Waters
THE SCIENCE OF WHAT'S POSSIBLE.™

Empower 3.6.1

Installation Configuration and Upgrade Guide

715007289
Version 00

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Audience and purpose

This guide describes the installation and configuration process for Empower 3.6.1 software. It is intended for those who install, configure, and administer Empower 3.6.1 software.

Safety information

Consult the operator’s guides of the instruments or devices associated with this software product for information explaining how to safely operate and maintain them.

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1 Introduction

1.1 Waters Empower Software

Empower is the Waters compliant-ready Chromatography Data System (CDS) for advanced data acquisition, management, processing, reporting, and distribution.

The Waters Empower Software system includes these configurations:

Configuration	Description
Personal workstation	The Empower Personal workstation is a stand-alone, personal computer directly connected to chromatographic systems. There is no limit to the number of chromatographic systems you can configure in the software. You can connect and control up to four chromatographic systems at one time. While you can configure additional systems, no more than four can be active at one time. The number of actively running systems allowed may vary depending on modules and use cases. Review section 1.4 in the *Waters Driver Pack 2020 Release 1 Installation and Configuration Guide* (715006278) for the instrument connection rules and restrictions. The Empower Personal workstation includes these components: • Empower application software, which includes an Oracle relational database • COM port • Instrument LAN card • Runs on Microsoft operating systems
Workgroup or Enterprise	The Empower Workgroup and Enterprise configurations comprise a server (used as a database server and as a raw data server), Empower clients, and LAC/E devices. **Note:** In a Linux type deployment, the raw data server is always separate from the database server. The Empower Workgroup is limited to 10 users. In an Enterprise configuration, you can configure as many users as you need. For details, see Activating Empower software licenses and options (Page 40). You can configure an unlimited number of chromatographic systems in the software. A maximum of four chromatographic systems per LAC/E device can be online at once. The Empower Workgroup and Enterprise configurations comprise these components:

Configuration	Description
	• Empower clients that are connected to the server and monitor data acquisition, access and process data, use methods, and process results and application administration tasks. • Empower LAC/E devices, which are Empower nodes connected directly to the instruments, ensuring uninterrupted data acquisition in case of a network failure. • Ethernet connections to interconnect Empower nodes (LAC/E devices). • Database server that stores all the data created by acquiring and processing data, as well as system objects (user accounts, licenses, Empower nodes, and chromatographic systems) in a password-protected database. Database servers can run on these platforms: Microsoft Windows Server and Red Hat operating systems. • Raw data server that stores the Empower raw data files created during the data acquisition process. The Empower raw data file share servers must be hosted on Microsoft Windows Server operating systems.

1.2 Naming convention

Starting with Empower 3.6.0, the naming convention for Empower releases is `Empower XX.YY.ZZ.QQ`, where:

- `XX` = Major Release version
- `YY` = Minor Release number
- `ZZ` = Maintenance Release number
- `QQ` = Hotfix Release

For example, Empower 3.6.0.1 is Major Release 3, Minor Release 6, Maintenance Release 0, Hotfix 1.

1.3 Empower releases

Waters periodically issues minor releases to provide enhanced software functionality and maintenance releases to address existing issues. These releases are available to customers with an active software maintenance plan. You must install these releases, available for download from the Waters Elite website , according to the instructions set forth in their associated release notes.

Notes:

- Contact your Waters technical service representative before you deploy these updates.
- For those customers who require physical media, note the part number from the website and contact your local subsidiary to place an order for a nominal fee.
- If you do not have access to the software downloads on the Waters Elite website, contact your Waters representative to renew your software maintenance plan.

Tip: To determine which release is installed, select **Start** > **Empower** > **Empower Installation Log**.

1.4 Typical system configurations

Empower software can operate in the following configurations:

- Empower Personal workstation
- Empower Workgroup
- Empower Enterprise

The following figures show typical Empower Personal workstation, Empower Workgroup, and Empower Enterprise configurations. Your configuration may vary.

Tip: You can identify the components of your configuration by viewing the installation log.

Figure 1–1: Empower Personal workstation

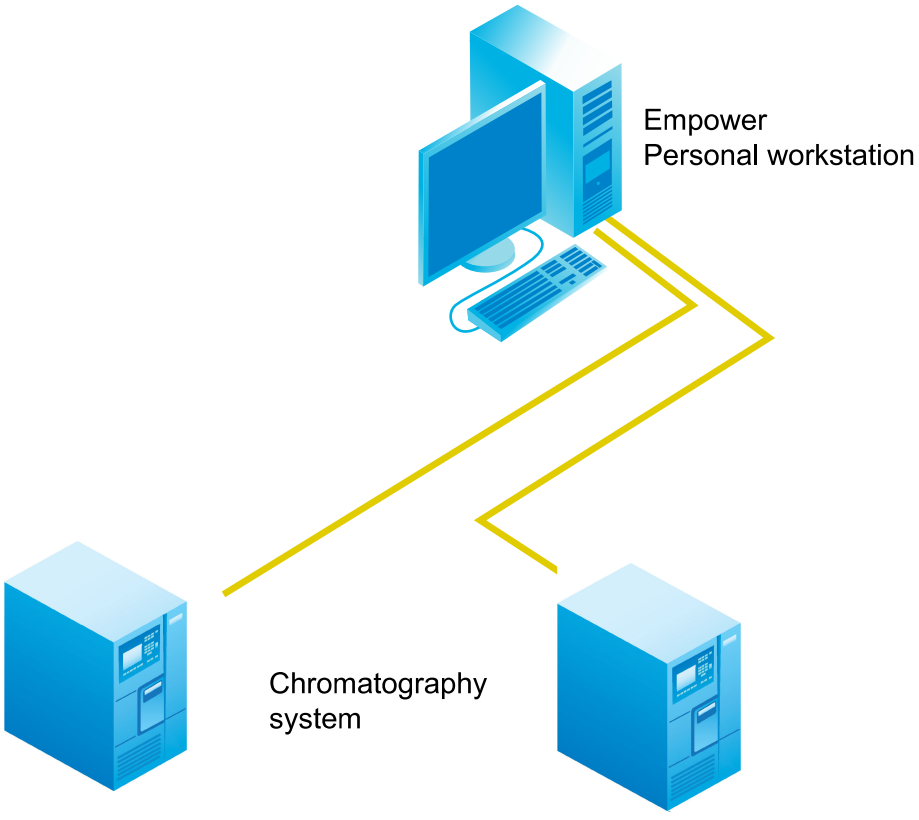
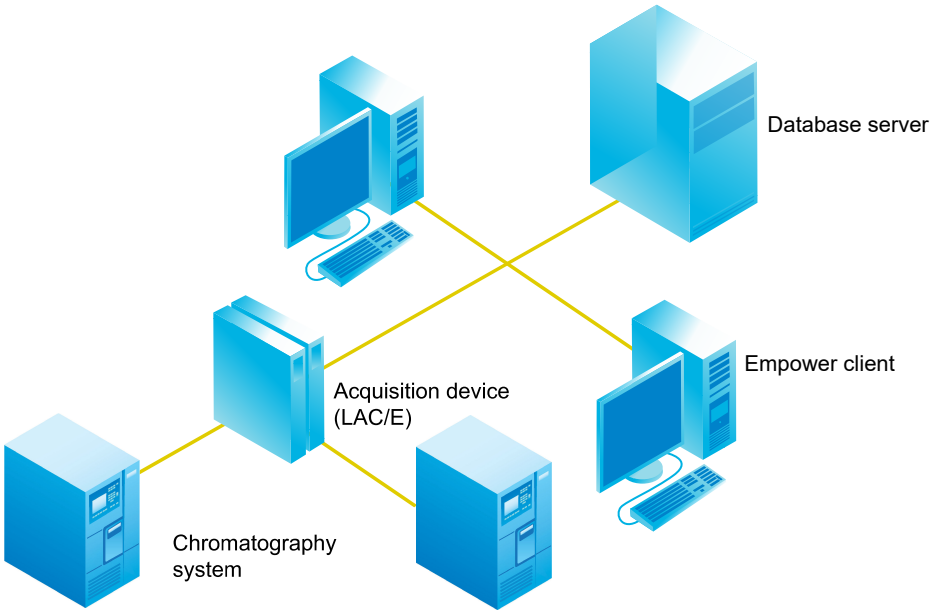


Figure 1–2: Empower Workgroup/Enterprise



1.5 Wide area network

When running Empower software over a wide area network (WAN), a network latency of 100 milliseconds (msec) or less is recommended, and latency up to 200 msec is supported. If your network latency is greater than 100 msec, system performance may be impaired and may degrade greatly as latency gets closer to 200 msec. The use of other applications is not accounted for in the recommended latency. Other WAN characteristics, such as bandwidth and packet loss, contribute to the performance of Empower over a WAN.

Recommendations: To avoid unexpected events, such as continuous LAC/E buffering, disconnect from instruments, or inability to monitor acquisitions:

- Exclude Empower traffic from WAN optimization devices.
- Prioritize Empower network traffic between all Empower nodes.
- Ensure that timeout configurations of any network devices supporting the Empower environment do not disrupt Empower network connections.

1.6 Hardware and software requirements

The following tables describe the major subsystems, hardware, and operating system configurations that Empower 3.6.1 software supports. For all platforms and operating systems that Empower 3.6.1 supports, see "Supported platforms and operating systems" in the *Empower 3.6.1 Release Notes* (715007302).

Note: You can install Empower 3.6.1 as a new installation on a system where no Chromatography Data System (CDS) is currently installed or as an upgrade from Empower 3.6.0.

Important: The following minimum requirements are for the successful installation of Empower. When assessing the required size for your computer, factor in the number of users that the system will service, the usage intensity, the required life span of the current deployment, and the requirements of data security (data backups). The same principles apply for sizing the NIC capacity and the overall network performance. Consult the local Waters deployment specialist on the sizing and requirements of Empower-related nodes that are appropriate for your environment.

1.6.1 Requirements for an Empower Personal workstation

Table 1–1: Empower Personal workstation requirements

Component	Minimum
Operating system [a]	Windows 10 Enterprise (including the Long Term Service Branch Build 1607) or Windows 10 Professional, 64-bit **Restriction:** The Windows 7 operating system is not supported.
Oracle [a]	Oracle version 19.7.0.0.0 64-bit for the database Oracle version 19.3.0.0.0 32-bit for the client
CPU	3.0 GHz, 2 cores
Random access memory (RAM)	8 GB
Virtual memory	Configure the system so that Windows automatically manages the virtual memory paging file size.
Minimum hard drive space	60 GB **Note:** Actual space recommendations depend on your usage for new installations and upgrades of Empower software. Ensure that there is plenty of space for your raw data files.
Free hard disk space	2 GB for Empower 3.6.1 application 33 GB for Oracle/Empower database (new installations) 5 GB of free disk space to accommodate projects
DVD drive	Access to a DVD drive required for installation from a DVD
Monitor	1024 × 768 resolution, 1920 × 1080 resolution recommended
Graphics capability	sVGA video at 1024 × 768 × 256 color resolution
Optional control interfaces	Edgeport USB-to-serial converter cable
Application software	Empower 3.6.1

Table 1–1: Empower Personal workstation requirements (continued)

Component	Minimum
Ethernet adapters	One Ethernet adapter for network connectivity and one Ethernet adapter to operate Ethernet instruments. Minimum speed for either adapter must be 1 Gbps.

a. For all platforms and operating systems that Empower 3.6.1 supports, see "Supported platforms and operating systems" in the *Empower 3.6.1 Release Notes* (715007302).

1.6.2 Requirements for Empower client computers

Table 1–2: Empower client computer requirements

Component	Minimum
Operating system	Windows 10 Enterprise (including Long Term Service Branch Build 1607) or Windows 10 Professional, 64-bit **Restriction:** Empower clients are not supported on Windows 7.
Oracle	Oracle client version 19.3.0.0.0 for 32-bit
CPU	2.1 GHz, 2 cores
Random access memory (RAM)	8 GB
Virtual memory	Configure the client so that Windows automatically manages the virtual memory paging file size.
Minimum hard disk space	25 GB
Free hard disk space	3 GB for Empower 3.6.1 application
DVD drive	Access to a DVD drive required for installation from a DVD
Monitor	1024 × 768 resolution
Graphics capability	sVGA video at 1024 × 768 × 256 color resolution
Application software	Empower 3.6.1 Internet Explorer 10.0 Google Chrome
Ethernet adapters	1 Ethernet adapter for network connectivity and 1 Ethernet adapter to operate Ethernet instruments. Minimum speed for either adapter must be 1 Gbps.

1.6.3 Requirements for LAC/E devices

Table 1–3: Empower LAC/E device requirements

Component	Minimum
Operating system [a]	Windows 10 Enterprise (including Long Term Service Branch Build 1607) or Windows 10 Professional, 64-bit **Restriction:** The installation of Empower LAC/E 3.6.1 is not supported on Windows 7.
Oracle [a]	Oracle client version 19.3.0.0.0 for 32-bit
CPU	**Recommended:** 1.91 GHz, 4 cores
Random access memory (RAM)	8 GB
Virtual memory	Configure the system so that Windows automatically manages the virtual memory paging file size.
Minimum hard disk space	50 GB (for data buffering when database or raw data file server cannot be reached)
Free hard disk space	3 GB for Empower 3.6.1 application
DVD drive	Access to a DVD drive required for installation from a DVD
Graphics capability	sVGA video at 1024 × 768 × 256 color resolution
Optional control interfaces	Edgeport USB-to-serial converter cable
Application software	Empower 3.6.1 Google Chrome
Ethernet adapters	One Ethernet adapter for network connectivity and one Ethernet adapter to operate Ethernet instruments. The second adapter must be either four-port or single-port with a network switch connected to it. Minimum speed for either adapter must be 1 Gbps.
LAC/E device	Configuration 15 and Configuration 16 are both supported with Windows 10 Enterprise Long Term Service Branch (LTSB) Build 1607. **Notes:** • Configuration 16 comprises both eLAC/E and cLAC/E, and the corresponding BC LAC/E option. • Empower 3.6.1 supports Configuration 15 and Configuration 16 LAC/E devices.

a. For all platforms and operating systems that Empower 3.6.1 supports, see "Supported platforms and operating systems" in the *Empower 3.6.1 Release Notes* (715007302).

1.6.4 Requirements for Empower Enterprise and Workgroup server

Table 1–4: Empower Enterprise and Workgroup server requirements

Component	Minimum
Operating system [a]	Windows Server 2016 Standard
Oracle [a]	Oracle version 19.7.0.0.0 64-bit for the database Oracle version 19.3.0.0.0 32-bit for the client
CPU	1.8 GHz, 4-core server-class processor
Random access memory (RAM)	16 GB
Virtual memory	Configure the server so that Windows automatically manages the virtual memory paging file size.
Hard disk drive	Enterprise or Workgroup: 4 hard drives 54 GB per hard drive
Free hard disk space	• 37 GB for Empower 3.6.1 application/Oracle Server and Client • 9 GB for Empower database • 5 GB of free disk space to accommodate projects **Note:** Actual space recommendations depend on your usage.
Backup device	Recommended
Monitor/Remote access	Required
Graphics capability	sVGA video at 1024 × 768 × 256 color resolution
Application software	Empower 3.6.1 Google Chrome **Recommendation:** Waters recommends Google Chrome for use with the Waters Database Manager (WDM) application.
Network interface card	1 Gbps NIC required

a. For all platforms and operating systems that Empower 3.6.1 supports, see "Supported platforms and operating systems" in the *Empower 3.6.1 Release Notes* (715007302).

1.6.5 Requirements for the Empower file server

Table 1–5: Empower file server requirements

Component	Minimum
Operating system [a]	Windows Server 2016 Standard
Hard drive	2 hard drives:

Table 1–5: Empower file server requirements (continued)

Component	Minimum
	• One hard drive of 80 GB minimum for the OS • One hard drive of 500 GB minimum for the raw data files
Random access memory (RAM)	8 GB
Virtual memory	Configure the system so that Windows automatically manages the virtual memory paging file size.

a. For all platforms and operating systems that Empower 3.6.1 supports, see "Supported platforms and operating systems" in the *Empower 3.6.1 Release Notes* (715007302).

The Empower software installer (Deployment Manager) gathers information about your system and compares your system settings to the minimum required specifications. The installation can display an error message and continue, or the installation can stop and exit, depending on the following conditions:

- If the system includes an incompatible processor, the installation continues without warning messages. The processor information is recorded in the installation log.

  Note: To view the installation log, click **Start** > **Empower** > **Empower Installation Log**.

- If the system does not meet the memory requirement, an error message states that there is insufficient memory and the installation terminates. This error is recorded in the installation log.
- If a system does not meet the hard drive space requirements for the required features, an error message appears stating that there is insufficient hard drive space. The installation continues after you free up space or select a different drive with enough free space.
- If the drive hosting the Empower projects directory does not meet the minimum requirement, a warning message appears stating that there is not enough free space for the projects directory and the installation continues. The warning message is recorded in the installation log.

1.6.6 Requirements for the Linux server

Table 1–6: Linux server requirements

Component	Minimum
Operating system [a]	Red Hat Enterprise Linux 8.0
CPU	1.8 GHz, 4-core server-class processor

Table 1–6: Linux server requirements (continued)

Component	Minimum
Random access memory (RAM)	16 GB
Swap memory size	See Red Hat recommendations for system swap space
Hard disk drive	Additional SAN storage recommended
Free hard disk space	Refer to *Oracle Database Installation Guide 19c for Linux E96432-11*, chapter *Oracle Database Installation Checklist*
Backup device	Recommended
Monitor	Not required
Server software	Red Hat Enterprise Linux 8.0 (Oracle RDBMS Relational Database Management) 19.7.0.0.0 **Note:** Empower requires that you use the same time zone version for both Oracle Client and Oracle Database. Use the time zone patch 29997937 to update the Oracle Database time zone to DST v34 to match the time zone on Oracle Client.
Network interface card	1 × 1 Gbps NIC **Note:** You may use multiple NICs for redundancy.

a. For all platforms and operating systems that Empower 3.6.1 supports, see "Supported platforms and operating systems" in the *Empower 3.6.1 Release Notes* (715007302).

1.6.7 Requirements for the Citrix server support

Table 1–7: Citrix server requirements

Component	Minimum
Operating system [a]	Windows Server 2016 Standard
CPU	2 × 2-core, server-class processors
Citrix XenApp software [a]	One of the following: • Citrix XenApp 7.15 LTSR CU2 (if running on Windows Server 2016 Standard) • Citrix Virtual Apps and Desktops 7 1912 LTSR CU2 (if running on Windows Server 2019 Standard) Citrix Virtual Delivery Agent (VDA) 7.15 Citrix Receiver 4.9
Number of concurrent users per server	25

Table 1–7: Citrix server requirements (continued)

Component	Minimum
Random access memory (RAM)	16 GB
Virtual memory	Configure the server so that Windows automatically manages the virtual memory paging file size.

a. For all platforms and operating systems that Empower 3.6.1 supports, see "Supported platforms and operating systems" in the *Empower 3.6.1 Release Notes* (715007302).

Note: Consult the Citrix product documentation for details on other Citrix components.

1.6.8 Virtualization support

Empower 3.6.1 supports virtualization using VMware vSphere ESXi 6.7 EP 04 on these platforms and operating systems:

- File server and Windows database server running on Windows Server 2016 Standard or Windows Server 2019 Standard
- Empower client and an Empower Citrix client running on Windows 10 Professional or Enterprise, 64-bit
- Citrix XenApp 7.15 LTSR CU2 running on Windows Server 2016 Standard or Citrix Virtual Apps and Desktops 7 1912 LTSR CU2 running on Windows Server 2019 Standard

Exception: Acquisition clients and LAC/E devices are not supported for use in a virtual environment.

1.6.9 Devices supported by Empower

Each Empower LAC/E can support these devices:

- Up to four simultaneous chromatographic systems.
- Multiple RS-232-based devices (such as gas chromatographs and detectors).
- Ethernet devices.
- Edgeport USB-to-serial converter cable provides a standard PC COM port connection with the serial instrument, usually by connecting a second cable with wiring specific to the instrument.

1.7 Container and Pluggable Databases

Starting with version 3.6.0, Empower implements the Oracle 19c Container Database (CDB) and Pluggable Database (PDB) infrastructure to your environment. This infrastructure creates a single

database (CDB) that can contain multiple databases (PDBs) and isolate them from one another. You can consolidate all databases in your environment to a Container Database. With this infrastructure, you can perform tasks such as database operations, backups, and software deployments faster.

Empower 3.6.1 implements the CDB and PDB infrastructure automatically on the supported Windows operating systems. For deploying an Empower 3.6.1 database and implementing the CDB and PDB infrastructure on a Linux server, see Installing Empower Enterprise database on a Red Hat server (Page 155).

1.8 Ethernet and serial instruments

Empower 3.6.1 supports Waters Driver Pack 2020 Release 1 and Instrument Control Framework Support Layer v3.5.

See also: For information on Waters drivers and the Instrument Control Framework Support Layer, refer to the following documents:

- *Waters Driver Pack 2020 Release 1 Installation and Configuration Guide* (715006278)
- *Instrument Control Framework Support Layer v3.5 Release Notes* (715007323)

Recommendation: For Empower 3.6.1, Waters recommends using only instrument drivers that are compatible with Windows 10.

To further align our products, after the release of Empower 3 Feature Release 5 Service Release 4, Waters no longer offers Empower defect corrections or enhancements related to IEEE control in any release of Empower. As a result, support for IEEE instrument control ceased in all versions of Empower after the release of Empower 3 Feature Release 5 Service Release 4. If you use IEEE instrument control beyond Empower 3 Feature Release 5 Service Release 4, it was not tested.

The instruments in the following table are no longer supported.

Table 1–8: Instruments no longer supported in Empower

Instrument	As of this release:
410 RI detector	Empower 3
486 TUV detector	Empower 3
996 PDA detector	Empower 3
474 fluorescence detector	Empower 3
Agilent 5890 gas chromatograph	Empower 3 FR3
Agilent 7673 automatic liquid sampler	Empower 3 FR3
Waters ZQ 2000 mass detector	Empower 3 FR3
Waters ZQ 4000 mass detector	Empower 3 FR3

Table 1–8: Instruments no longer supported in Empower (continued)

Instrument	As of this release:
Waters EMD1000 mass detector	Empower 3 FR3
Waters SQ mass detector	Empower 3 FR5
Waters TQ mass detector	Empower 3 FR5
Waters 3100 mass detector	Empower 3 FR5

2 Installing and configuring the hardware

2.1 Preparing for Empower 3.6.1 software

Requirement: You must use a computer connected to the Internet to install and activate Waters licenses and options. This computer does not need to be running Empower software.

Tip: If your Waters technical service representative already installed and configured the system for you, proceed to Power on the chromatographic system (Page 31).

Recommendation: Before installing any hardware or software, perform a full backup of your hard drives (see the instructions provided by the manufacturer of your computer). After installation, back up your Empower 3.6.1 data regularly.

2.2 Selecting the site

Locate the Empower 3.6.1 system in a clean area free from shock, vibration, and extremes of temperature and humidity.

2.2.1 Environmental requirements

Operate the Empower 3.6.1 system within the following temperature and humidity ranges:

- Temperature: 10 to 31 °C
- Humidity: 20 to 80% relative humidity, non-condensing, maximum wet bulb of 25 °C and minimum dew point of 2 °C

Acceptable temperature and humidity ranges vary according to the model of computer and printer, and the instruments and devices that are part of the chromatographic systems.

Protect equipment from direct sunlight, heat registers, or air conditioning vents.

2.2.2 Bench space

Allow sufficient bench space for the Empower Personal workstation, Workgroup, or client computers (keyboard, monitor, system unit, and printer) as recommended in the documentation supplied with the computer. You can place the computers on the lab bench or on a desktop near the chromatography instrumentation. The total bench space required depends on the number of devices you plan to configure (pumps, detectors, autosamplers, eSAT/IN modules, and so on).

2.2.3 Instrument arrangement

Ensure that the ventilation slots on all instruments are not blocked. Allow at least 15 cm of space on all sides of each instrument to ensure adequate air flow.

For information on the best arrangement of your Empower system and connected instruments, consult your Waters technical service representative.

2.3 Installing and configuring computer systems

This section describes the process for installing and configuring the Empower computer systems and other components.

2.3.1 Setting up an Empower Personal workstation

The Empower Personal workstation supports these additional interfaces:

- A second network interface card for Ethernet instruments
- USB-to-serial converter cable

To install and set up the Empower Personal workstation:

Restriction: Install the instruments or the instrument control software (ICS) only after you install Empower software.

1. Unpack and place the workstation in the desired location.
2. Attach the keyboard, mouse, and monitor to the workstation.

   Note: To install other computer peripherals, such as printers or storage devices, see the installation documentation supplied with the device.
3. If applicable, install and connect the optional network device, and then power-off the workstation:
   - Connect and configure the Ethernet devices (see Connecting and configuring Ethernet chromatographic devices (Page 29)).
   - Connect and configure the serial devices (see Ethernet and serial device connections (Page 29)).
4. Power-on the workstation.
5. Prepare the Personal workstation. See Preparing the Personal workstation (Page 32).
6. Install Empower software. See Installing Empower on a workstation (Page 36).
7. Install instrument control software (ICS).

2.3.2 Empower Workgroup or Enterprise system

The Empower Workgroup or Empower Enterprise system consists of one or more servers, one or more clients, and one or more LAC/E devices. LAC/E devices and acquisition clients require two network interface cards: one for Enterprise network communication, the other for instrument control.

Chromatographic devices in an Empower Workgroup or Enterprise system are connected to the LAC/E or an acquisition client. The LAC/E or acquisition client provides distributed acquisition for the Workgroup and Enterprise configuration, including the following:

- Data acquisition
- Instrument control
- Remote access to instruments
- Remote data processing and printing in Run and Report modes

  Note: In an environment where the server is hosted at a different location and is connected via a WAN-type connection, use the Run Only mode.

2.3.2.1 Setting up a LAC/E device

The LAC/E devices and acquisition clients support these additional interfaces:

- A second network interface card or multiple cards in a MACPort bridge configuration
- USB-to-Serial converter cable

To install and set up a LAC/E device:

1. Unpack and place the LAC/E in the desired location.
2. Ensure that the network interface card is installed and set up correctly in the LAC/E, as well as the serial device.

   Requirement:

   - If you are using Ethernet instruments, ensure that at least one additional network card is present.
   - If you are using serial instruments with acquisition machines that do not have built-in serial ports, verify that a USB-to-serial cable is present.
3. Connect the LAC/E to the network.
4. Connect the chromatographic instruments to the LAC/E.

2.3.3 Optional interface connectors

You can directly connect to the COM port on an Empower Personal workstation or an acquisition client when you are acquiring data from a SAT/IN Module.

2.3.3.1 Network interface card for Ethernet instruments

An acquisition client, LAC/E, or Personal workstation must use an additional network interface card (NIC) to communicate with Ethernet instruments (such as an ACQUITY, e-SAT/IN, or detector). You must assign an IP address to this network card (also called an instrument LAN) so that it can assign IP addresses to your Ethernet instruments. To set the IP address, you must first install Empower software on the client, LAC/E, or workstation.

