Y	Y		
2.3				Y	Y	Y		
2.2			Y	Y	Y	Y		
2.1		Y	Y	Y	Y			
2.0	Y	Y	Y					

## Backward Compatibility During Upgrade

**NOTE**

Different ChemStation Software revisions can be used within one network during the upgrade phase only. Acquisition and data analysis are supported on the same version of software last used for reprocessing, or on a newer version of the software.

Agilent recommends that all ChemStation installations in a network are on the same software version. As long as this is not the case, ensure procedures are in place to prevent older clients or workstations to access and reprocess data created by newer clients or workstations.

During the upgrade phase ChemStation may be used to start/run instruments that were previously configured and working prior to the upgrade. During the upgrade phase, the **Instruments** and **Projects** tabs will be fully functional in the existing revision of the Control Panel. You can start and operate an instrument that was configured and running prior to the upgrade. Administrative tasks such as adding users or changing passwords must be done on the newer revision of the software. No other functionality is supported until the system upgrade is completed.



## 5 Licensing

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This chapter details on Licensing aspects.

## Software subscriptions and Software Maintenance Agreement (SMA)

Bundled into OpenLab ChemStation is a one-year software subscription which provides access via SubscribeNet to new software updates, product upgrades, e-introduction and media.

As a best practice, we recommend customers to renew subscriptions annually so as to maintain their licenses and have full access to the newest updates, upgrades, media and e-introduction. To manage software entitlements and download software, log in to SubscribeNet by pasting this link in your browser: <http://agilent.subscribenet.com/>

Software subscriptions do not include installation services. Installation or upgrade services must be purchased by contacting your sales representative in your region.

## License Types

The license file is a collection of Product, Instruments and Add-on licenses (or activation keys), and is installed to your OpenLab System.

The licenses or activation keys in the license file can either be Shared or Counted:

- Shared licenses — system computers and other components can have shared, or add-on, licenses — because they share a core license.
- Counted licenses — these licenses are part of the OpenLab ChemStation floating licensing strategy. They are not permanently assigned to any one component. Instead they are automatically assigned to components, such as AICs and instruments, while the components are starting up. The licenses are automatically returned when the component is closed. The license management program controls license issuance and retrieval.

In this case, the only requirement is that a component is licensed while running. You only need enough licenses for all components running concurrently, rather than for each installed component.

A startup license for the system allows you to run OpenLab ChemStation for 60 days after the installation. In order to run the data system software after the 60-day period, you must install your license file.

## License File

A license file will contain your software license. This file is installed on the workstation. The license file is bound to this computer, and cannot be moved to another workstation without regenerating the license in SubscribeNet.

Information in the license file defines the number of instruments and other options that may be used concurrently with your system.

The most efficient way to manage and maintain your licensing is through the Internet.

## Supported Licensing Software

OpenLab ChemStation uses FlexNet Publisher (v. 11.12) for the distribution and tracking of license entitlements. This software is installed with the OpenLab ChemStation components.

## Licensing Scheme

Figure 5 on page 49 shows the licenses for OpenLab ChemStation in the different installation scenarios:

- Workstation
  - One OpenLab ChemStation core license
  - Instrument and Add-on licenses as needed; you can run up to four 2D LC or GC instruments on the same workstation.
- Networked Workstation
  - One OpenLab Shared Services server license
  - One OpenLab ChemStation core license for each Networked Workstation; you can connect multiple Networked Workstations to the OpenLab CDS Shared Services server.
  - Instrument and Add-on licenses as needed; you can run up to four 2D LC or GC instruments on the same Networked Workstation.
- Distributed System
  - One OpenLab Shared Services server license or one or OpenLab Server/OpenLab ECM XT license
  - One OpenLab ChemStation core license and AIC-Add-on license for each Analytical Instrument Controller (AIC) machine. You need one AIC license for each AIC connected to the server.
  - Instrument and Add-on licenses as needed; you can run up to ten 2D LC or GC instruments on the same AIC.

To control instruments from vendors other than Agilent, an Agilent Instrument Control License is required in addition to the driver license for the other vendor's instrument. A list of driver licenses that are available for instruments from other vendors can be found in the *Supported Instruments and Firmware Guide*.

For Agilent instruments, Analytical Instrument Controller licenses and Agilent Driver licenses are always bundled together. They are shown as one product license in the License Management. You can see these items as separate lines in the license file itself only.