To configure the instrument LAN, see Configuring the instrument LAN (Page 39).

When bridging ports for computers running on Windows 10, you must configure the instrument LAN as described in: Bridging multiport network cards for Ethernet instruments (Page 39).

2.4 Connecting and configuring Ethernet chromatographic devices

Ethernet instruments connect directly to a computer's network interface card. If you are connecting multiple Ethernet instruments through a single-port Ethernet adapter, use a Waters-supplied switch and connect the Ethernet cable from the computer to the switch, and then plug each instrument into the switch.

Note: The network interface card (NIC) used for instrument connections is supplementary to the NIC used to communicate with your corporate network.

First, power-on the client and LAC/E devices, and then power-on the Ethernet devices. See the *Waters Ethernet Instrument Getting Started Guide* for more information on connecting and configuring Ethernet devices.

2.5 Connecting serial chromatographic devices

2.5.1 USB-to-serial converter cable

The USB-to-serial converter cable provides a standard PC COM port connection with the serial instrument—by connecting a second cable with wiring that is usually specific to the instrument.

2.5.2 Ethernet and serial device connections

For the latest information about instruments and devices supported in Empower, refer to the Release Notes and the Empower third-party support matrix , both available on the Waters website. For a complete list of instruments controlled in Empower, contact your local Waters representative.

2.6 Connecting mass spectrometers

You can connect an ACQUITY QDa Detector, and SQD2 mass spectrometers to an Empower Personal workstation or to an acquisition client (a client connected directly to one or more chromatographic systems).

Note: Examples in this section reflect a system configuration that Waters currently ships. The specific type of network card that Waters ships is subject to change at any time.

The computer requires two network cards:

- Network card for connecting the Mass Spectrometer to the computer
- Network card for connecting to your facility's network

Note: Drivers for MS detectors are deployed one at a time. If you want to switch between using a QDa or SQD2, you must perform these actions:

- Uninstall the existing ICS for all mass detectors.
- Install the ICS for the mass detector you want to use. This will be the active mass detector. If you want to install the ICS for more than one detector, select all the mass detectors you want to install, and then choose the active mass detector.
- Configure the new system.

If you obtain the computer (Empower Personal workstation or acquisition client) from Waters, the network cards are installed and configured before the computer is shipped to you. If you installed your own network cards, use the following instructions as a guideline.

2.6.1 Connecting mass spectrometers to the Empower system

Restriction: Except for the Waters ACQUITY QDa Detector, mass spectrometers cannot be connected to a LAC/E.

To connect a mass spectrometer to the Empower system:

1. Locate the computer within 5 m of the instrument.
2. Ensure that the computer has two network cards:
   - Network card for Ethernet instruments
   - Network card for connecting to your Empower network
3. When using a switch, connect it to the computer's network card for Ethernet instruments, and then connect the mass spectrometer to the switch. Use a Waters-supplied switch for this connection. Connect the other end of the network cable to the port labeled "Instrument LAN" on the rear panel of the Empower workstation.

   Note: If you did not obtain the computer from Waters, label one of the network cards as indicated.
4. Power-on the system (see Power-on the chromatographic system (Page 31)).

2.7 Power-on the chromatographic system

Powering-on the Empower chromatographic system entails powering-on the individual instruments and devices in a particular sequence.

This section contains the startup sequence for the Empower chromatographic system and its peripheral equipment.

To power-on instruments and devices:

1. Power-on the computer.
2. Power-on all equipment controlled by the Empower system. This includes all Ethernet devices, all serial equipment, and all third-party USB devices.
3. Power-on all equipment not controlled by the Empower system (for example, computer peripherals such as printers).

3 Installing an Empower Personal workstation

Restriction: Empower 3.6.1 Personal is supported only in Windows 10 Professional or Enterprise edition 64-bit (including LTSB Build 1607).

Recommendation: Before installing any hardware or software, perform a full backup of your hard drives (see the instructions provided by the manufacturer of your computer). After the installation, back up your Empower 3.6.1 data regularly.

To upgrade from a previous version of Empower (prior to Empower 3.6.0), back up all your projects and uninstall any instrument component software. Next, deactivate the licenses and options, and then uninstall the previous version of Empower. Then, follow the procedures in this chapter to install Empower 3.6.1 software. After that, you can restore your projects into Empower 3.6.1. You must recreate your chromatographic systems, users, and libraries.

3.1 Preparing the Personal workstation

Installing Empower 3.6.1 software on a Personal workstation requires the hardware and software specified in Requirements for an Empower Personal workstation (Page 17).

You can install Empower 3.6.1 as a new installation on a system where no Chromatography Data Software (CDS) is currently installed or as an upgrade from Empower 3.6.0.

If you plan to change the name of the computer, follow these guidelines:

- Change the name before you install Empower software.
- Do not change the name of the computer after Empower is installed.
- The computer name must be less than 16 characters in length.
- The computer name must begin with an alphabetic character (A to Z) and cannot begin with a numeric character (0 to 9). `Empower123` is an acceptable computer name, but not `123Empower`.

Notes:

- An upgrade to Empower 3.6.1 is an in-place upgrade that retains all data.
- Empower workstations purchased from Waters already contain these settings.

Complete these tasks before you begin the installation or upgrade:

- Ensure that the workstation has the required hardware and software, as specified in Requirements for an Empower Personal workstation (Page 17).
- Log in to the operating system using an account that is part of the local Administrators group.

- Configure the system so that Windows automatically manages the virtual memory paging file size.
- Configure Windows Updates to notify you before downloading and installing new updates.
- Close all applications, and then restart the workstation.
- Ensure that any operating system or application update processes are complete.
- Configure the system power options. See Configuring the power options (Page 34).
- Verify that the disk drive allows enough space to install Empower 3.6.1 software (see the tables below).

The Empower 3.6.1 installer (Deployment Manager) gathers information about your system and compares its settings to the minimum required specifications (Page 17). The installation can display an error message and continue, or the installation can stop and exit, depending on the following conditions:

- If a system does not meet the hard drive space requirements for the required features, an error message states that there is insufficient hard drive space. You must free up disk space or change installation drives before you can continue.
- If the drive hosting the Empower projects directory does not meet the 5-GB minimum requirement, a warning message states that the projects directory may not have enough space to handle data acquired from future projects and the installation continues.
- If the system includes an incompatible processor, the installation continues without warning messages. The processor information is recorded in the installation log.
- If the system does not meet the memory requirement, an error message states the insufficiency and the installation terminates. The insufficiency is recorded in the installation log.

3.1.1 Configuring .NET Framework

You must install Microsoft .NET 3.5 Framework manually on Windows 10. .NET 4.0 Framework is installed and enabled by default. .NET 4.8 is preinstalled and the .NET 4.8 is backward-compatible with all versions back to 4.0.

To install .NET 3.5 Framework:

1. From Windows **Control Panel**, click **Programs** > **Programs and Features** > **Turn Windows features on or off**.
2. In Windows Features, expand **.NET Framework 3.5 (include .NET 2.0 and 3.0)**, select the **Windows Communication Foundation HTTP Activation** and **Windows Communication Foundation Non-HTTP Activation** features, and then click **OK**.
3. After Windows completes the requested changes, click **Close**.

3.1.2 Configuring power options

You must configure the power management settings to disable the power-saving features.

Note: If you obtain the computer from Waters, it has the power options already configured.

To configure the power options in Windows:

1. In the Windows Search text box, type `Power`, and then click **Power and Sleep settings**.
2. On the **Power and Sleep settings** tab, click **Additional power settings**.
3. On the **Power Options** tab, select **High performance**, and then click **Change plan settings**.
4. On the Edit Plan Settings page, perform these tasks:
   - Select **Never** from the **Turn off the display** field.
   - Select **Never** from the **Put the computer to sleep** field.
5. On the Edit Plan Settings page, click **Change advanced power settings**.
6. In the Power Options dialog box, verify the settings as listed in the **Power options settings** table, and then click **OK**.

   Table 3–1: Power option settings

Power options	Settings
Expand **Hard disk** and **Turn off hard disk after**	Type `Never` in the Setting (Minutes) field
Expand **Sleep** settings	
Sleep after	**Never**
Allow hybrid sleep	**Off**
Hibernate after	**Never**
Allow wake timers	**Disable**
Expand **USB settings** and **USB selective suspend setting**	**Disabled**
Expand **Display** and **Turn off display after**	**Never**

7. Go back to the **Power Options** tab, select **Choose what the power buttons do**, click **Change settings that are currently unavailable**, and clear the **Turn on fast startup (recommended)** check box.

3.1.3 Configuring network discovery

You must enable the network discovery function and the file and printer sharing functions so that clients and servers can communicate. To enable the network discovery function on domain devices, you must start certain services.

3.1.3.1 Starting the required services

To start the required services:

1. Open the **Control Panel** and select **System and Security** > **Administrative Tools** > **Services**.
2. Change the start-up type to **Automatic** and start these services:
   - DNS Client
   - Function Discovery Resource Publication
   - SSDP Discovery
   - UPnP Device Host

   Tip: When all services are running, you can modify the network discovery and printer sharing settings.

3.1.3.2 Turning on the network discovery and file and printer sharing functions

To turn on the network discovery and file and printer sharing functions:

1. In the Windows Search text box, type `Network` and then select **Network and Sharing Center**.
2. Click **Change advanced sharing settings** and turn on these functions:
   - **Network discovery**
   - **File and printer sharing**

3.1.4 Confirming regional settings

If you are installing Empower software on an English-language computer, you must confirm that your Windows regional settings are configured for English (United States). The symbols for English (United States) use decimal formatting, not comma formatting, which is important when displaying numeric values (12.56, not 12,56).

To confirm that the regional settings are correct:

1. From Control Panel (**Category** view), under **Clock, Language, and Region**, click **Change date, time, or number formats**.
2. In the Region dialog box, ensure that **English (United States)** is selected as the format in the **Formats** tab.

3.1.5 Synchronizing Empower and Windows time

Synchronize the Waters Empower software time zone and the time zone on the host Windows operating system to avoid any discrepancy, which typically can be one hour.

To synchronize Empower and Windows time:

1. In the Windows Search box, type `Time Zone`, and then select **Change the time zone**.
2. In the Settings window, click **Date and time**, and ensure that the Adjust for daylight saving time automatically option is **On**.

3.2 Installing Empower 3.6.1 software on a workstation

You install Empower 3.6.1 software from the Empower 3.6.1 software media. You can perform a typical installation of the software on the default location. Alternatively, you can perform a custom installation specifying different drives.

Recommendation: Specify a drive that is different from the OS drive.

Allow approximately 60 minutes to install the software.

Restriction: Empower 3.6.1 Personal is supported only on Windows 10 Professional or Enterprise 64-bit (including LTSB Build 1607).

3.2.1 Installing Empower software

Follow the instructions in this section if this is a new installation of Empower 3.6.1 software. If you are upgrading to Empower 3.6.1, follow the instructions on upgrading Empower on a workstation (Page 55).

To install Empower software:

1. Navigate to the location of the Empower 3.6.1 software.
2. Browse to the main folder and double-click the **setup.exe** file.

   Note: A dism.exe window may open after you double-click **setup.exe**. It closes automatically after several seconds.
3. On the Choose Setup Language page, select the desired language from the list, and then click **OK**.

   Important: If you install Empower in a language for which the font packs are not installed on your operating system, Empower interface strings are not readable.
4. On the Main page, select **Install Empower Software**.
5. On the Select Product Type page, select **Personal**.
6. On the Customer Information page, type your username, organization, and Software Support ID number, and then click **Next**.
7. On the End-User License Agreement page, read and accept the license agreement, and then click **Next**.
8. On the Installation Type page, select one of the following options:

- **Typical**: Select and then proceed to step 10. All Empower and Oracle files and projects are installed on the system drive, which is typically *C:*.
- **Custom**: Select and then proceed to step 9 to install Empower Application, Projects, and Oracle files on different drives.

9. On the Destination folders page, select the appropriate drives from the list for the Empower Application, Empower Projects, and Empower Oracle with Database, and then click **Next**.
10. On the Ready to Install page, click **Next**.

    Tip: If an Empower-related process triggers a Windows Security Alert message, click **Allow Access**.

    Result: The software installation begins. This process requires approximately 60 minutes, but the time can vary depending on the computer.
11. On the Status page, click **Finish**.
12. When the restart message appears, click **Yes**.

    Result: The computer restarts.
13. Complete the installation. See Completing the installation (Page 37).

3.2.2 Completing the installation

After the computer restarts, perform the following tasks to complete the installation:

- Log in to the operating system using an account that is part of the local Administrators group. The account must be the same one you logged in to when you installed the software.
- If you want to install instrument drivers for one or more instruments, use the latest Empower Instrument Driver Pack media. Refer to the appropriate installation guide and release notes for the driver. Visit www.waters.com for the most recent instrument drivers.
- The first time you log in to Empower 3.6.1, you must select the time zone you want to use in the Empower Login dialog box. A message informs you that the base license is not installed.
- Activate the Empower 3.6.1 software license and option licenses. See Activating Empower software licenses and options (Page 40) for instructions.
- Verify the installed files. See Verifying your Empower software installation (Page 56) for instructions.

Requirement: If you are using real-time virus scanning, during and after installation, exclude all Empower-related directories and their sub-directories from the scans. Some real-time virus scanners mistake normal data acquisition and instrument control for virus activity and interfere with proper operations. Full-system scans and live updates can be network-intensive, disk-intensive, and CPU-intensive, and can interfere with normal data acquisition. Certain antivirus program features such as "intrusion prevention" and "tamper protection" can also interfere with normal operation. If you observe issues with Empower, review and verify the antivirus logs. It may be necessary to white-list any affected components.

Note: If you experience communication problems, review the firewall exceptions list by clicking **Control Panel**, double-click **Windows Firewall**, and then click the **Exceptions** tab. Ensure that the following exceptions are selected in the Programs and Services list:

- Empower-related ports and processes:
  - DCOM Port (135)
  - Empower
  - Empower Configuration Manager
  - Processing Monitor
  - Processing Server
  - Waters Instrument Server
  - Waters Service
  - WDHCP Server Configuration
  - WDHCP Server Svc.exe
- Instrument component software-related processes:

  Note: Depending on your system, there may be more instruments than those in this list.
  - ACQUITY ASM Server
  - ACQUITY BSM Server
  - ACQUITY CM Server
  - ACQUITY Console Client
  - ACQUITY Console Server
  - ACQUITY ELSD Server
  - ACQUITY MD Server
  - ACQUITY FLR Server
  - ACQUITY PDA Server
  - ACQUITY SM Server
  - ACQUITY SQ Server
  - ACQUITY TQ Server
  - ACQUITY TUV Server
  - Local Console Controller (LCC Handheld Controller)
  - Trinity UI (if applicable)
  - W2489 Server
  - W2707 Server
  - W2998 Server

3.2.3 Configuring the instrument LAN

To configure the instrument LAN, access the Waters DHCP Server Configuration wizard:

1. In Configuration Manager, right-click an **Empower Node**, and then select **Properties**.
2. From the Node Properties dialog box, click **Configure DHCP**, and then click **Configure DHCP**.
3. From the Waters DHCP Server Configuration dialog box, click **Server**, and then click **Configuration Wizard**.
4. In the Select Network Connection dialog box, select the **Instrument LAN**, and then follow the steps of the wizard.
5. Assign an NIC an IP address that is different from the subnet already in use by the corporate network.

   Note: For more details, see the *Waters Ethernet Instrument Getting Started Guide* or the topic “Configuring chromatographic instruments” in the *Empower online Information System*.

3.2.4 Bridging multiport network cards for Ethernet instruments

An acquisition client, LAC/E, or Personal workstation supports both single-port network cards and bridging multiport network cards. If you are using a single network card, refer to the Empower Help topic “Configuring DHCP settings”. When bridging ports for computers running on Windows 10, you must configure the instrument LAN as described below.

Note: This procedure was tested using Waters hardware. If you are using non-Waters computers, you may notice differences in this procedure. Contact Waters for assistance.

To configure the instrument LAN for bridging multiport network cards in Windows 10:

1. From **Control Panel** > **Network and Internet** > **Network and Sharing Center** > **Change Adapter Settings**, right-click the Local Area Connection to be used for the bridge.
2. In the Local Area Connection Properties dialog box, click **Configure**.
3. In the Properties dialog box, click the **Advanced** tab.

   Requirement: You must change these settings for every Local Area Connection that comprises the instrument LAN bridge.
4. From the Property list box, select these items, change the value to **Disabled**, and then click **OK**:
   - IPv4 Checksum Offload
   - TCP Checksum Offload (IPv4)
   - UDP Checksum Offload (IPv4)

5. From the Windows Network Connections page, select all the Local Area Connections that comprise the bridge, and then right-click and select **Bridge Connections**.
6. After the bridge is created, right-click it, select **Rename**, and then type `Instrument LAN`.
7. From **Control Panel** > **Device Manager** > **Network Adapters**, select **Microsoft Multiplexor Driver**, and then right-click **Properties**.
8. In the Microsoft Network Adapter Multiplexor Driver Properties dialog box, click the **Advanced** tab.

   From the Property list box, select these items, change the value to **Disabled**, and then click **OK**:

   - IPv4 Checksum Offload
   - TCP Checksum Offload (IPv4)
   - UDP Checksum Offload (IPv4)

   Result: The network card is properly configured. However, you must perform additional steps as described in the Empower Help topic “Configuring DHCP settings”.

3.2.5 Activating Empower software licenses and options

To access Empower software, you must first activate the Empower base software license. You can activate licenses other than the Empower base software license at the same time as or after the Empower base software license. However, you cannot activate another license before you activate the Empower base license.

License serial numbers purchased from Waters or the order numbers of the purchased licenses are necessary for activating the Empower licenses and option licenses. If you need to transfer a software license or option license from one computer to another, you must deactivate it from the original computer before you activate it on a new computer.

The Empower base software license includes Named User licenses and system licenses. The number of named users you can create in the software is based on the number of Named User licenses you installed. You can create multiple user accounts. However, you can only have as many accounts active at one time as you have licenses. (The number of active accounts cannot exceed the number of Named User licenses you purchased.)

Note: Empower software comes with a default system user account that does not require a named user license. However, the account does require an Empower base license. This administrator account can be disabled but not removed from Empower software. The default username is `system` and the default password is `manager`. Neither the username nor the password are case sensitive.

Notice: To avoid rendering licenses and options unusable, deactivate all licenses and options before uninstalling Empower software. If you do render the licenses and options unusable, call Waters Technical Support for assistance. If you must uninstall Empower software, first uninstall any instrument component software and deactivate the licenses and options, and then uninstall the Empower software.

Software option licenses are available for optional software functionality such as System Suitability, Dissolution, GPC/SEC, or Method Validation Manager. These are project-configurable options. When you activate an option license following the procedures in this section, you can enable each option in projects as needed. You can disable an option for specific projects (see “Modifying project properties” in the *Empower online Information System*).

Exception: You cannot activate a license labeled for an Enterprise or Workgroup system on an Empower Personal workstation or activate a license labeled for an Empower Personal workstation on an Enterprise or Workgroup system.

Restriction: You can activate Empower software licenses only by using the serial numbers provided with the Empower licenses and options. You cannot use Empower license serial numbers provided with a previous major release.

Note: You may also need to install third-party control licenses for certain other systems, such as Agilent LC, Agilent GC, Hitachi LC, Shimadzu LC, and others.

3.2.6 Activating Empower licenses on a workstation

You must activate the Empower base license first.

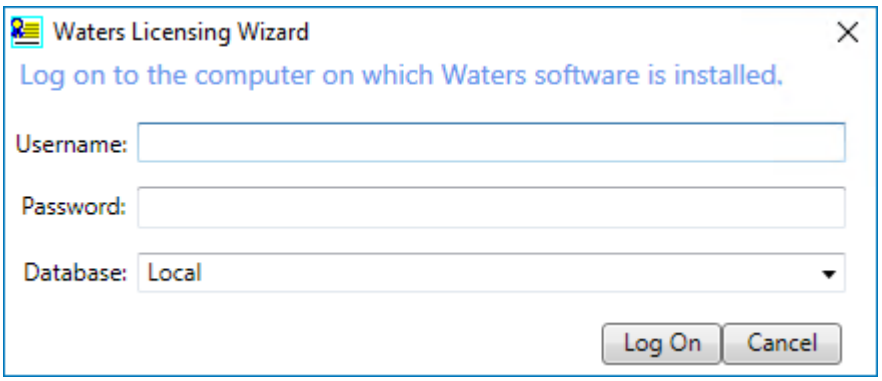
Important: Set the **Startup type** of the Oracle listener service to **Automatic (Delayed Start)**. Power-on the machine, wait until the status of the Oracle listener service is `Running`, log in to Empower, and then start the Waters Licensing Wizard.

To activate the Empower license:

1. Log on to the computer using an account that is part of the local Administrators group.
2. From the Windows Start menu, click **Start** > **Empower** > **Waters Licensing Wizard**.
3. In the Waters Licensing Wizard log on dialog box, perform these tasks:
   - Type the default user name and password.

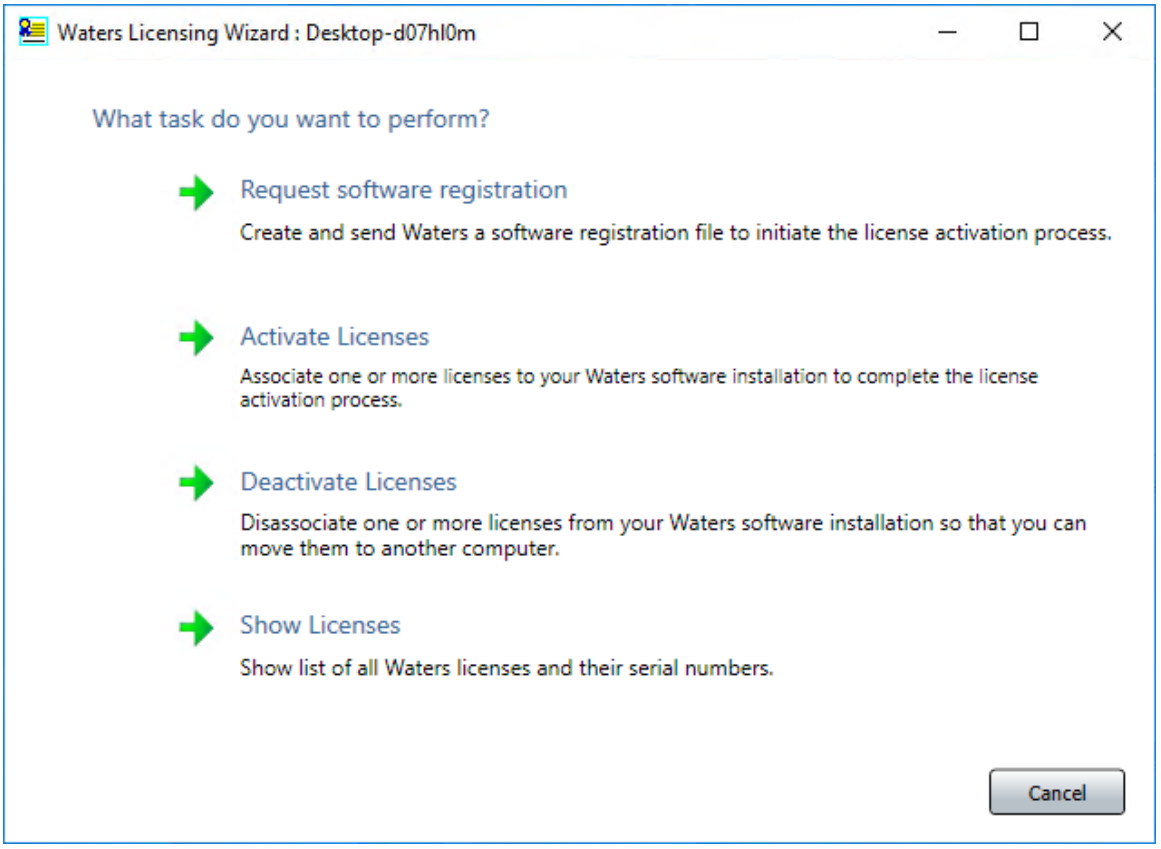
     Note: Empower software provides a default system user account you can disable, but not remove, from the software. The default user name for the account is `system` and the default password is `manager`. When logging in to Empower software and using the licensing wizard for the first time, specify the default user name and password. Subsequently, any user with the administrator privilege can access the Waters Licensing Wizard.
   - For Empower Personal installations, leave **Local** as the database, and then click **Log On**.

Figure 3–1: Waters Licensing Wizard Log On



4. On the Waters Licensing Wizard page, click **Request software registration**.

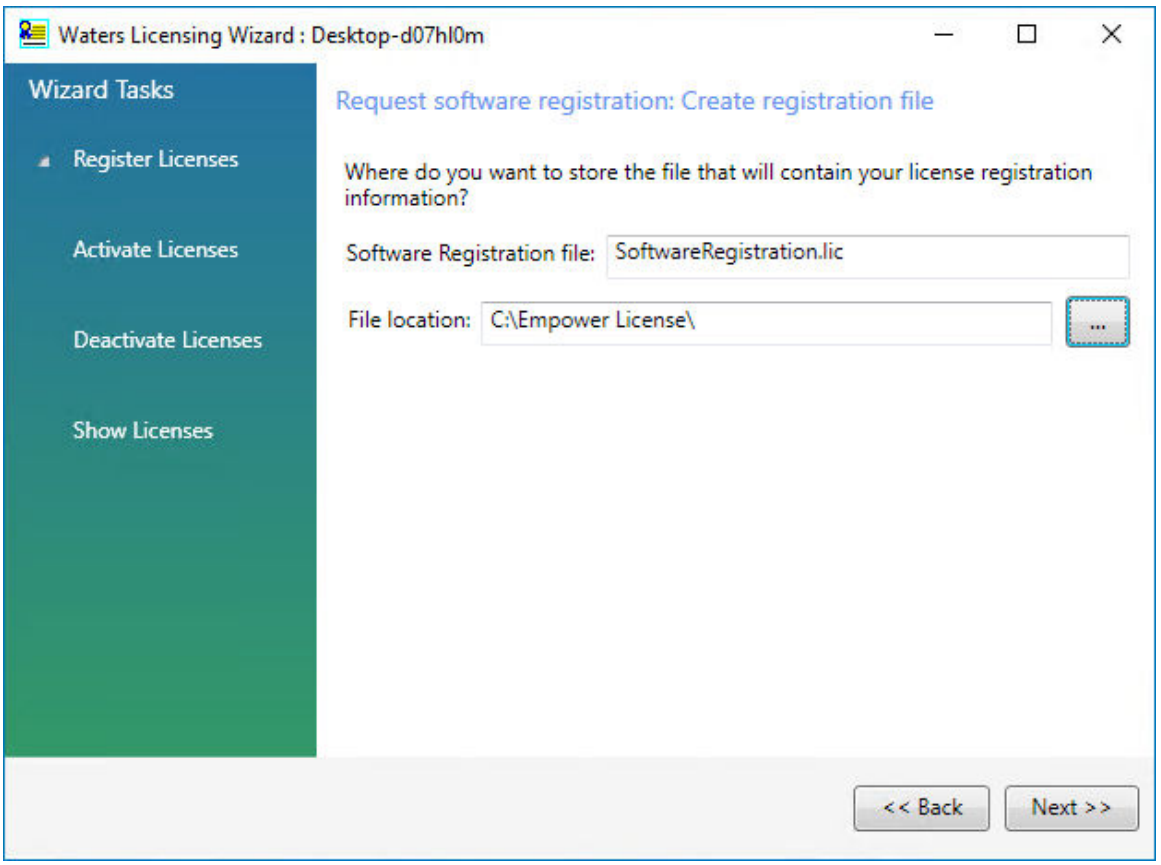
Figure 3–2: Waters Licensing Wizard - Request software registration



5. On the Create registration file page, browse to the location where you want to store the software registration file, and then click **Next**.

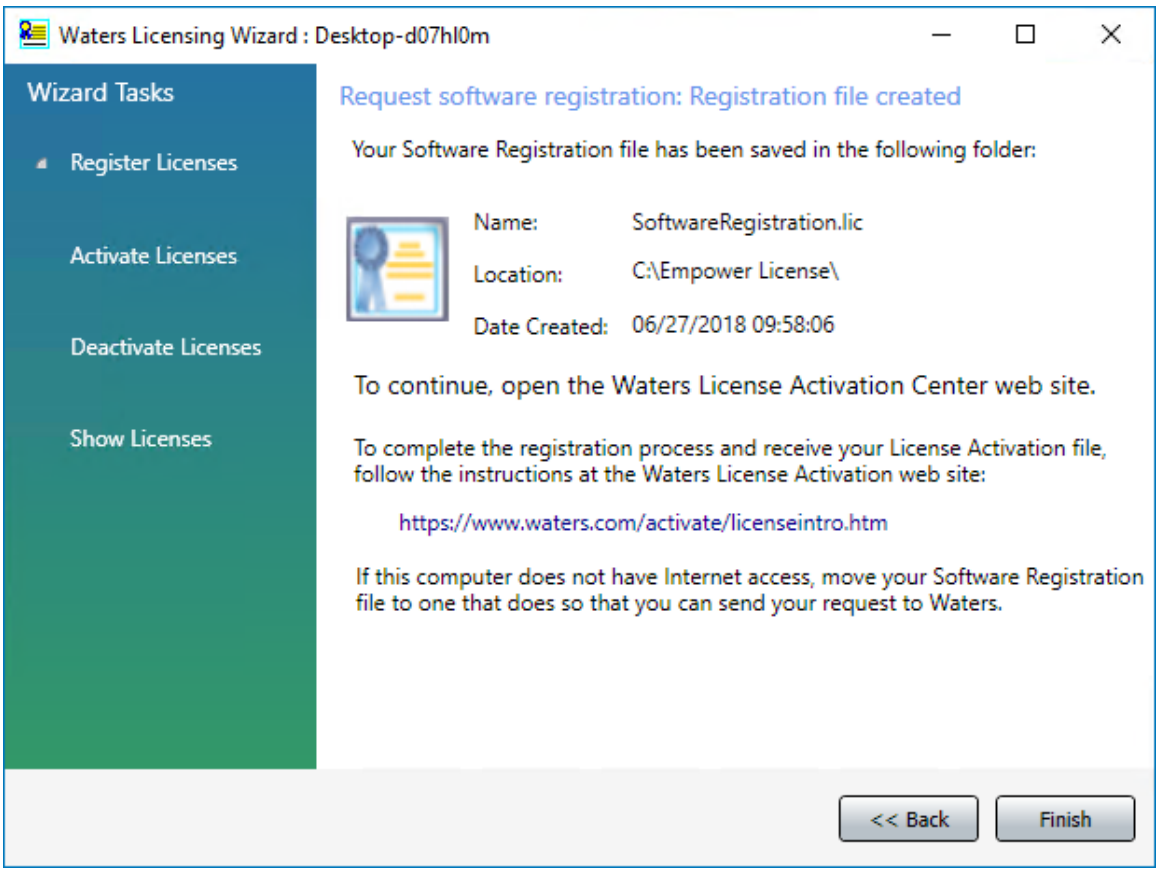
Note: You must supply the registration file on the Waters website when you activate the licenses.

Figure 3–3: Create registration file



6. On the Registration file created page, click the **Web address** or open an Internet browser and browse to https://www.waters.com/activate/licenseintro.htm.

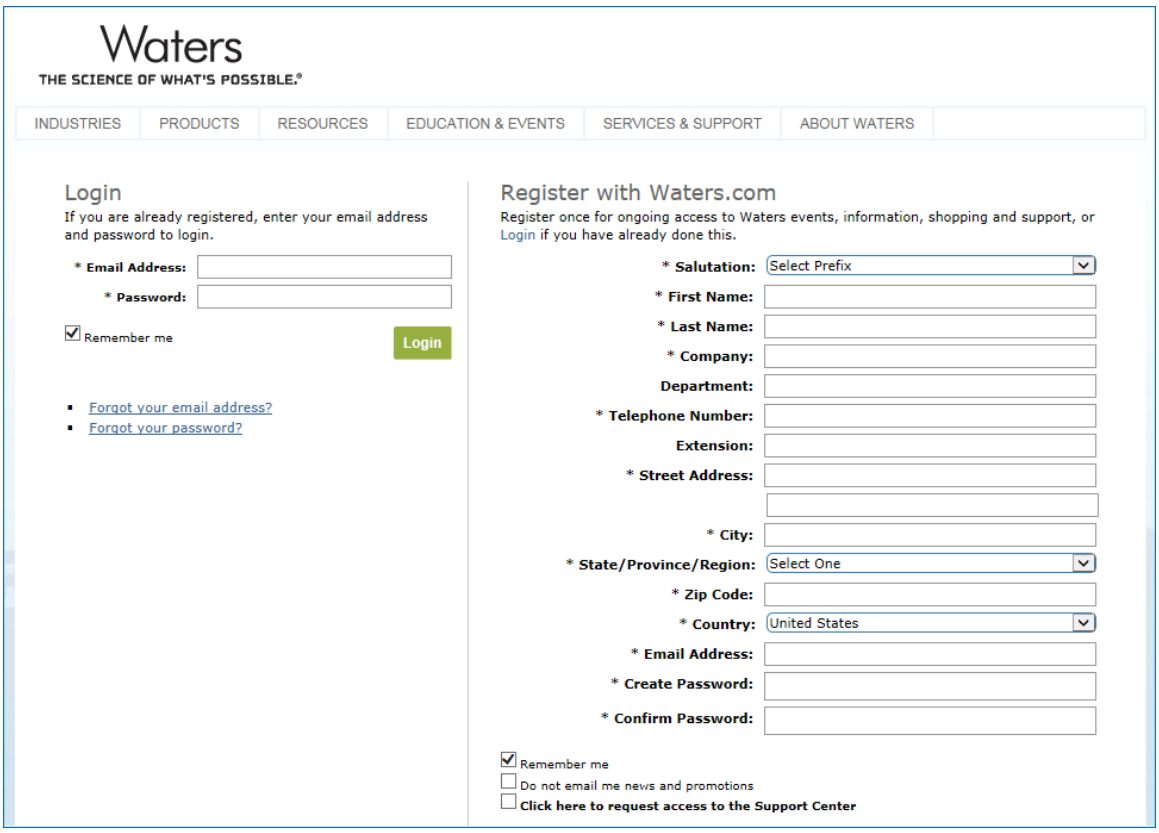
Figure 3–4: Registration file created



Requirement: You must have a Waters account to log on to the Waters licensing page.

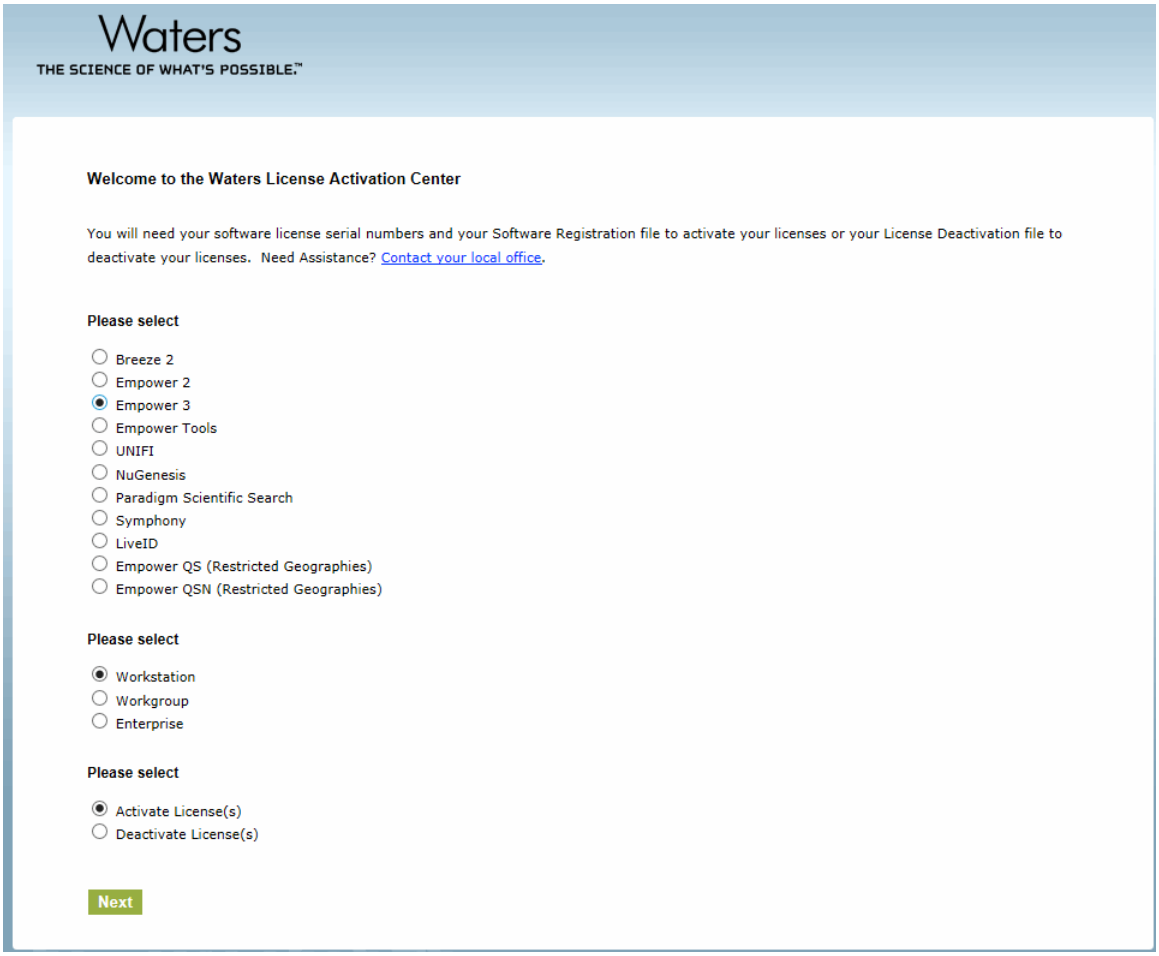
7. Log on to the Waters website. If you do not have an account, create one.

Figure 3–5: Waters Website Login page



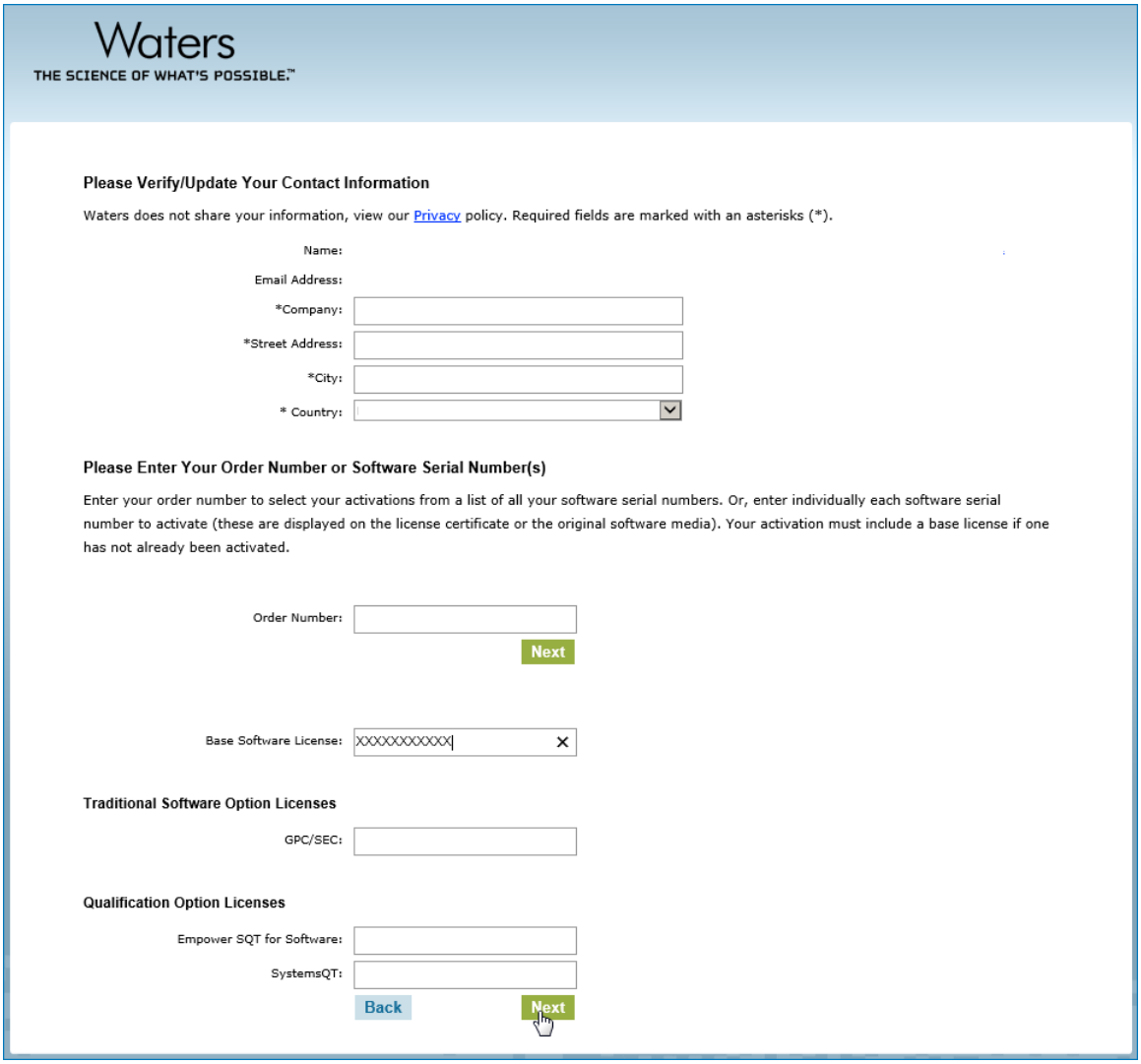
8. On the Welcome to the Waters License Activation Center page, perform these tasks:
   - Select **Empower 3**.
   - Select **Workstation**.
   - Select **Activate Licenses**.
   - Click **Next**.

Figure 3–6: Waters License Activation Center - Activate Empower Workstation



9. On the Please Enter Your Order Number or Software Serial Number(s) page, do one of the following tasks, and then click **Next**:
   - If you have a purchase order, type the number in the **Order Number** field.
   - If you have serial numbers, type the serial number in the appropriate field.

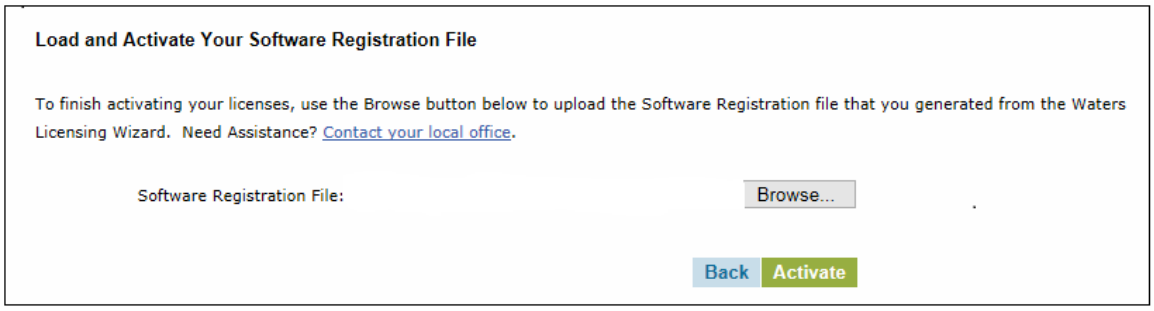
Figure 3–7: Enter Software Serial Numbers



Note: You can activate your option licenses later, but you must activate the base license first to access Empower software.

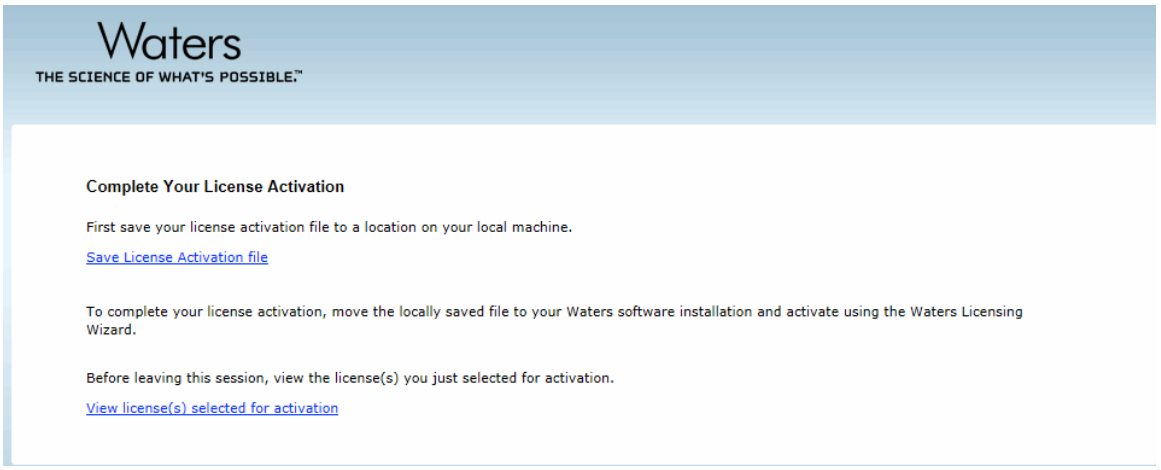
10. On the Load and Activate Your Software Registration File page, browse to the location of the Software Registration file you created using the Waters Licensing Wizard, and then click **Activate**.

Figure 3–8: Load and Activate Your Software Registration File



11. On the Complete Your License Activation page, click the link to save your license activation file and view licenses selected for activation.

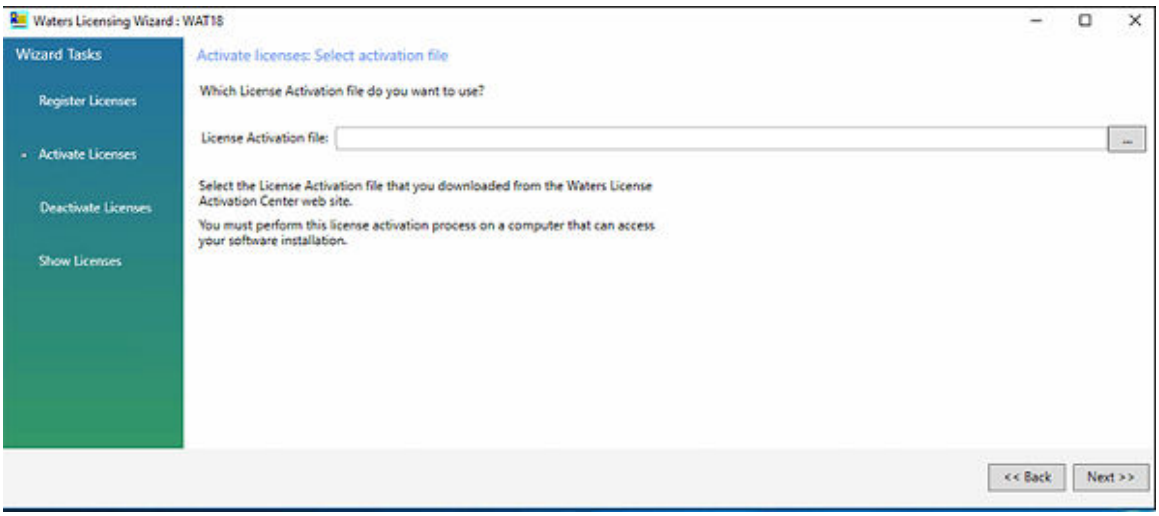
Figure 3–9: Complete Your License Activation



Note: A license activation file is saved. The license activation file is a 20-alphanumeric-key file that contains all licenses for which you provided a serial number. It is not the same as the SoftwareRegistration.lic file. Copy the license activation file to a location accessible to your Empower computer.

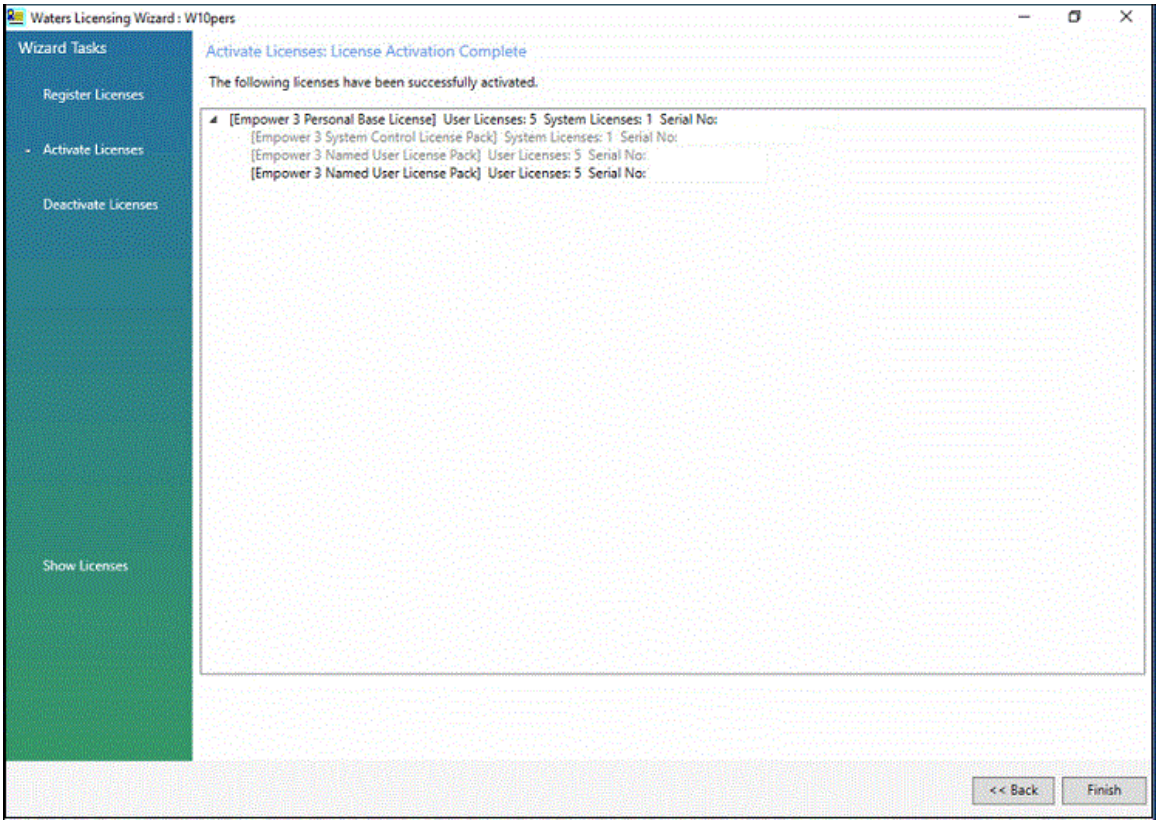
12. Log back on to the Waters Licensing Wizard and perform these tasks:
    - Click **Activate Licenses**.
    - Browse to the location of your license activation file and select it.
    - Click **Next**.

Figure 3–10: Select activation file



13. On the License Activation Complete page, click **Finish**.

Figure 3–11: Activate Licenses: License Activation Complete



3.2.7 Deactivating Empower licenses

Before uninstalling Empower software, you must first deactivate the licenses and options using the Waters Licensing Wizard and License Activation Center Website. This ensures that you can reactivate the license or option on a different computer.

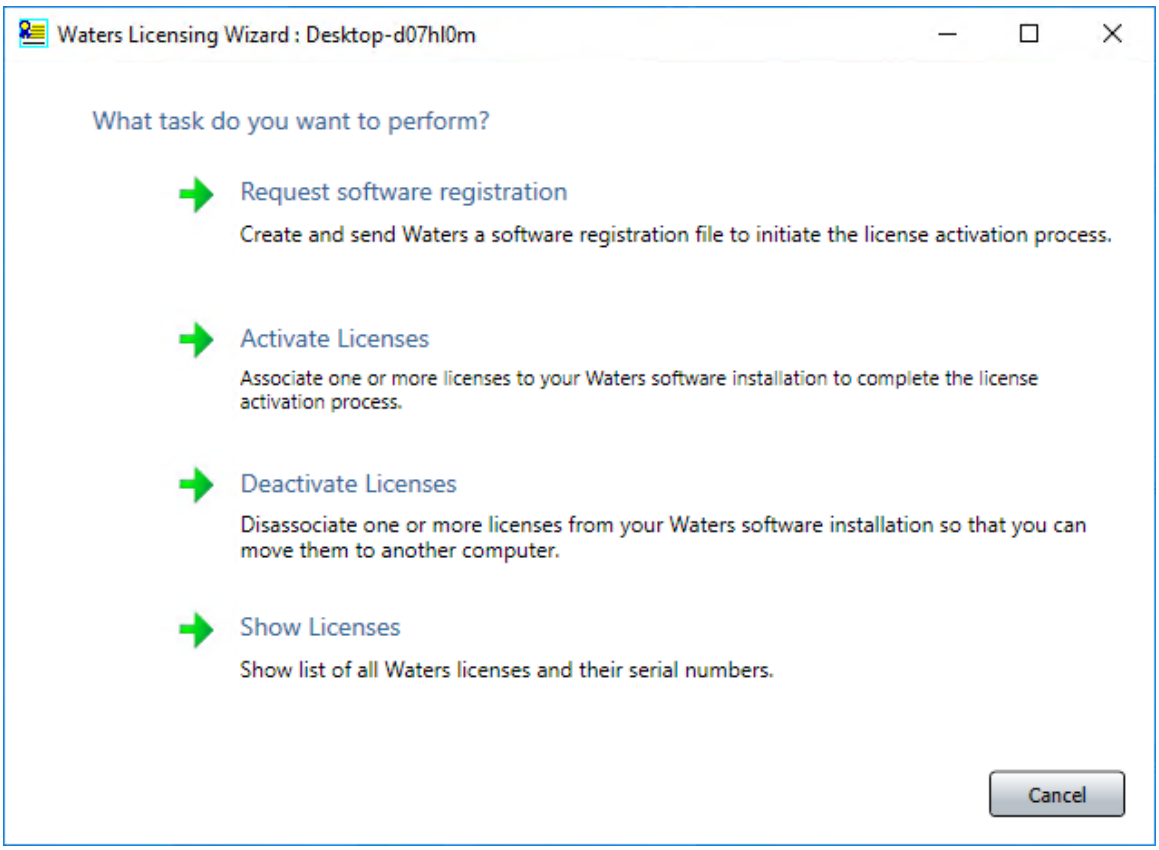
Important: If you deactivate the base software license, the Licensing Wizard automatically deactivates and removes all user licenses, system licenses, and option licenses, and you cannot log on to Empower software.