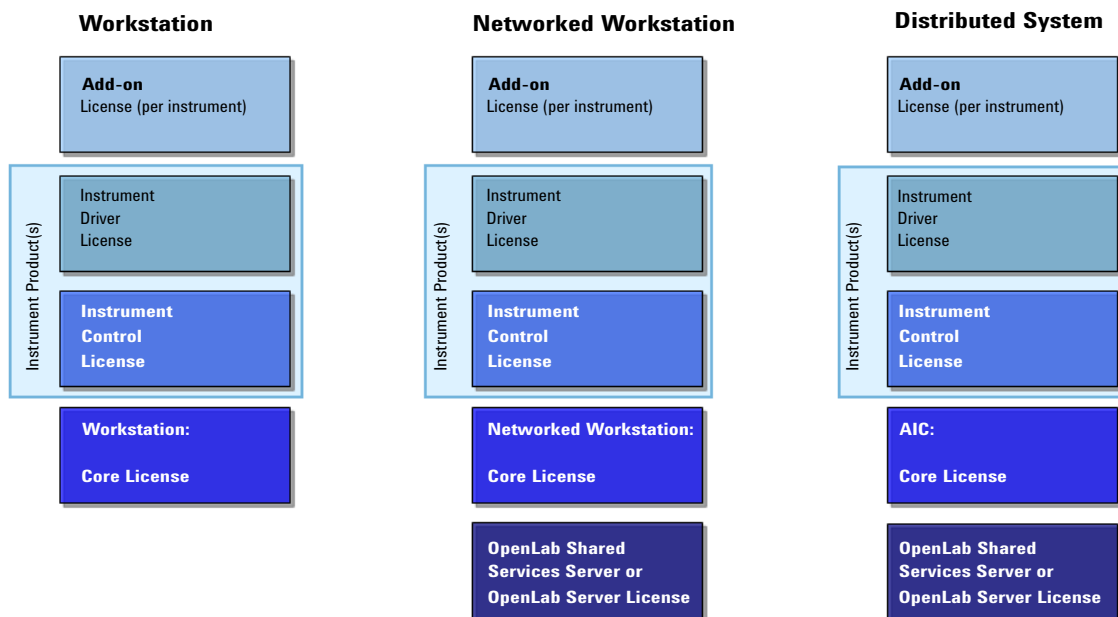


Figure 5 Licensing schema

## 6

# System Preparation Tool

The System Preparation Tool (SPT) checks and applies Windows settings on your machine.

The System Preparation Tool (SPT) checks and applies Windows settings on your machine. The settings are also applied automatically when you run the OpenLab ChemStation installer. Running the SPT in advance helps you to shorten the installation process. For an overview of both mandatory and recommended settings, see “Reference of SPT Checks” on page 52.

- 1 To open the installer, navigate to \Disk1\ and run Setup.bat.
- 2 From the **Planning** tab, select **System Preparation Tool**.  
The **System Preparation Tool** window opens.
- 3 Select the product configuration corresponding to your system:
  - For a Workstation, select **Workstation\_ChemStation\_Windows~10** or **Workstation\_ChemStation\_Windows~11**.
  - For a Networked Workstation, select **Workgroup\_Networked\_Workstation\_ChemStation\_Windows~10** or **Workgroup\_Networked\_Workstation\_ChemStation\_Windows~11**.

For AICs:

- **Workgroup\_Instrument\_Controller\_ChemStation\_Windows~Server~2019**
- **Workgroup\_Instrument\_Controller\_ChemStation\_Windows~Server~2022**

For clients:

- **Workgroup\_CDS\_Client\_ChemStation\_Windows~10**
- **Workgroup\_CDS\_Client\_ChemStation\_Windows~11**

For an OpenLab Shared Services Server:

- **Workgroup\_OLSS\_Server\_Windows~Server~2019**

- 4 Click **Continue**. The installer checks the status of the operating system.
- 5 Select which recommended settings to apply to the system.

There are several recommended settings that can improve the performance and stability of your system, but do not need to be completed to deploy the application. The recommended settings are listed after the mandatory settings.

You can clear the check boxes for recommended settings. Mandatory settings cannot be cleared. Recommended actions are selected by default and will be applied unless they are cleared.

- 6 Click **Apply Fixes** to apply the correct settings.