To deactivate a license or option:

1. From the Windows Start menu, click **Start** > **Empower** > **Waters Licensing Wizard**.
2. In the Waters Licensing Wizard dialog box, perform these tasks:
   - Type the username and password of a user who is part of the local Administrators group.

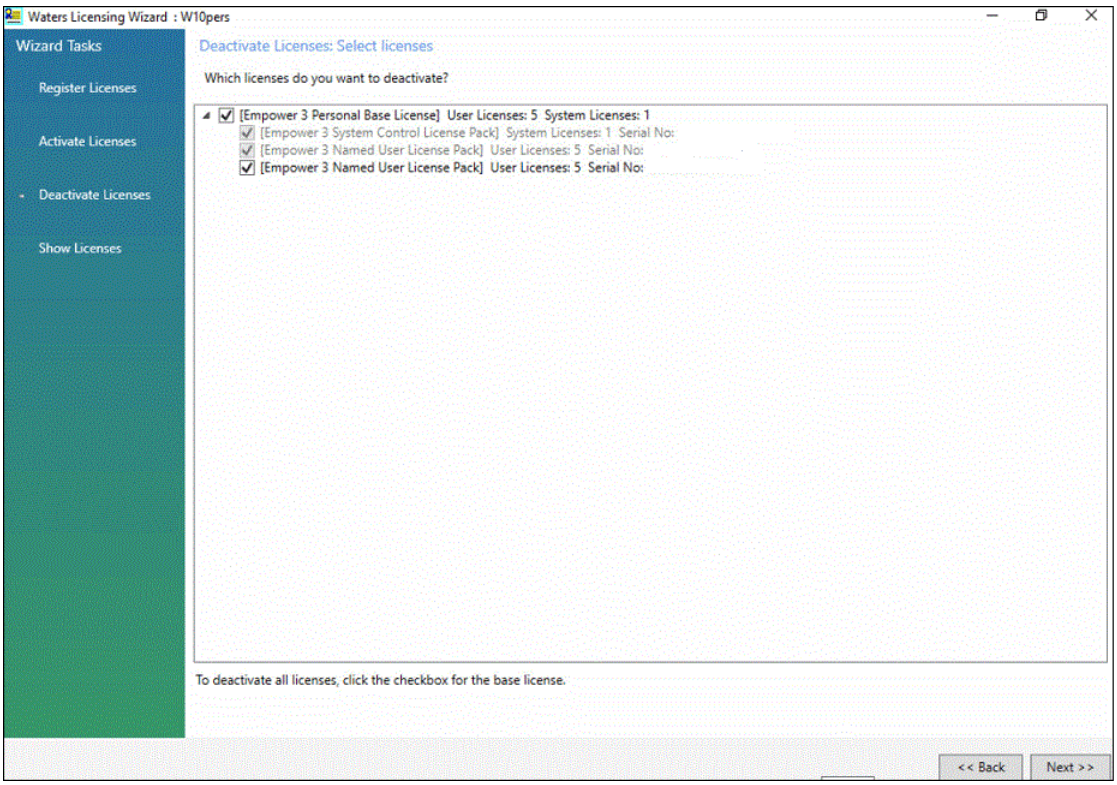
     Note: Empower software provides a default system user account that you can disable, but not remove, from the software. The default username for the account is `system`, and the default password is `manager`.
   - For Empower Personal installations, leave **Local** as the database, and then click **Log On**.
3. On the Waters Licensing Wizard task page, click **Deactivate Licenses**.

Figure 3–12: Waters Licensing Wizard - Deactivate Licenses



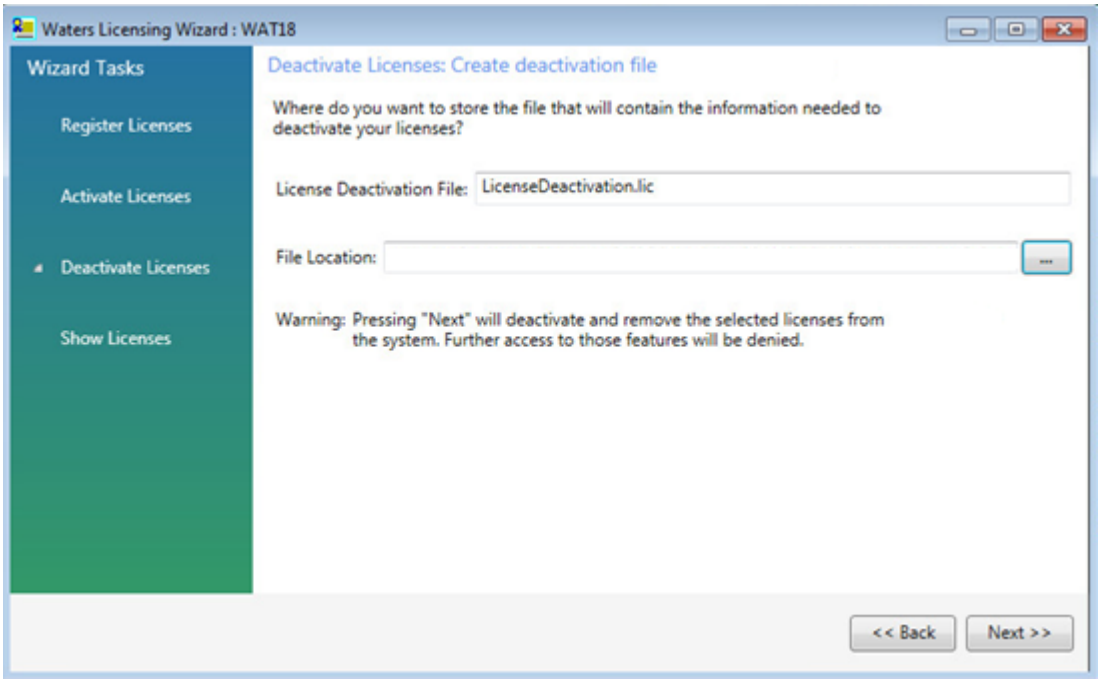
4. On the Deactivate Licenses page, select the licenses you want to deactivate, and then click **Next**.

Figure 3–13: Deactivate Licenses: Select licenses



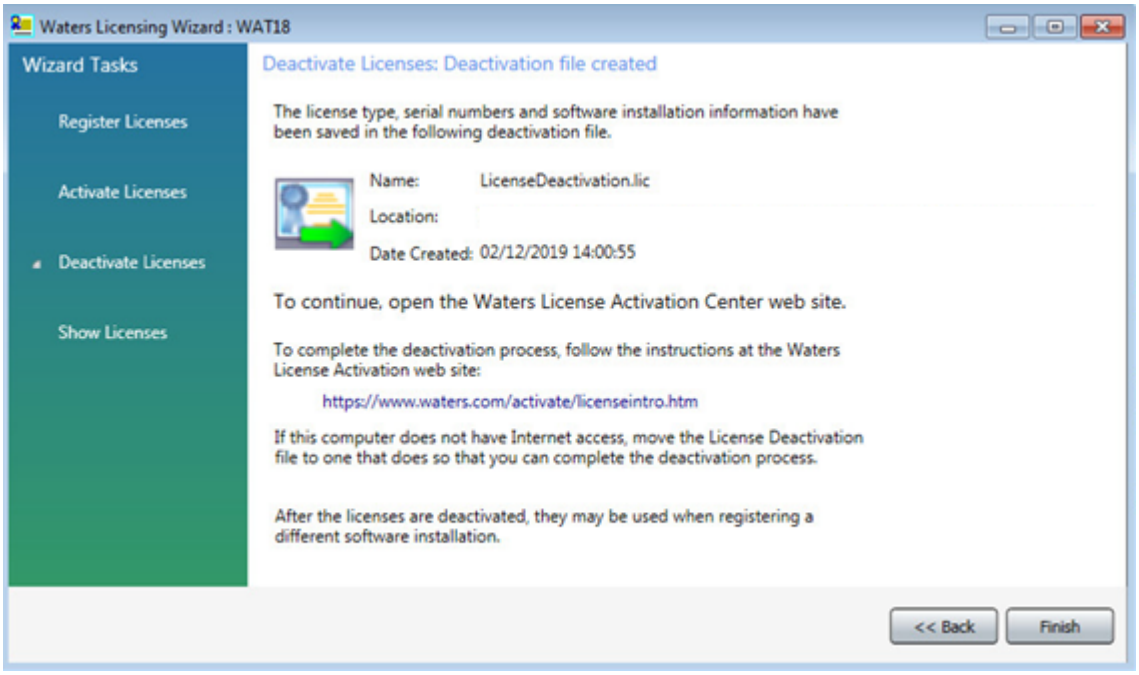
5. On the Deactivate Licenses: Create deactivation file page, select a location for the license deactivation file, and then click **Next**.

Figure 3–14: Deactivate Licenses: Create deactivation file



6. On the Deactivate Licenses: Deactivation file created page, click **Finish**.

Figure 3–15: Deactivate Licenses: Deactivation file created



7. Log in to https://www.waters.com/activate/licenseintro.htm.
8. On the Welcome to the Waters License Activation Center page, perform these tasks:
   - Select **Empower 3** and select **Workstation**.
   - Select **Deactivate Licenses**.
   - Click **Next**.

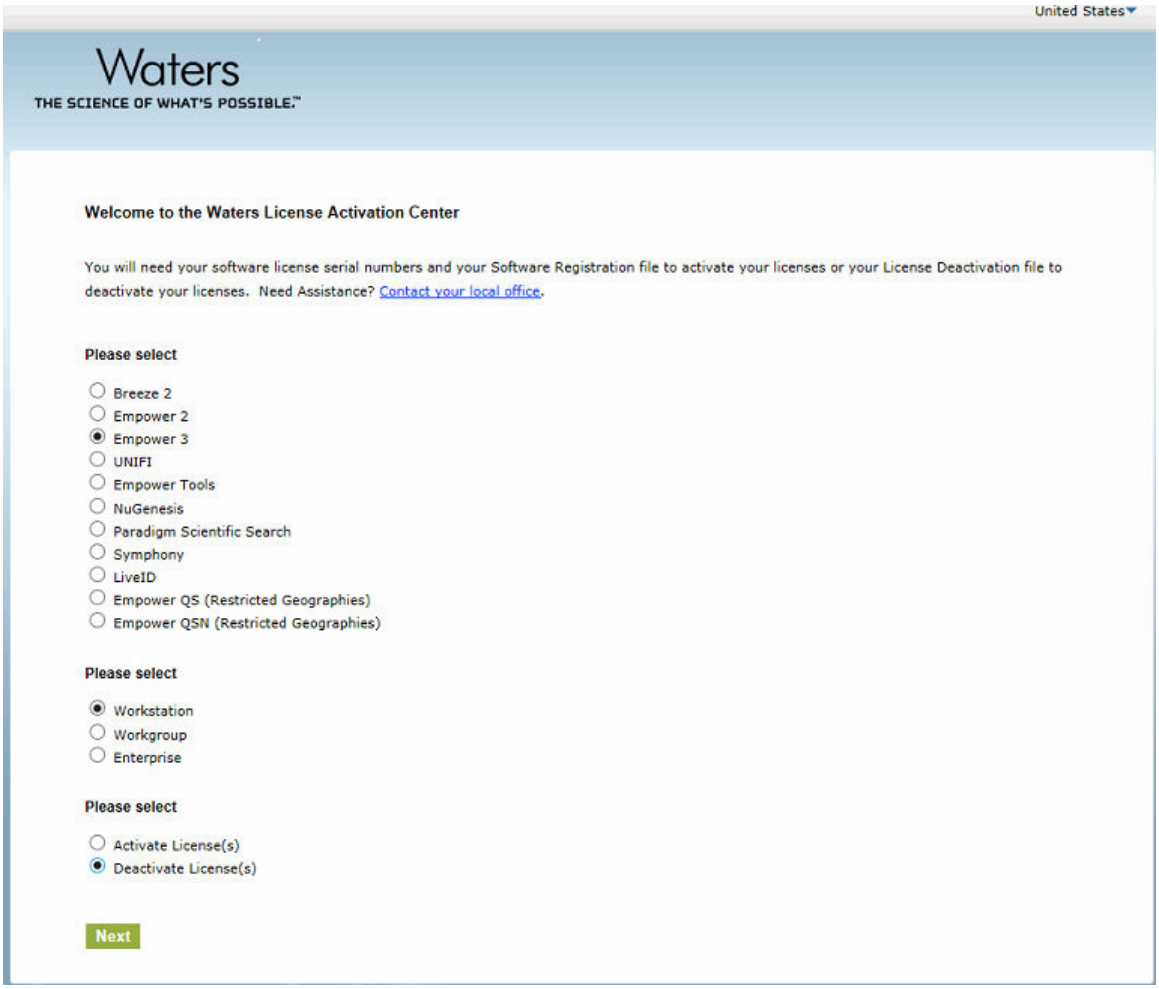


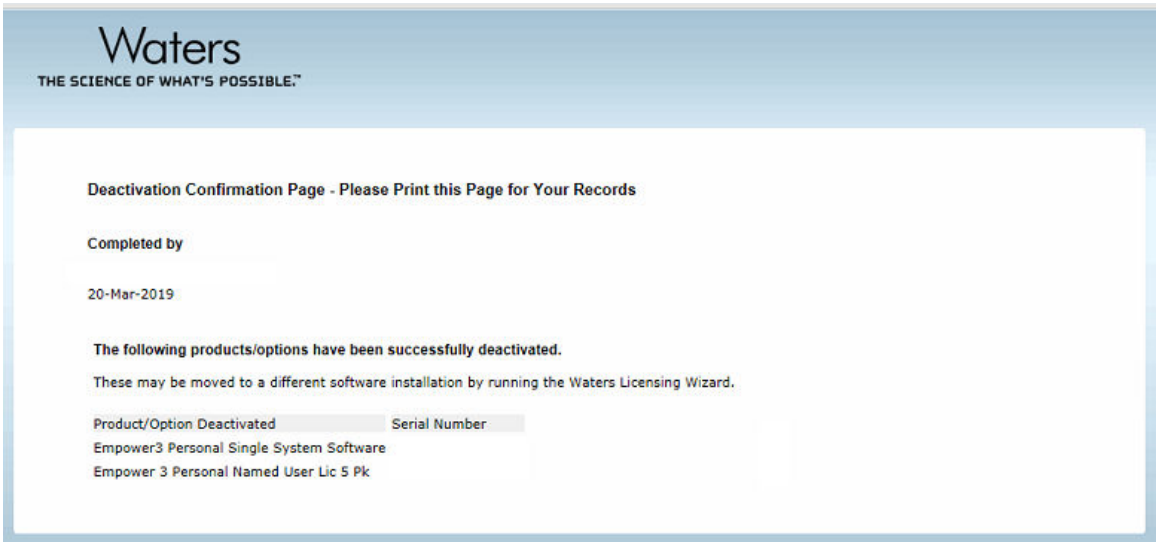
Figure 3–16: Waters License Activation Center - Deactivate Licenses

9. On the Load and Deactivate Your License Deactivation File page, browse to the location of the deactivation file you created using the Waters Licensing Wizard, and then click **Deactivate**.

Figure 3–17: Load and Deactivate Your License Deactivation File

The Deactivation Confirmation Page lists the licenses you deactivated.

Figure 3–18: Deactivation Confirmation Page



3.3 Upgrading from earlier versions of Empower

Follow the instructions in this section to upgrade to Empower 3.6.1. If you are not upgrading, follow the instructions for a new Empower 3.6.1 installation (Page 36).

You can upgrade to Empower 3.6.1 from Empower 3.6.0.

Requirement: Back up all projects to a separate drive location before upgrading to Empower 3.6.1.

Note: If you changed the Oracle Sys account password, you may be prompted to supply a password for the Oracle Sys account. Supply the correct password and the Empower upgrade will continue. If you have not changed the Oracle Sys password, then you may have received the message to supply the Oracle Sys password in error and should confirm that the Oracle Listener and Empower database are running.

To start the Oracle Listener service:

1. Click **Start** > **Administrative Tools** > **Computer Management**.
2. In the Computer Manager window, expand **Services and Applications**, and then click **Service**.
3. In the list of services, right-click **OracleEmpowerOracle19cTNSListener**, and then select **Properties**.
4. Ensure that you set the **Startup type** to **Automatic (Delayed Start)**.
5. Click **Start**.

3.3.1 Upgrading to Empower 3.6.1 software

You can upgrade to Empower 3.6.1 from Empower 3.6.0.

To upgrade to Empower 3.6.1:

1. Mount the Empower 3.6.1 software ISO file.

   Alternative: Insert the Empower 3.6.1 software media into the DVD drive.
2. On the Maintenance Mode: Empower Personal page, select **Upgrade Empower Software**.
3. On the Ready to Upgrade page, click **Next**.
4. When the Windows Security Alert appears, select **Domain networks** and click **Allow access**.
5. On the Status page, when the upgrade is complete and the `Success` message appears, click **Finish**.
6. When the restart message appears, click **Yes**.

3.4 Verifying your Empower software installation

3.4.1 Using the Verify Files Utility

The Verify Files Utility checks the integrity of the installed Empower program files.

After the Empower installation, run the Verify Files Utility to verify the Empower program files (not the database or data files):

- As part of your installation qualification, if you purchased an Empower Qualification option.
- To ensure that the Empower files did not change since installation.

3.4.2 Viewing the installation log

The installation log contains information about your Empower installation. You can read the log file to review your installation choices, the installation environment, and the status of the installation steps. In case of a partial or unsuccessful installation, review the installation log to inspect for errors.

The `Installation success or error status` value appears at the end of the installation log. If the value displayed is 0, then the installation was successful. If the value displayed is anything other than 0, record the number and contact Waters Technical Support.

To view the install log:

1. Select **Start** > **Empower** > **Empower Installation Log**.

Result: The program displays the *empower.log* file in Notepad.

2. Review the contents of the file.
3. Click **File** > **Exit**.

3.5 Empower programs and logs

The Empower program folder (in the Start menu) contains these items:

Item	Description
Configure ICS for 64-bit OS	Use this utility to make your legacy instrument drivers 64-bit compatible.
Empower Installation Log	Records information about the current installation.
Empower	Displays the Empower login page, which starts the Empower software. After you log in, you can select one of several Empower applications. For details, see “Starting and exiting from Empower” in the *Empower online Information System*.
Remove Waters Instrument Component Software	Use this utility to uninstall instrument component software (ICS). You see this item only if instrument component software is installed.
Verify Files	Verifies the integrity of the Empower software files on your hard disk.
View Verify Files	Opens the Checksum file in Notepad, which displays the results (checksums) of the verified files.
Waters Licensing Wizard	Starts the Waters Licensing Wizard, which you can use to initiate software license and option activation and deactivation.
Manage Waters Email Center	The Email Center facilitates troubleshooting because it allows the recipient to quickly respond to an Empower error without having to check the Message Center throughout the day. See *Empower online Information System* for details about configuring the Waters Email Center.

3.6 Uninstalling Empower software on a workstation

When you want to uninstall Empower 3.6.1 software, use the Programs and Features utility in the Windows Control Panel to remove the software.

Requirement: Before you uninstall Empower, remove Waters Instrument Control Software (ICS), and then deactivate the Empower licenses.

To uninstall Empower 3.6.1 software:

1. Open the Windows Control Panel, click **Programs and Features**, and then double-click **Empower 3.6.1 Personal**.

   Note: From Windows 10, click **Start** > **All apps**, right-click **Empower 3.6.1 Personal**, and then click **Uninstall**.
2. Follow the steps in the Deployment Manager wizard to uninstall Empower software.
3. Restart the computer.

4 Installing an Empower Enterprise or Workgroup server

When installing Empower 3.6.1 software, you can choose to perform a fresh, new installation of Empower, upgrade from Empower 3.6.0, or perform a system object import.

To perform a system object import, you must first export the system objects from your previous Empower version. For details, see System object export (Page 80).

For any installation option, the first step is to prepare the server, and then you can install the Empower software.

Recommendation: Back up your computer before installing any hardware or software (see the instructions provided by the manufacturer of your computer). After the installation, back up your Empower data regularly.

4.1 Preparing the server

The database runs these applications:

Table 4–1: Database server applications

Application	Description
Waters Service	Responsible for writing raw data files from Empower nodes, copying raw data from project to project (through the Empower application), and creating new projects.
Oracle Database	Stores methods, audit trails, and specific, raw-data file parameters (the data points are stored as external files controlled by Waters Service).
Waters Database Manager	A Web-based software application that helps you manage your database, including backing up the database and monitoring database backups.

Note: The default Empower server installation places the Waters Service and the Oracle database on the same server. Empower also supports placing the Waters Service on a Windows server, separate from the Oracle database.

The Empower server installation program gauges the extent of the system's physical memory, and then automatically configures the Oracle initialization parameters according to available resources.

The installation program assumes that the server is used exclusively as the Empower database server. Other applications running on the server can require you to adjust the initialization parameters accordingly.

Important: The adjustment of the Oracle initialization parameters is not dynamic. If you adjust the size of your server after installing Empower, you must adjust the Oracle initialization parameters. For more details, contact Waters Technical Support.

To assist with any potential troubleshooting, review the MSI install log from the *Windows* folder.

Important: If you plan to change the name of the computer, follow these guidelines:

- Change the name before you install Empower software.
- Do not change the computer name after Empower is installed.
- The computer name must be less than 16 characters in length.
- The computer name must begin with an alphabetic character (A to Z), and cannot begin with a numeric character (0 to 9). `Empower123` is acceptable for a computer name, but not `123Empower`.

4.1.1 Network considerations

The Empower Enterprise/Workgroup system requires a network infrastructure that is based on Active Directory Domain Services (referred to as "domain" throughout the document). You must synchronize Empower-related computers (clients, LAC/E devices, and servers) with a time server.

Recommendation: Do not install Empower software on a domain controller.

To maximize service time and minimize issues related to the network environment, Waters recommends that you follow these practices:

- All Empower-related user accounts and computers should reside within the same domain.
- If you are using real-time virus scanning, during and after installation, exclude all Empower-related directories and their sub-directories from the scans. Some real-time virus scanners mistake normal data acquisition and instrument control for virus activity and interfere with proper operations. Full-system scans and live updates can be network-intensive, disk-intensive, and CPU-intensive, and can interfere with normal data acquisition. Certain antivirus program features such as "intrusion prevention" and "tamper protection" can also interfere with normal operation. If you observe issues with Empower, review and verify the antivirus logs. You may need to white-list any affected components.
- After you install Empower software, do not change the name and IP (Internet Protocol) address on the server. The host name should not contain more than 15 characters, dashes, or symbols. Waters recommends a static IP address for Empower servers. If you are using DHCP (Dynamic Host Configuration Protocol) instead of a static IP, ensure that the host name remains the same.
- Configure Windows Updates to notify you before downloading and installing new updates.

- Ensure that any operating system or application update processes are complete.
- Configure preferences in Waters Database Manager (WDM) to notify you by email when tablespaces reach a user-defined size. Doing so helps you monitor database space usage. See the Waters Database Manager Online Help for more information.
- When you add a server, LAC/E, or client to a domain, ensure that the Windows network discovery functionality is turned on for these computers.

4.1.1.1 Group Policy Objects

System administrators use Group Policy Objects (GPOs) to define and enforce settings in an Active Directory network. Administrators can apply settings to users and computers based on locally defined group and site membership criteria. Before defining GPOs in an Empower network, keep in mind that Empower software is a distributed chromatography data acquisition system that relies on remote access and the Distributed Component Object Model (DCOM) configuration to carry out its activities. Empower software makes use of information stored in the database and in individual flat files, such as instsrv.dat (instrument configuration information) and channel_id.dat (raw data files).

If GPOs are used in an Empower network, Waters recommends that you follow these guidelines:

- Place Empower nodes in their own Organization Unit (OU). For the OU, define GPOs that minimize allowable changes. Waters recommends that you have a secondary (DEV) environment where you test Microsoft hot fixes and service packs before applying them to the environment.
- Grant administrators full access to the registry and file system so they can properly install software.
- Limit changes to the file system protections expected by the Empower application.
- Set the power options as recommended in this guide. See Configuring power options (Page 34).

GPOs can interfere with successful Empower operations. For example, data buffering can occur if the anonymous access to the raw data share is altered, or the editors for the COM instruments can sometimes operate improperly if the access control list for the HTML directories is altered.

4.1.1.2 Configuring .NET 3.5 Framework on Windows Server 2016 and 2019 Standard

You must install Microsoft .NET 3.5 Framework manually on Windows Server 2016 or 2019 Standard. .NET Framework 4.6 (or 4.7, respectively) is installed and enabled by default.

Tip: To ensure that no internal windows update server prevents access to the Internet-based windows update service that hosts the necessary files, install .NET 3.5 after you configure the network and before you put the server into a domain.

To install .NET 3.5 Framework on Windows Server 2016 or 2019 Standard:

1. Click **Start** > **Server Manager** and, in the Manage menu, click **Add roles and features**.

2. Click **Next** in the Wizard, select **Role-based or feature-based installation**, and then click **Next**.
3. Click **Select a server from the server pool**, select the target server, and then click **Next**.
4. In **Server Roles**, skip this section, and then click **Next**.
5. In **Features**, select **.NET Framework 3.5 Features (1 of 3 installed)**, and then click **Next**.
6. In the **Confirm installations selections** page, select **Restart the destination server automatically if required**, and then click **Install**.

4.1.1.3 Confirming regional settings

If you are installing Empower software on an English-language computer, you must confirm that your Windows regional settings are configured for English (United States). The symbols for English (United States) use decimal formatting, not comma formatting, which is important when displaying numeric values (12.56, not 12,56).

To confirm that the regional settings are correct:

1. From Control Panel (**Category** view), under **Clock, Language, and Region**, click **Change date, time, or number formats**.
2. In the Region dialog box, ensure that **English (United States)** is selected as the format in the **Formats** tab.

4.1.1.4 Synchronizing Empower and Windows time

Synchronize the Waters Empower software time zone and the time zone on the host Windows operating system to avoid any discrepancy, which typically can be one hour.

To synchronize Empower and Windows time:

1. In the Windows Search box, type `Time Zone`, and then select **Change the time zone**.
2. In the Settings window, click **Date and time**, and ensure that the Adjust for daylight saving time automatically option is **On**.