The System Preparation Tool attempts to update the selected settings and displays the new status on the **Update Configuration** page. All actions are saved to a log file. A link to the log file is provided at the bottom of the page.

- 7 Click **Next** to proceed to the **System Preparation Report** page.

The System Preparation Report is displayed. It lists the new status for all selected settings.

The System Preparation Report is saved to disk. Its location is shown at the top of the page.

- 8 Click **Print Report** to print the *System Preparation Report*.

You may print to a file, for example, using the *Adobe PDF* printer, and add comments.

- 9 The System Preparation Report lists any mandatory or recommended settings that are not automatically updated by the System Preparation Tool. Follow the instructions provided in the **Actions Required** section of the System Preparation report to manually update operating system settings.

- 10 Click **Finish**.

- 11 Reboot your system if requested to do so.

## Reference of SPT Checks

Table 17 Mandatory settings

Name	Workstation CDS Client	Networked Workstation	AIC	OLSS Server
<b>Programs and Features</b>				
Enable/deploy .NET Framework 3.5	●	●	●	●
Tcp Port Sharing and Activation	●	●	●	●
Windows Communication Foundation Non-HTTP Activation	●	●	●	●
.NET Framework 4.X Advanced Services <sup>1</sup>	●			
Telnet Client	●	●	●	
TFTP Client	●	●	●	
<b>System</b>				
Local Group Policy Requirements <sup>2</sup>	●	●	●	●
HTTP service	●	●	●	●
Set Services Timeout	●	●	●	●
<b>Power options</b>				
Set preferred plan to High performance	●	●	●	●
Set "Put the computer to sleep" to "Never for Performance Power Plan"	●	●	●	●
Set "Turn off hard disk" after to "Never for Performance Power Plan"	●	●	●	●
Security Options: Set Sharing and security model for local accounts to Classic	●	●	●	●
Network: Disable Power Management options for Network Adapter	●	●	●	●
Disable Quick Start	●	●	●	

<sup>1</sup> W10/W11 only

<sup>2</sup> Local Group Policy Requirements for OpenLab: - Set "Hide entry points for Fast User Switching" to Enabled - Adds "Users" group to "Access this computer from the network" setting

**Table 18 System Checks**

Name	Workstation CDS Client	Networked Workstation	AIC	OLSS Server
Minimum Memory	●	●	●	●
CPU	●	●	●	●
OS Compatibility	●	●	●	●
OS Minimum Version <sup>1</sup>	●	●		
OS Architecture (64 bit) <sup>1</sup>	●			
Screen Resolution	●	●	●	
Language Compatibility	●	●	●	●
Network Availability - Verify active network adapter	●	●	●	●
Ports - configuration	●	●	●	●
Processor Speed	●	●	●	●
Pending Reboot	●	●	●	●
Disable Default Printer	●	●	●	●
Hide Fast User Switching	●	●	●	●

<sup>1</sup> W10/W11 only

**Table 19 Recommended Settings**

Name	Workstation CDS Client	Networked Workstation	AIC	OLSS Server
System - Startup and Recovery Settings	●	●	●	
System - Turn off system protection (restore points) for all drives <sup>1</sup>	●			
Indexing options - Disable indexing Options for all drivers and locations	●	●	●	
Offline Maps - Disable Metered connections and Map updates	●			
Windows Update - Disable Windows Update service	●	●	●	●
Tablet mode: Enable Desktop mode <sup>2</sup>	●			

**Table 19 Recommended Settings**

Name	Workstation CDS Client	Networked Workstation	AIC	OLSS Server
Windows Explorer: Enable Navigation panel <sup>2</sup>	●	●	●	
Personalization - Disable Transparency effects <sup>2</sup>	●	●	●	
Personalization - Disable advertising info	●	●	●	
Personalization - Combine Taskbar Buttons	●	●	●	

<sup>1</sup> W10/W11 only

<sup>2</sup> Windows 10 only

**Table 20 Actions Required section of the SPT report (Settings need to be checked and updated manually)**

Name	Workstation CDS Client	Networked Workstation	AIC	OLSS Server
Windows Update - Apply pending updates	●	●	●	●
Windows activation	●	●	●	●
System domain membership	●	●	●	●
Region - Change system locale	●	●	●	●
File Explorer - Display Settings	●	●	●	
Recycle Bin - Set Recycle Bin properties	●	●	●	
System - Performance Settings	●	●	●	
Privacy - Set privacy settings	●	●	●	
Apps - Default browser	●	●	●	
Personalization - Turn off show lockscreen background picture	●	●	●	