4.1.1.5 Disabling User Access Control

To disable User Access Control (UAC) on the Server:

1. Click **Start** > **Control Panel** > **System and Security** > **Change User Account Control settings**.

   Tip: To access **Control Panel** in Windows Server 2016 or 2019 Standard, right-click the **Windows** icon and click **Control Panel**.
2. Drag the slider down to the lowest setting **(Never notify)** and click **OK**.

   Important: To fully disable User Access Control (UAC), you must disable the policy `User Account Control: Run all administrators in Admin Approval Mode`. For details, see How User Account Control works.

3. In the Windows search box, type `secpol.msc` and press `Enter`.
4. In the Local Security Policy window, navigate to **Local Policies** > **Security Options**.
5. Right-click the **User Account Control: Run all administrators in Admin Approval Mode** policy in the list and select **Properties**.
6. In the policy's properties window, select **Disabled** and click **OK**.

4.1.2 Memory considerations

The server in an Enterprise system or workgroup requires sufficient memory for Oracle 19c and Empower software to operate. The amount of required memory depends on the number of applications, users, and the operating system. The largest quantity of memory is used by Oracle. When Oracle initializes, it creates a space in memory for most of the Oracle functions. The space is called the System Global Area (SGA). (For more information about the SGA, see the Oracle documentation or your database administrator.) The server must have adequate memory and the memory must be configured correctly. The amount of required memory depends on the number of client and LAC/E devices, users, chromatograms per project, and the number of integrated peaks per channel.

4.2 Disk space considerations

Each Workgroup or Enterprise system requires sufficient disk space for Oracle 19.7.0.0.0 and Empower software.

See also: Requirements for Empower Enterprise and Workgroup server (Page 20)

Important: The following minimum requirements are for the successful installation of Empower. When assessing the required size for your machine, factor in the number of users that the system will service, the usage intensity, the required life span of the current deployment, and the requirements of data security (data backups). The same principles apply for sizing the NIC capacity and the overall network performance. Consult the local Waters Deployment Specialist on the sizing and requirements of Empower-related nodes that are appropriate for your environment.

Table 4–2: Minimum disk space requirements

Purpose	Minimum Disk Space	Drive
Empower application	2 GB	Program drive
Oracle application	35 GB	Program drive **Recommendation:** Do not install Oracle on the OS drive, which is typically the “C:” drive.
Empower raw data	**Note:** See File server requirements (Page 134)	RawData drive

Table 4–2: Minimum disk space requirements (continued)

Purpose	Minimum Disk Space	Drive
Empower database	9 GB	Database drive
Empower projects	5 GB	RawData drive
Oracle database	10 GB	Database drive
Archive Log Dest1	10 GB (At a minimum, 50 archive logs of 200 MB each)	RawData drive
Archive Log Dest2	10 GB	Program drive
Mirrored Redo and Control files	1 GB	RawData drive

To maximize performance and make it possible to recover from disk failures, you must install the various software components on multiple drives. This minimum disk space requirements table reflects the minimum requirements at installation. However, you must account for additional disk space when the system is operational.

You must consider the following items when sizing drives for future use:

- Empower program files
- Empower raw data files
- Empower database

4.2.1 Empower program files

These are suggested storage requirements:

- Empower and Oracle application files – Fixed size at installation, approximately 6 GB.
- Archive log files – 200 MB each; allow space for at least 50 logs (10 GB total disk space). The number of archive logs you generate will depend on the level of database activity. The number of archive logs maintained on the server depends on how often the database is backed up, as well as overall activity. If you perform daily backups, the archive log files are deleted after they are backed up.

  Note: Deletion depends on the policy in **WDM** > **Backup & Recovery** > **Backup Settings** > **Policy**.

Tip: Each of the two locations for archive logs contains a full set of logs. Archive logs are essential for recovering databases. If you fill the space for archive logs, the database “hangs” until you provide more space for the logs.

4.2.2 Empower raw data files

The size of the Empower chromatography raw data files varies according to sampling rates, run times, and number of samples. PDA and MS files are bigger because they are 3-dimensional data (wavelength and mass range must be included). The total space requirement depends on how often you archive and how many systems are creating raw data files.

Tip: Raw data files can grow very quickly. Hundreds of GB may be needed for raw data. If you use up too much space, you can backup and then remove older projects to regain space on the raw data drive.

4.2.3 Empower database

The database datafiles (tablespace files) are configured to “autoextend”. As projects, raw data files, and results are created, the initial database datafile must autoextend to store all information.

Tip: The amount of free disk space limits the extension of the database files. You can add additional tablespace files to other hard drives, space permitting, or free space on the original drive to allow for adequate extension. Contact Waters for more information about this. See Contacting Waters (Page iii).

Most information stored in the database consists of results. The actual tablespace used for each result is related to the number of integrated peaks (named or unknowns). Additional space is required when you enable an option such as System Suitability, which produces the calculation of additional results, or when the data originates with a 3D detector and additional processing calculations are requested (for example, a PDA channel for which you enabled multi-pass purity).

4.2.4 Empower database backups

When you install Empower software on a server, default database backup schedules are installed but not enabled. In addition, RMAN (Oracle Recovery Manager) daily (hot) database backups can be enabled and run as a scheduled task. You can enable the database backup jobs and specify the time and other backup settings in the Waters Database Manager application.

The Fast Recovery Area is the default location where database backups are stored. This location must be able to accommodate two full backups simultaneously. The software does not delete an obsolete backup until it confirms that a current one is completed. The default directory for the fast recovery area is [drive used for the installation]:*Empower**Oracle**Fast_Recovery_Area*.

Recommendations:

- Set up a schedule of full (level 0) and incremental (level 1) backups.
- Include raw data files and external tablespaces in the backups (select the **Enable Extended Backup feature?** check box).
- Test database recovery from the backups regularly.

You must specify the backup location of your raw data files in Waters Database Manager.

For information about how to change the location of your database backups and specify the backup location of your raw data files, see the *Empower 3.6.1 System Administrator's Guide* (715007291).

Before changing the location of the database backups, consider the location, size, and number of backups that you want to retain:

- Choose a network location or storage array that can accommodate the number of database backups that you want to retain.
- Copy the database backup folders daily to a network share or storage array. If you schedule a task to copy the database backup folders, ensure that the task runs at a time other than the scheduled backup. The folder location where you copy database backups must not contain spaces in the path name.

A database backup generates a time-stamped log file that includes details about individual steps of the backup process. This log file is located in [drive used for the installation]:*Empower**wdm* \<*database name*>*scripts**logs*.

With the default configuration, one full backup set remains in the Fast Recovery Area (FRA). Archive logs are removed when a new backup is made. When a new, full database backup (level-0) runs, previous backups are removed from the FRA.

Once the default database backup schedules are enabled, you can backup the database automatically through the default schedules provided. In addition, you can configure your own automatic backup schedules in the Waters Database Manager application. You can restore the database by using scripts stored in this location: [drive used for the installation]:*Empower**Oracle* *BackupRecoveryScripts* folder. For details on restoring databases, see the *Empower 3.6.1 System Administrator's Guide* (715007291).

The database backup process typically compresses a database, reducing its size by 50 percent.

4.3 Installing Empower 3.6.1 software on a Windows server

Follow the instructions in this section to install Empower 3.6.1 software on a Windows server. If you are upgrading your current version of Empower software to Empower 3.6.1, follow the instructions on upgrading Empower on a server (Page 79).

4.3.1 Oracle software installation

Waters supplies Oracle software and Empower 3.6.1 software on the Empower 3.6.1 software installation media. Oracle is installed automatically during Empower 3.6.1 installation. If Oracle is already installed on the Windows server machine, the installation of Empower 3.6.1 software does not proceed. Allow approximately 60 minutes to install the software.

4.3.2 Starting the installation

To start the Empower software installation:

1. Ensure that the server is added to your domain.
2. Log in to the computer as a user who is part of the local Administrators group and ensure that no antivirus software is active during the deployment.
3. Ensure that all OS updates and other software installs are complete.
4. Navigate to the location of the Empower 3.6.1 software.
5. Browse to the main folder and double-click the **setup.exe** file.

   Tip: A *dism.exe* window opens after you click **setup.exe**. It will close automatically after several seconds.
6. Select a language from the list, and click **OK**.
7. On the main page, select **Install Empower Software**.
8. On the Select Product Type page, select **Enterprise** or **Workgroup**, depending on your environment.
9. On the Select Installation Type page, select **Server**.
10. On the Customer Information page, type your **username**, **organization**, and **Software Support ID number**, and then click **Next**.
11. On the End-User License Agreement page, read and accept the terms in the license agreement, and then click **Next**.
12. On the Destination Folders page, specify where you want the program features installed by selecting a drive letter from the list.

    Tip: By default, all locations point to drive C:\.

    Requirement: Do not install all the features on drive C:\.

    Recommendation: For best performance and for fault tolerance reasons:

    - Spread the components across multiple drives.
    - When possible, do not use the drive where the OS is installed (usually drive C:\) to install anything.
13. On the Database Option page, specify the locations of the archive and mirror directories (by changing the drive letter of the provided paths), and then click **Next**.

    Tips:

- Typically, the mirror directory (containing mirrored control files and redo logs) and the first archive directory are installed on the raw data drive. The second archive directory is installed on the program file drive. These are the recommended locations.
- By default, all locations point to drive C:\.

Important: Do not place the *EmpowerMirrorDB* directory on the same drive as the physical drive selected for the Empower Oracle Database. In the event of a disk malfunction, database recovery will not be possible.

14. On the Database Identification page, take the following actions:
    - Specify the Oracle Service Identifier (SID).

    Requirement: The database SID can be any combination of alphanumeric characters, up to eight characters.

    Recommendation: On Windows operating systems, you can name the SID with the prefix WAT followed by a maximum of five alphanumeric characters (to a total of eight).

    - Specify the Global Database Name, and click **Next**.

    Note: The default values are WAT19 for the SID and WAT19CDB for the Global Database Name.
15. On the Ready to Install page, click **Next**.

    Tip: If an Empower-related process triggers a Windows Security Alert message, click **Allow Access**.

    Result: The software installation begins. This process usually requires approximately 40 minutes, but the time can vary depending on the computer and the environment.
16. On the Status page, click **Finish**.
17. When the restart message appears, click **Yes**.

    Result: The computer restarts.

4.3.2.1 Activating Empower software licenses and options

To access Empower software, you must first activate the Empower base software license. You can activate licenses other than the Empower base software license at the same time as or after the Empower base software license. However, you cannot activate another license before you activate the Empower base license.

License serial numbers purchased from Waters or the order numbers of the purchased licenses are necessary for activating the Empower licenses and option licenses. If you need to transfer a software license or option license from one computer to another, you must deactivate it from the original computer before you activate it on a new computer.

The Empower base software license includes Named User licenses and system licenses. The number of named users you can create in the software is based on the number of Named User licenses you installed. You can create multiple user accounts. However, you can only have as many accounts active at one time as you have licenses. (The number of active accounts cannot exceed the number of Named User licenses you purchased.)

Note: Empower software comes with a default system user account that does not require a named user license. However, the account does require an Empower base license. This administrator account can be disabled but not removed from Empower software. The default username is `system` and the default password is `manager`. Neither the username nor the password are case sensitive.

Notice: To avoid rendering licenses and options unusable, deactivate all licenses and options before uninstalling Empower software. If you do render the licenses and options unusable, call Waters Technical Support for assistance. If you must uninstall Empower software, first uninstall any instrument component software and deactivate the licenses and options, and then uninstall the Empower software.

Software option licenses are available for optional software functionality such as System Suitability, Dissolution, GPC/SEC, or Method Validation Manager. These are project-configurable options. When you activate an option license following the procedures in this section, you can enable each option in projects as needed. You can disable an option for specific projects (see "Modifying project properties" in the *Empower online Information System*).

Exception: You cannot activate a license labeled for an Enterprise or Workgroup system on an Empower Personal workstation or activate a license labeled for an Empower Personal workstation on an Enterprise or Workgroup system.

Restriction: You can activate Empower software licenses only by using the serial numbers provided with the Empower licenses and options. You cannot use Empower license serial numbers provided with a previous major release.

Note: You may also need to install third-party control licenses for certain other systems, such as Agilent LC, Agilent GC, Hitachi LC, Shimadzu LC, and others.

4.3.2.2 Activating Empower licenses on a server

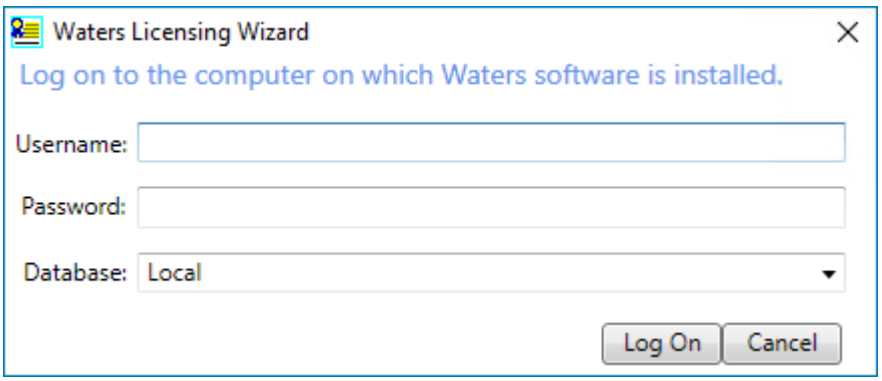
You must activate the Empower base license first.

To activate the Empower license:

1. Log in to the computer using an account that is part of the local Administrators group.
2. From the Windows Start menu, click **Start** > **Empower** > **Waters Licensing Wizard**.
3. In the Waters Licensing Wizard log on dialog box, perform these tasks:
   - Type the default user name and password.

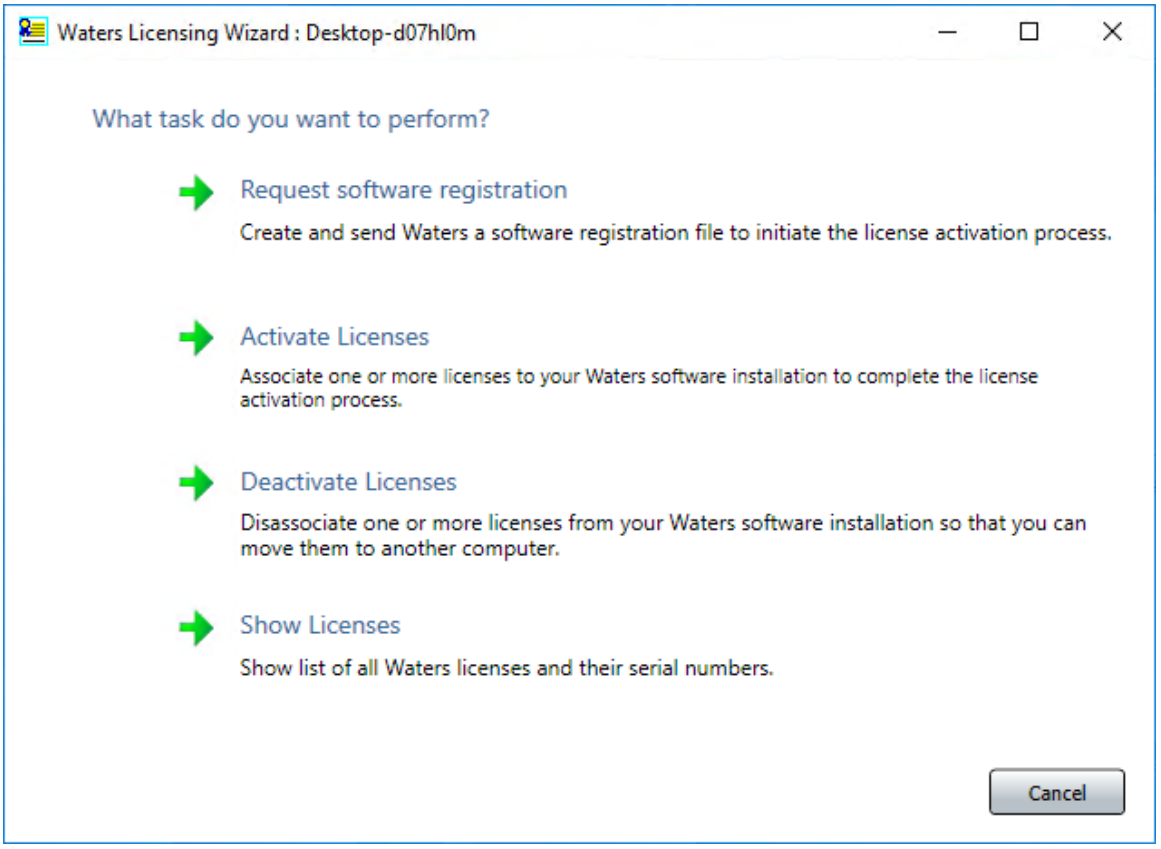
     Note: Empower software provides a default system user account that you can disable, but not remove, from the software. The default user name for the account is `system` and the default password is `manager`. When logging in to Empower software and using the licensing wizard for the first time, specify the default user name and password. Subsequently, any user with the administrator privilege can access the Waters Licensing Wizard.
   - For Empower Enterprise installations, select the database, and then click **Log On**.

Figure 4–1: Waters Licensing Wizard log on



4. On the Waters Licensing Wizard task page, click **Request software registration**.

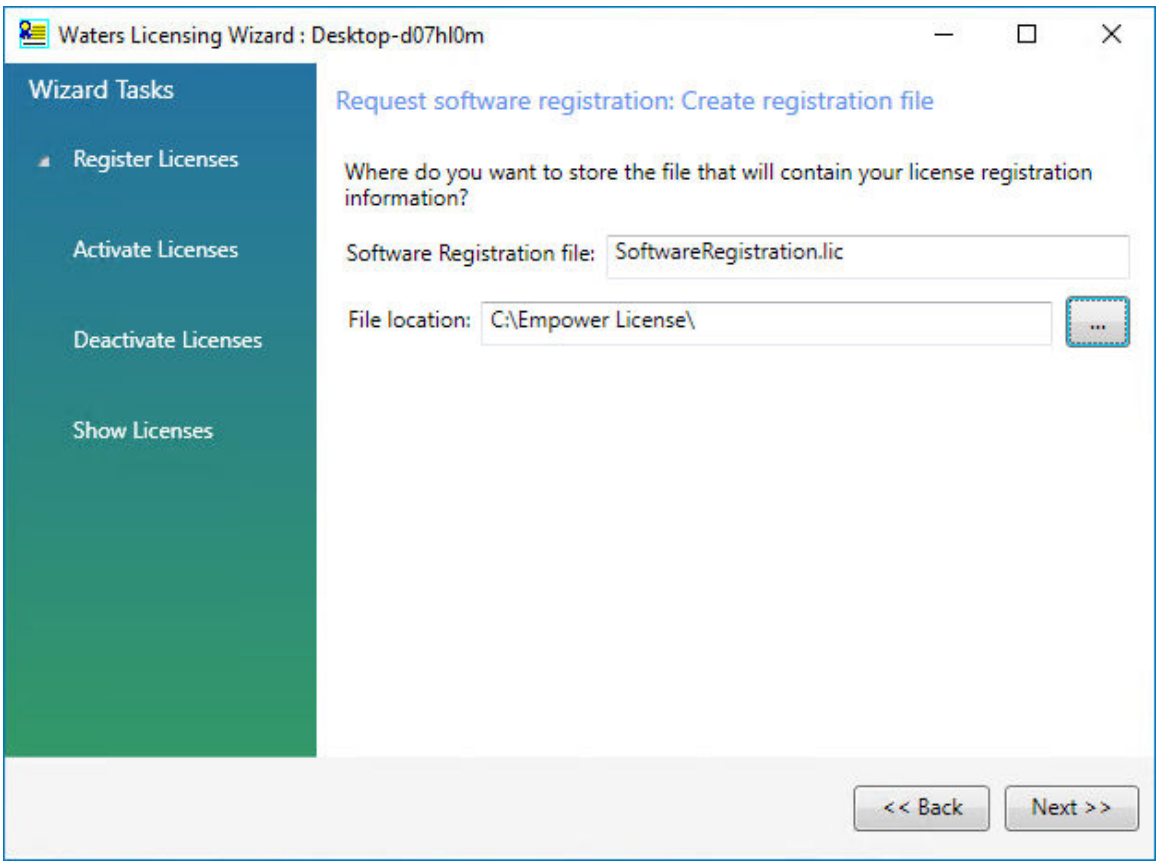
Figure 4–2: Waters Licensing Wizard - Request software registration



5. On the Create registration file page, browse to the location where you want to store the software registration file, and then click **Next**.

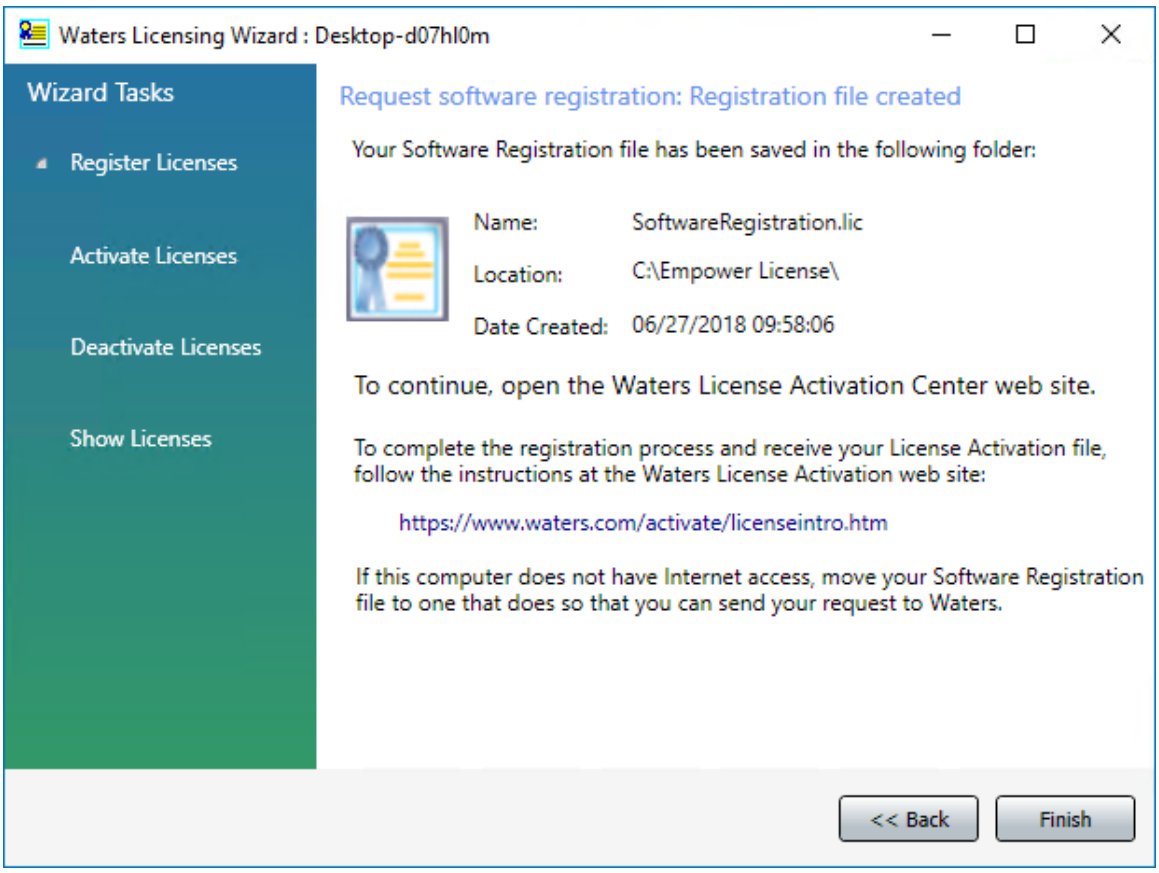
Note: You need to supply the registration file on the Waters website when you activate the licenses.

Figure 4–3: Create registration file



6. On the Registration file created page, click the **Web address** or open an Internet browser and browse to https://www.waters.com/activate/licenseintro.htm.

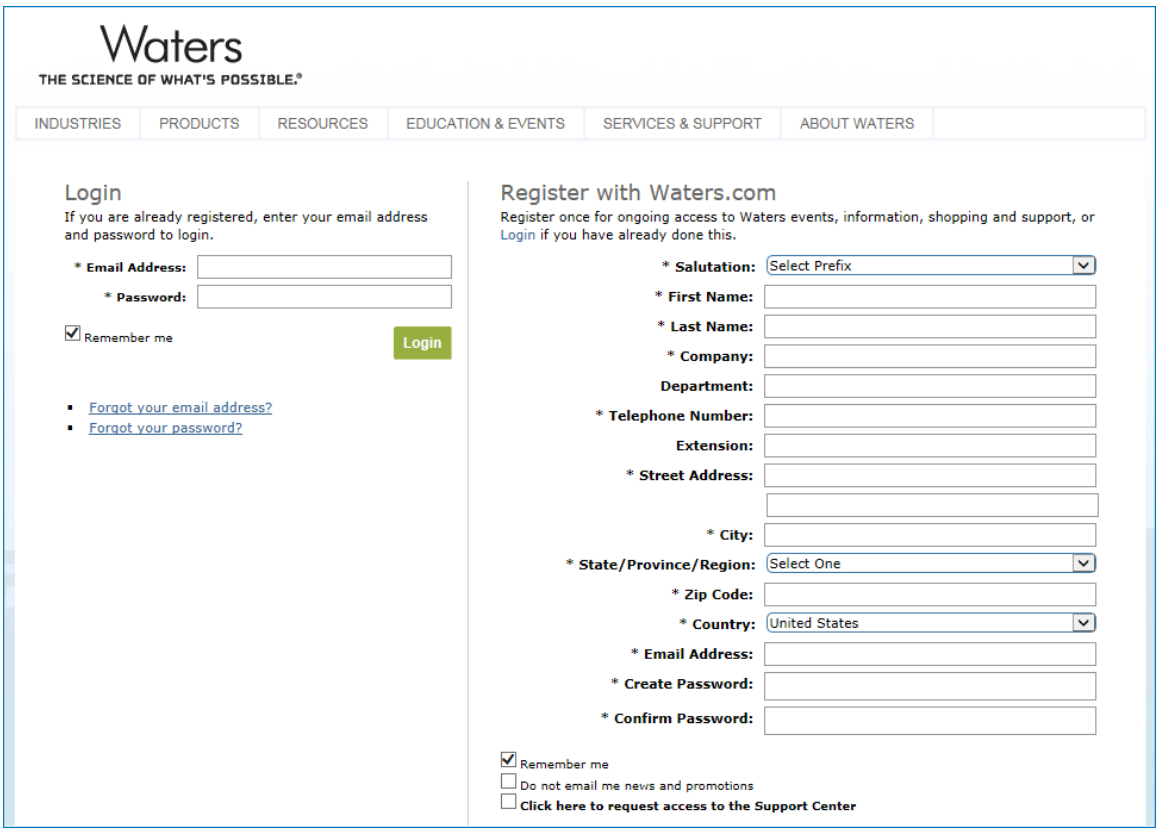
Figure 4–4: Registration file created



Requirement: You must have a Waters account to log on to the Waters licensing page.