# 7

## Appendix

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## System Topologies

### Overview of Modules

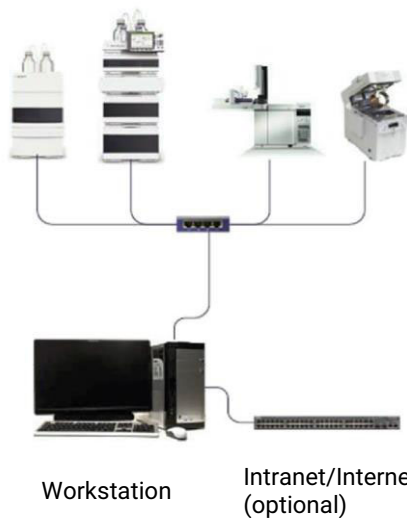
ChemStation contains the following software and interface modules:

- OpenLab Control Panel  
The OpenLab Control Panel is the user interface that provides access to OpenLab components, as well as administrative functions used for managing Shared Services features.
- Shared Services  
These services offer central access, central configuration, lab status at a glance, and remote control of instruments. The central functions can be used by all OpenLab modules.
- Instrument control, data acquisition and data analysis module
- Reporting (Classic and Intelligent Reporting)
- File System or Central Data Storage (Content Management provided by OpenLab Server)

Depending on the type of installation, these software and interface modules are installed on different hardware components. The following sections give an overview.



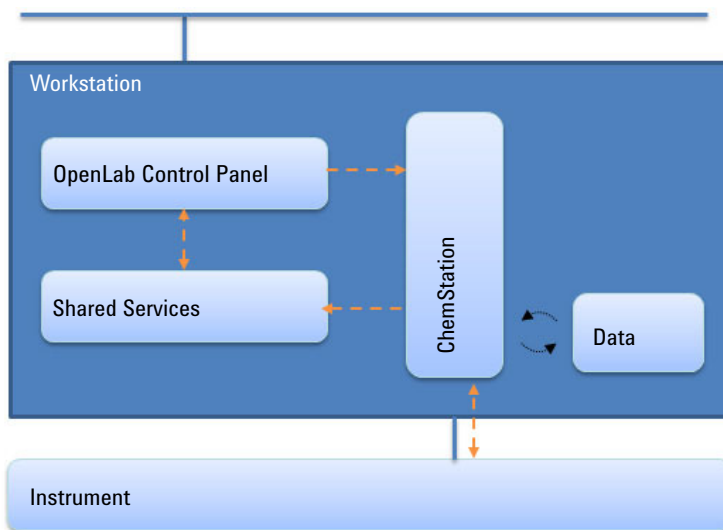
## Workstation



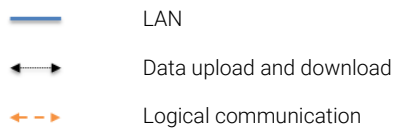
**Figure 6** OpenLab ChemStation Workstation

In a workstation, all components (shared services, control panel, instrument configuration, methods, sequences and data files) are installed on the same computer.

The following figure shows the configuration of a ChemStation Workstation. You can have multiple instruments on one workstation (see [“Number of Instruments”](#) on page 12).