7. Log on to the Waters website. If you do not have an account, create one.

Figure 4–5: Waters Web login page



8. On the Welcome to the Waters License Activation Center page on the Waters website, perform these tasks:
   - Select **Empower 3**.
   - Select **Workgroup** (for Empower Workgroup installations) or **Enterprise** (for Empower Enterprise installations).
   - Select **Activate Licenses**.
   - Click **Next**.

Figure 4–6: Waters License Activation Center - Activate Empower Workgroup

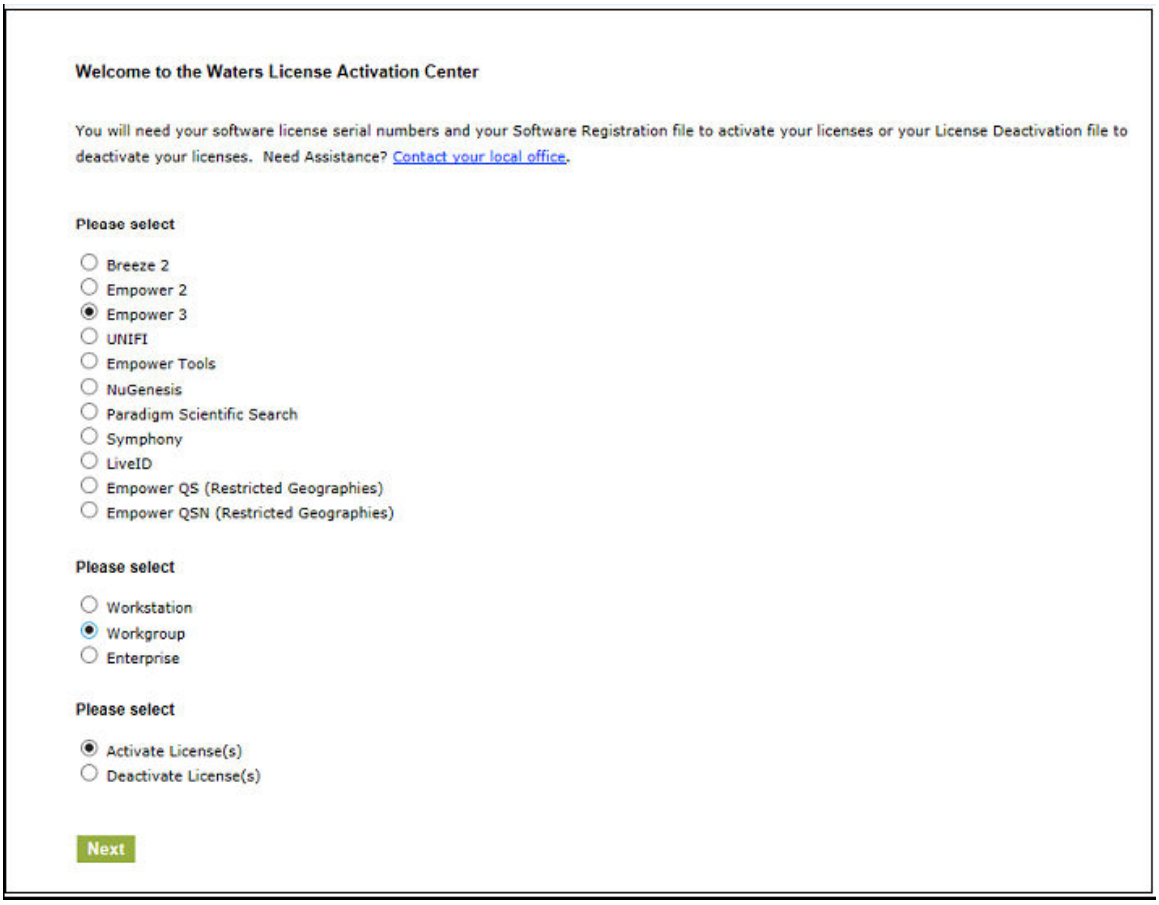
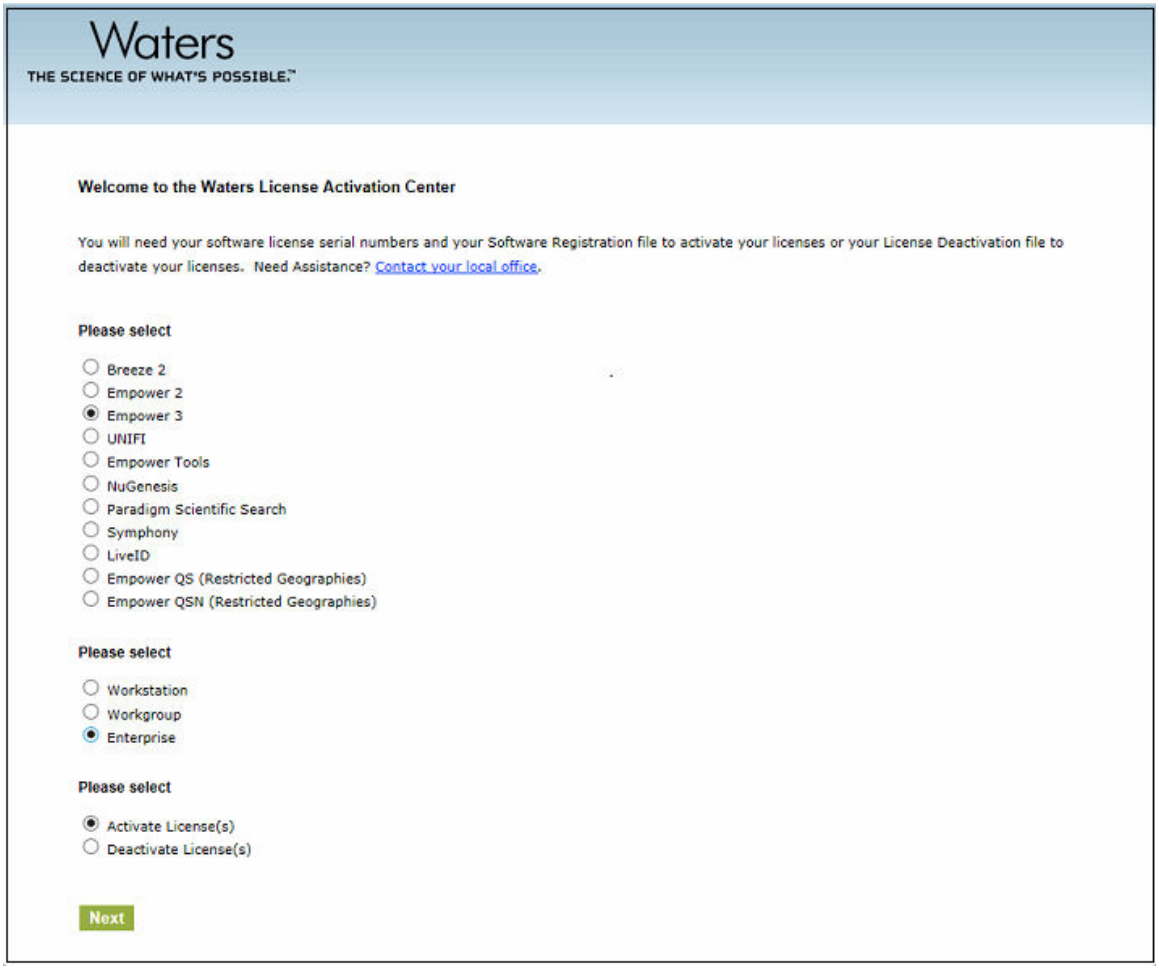
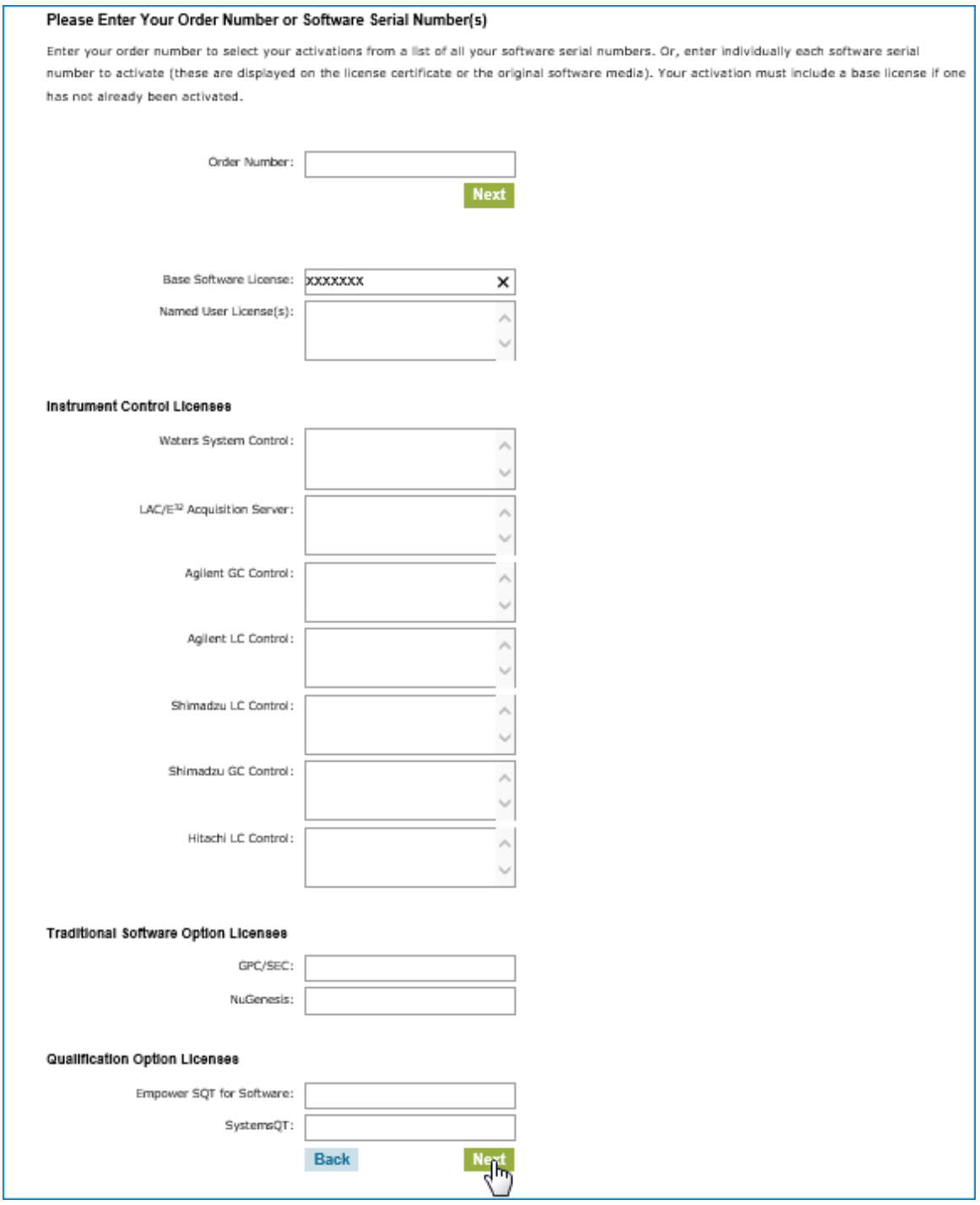


Figure 4–7: Waters License Activation Center - Activate Empower Enterprise



9. On the Please Enter Your Order Number or Software Serial Number(s) page, do one of the following tasks, and then click **Next**:
   - If you have a purchase order, type the number in the **Order Number** field.
   - If you have serial numbers, type the serial number in the appropriate field.

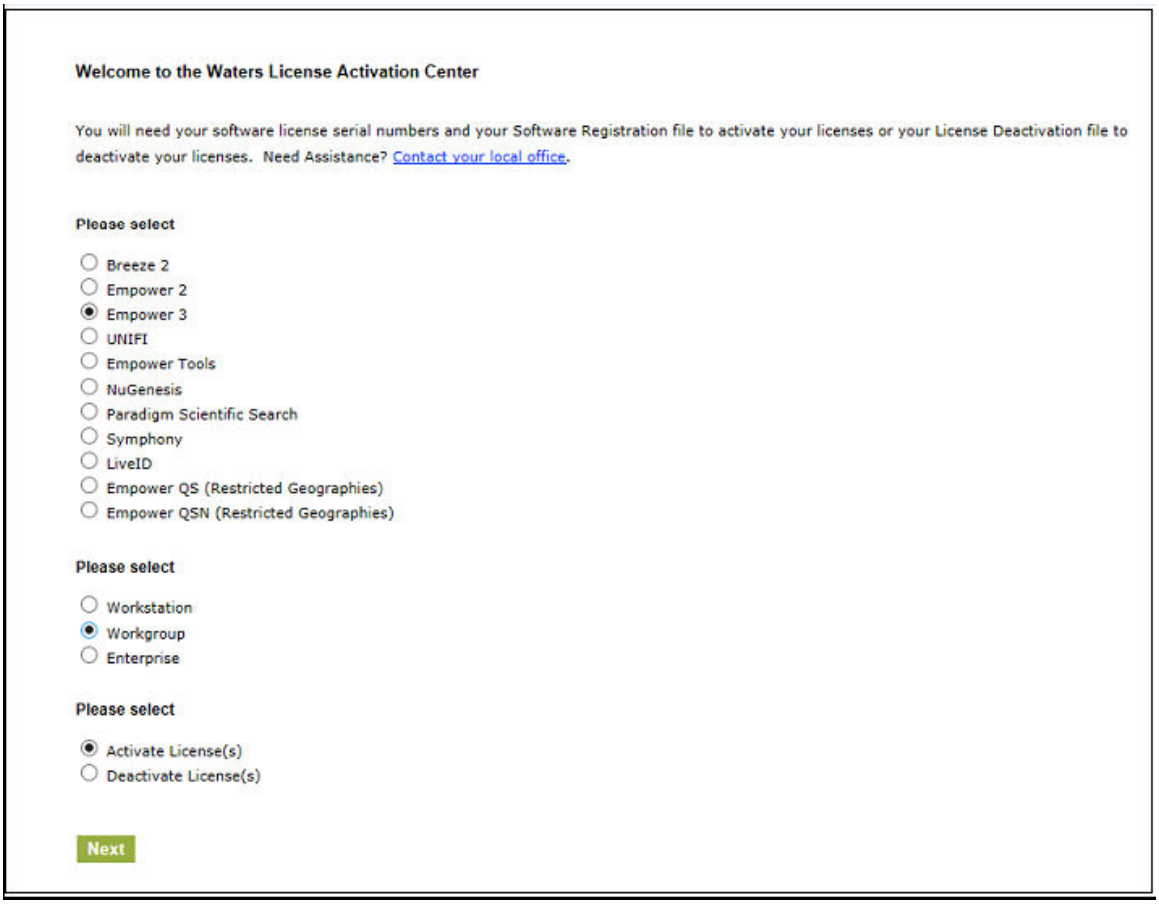
Figure 4–8: Enter software serial numbers



Note: You can activate your option licenses later, but you must activate the base license first to access Empower software.

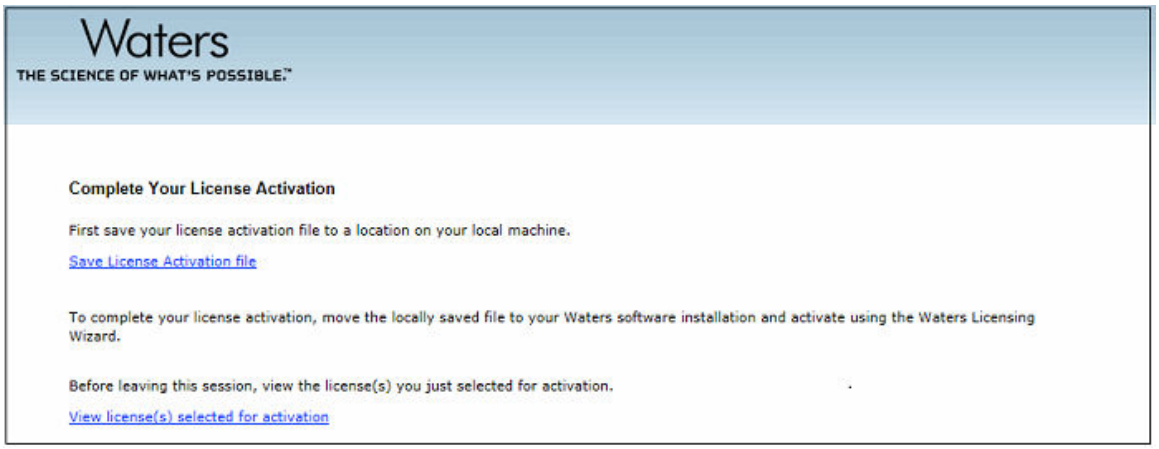
10. On the Load and Activate Your Software Registration File page, browse to the location of the SoftwareRegistration file you created using the Waters Licensing Wizard, and then click **Activate**.

Figure 4–9: Load and Activate Your Software Registration File



11. On the Complete Your License Activation page, click the link to save your license activation file and view licenses selected for activation.

Figure 4–10: Complete Your License Activation

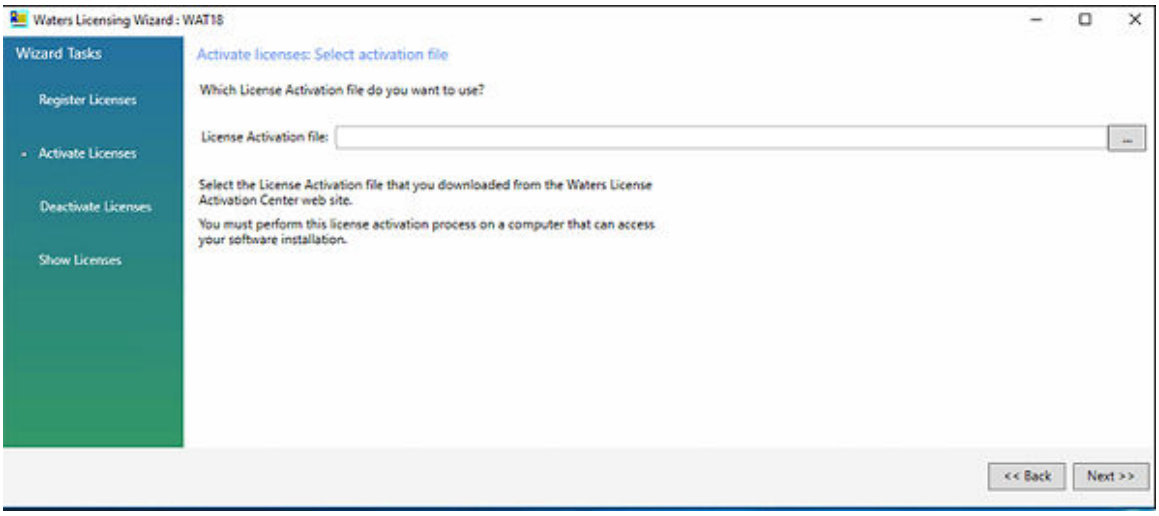


Note: A license activation file is generated. The license activation file is a 20-alphanumeric-key file that contains all licenses for which you provided a serial number. It is

not the same as the SoftwareRegistration.lic file. Copy the license activation file to a location accessible to your Empower computer.

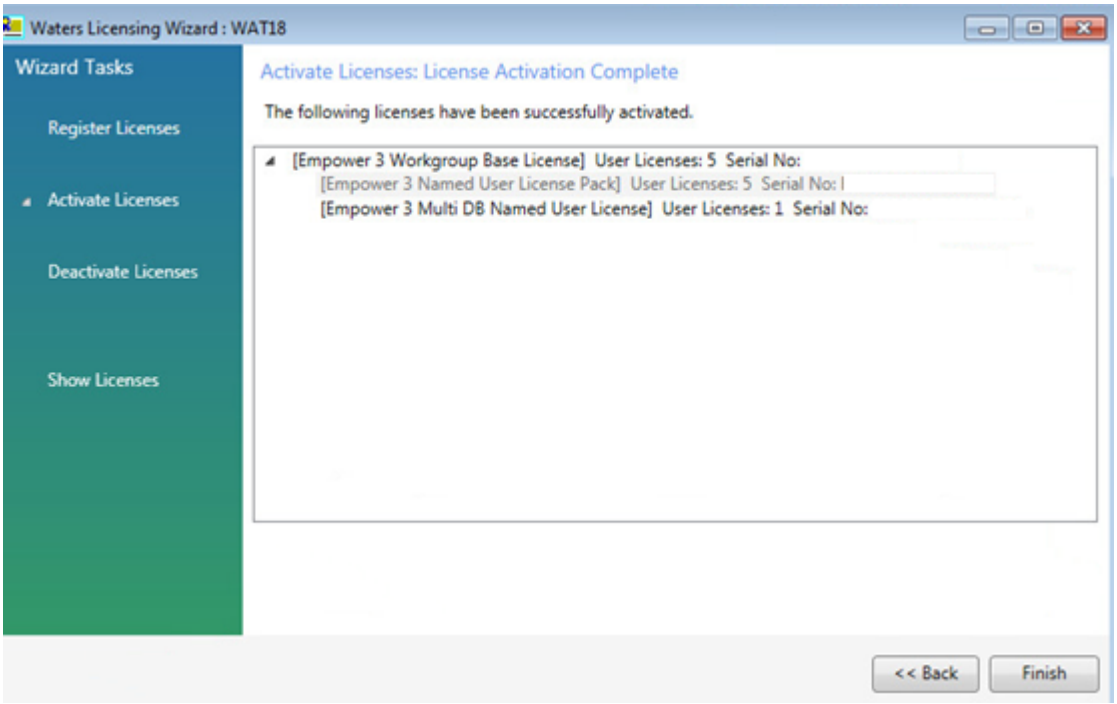
12. Log back on to the Waters Licensing wizard and perform these tasks:
    - Click **Activate Licenses**.
    - Browse to the location of the license activation file you saved in the previous step, and then select it.
    - Click **Next**.

Figure 4–11: Select activation file



13. On the License Activation Complete page, click **Finish**.

Figure 4–12: License Activation Complete



4.4 Upgrading from earlier versions of Empower

Follow the instructions in this section to upgrade to Empower 3.6.1. If you are not upgrading, follow the instructions for a new Empower 3.6.1 installation (Page 66).

You can upgrade to Empower 3.6.1 from Empower 3.6.0. If you have a version of Empower prior to 3.6.0, see system object export (Page 80).

Requirement: Back up all projects to a separate drive location before upgrading to Empower 3.6.1.

Note: If you changed the Oracle Sys account password, you may be prompted to supply a password for the Oracle Sys account. Supply the correct password and the Empower upgrade will continue. If you have not changed the Oracle Sys password, then you may have received the message to supply the Oracle Sys password in error and should confirm that the Oracle Listener and Empower database are running.

To start the Oracle Listener service:

1. Click **Start** > **Administrative Tools** > **Computer Management**.
2. In the Computer Manager window, expand **Services and Applications**, and then click **Service**.
3. In the list of services, right-click **OracleEmpowerOracle19cTNSListener**, and then select **Properties**.

4. Ensure that you set the **Startup type** to **Automatic (Delayed Start)**.
5. Click **Start**.

4.4.1 Upgrade considerations

When you upgrade Empower software on a server from Empower 3.6.0 to Empower 3.6.1, database backups are automatically installed and maintain the Enabled or Disabled state they were in before the in-place upgrade.

Recommendation: Ensure that you have good backups of your 3.6.0 database, including the raw data files, to allow for recovery of the database if needed.

For more information, see the *Empower 3.6.1 System Administrator's Guide* (715007291).

4.4.2 System object export

Restriction: In-place upgrades from Empower software versions prior to Empower 3.6.0 are not available. If you want to upgrade an installation previous to Empower 3.6.0, you can perform a system object export.

A system object export captures most objects from within Configuration Manager, such as nodes, chromatographic systems, users, user groups, libraries, user types, plate types, project archives, sample archives, offline project archives, offline sample archives, system audit trial, offline system audit trial, Message Center messages including messages that are stored in external tables, eCord information, system policies, and default strings.

Recommendations:

- Perform a system object export before you install the Empower 3.6.1 software.
- If logistics allow, do not retire or destroy the old server until the new one is ready to replace it.

Note: Empower projects and licenses are not included in the system object export.

Requirement: If you choose to perform a system object export from older versions of Empower for use with Empower 3.6.1, you must use the System Object Export Utility supplied with the Empower 3.6.1 media and not the utility supplied with previous versions of Empower. The output of the utility supplied with older Empower versions is not compatible with an Empower 3.6.1 installation. After you have successfully performed a system object export, you can then perform a system object import of the objects to bring them into your Empower 3.6.1 installation.

Restrictions:

- Waters recommends using the system object export and import utilities for upgrading from older versions of Empower. If you do not perform the system object export and the subsequent object import, you must manually recreate any objects you want to use with Empower 3.6.1 (such as systems, users, nodes, and so on).
- You can only perform a system object export on a server.

You can export system objects from these versions:

- Empower 3 Feature Release 2 (FR2)
- Empower 3 FR2 Hotfix 1
- Empower 3 Service Release 1 (SR1)
- Empower 3 Service Release 2 (SR2)
- Empower 3 SR2 Hotfix 1
- Empower 3 SR2 Hotfix 2
- Empower 3 SR2 Hotfix 3
- Empower 3 SR2 Hotfix 4
- Empower 3 SR2 Hotfix 5
- Empower 3 Feature Release 3 (FR3)
- Empower 3 FR3 Hotfix 1
- Empower 3 Feature Release 4 (FR4)
- Empower 3 Service Release 3 (SR3)
- Empower 3 SR3 Hotfix 1
- Empower 3 SR3 Hotfix 2
- Empower 3 Feature Release 5 (FR5)
- Empower 3 FR5 Hotfix 1
- Empower 3 Service Release 4 (SR4)
- Empower 3 Service Release 5 (SR5)
- Empower 3 SR5 Hotfix1
- Empower 3.6.0

To perform a system object export on the server:

1. Back up all projects.
2. Log in to the server as a user who is part of the local Administrators group.
3. Navigate to the location of the Empower software.
4. Browse to *Optional Components\Export Utility\WATEXP.exe*.
5. On the Welcome screen, click **Next**.
6. On the Found Waters Application screen, click **Next**.
7. Type the Oracle System user account password, specify the Oracle Service Identifier (SID), and then click **Verify Password**.

   Note: For exports from the previous Empower versions, the default password for System is `empower`. For exports from Empower 3 FR5 or later, the default password for System is `Waters2!`.
8. When the Valid Password message appears, click **OK**.

9. Click **Browse**, select a directory in which to place the system object export (**.exp*), and then click **Next**.

   Result: The system object export begins.
10. After the object export completes, click **Finish**.
11. Copy the system objects export file (**.exp*) onto a shared location that you can access from the server.