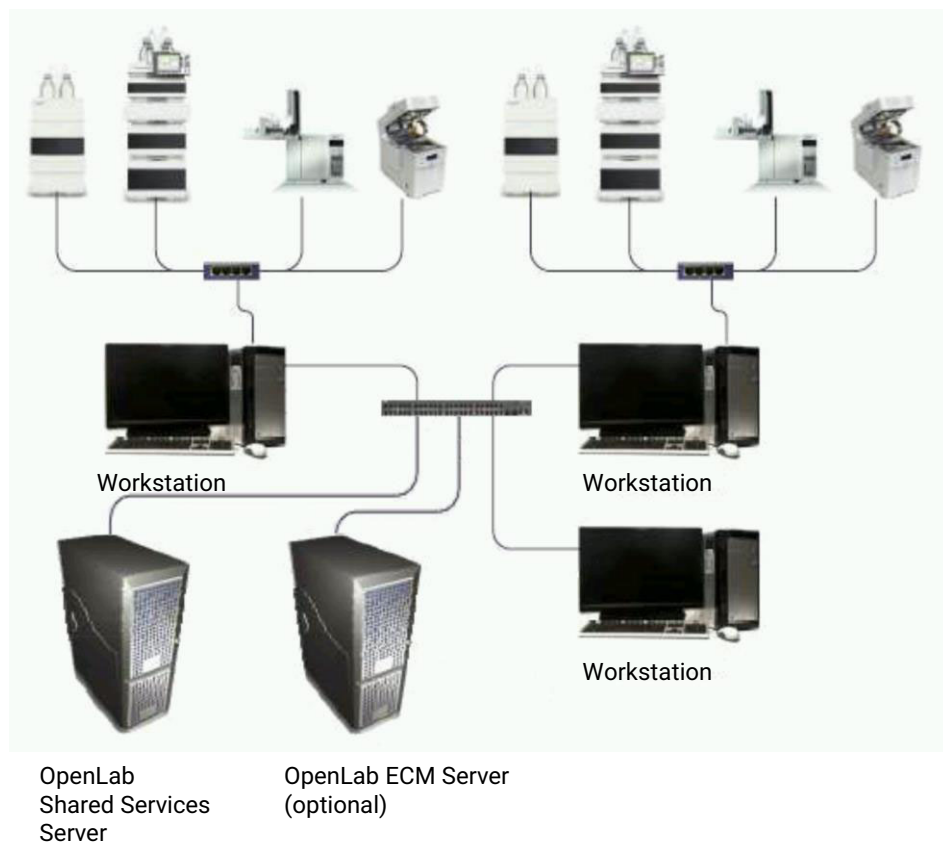


**Figure 7 ChemStation Workstation**



Secure Workstation is no longer supported in ChemStation LTS 01.11.

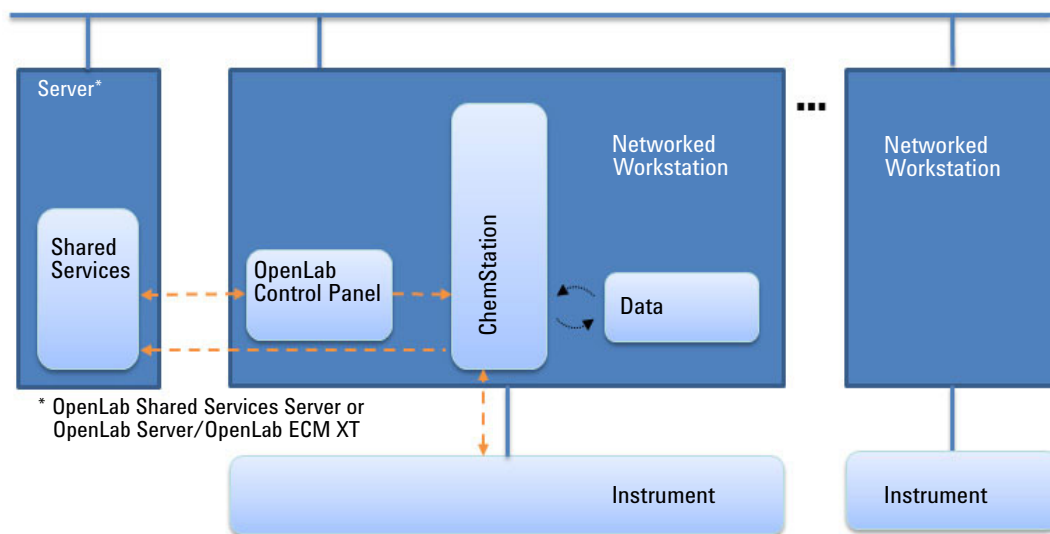
## Networked Workstation



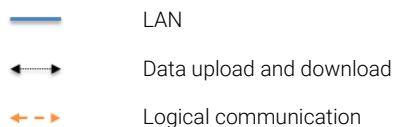
**Figure 8** Networked Workstation configuration (example)

In the Networked Workstations topology a central Shared Services Server links several Workstations, with or without a central data backend. The Networked Workstations concept offers central administration of users, roles, and licensing. The instrument status can be viewed from any Networked Workstation. However, you can launch and configure instruments only from the PC on which you configured the instrument.