    Tip: To include external tables with your typical export, also copy the following files:

    - *ET_14042018_1.DMP*
    - *ET_15042018_1.DMP*
    - *SchemaExport.log*
    - *WATERSSCHEMA.EXP*

4.4.3 Installing base Empower software with system object import

Recommendation: Ensure that you have a complete backup of all your projects from the old database before performing this procedure, and ensure that the server is in the domain.

To start the Empower software installation:

1. Log in to the computer as a user who is part of the local Administrators group.
2. Navigate to the location of the Empower software.
3. Browse to the main folder on the software media and double-click **Setup.exe**.

   Tip: A *dism.exe* window opens after you click **Setup.exe**. It will close automatically after appearing for several seconds.
4. Select a language from the list, and click **OK**.
5. On the main page, select **Install Empower Software**.
6. On the Select Product Type page, select **Enterprise** or **Workgroup**, depending on your environment.
7. On the Select Installation Type page, select **Server**.
8. On the Customer Information page, type your user **name**, **organization**, and **Software Support ID number**, and then click **Next**.
9. On the End-User License Agreement page, accept the terms in the license agreement, and then click **Next**.
10. On the Import System Object page, do the following:

- Click the **Import System Object** check box.
- You can exclude nodes and chromatographic systems, system audit trail, external tables, and messages from the Message Center by clicking the appropriate check boxes.
- Browse to the location of the system objects file (**.exp*) that you want to import into your Empower database, and then click **Next**.

11. On the Destination Folders page, specify where you want the program features installed by selecting a drive letter from the list.

    Tip: By default, all locations point to drive C:\.

    Requirement: Do not install all the features on drive C:\.

    Recommendation: For best performance and for reasons of fault tolerance, spread the components across multiple drives by selecting them from the list.

12. On the Database Option page, specify the locations of the archive and mirror directories (by changing the drive letter of the provided paths), and then click **Next**.

    Tips:

    - The recommended location for installing the mirror directory (containing mirrored control files and redo logs) and the first archive directory is the raw data drive. The recommended location for the second archive directory is the program file drive.
    - By default, all locations point to drive C:\.

    Important: If you are installing a server with fewer than four physical drives, ensure that the path for the EmpowerMirrorDB directory is to a drive other than the physical drive selected for the Empower Oracle Database. If the location of the mirrored files is on the same physical drive as the database, database recovery in the event of a disk malfunction may be impossible.

13. On the Database Identification page, take the following actions:

    - Specify the Oracle Service Identifier (SID).

      Requirement: The database SID can be any combination of as many as eight alphanumeric characters. The initial three characters of the sequence must be “WAT”.

      Result: Doing so automatically changes the identifier in the **Global Database Name** box.

    - Type the Global Database Name, and click **Next**.

14. On the Ready to Install page, click **Next** to start the installation.

    Tip: If an Empower-related process triggers a Windows Security Alert message, click **Allow Access**.

    Result: The software installation begins. This process usually requires approximately 60 minutes, but the time can vary depending on the computer and the environment.

15. On the Status page, click **Finish**.
16. When the restart message appears, click **Yes**.

Result: The computer restarts.

4.4.4 Upgrading to Empower 3.6.1 software

You can upgrade to Empower 3.6.1 from Empower 3.6.0.

Recommendation: Before upgrading, perform a complete backup of all your projects.

To upgrade to Empower 3.6.1:

1. Insert the Empower 3.6.1 software media into the DVD drive.

   Tip: If the software setup does not start automatically, double-click **Setup.exe**.
2. On the Maintenance Mode page, select **Upgrade Empower Software**.
3. On the Ready to Upgrade page, click **Next**.
4. On the Status page, when the upgrade is complete and the `Success` message appears, click **Finish**.
5. When the restart message appears, click **Yes**.

4.4.5 Logging in to Empower and updating the database

After you install Empower 3.6.1, you must log in to it to update the database.

4.4.5.1 Updating the database after a system object import or an in-place upgrade

To log in and update the database after a system object import or an in-place upgrade:

1. Log in to the computer using an account that is part of the local Administrators group.
2. Log in to Empower as an administrator user.
3. In the Password box on the C/S Update Server Database screen, type the following password: `EMPOWER3CSUPDATE`.
4. At the Database Update message, click **OK**.

   Result: A message stating that the Empower base package option was not installed appears only with the system object import, or if you deactivated the licenses before performing the in-place upgrade.
5. When the message appears stating that the Empower base package option has not been installed, click **OK**.
6. Click **Cancel** to close the Login window.

4.5 DCOM settings installed by Empower 3.6.1

Empower 3.6.1 software sets the appropriate DCOM application settings and access and launch permissions during installation. The following table lists these settings and the paths to set them.

Note: You must set some of these settings manually. For example, you must add domain users after software installation. You can access these settings on the Local Security Page in Server Manager.

Table 4–3: DCOM settings and permissions set during installation

Path	Allow
Local Security Policy > **Local Policies** > **Security Options** > **DCOM: Machine Access Restrictions in Security Descriptor Definition Language (SDDL) syntax** > **Properties**	**Local Access** and **Remote Access** permissions for: • **Everyone** **Note:** In addition to the **Everyone** group, you can add a custom group of Empower users with security settings specific to your implementation. • **System** • **Domain Users** • **Performance Log Users** • **Distributed COM Users**
Local Security Policy > **Local Policies** > **Security Options** > **DCOM: Machine Launch Restrictions in Security Descriptor Definition Language (SDDL) syntax** > **Properties**	**Local Launch**, **Local Activation**, and **Remote Activation** permissions for **Everyone**. **Note:** In addition to the **Everyone** group, you can add a custom group of Empower users with security settings specific to your implementation. All permissions for: • **Administrators** • **Domain Users** • **Performance Log Users**
Local Security Policy > **Local Policies** > **Security Options** > **Network Access: Let Everyone permissions apply to anonymous users**	**Enabled**
Component Services > **Computers** > **My Computer** > **DCOM Config** > **WatersService** > **Properties** > **Security**	Under **Launch and Activation Permissions**, set **Local Launch**, **Local Activation**, and **Remote Activation Permissions** for:

Table 4–3: DCOM settings and permissions set during installation (continued)

Path	Allow
	• **Everyone** • **System** • **Administrators** • **Interactive** • **Domain Users**
Component Services > **Computers** > **My Computer** > **DCOM Config** > **WatersService** > **Properties** > **Security**	Under **Access Permissions**, set **Local Access** and **Remote Access Permissions** for: • **Everyone** • **SELF** • **System** • **Administrators** • **Domain Users**

4.6 Windows Firewall settings for an Empower server

After Empower is installed on the server, open the Windows Firewall settings and verify that the following exceptions appear in the Windows Firewall Exceptions List:

- Empower-related ports and processes:
  - DCOM Port (135)
  - Oracle.exe
  - TNSLSNR.exe Port (1521)
  - Empower
  - Empower Configuration Manager
  - Processing Monitor
  - Processing Server

- Waters Instrument Server
- Waters Service

4.7 Configuring a database net service name

You must configure a database net service name (previously called a database alias) on each client and LAC/E device to connect to the Empower database, unless you are using the *TNS_ADMIN* environment variable. A database net service name is a name for an individual Empower database. This name appears in the **Database** field of the Empower Login page.

Tip: The *TNS_ADMIN* variable points to the *tnsnames.ora* file. A *tnsnames.ora* file contains the list of Empower databases that can be accessed by the client or LAC/E device.

Use the following procedure to create a new database net service name or modify an existing net service name. You must define the same database net service name on each client or LAC/E device.

To configure a database net service name:

1. Select **Start** > **Empower** > **Waters Net Configuration Assistant**.

   Alternative: Click **Start** and type `Waters Net Configuration Assistant`.
2. On the Waters Net Configuration Assistant utility, click the first row to edit the column details.
3. In the **Alias** column, type the alternative name for the database service.

   Example: `WATWIN2016R2`

   Rule: The database service identifier must begin with a character, not a number.
4. In the **Server Name** column, type the computer name or IP address of the database server.
5. In the **Service Name** column, type the database service name. The database service name is the same as the PDB (pluggable database) name of the current server installation. By default, the PDB name is `EMPPDB1`.

   Tips:

   - If you do not know the service name, you can find it using the Listener Configuration on the database server. The Listener Configuration is disabled on the client. To perform the inspection on the database server, click **Configuration** > **Listener Configuration**. The Waters Net Configuration Assistant displays the CDB and the PDB service names, which are identified by the `CDB` or `PDB` suffix.
   - The global database name is supplied during installation. The default value is <*SIDPDB*> and you can modify it with the note that the `PDB` suffix must be kept.
6. In the **Port Number** column, ensure that the default port selection is `1521`.
7. Click **Save**.

Result: The *tnsnames.ora* file is created.

8. Select the row, right-click, and then select **Test**.
9. In the Change Login dialog box, verify that the username `System` and password are pre-populated, and then click **OK**.

   Note: The default Oracle System password is *Waters2!*.
10. When the connection test is successful, click **OK**.
11. **Note:** If you are using an Empower Personal workstation as a client, perform this procedure to force the use of the *TNSNames.ora* file. If not, skip this step.

    Create a WATnames.ora file that contains the database alias of the database in the *tnsnames.ora* file. Save this file to the *C:\Empower\Script* folder.

Figure 4–13: WATNAMES.ora file content

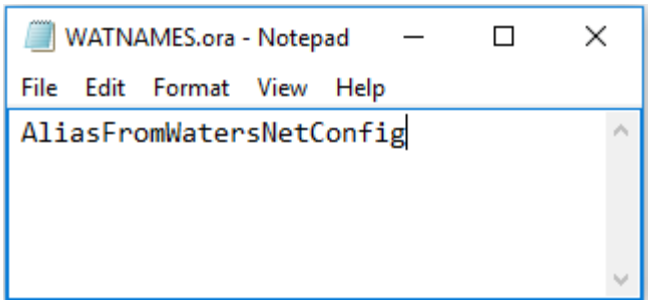
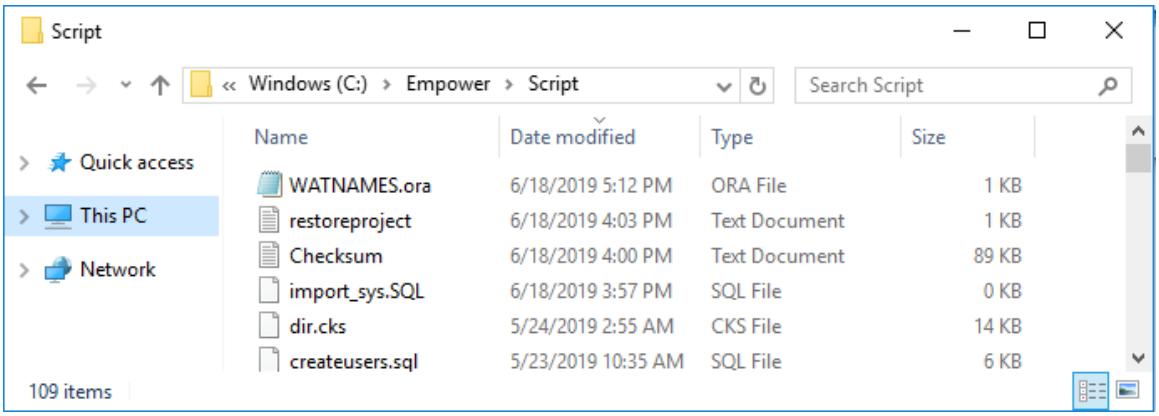


Figure 4–14: WATNAMES.ora file location



Result: When you log in to Empower 3.6.1 from a client, the database alias name is automatically populated in the Login dialog box if the service name prefix is *EMP*. Otherwise, you must type the name of the database in the **Database** field in the Empower Login dialog box.

4.8 Configuring a shared tnsnames.ora file

A tnsnames.ora file uses the net service name to define the list of Empower databases that clients and LAC/E devices can access.

Use the Empower client/LAC/E installer (Deployment Manager) to create an environmental variable named *TNS_ADMIN*. The value for this variable is the path to the location of a shared folder containing a pre-configured tnsnames.ora file.

Using the *TNS_ADMIN* variable on client and LAC/E devices eliminates the need to manually configure and maintain individual tnsnames.ora files. If you use this feature, place the tnsnames.ora file in a share on a server accessible to Empower users.

Recommendation: Place the shared tnsnames.ora file, on which normal Empower functionality depends, in the *\Empower\Projects* directory so that it is automatically shared with the applied security settings.

4.8.1 Configuring a Windows server for a shared tnsnames.ora file

To use the TNS_ADMIN environment variable with Empower database servers running on Windows Server 2016 Standard, you must modify the default Local Security Policy.

Tip: The appropriate security settings are typically set by the Empower installer (Deployment Manager). Otherwise, you must configure the settings manually.

To configure a Windows server for a shared tnsnames.ora file:

1. Log on to the Empower database server using an account that is part of the local Administrators group.
2. Select **Server Manager** > **Tools** > **Local Security Policy**.
3. In the tree, click **Security Settings**, and then expand **Local Policies** > **Security Setting** > **Security Options**.
4. In the right-hand pane, double-click the policy **Network Access: Let Everyone permissions apply to anonymous users**, and then select **Enabled**.
5. Click **Apply**, and then click **OK**.
6. Exit the Local Security Policy.

4.8.2 Configuring a shared tnsnames.ora file server

You must configure the *tnsnames.ora* file before permissions are set on the raw data share.

To configure a shared *tnsnames.ora* file:

1. Locate the drive installed with the Oracle program files, and browse to the *Empower\Oracle\Oracle19cClient\Network\Admin* directory.
2. Locate the *tnsnames.ora* file, right-click the file, and then click **Copy**.

   Requirement: If you have multiple Empower database servers, add them to the *tnsnames.ora* file using the Waters Net Configuration Assistant prior to copying the *tnsnames.ora* file.

3. Browse to the *raw data drive:\Empower\Projects* directory, and paste the *tnsnames.ora* file into the folder.

   Recommendation: Place the shared file in the same directory that will hold Empower raw data. If you use custom directories, set the share permissions exactly as described in the next section.

4.9 Configuring projects directory

The Empower projects directory is the location where raw data is stored.

Note: If you performed a system object import as part of your Empower installation and want to use the \Empower\Projects folder on the server as a raw data share, you must manually configure the share in Empower.

Requirement: To ensure the proper level of access and security for the projects directory, you must grant your Empower users read-only access to the share so that they can view the raw data. An easy way to perform this task is for your domain administrator to create a custom domain group and use this group to grant read access to Empower users.

To configure the Empower Projects directory:

1. From the **Sharing** tab in the Properties dialog box, share the folder, using *Waters_Projects $* as the share name with the following permissions:
   - System account **Full Control** permissions.
   - Grant **Read** permissions to the custom domain-user group your domain administrator created for Empower users.
2. From the **Security** tab:
   a. Specify the security settings for the *Waters_Projects$* as follows:
      - Disable inheritance and do not convert the inherited permission into explicit permissions.
      - Add System account and grant this account **Full Control**.
   b. Grant these **Effective permissions** to the custom domain-user group your domain administrator created for Empower users:
      - **Traverse folder / execute file**
      - **List folder / read data**
      - **Read attributes**
      - **Read extended attributes**
      - **Read permissions**
   c. Ensure that the **Replace all child object permissions with inheritable permissions from this object** check box is selected.

Note: You can also use the Everyone user group to grant your Empower users read-only access to the share.

4.10 Verifying your Empower software installation

4.10.1 Viewing the installation log

The installation log contains information about your Empower installation. You can read the log file to review your installation choices, the installation environment, and the status of the installation steps. In case of a partial or unsuccessful installation, review the installation log to check for errors.

The “Installation success or error status” value appears at the end of the installation log. If the value displayed is 0, the installation was successful. If the value displayed is anything other than 0, record the number, and contact Waters Technical Support.

To view the installation log:

1. From **Start**, click **Empower**, and then click **Empower Installation Log**.
2. Review the contents of the file.

   Tip: You can print a copy by selecting **File** > **Print**.
3. Click **File** > **Exit**.

4.10.2 Using the Verify Files Utility

The Verify Files Utility checks the integrity of the installed Empower program files.

After the Empower installation, run the Verify Files Utility to verify the Empower program files (not the database or data files):

- As part of your installation qualification, if you purchased an Empower Qualification option.
- To ensure that the Empower files did not change since installation.

4.10.2.1 Running the file verification utility

To run the file verification utility:

1. Click **Start** > **Empower** > **Verify Files**.

   Result: The Verify Files Utility compares the installed Empower files’ checksum with a previously stored checksum, and then creates a file verification results log (for example, *checksum_date_timestamp.txt*).
2. Review the contents of the file and print or save a copy of the results.
3. Click **File** > **Exit**.

4.10.2.2 Viewing the file verification results

To view the file verification results:

1. Click **Start** > **Empower** > **View Verify Files**.

   Result: The *checksum.txt* file displays in Notepad.

2. Review the contents of the checksum file.

   Note: Your Empower 3.6.1 software installation passes the verification check when all files have a status of `OK` and the installation qualification summary on the final page states `No installation changes were detected`. If the *checksum.txt* file indicates any files marked as “changed”, contact Waters Technical Support.

4.11 Empower programs and logs on a server

The Empower program folder contains these items:

Note: From **Start**, click **Empower**, and then click the Empower utility.

Table 4–4: Empower programs and logs

Item	Description
Empower Installation Log	Records information about the current installation.
Empower	Displays the Empower login page, which starts the Empower software. After you log in, you can select one of several Empower applications. For details, see “Starting and exiting from Empower” in the *Empower online Information System*.
Configure ICS for 64-bit OS	Use this utility if Instrument Component Software (ICS) was installed from a source other than Empower Instrument Driver Pack media.
Register Empower Node printers	Registers printers so you can print Empower reports.
Verify Files	Verifies the integrity of the Empower software files on your hard disk.
View Verify Files	Opens the Checksum file in Notepad, which displays the results (checksums) of the verified files.
Waters Net Configuration Assistant	Opens the Waters Net Configuration Assistant. This utility allows you to configure the Empower database connection.
Waters Licensing Wizard	Starts the Waters Licensing Wizard, which you can use to initiate software license and option activation and deactivation.
Manage Waters Email Center	The Email Center facilitates troubleshooting because it allows the recipient to quickly respond to an Empower error without having to

Table 4–4: Empower programs and logs (continued)

Item	Description
	inspect the Message Center throughout the day. See Empower online Help information about configuring the Waters Email Center.

Note: The Waters Database Manager application is located in a separate directory. Click **Start** > **Waters Database Manager** > **Waters Database Manager**.

4.12 Managing raw data files

If you performed a system object import and want to use the Empower\Projects folder on the server as a raw data share, you must manually configure the share in Empower. For additional details, see “Managing raw data files in an Enterprise Client/Server configuration” in *Empower online Information System* or Configuring raw data directory permissions (Page 140).

4.13 Registering printers

To print Empower reports, you must first register the printers you want to use.

To register printers for Empower reports:

1. Type `Empower` in the Windows Search box, and click **Empower** > **Register Empower Node Printer**.

   Requirement: You must be logged in to the Empower node as a local administrator or a user whose privileges allow you to write to the registry.
2. In the Register Empower Node Printers page, review the list of printers that are currently registered.

   Tip: The Register Empower Node Printers page shows only printers added using the **Add a printer** function.
3. If you must register additional printers, click **Get Printers**, select the printers, and then click **OK**.
4. Click **OK**, to save the changes, and close the page.

4.14 Uninstalling Empower 3.6.1 on a server

Before uninstalling Empower 3.6.1, or if you installed a license or option on an Empower Enterprise Server or Workgroup and you want to transfer it to another, you must first uninstall the

license or option from its current location by using the Waters Licensing Wizard and the License Activation Center Web site.

Restriction: If you deactivate the base software license, the Licensing Wizard software automatically deactivates and removes all user licenses, system licenses, and option licenses.

4.14.1 Deactivating Empower licenses on a server

Before uninstalling Empower software, you must first deactivate the licenses and options using the Waters Licensing Wizard and License Activation Center Website. This ensures that you can reactivate the license or option on a different computer.

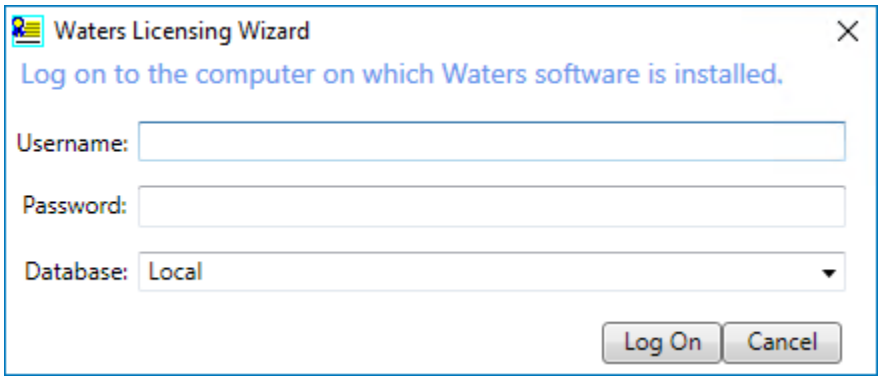
Important: If you deactivate the base software license, the Licensing Wizard automatically deactivates and removes all user licenses, system licenses, and option licenses, and you cannot log on to Empower software.

To deactivate a license or option:

1. From the Windows Start menu, click **Start** > **Empower** > **Waters Licensing Wizard**.
2. In the Waters Licensing Wizard dialog box, perform these tasks:
   - Type the username and password of a user with Administrator privilege.

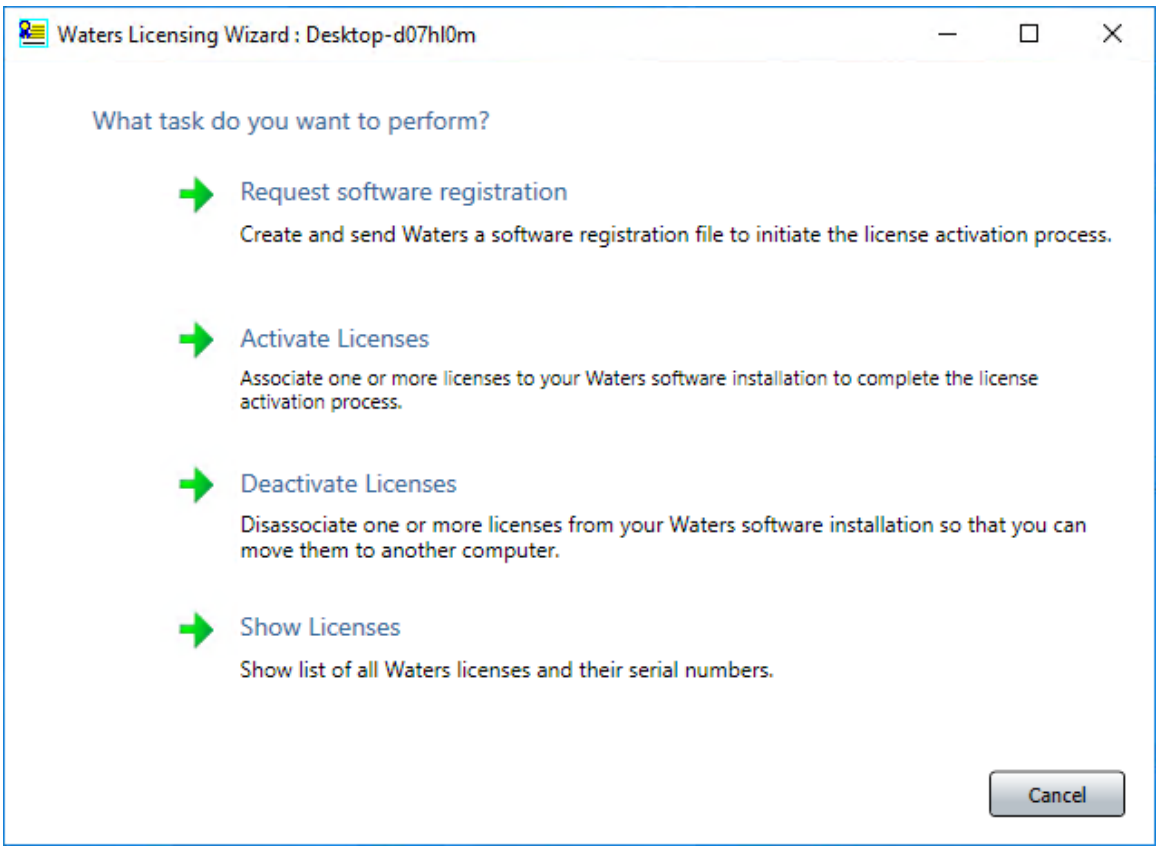
     Note: Empower software provides a default system user account that you can disable, but not remove, from the software. The default username for the account is `system` and the default password is `manager`.
   - For Empower Enterprise installations, select the database, and then click **Log On**.

     Figure 4–15: Waters Licensing Wizard Log On

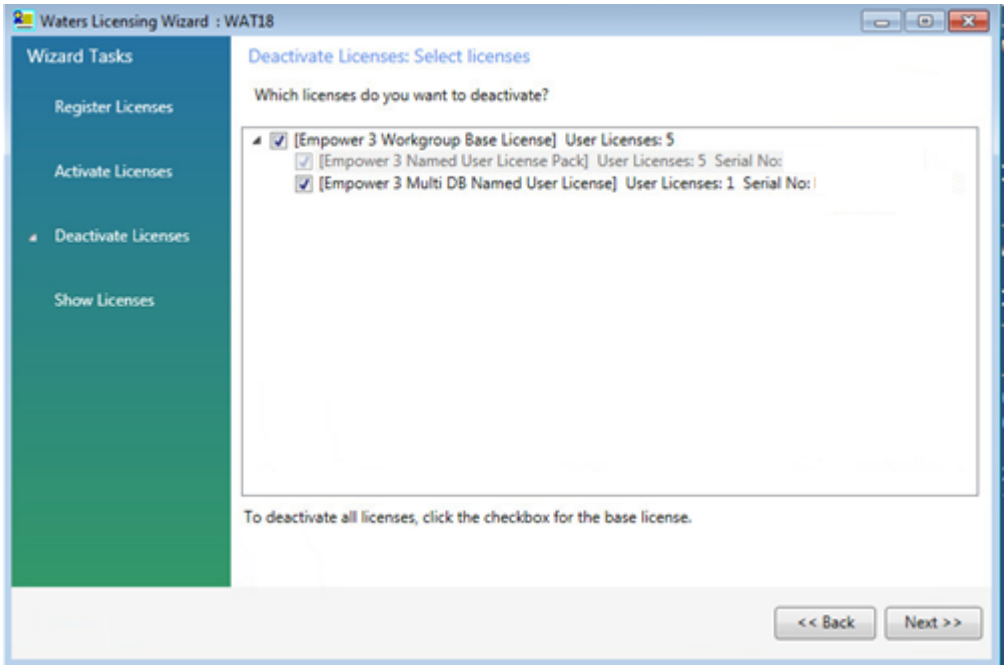
3. On the Waters Licensing Wizard task page, click **Deactivate Licenses**.