The following figure shows a Networked Workstation configuration. Multiple workstations can be part of the Networked Workstation system. The figure shows only one ChemStation instance, but you can configure multiple instances and associated instruments on the same machine.



**Figure 9 ChemStation Networked Workstation**



You can use the ChemStation Networked Workstation configuration with or without central data storage. If you are connected to a central repository, the data stored on the workstation is synchronized with the central repository. For more information on ChemStation with central data storage, refer to the *OpenLab ChemStation with Content Management Systems Administration guide* (CDS\_CS\_withCM-admin.pdf).

In case of OpenLab ECM 3.x systems, separate Shared Services servers are required per ECM Account.

## Distributed Systems

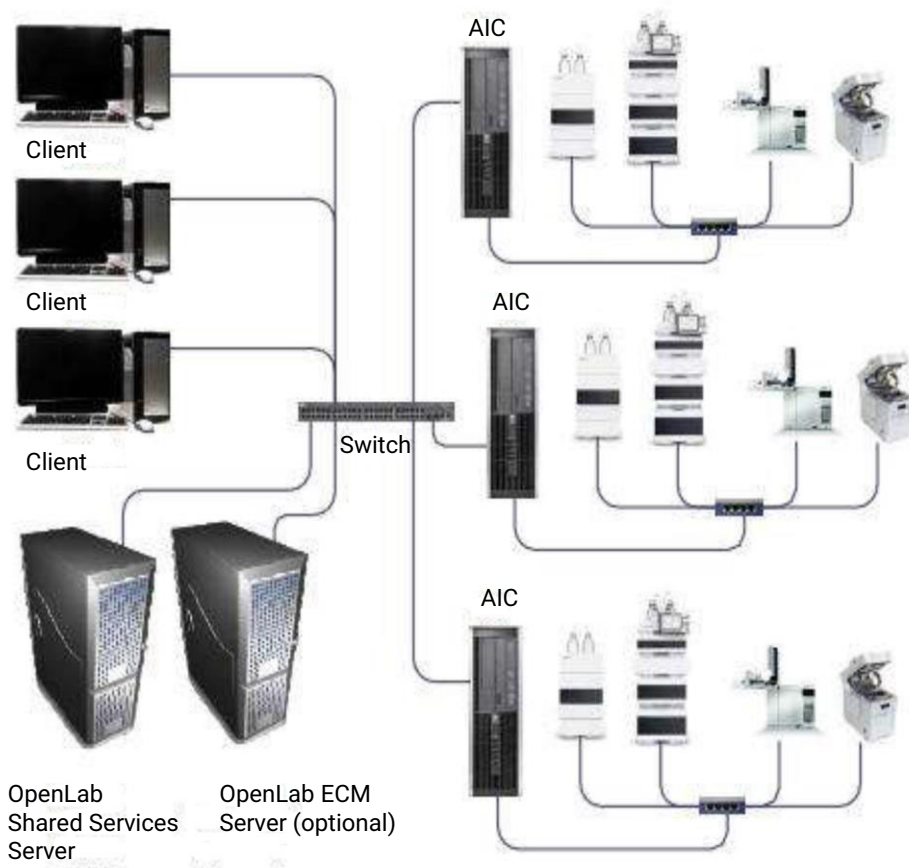


Figure 10 Distributed System Configuration

With OpenLab ChemStation installed as a Distributed System, you are able to access and run instruments from any ChemStation Client PC in the system.

As in the Networked Workstation installation, the OpenLab Control Panel provides an overview of all instruments in the system. You can access all information provided by Shared Services from any ChemStation Client. For example, you can see the availability, location, and status (Online, Offline, Error, In Run, Not Ready, etc.) of your instruments.

In contrast to the Networked Workstation installation, in a Distributed System you can configure, launch and control any instrument from any ChemStation Client PC.

The Distributed System configuration enables you to work more flexibly with instrument sessions. You can launch an online instrument, start a sequence, and then disconnect the ChemStation Client while the instrument continues to run on the Analytical Instrument Controller machine (AIC). Later any user can connect to this instrument again from any client to finish work on the online instrument or to analyze the data.

**NOTE**

The Distributed System configuration requires either OpenLab Server/OpenLab ECM XT or OpenLab ECM 3.x.

In a ChemStation Distributed System, the instruments are controlled by the AIC. The AIC is a Windows server. Each AIC can control up to ten instruments. You can access the ChemStation instance on the AIC machine from any ChemStation Client. The connection between the ChemStation Client and the AIC is transparently using Remote Desktop Services. When you disconnect the ChemStation Client, you disconnect the Remote Desktop Connection. ChemStation continues to run on the AIC. For more information on remote instrument control, session takeover, session disconnect, or force shutdown, refer to the *OpenLab ChemStation Concepts and Workflows* (CDS\_CS\_Concepts.pdf).

The Distributed System configuration of OpenLab ChemStation requires a central data storage. The data acquired on each AIC is uploaded to the central repository. For more information on ChemStation with central data storage, refer to the *OpenLab ChemStation with Content Management Systems Administration guide* (CDS\_CS\_withCM-admin.pdf).

The following figure shows the system architecture of ChemStation with OpenLab ECM 3.x. If you use the Content Management provided by OpenLab Server/OpenLab ECM XT, you only need one server, as Content Management and Shared Services are installed on the same server. In case of OpenLab ECM 3.x systems, separate OpenLab Shared Services servers are required per ECM Account.

Topologies where ChemStation is a client in a OpenLab Server/OpenLab ECM XT environment with OpenLab CDS clients are also supported under certain preconditions. See [“Mixed Environments with ChemStation and OpenLab CDS”](#) on page 36 for details.

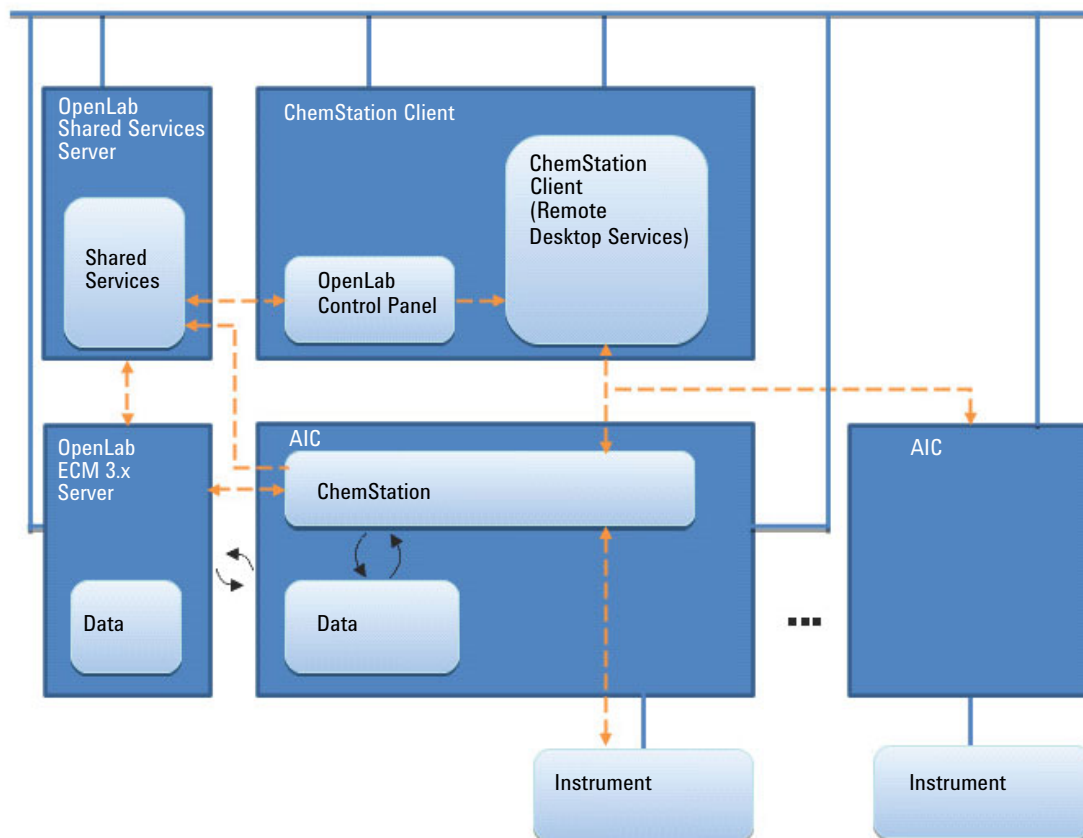
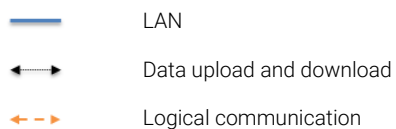


Figure 11 Distributed System with ChemStation and OpenLab ECM 3.x



## Networked Workstations in Distributed Systems

When an instrument cannot be controlled by an AIC or needs to be isolated and controlled by a single computer, you can add one or multiple Networked Workstations to a distributed environment.

Figure 12 on page 65 shows a mixed topology with one Networked Workstation, one ChemStation Client, one AIC, and central data storage. You can have multiple Networked Workstations, multiple clients, and multiple AICs in this topology.

In a mixed environment, you can use the Networked Workstation to access all instruments configured on this workstation, and you can also use it as a client for all instruments configured on AICs. On the contrary, instruments configured on a Networked Workstation cannot be controlled from a pure ChemStation Client of a Distributed System.

Systems with both ChemStation and EZChrom being controlled by the same OpenLab Shared Services server are not supported. ChemStation and EZChrom always must be managed by separate OpenLab Shared Services servers. The ECM backend may be shared.



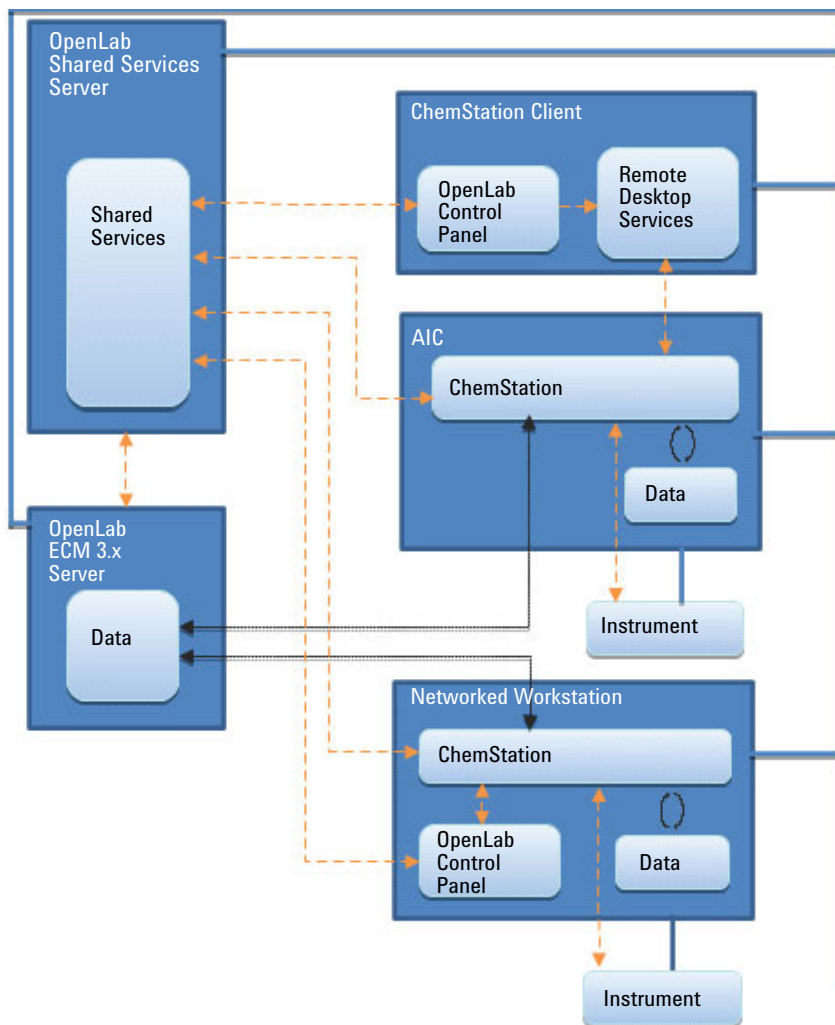


Figure 12 Example: Networked Workstation in a Distributed System with ECM 3.x

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## In This Book

This document details the minimum network, hardware and software settings required to successfully work with revision LTS 01.11 of OpenLab ChemStation.

It contains information on ChemStation Workstations, Analytical Instrument Controllers, and on the OpenLab Shared Services Server.

Unless stated otherwise, these requirements apply to both the Value Line (VL) Edition of OpenLab ChemStation and the full OpenLab ChemStation.

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