Figure 4–16: Waters Licensing Wizard - Deactivate Licenses



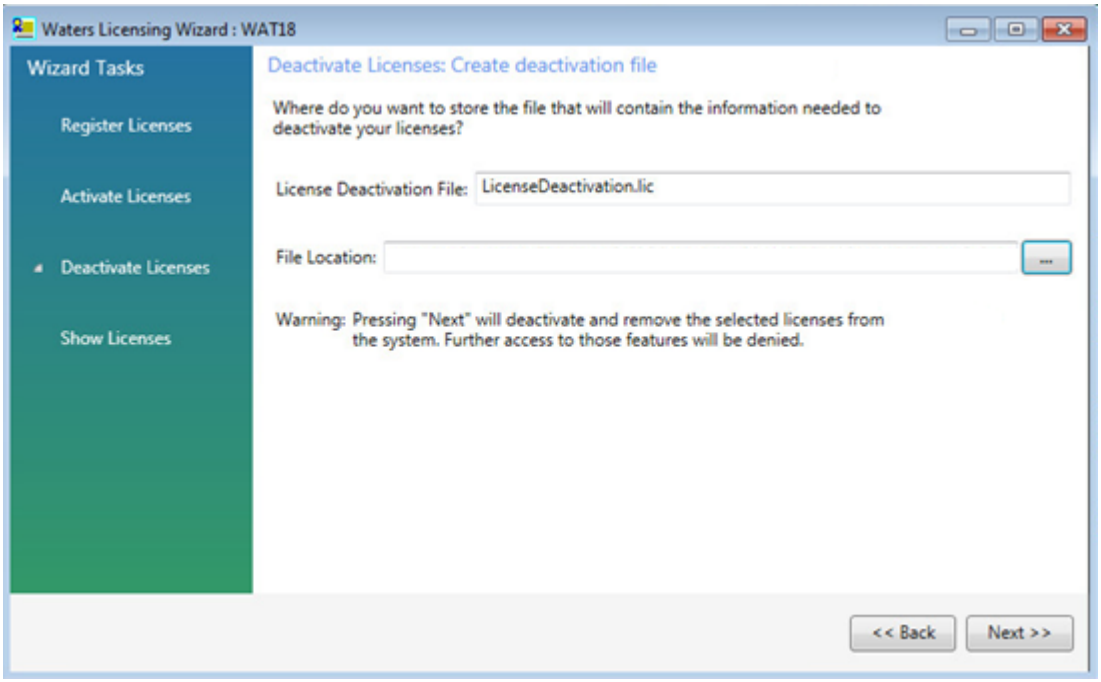
4. On the Deactivate Licenses page, select the licenses you want to deactivate, and then click **Next**.

Figure 4–17: Deactivate Licenses - Select licenses



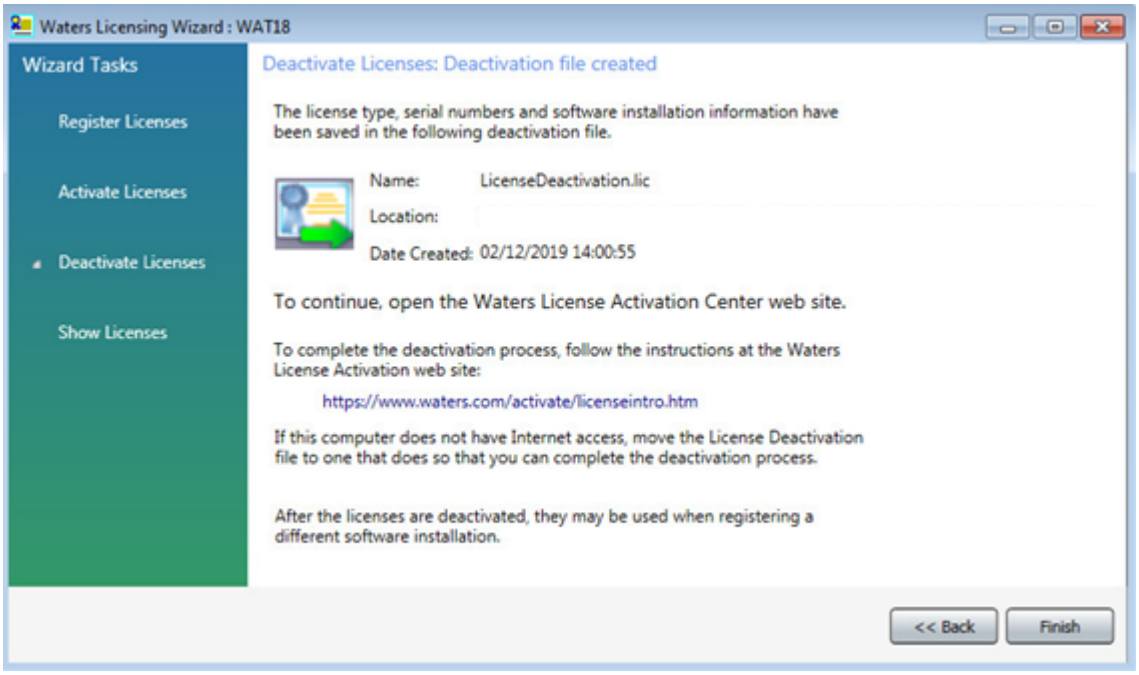
5. On the Create deactivation file page, select a location for the license deactivation file, and then click **Next**.

Figure 4–18: Create deactivation file



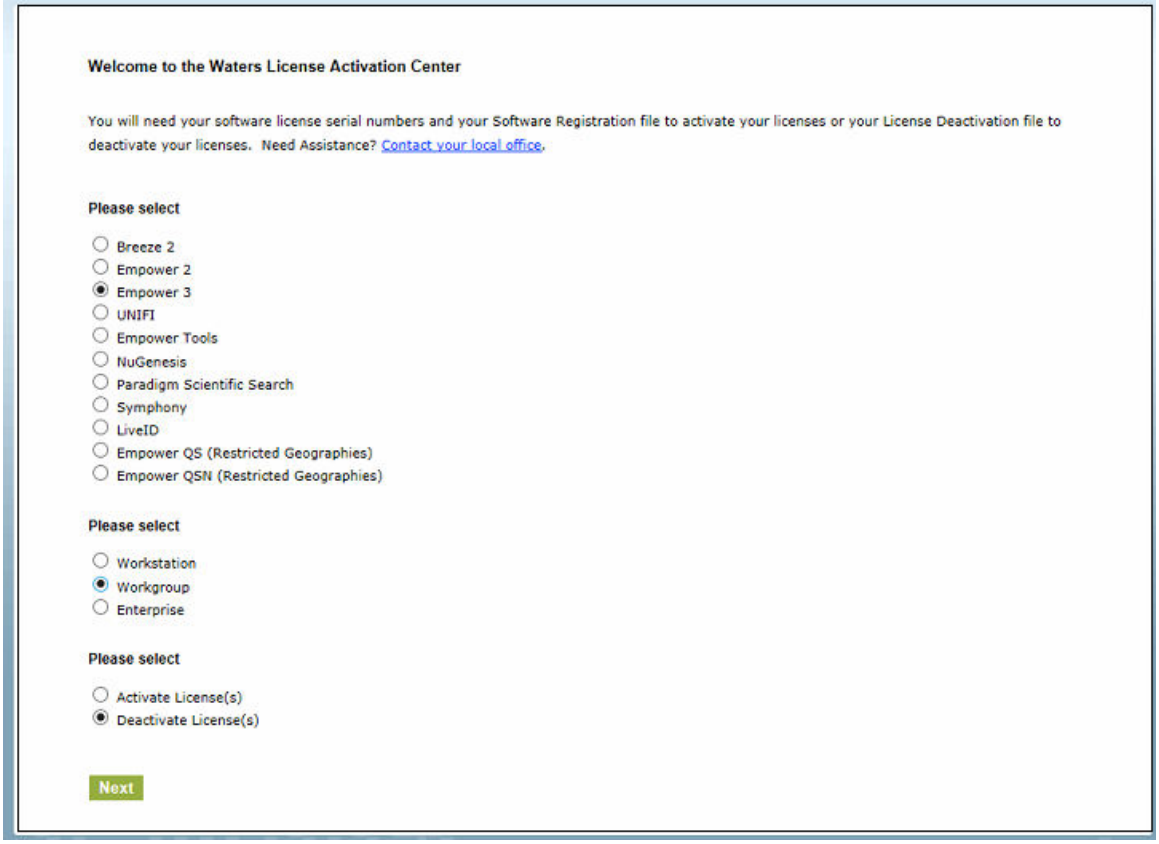
6. On the Deactivation file created page, click **Finish**.

Figure 4–19: Deactivation File Created



7. Log in to https://www.waters.com/activate/licenseintro.htm.
8. On the Welcome to the Waters License Activation Center page, perform these tasks:
   - Select **Empower 3** and select **Workgroup** or **Enterprise**.
   - Select **Deactivate Licenses**.
   - Click **Next**.

Figure 4–20: License Activation Center - Deactivate Licenses

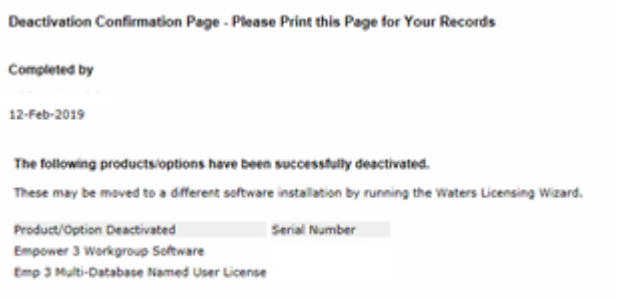


9. On the Load and Deactivate Your License Deactivation File page, browse to the location of the deactivation file you created using the Waters Licensing Wizard, and then click **Deactivate**.

Figure 4–21: Load and Deactivate Your License Deactivation File

The Deactivation Confirmation Page lists the licenses you deactivated.

Figure 4–22: Deactivation Confirmation Page


Deactivation Confirmation Page - Please Print this Page for Your Records

Completed by

12-Feb-2019

The following products/options have been successfully deactivated.

These may be moved to a different software installation by running the Waters Licensing Wizard.

Product/Option Deactivated	Serial Number
Empower 3 Workgroup Software	
Emp 3 Multi-Database Named User License	

4.14.2 Uninstalling Empower software on a server

When you want to uninstall Empower 3.6.1 software, use the **Programs and Features** utility in the Windows Control Panel to remove the software.

Requirement: Before you uninstall Empower, remove Waters Instrument Control Software (ICS), and then deactivate the Empower licenses.

To uninstall Empower 3.6.1 software:

1. Open the Windows Control Panel, click **Programs and Features**, and then double-click **Empower 3.6.1 Server**.
2. Follow the steps in the Deployment Manager wizard to uninstall Empower software.
3. Restart the computer.

   Note: Uninstalling Empower leaves the database files in case you want a backup. Delete these files to complete the uninstall.

5 Installing an Empower client

Follow the instructions in this chapter to install the Empower 3.6.1 software on a client (or an acquisition client) in an Empower Enterprise or Workgroup system.

5.1 Preparing the client

Installing Empower 3.6.1 software on a client requires the hardware and software specified in Requirements for client computers (Page 19).

You can install Empower 3.6.1 as a new installation on a system where no Chromatography Data Software (CDS) is currently installed or as an upgrade from Empower 3.6.0.

Important: If you plan to change the name of the computer, follow these guidelines:

- Change the name before you install Empower software.
- Do not change the name of the computer after Empower is installed.
- The computer name must begin with an alphabetic character (A to Z) and cannot begin with a numeric character (0 to 9). `Empower123` is acceptable for a computer name, but not `123Empower`.

Follow these procedures to prepare a client or acquisition client:

- Log on to the client using an account that is part of the local Administrators group.
- Ensure that the client is a member of the domain in which the targeted Empower server is planned to work or is working already.
- Configure the system so that Windows automatically manages the virtual memory paging file size.
- If the client does not have an Internet connection and you need to activate Empower licenses from this client, follow the procedure in Activating Empower software licenses and options (Page 40).
- Configure the system power options. See Configuring the power options (Page 34).

Requirements:

- If you change domains after installing Empower and any ICS, ensure that the Empower-related ports and processes and Instrument component software processes are in the Windows Firewall exception list. See Completing the installation on a client (Page 104)
- If you are using real-time virus scanning, during and after installation, exclude all Empower-related directories and their sub-directories from the scans. Some real-time virus scanners mistake normal data acquisition and instrument control for virus activity and interfere with proper operations. Full-system scans and live updates can be network-intensive, disk-

intensive, and CPU-intensive, and can interfere with normal data acquisition. Certain antivirus program features such as "intrusion prevention" and "tamper protection" can also interfere with normal operation. If you observe issues with Empower, review and verify the antivirus logs. You may need to white-list any affected components.

5.1.1 Configuring .NET Framework

You must install Microsoft .NET 3.5 Framework manually on Windows 10. .NET 4.0 Framework is installed and enabled by default. .NET 4.8 is preinstalled and the .NET 4.8 is backward-compatible with all versions back to 4.0.

To install .NET 3.5 Framework:

1. From Windows **Control Panel**, click **Programs** > **Programs and Features** > **Turn Windows features on or off**.
2. In Windows Features, expand **.NET Framework 3.5 (include .NET 2.0 and 3.0)**, select the **Windows Communication Foundation HTTP Activation** and **Windows Communication Foundation Non-HTTP Activation** features, and then click **OK**.
3. After Windows completes the requested changes, click **Close**.

5.1.2 Configuring network discovery

You must enable the network discovery function and the file and printer sharing functions so that clients and servers can communicate. To enable the network discovery function on domain devices, you must start certain services.

5.1.2.1 Starting the required services

To start the required services:

1. Open the **Control Panel** and select **System and Security** > **Administrative Tools** > **Services**.
2. Change the start-up type to **Automatic** and start these services:
   - DNS Client
   - Function Discovery Resource Publication
   - SSDP Discovery
   - UPnP Device Host

Tip: When all services are running, you can modify the network discovery and printer sharing settings.

5.1.2.2 Turning on the network discovery and file and printer sharing functions

To turn on the network discovery and file and printer sharing functions:

1. In the Windows Search text box, type `Network` and then select **Network and Sharing Center**.
2. Click **Change advanced sharing settings** and turn on these functions:
   - **Network discovery**
   - **File and printer sharing**

5.1.3 Confirming regional settings

If you are installing Empower software on an English-language computer, you must confirm that your Windows regional settings are configured for English (United States). The symbols for English (United States) use decimal formatting, not comma formatting, which is important when displaying numeric values (12.56, not 12,56).

To confirm that the regional settings are correct:

1. From Control Panel (**Category** view), under **Clock, Language, and Region**, click **Change date, time, or number formats**.
2. In the Region dialog box, ensure that **English (United States)** is selected as the format in the **Formats** tab.

5.1.4 Synchronizing Empower and Windows time

Synchronize the Waters Empower software time zone and the time zone on the host Windows operating system to avoid any discrepancy, which typically can be one hour.

To synchronize Empower and Windows time:

1. In the Windows Search box, type `Time Zone`, and then select **Change the time zone**.
2. In the Settings window, click **Date and time**, and ensure that the Adjust for daylight saving time automatically option is **On**.

5.2 Installing Empower 3.6.1 software on a client

Follow the instructions in this section if this is a new installation of Empower 3.6.1 software. If you are upgrading to Empower 3.6.1, follow the instructions on upgrading Empower on a client (Page 106).

You can perform a typical installation of the software on the system drive or a custom installation specifying a different drive.

By default, the Empower 3.6.1 installer (Deployment Manager) installs both the Oracle 19c client and Empower 3.6.1 software on the system drive, which is most often the *C:* drive. If your site has its own Oracle license and prefers to install Oracle 19c as a separate application, the following considerations apply:

- Install Oracle 19c Enterprise Client software prior to installing Empower 3.6.1 software.

  Rule: Install the 32-bit client only. The 64-bit client is not supported.

- Change the language registry key value to `AMERICAN_AMERICA.WE8ISO8859P1`. The path to this key value depends on your environment:
  - For 32-bit environments, the path is *HKEY_LOCAL_MACHINE\Software\Oracle\KEY_EmpowerOracle19cClient\NLS_LANG*.
  - For 64-bit environments, the path is *HKEY_LOCAL_MACHINE\Software\WOW6432Node\Oracle\KEY_EmpowerOracle19cClient\NLS_LANG*.
- The permissions on the Oracle Home directory (and subdirectories) must be changed to allow the Group Users all privileges except **Full Control**.
- During the installation of Empower 3.6.1, you are asked whether you want to use your installed Oracle software. Select **Yes** and specify the location of the Oracle program files.

5.2.1 Starting the installation on a client

To start the Empower 3.6.1 software installation on a client:

1. Ensure that the computer is added to your domain.
2. Log in to the computer as a user who is part of the local Administrators group and ensure that no antivirus software is active during the deployment.
3. Navigate to the location of the Empower 3.6.1 software.
4. Browse to the main folder and double-click the **setup.exe** file.

   Tip: A dism.exe window might open after you double-click **setup.exe**. It will close automatically after several seconds.
5. On the main page, select **Install Empower Software**.
6. On the Select Product Type page, select **Enterprise** or **Workgroup**, depending on your environment.
7. On the Select Installation Type page, select **Client**.
8. On the Customer Information page, specify your **username**, **organization**, and **Software Support ID number**, and then click **Next**.
9. On the End-User License Agreement page, read and accept the terms in the license agreement, and then click **Next**.
10. On the TNS_ADMIN Environment Variable page, you can choose to set the *TNS_ADMIN* environment variable, which adds an environmental variable to the client that points to a pre-configured *tnsnames.ora* file stored locally or in a network-accessible share. (A tnsnames.ora file contains the list of Empower databases the client can access.) The

TNS_ADMIN environment variable allows large installations to maintain a single *tnsnames.ora* file in a share, eliminating the need to configure a *tnsnames.ora* file on each client computer.

- If you do not intend to use this option, do not check the box. Click **Next**.
- If you want to enable the *TNS_ADMIN* variable, select the check box and specify the local or network path to the share containing the pre-configured *tnsnames.ora* file (for example, \\servername\sharename$), and then click **Next**.

Note: Use the TNS_ADMIN directory that was set in Configuring a shared tnsnames.ora file (Page 88).

Tip: If the *TNS_ADMIN* variable is set, the client disregards local *tnsnames.ora* files.

11. On the Setup page, select one of the following options:
    - **Typical** – Select and then proceed to step 13, installing all Empower and Oracle files on the system drive, which is typically *C:*\.
    - **Custom** – Select and then proceed to step 12, installing the Empower and Oracle files on different drives.
12. On the Destination Folders page, select the appropriate drives from the list for the Empower Application and Empower Oracle files, and then click **Next**.
13. On the Ready to Install page, click **Next** to begin the installation.

    Tip: If an Empower-related process triggers a Windows Security Alert message, click **Allow Access**.
14. On the Status page, click **Finish**.
15. When the restart message appears, click **Yes**.
16. After the computer restarts, log in using an account that is part of the local Administrators group.

    Tip: If an Empower-related process triggers a Windows Security Alert message, click **Allow Access**.
17. If you are not using the *TNS_ADMIN* environmental variable, see Configuring a database net service name (Page 87) to configure a local *tnsnames.ora* file.

    If you want to use the same client for your Empower 3.6.1 software installation that you used for a previous version of Empower, copy the *instsrv.dat* file and the *dhcp.xml* file from the secure location where you stored them (before you started the installation) and use them to replace the files installed by Empower software. (Replace *instsrv.dat* in *\Empower\InstrumentServer*, and replace *dhcp.xml* in *\Empower\Instruments*.)

5.2.2 Completing the installation on a client

After the computer restarts, perform the following tasks to complete the installation:

- Log in to the operating system using an account that is part of the local Administrators group.
- If you want to install instrument drivers for one or more instruments, use the latest Empower Instrument Driver Pack media. Refer to the appropriate installation guide and release notes for the driver. Visit www.waters.com for the most recent instrument drivers.

Note: If you experience communication problems, review the firewall exceptions list by clicking **Control Panel**, double-clicking **Windows Firewall**, and then clicking the **Exceptions** tab. Check with your IT department if there are network firewall and Domain enforced security policies. Ensure that the following exceptions are selected in the Programs and Services list:

- Empower-related ports and processes:
  - DCOM Port (135)
  - Empower
  - Empower Configuration Manager
  - Processing Monitor
  - Processing Server
  - Waters Instrument Server
  - Waters Service
  - WDHCP Server Configuration
  - WDHCP Server Svc.exe
- Instrument component software-related processes:

  Note: Depending on your system, there may be more instruments than those in this list.
  - ACQUITY ASM Server
  - ACQUITY BSM Server
  - ACQUITY CM Server
  - ACQUITY Console Client
  - ACQUITY Console Server
  - ACQUITY ELSD Server
  - ACQUITY MD Server
  - ACQUITY FLR Server
  - ACQUITY PDA Server
  - ACQUITY SM Server
  - ACQUITY SQ Server
  - ACQUITY TQ Server
  - ACQUITY TUV Server
  - Local Console Controller (LCC Handheld Controller)

- Trinity UI (if applicable)
- W2489 Server
- W2707 Server
- W2998 Server

5.3 Upgrading from earlier versions of Empower

Follow the instructions in this section to upgrade to Empower 3.6.1. If you are not upgrading, follow the instructions for a new Empower 3.6.1 installation (Page 102).

You can upgrade to Empower 3.6.1 from Empower 3.6.0.

Note: If you are using a version of Empower prior to Empower 3.6.0 software, you must completely uninstall the earlier version of Empower and ensure that your system meets the hardware and software requirements specified in Requirements for client computers (Page 18).

5.3.1 Upgrading to Empower 3.6.1 software

You can upgrade to Empower 3.6.1 from Empower 3.6.0.

To upgrade to Empower 3.6.1:

1. Mount the Empower 3.6.1 software ISO file.

   Alternative: Insert the Empower 3.6.1 software media into the DVD drive.
2. On the Maintenance Mode: Empower Personal page, select **Upgrade Empower Software**.
3. On the Ready to Upgrade page, click **Next**.
4. When the Windows Security Alert appears, select **Domain networks** and click **Allow access**.
5. On the Status page, when the upgrade is complete and the `Success` message appears, click **Finish**.
6. When the restart message appears, click **Yes**.

5.4 DCOM settings installed by Empower 3.6.1

Empower 3.6.1 software sets the appropriate DCOM application settings and access and launch permissions during installation. The following table lists these settings and the paths to set them.

Note: You must set some of these settings manually. For example, you must add domain users after software installation. You can access these settings on the Local Security Page in Server Manager.

Table 5–1: DCOM settings and permissions set during installation

Path	Allow
Local Security Policy > **Local Policies** > **Security Options** > **DCOM: Machine Access Restrictions in Security Descriptor Definition Language (SDDL) syntax** > **Properties**	**Local Access** and **Remote Access** permissions for: • **Everyone** **Note:** In addition to the **Everyone** group, you can add a custom group of Empower users with security settings specific to your implementation. • **System** • **Domain Users** • **Performance Log Users** • **Distributed COM Users**
Local Security Policy > **Local Policies** > **Security Options** > **DCOM: Machine Launch Restrictions in Security Descriptor Definition Language (SDDL) syntax** > **Properties**	**Local Launch**, **Local Activation**, and **Remote Activation** permissions for **Everyone**. **Note:** In addition to the **Everyone** group, you can add a custom group of Empower users with security settings specific to your implementation. All permissions for: • **Administrators** • **Domain Users** • **Performance Log Users**
Local Security Policy > **Local Policies** > **Security Options** > **Network Access: Let Everyone permissions apply to anonymous users**	**Enabled**
Component Services > **Computers** > **My Computer** > **DCOM Config** > **WatersService** > **Properties** > **Security**	Under **Launch and Activation Permissions**, set **Local Launch**, **Local Activation**, and **Remote Activation Permissions** for: • **Everyone** • **System** • **Administrators** • **Interactive** • **Domain Users**

Table 5–1: DCOM settings and permissions set during installation (continued)

Path	Allow
Component Services > **Computers** > **My Computer** > **DCOM Config** > **WatersService** > **Properties** > **Security**	Under **Access Permissions**, set **Local Access** and **Remote Access Permissions** for: • **Everyone** • **SELF** • **System** • **Administrators** • **Domain Users**

5.5 Configuring a database net service name

You must configure a database net service name (previously called a database alias) on each client and LAC/E device to connect to the Empower database, unless you are using the *TNS_ADMIN* environment variable. A database net service name is a name for an individual Empower database. This name appears in the **Database** field of the Empower Login page.

Tip: The *TNS_ADMIN* variable points to the *tnsnames.ora* file. A *tnsnames.ora* file contains the list of Empower databases that can be accessed by the client or LAC/E device.

Use the following procedure to create a new database net service name or modify an existing net service name. You must define the same database net service name on each client or LAC/E device.

To configure a database net service name:

1. Select **Start** > **Empower** > **Waters Net Configuration Assistant**.

   Alternative: Click **Start** and type `Waters Net Configuration Assistant`.
2. On the Waters Net Configuration Assistant utility, click the first row to edit the column details.
3. In the **Alias** column, type the alternative name for the database service.

   Example: `WATWIN2016R2`

   Rule: The database service identifier must begin with a character, not a number.
4. In the **Server Name** column, type the computer name or IP address of the database server.
5. In the **Service Name** column, type the database service name. The database service name is the same as the PDB (pluggable database) name of the current server installation. By default, the PDB name is `EMPPDB1`.

Tips:

- If you do not know the service name, you can find it using the Listener Configuration on the database server. The Listener Configuration is disabled on the client. To perform the inspection on the database server, click **Configuration** > **Listener Configuration**. The Waters Net Configuration Assistant displays the CDB and the PDB service names, which are identified by the `CDB` or `PDB` suffix.
- The global database name is supplied during installation. The default value is <*SIDPDB*> and you can modify it with the note that the `PDB` suffix must be kept.

6. In the **Port Number** column, ensure that the default port selection is `1521`.
7. Click **Save**.

   Result: The *tnsnames.ora* file is created.
8. Select the row, right-click, and then select **Test**.
9. In the Change Login dialog box, verify that the username `System` and password are pre-populated, and then click **OK**.

   Note: The default Oracle System password is *Waters2!*.
10. When the connection test is successful, click **OK**.
11. **Note:** If you are using an Empower Personal workstation as a client, perform this procedure to force the use of the *TNSNames.ora* file. If not, skip this step.

    Create a WATnames.ora file that contains the database alias of the database in the *tnsnames.ora* file. Save this file to the *C:\Empower\Script* folder.

Figure 5–1: WATNAMES.ora file content

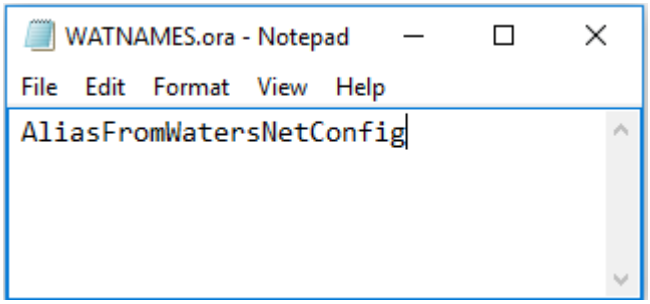
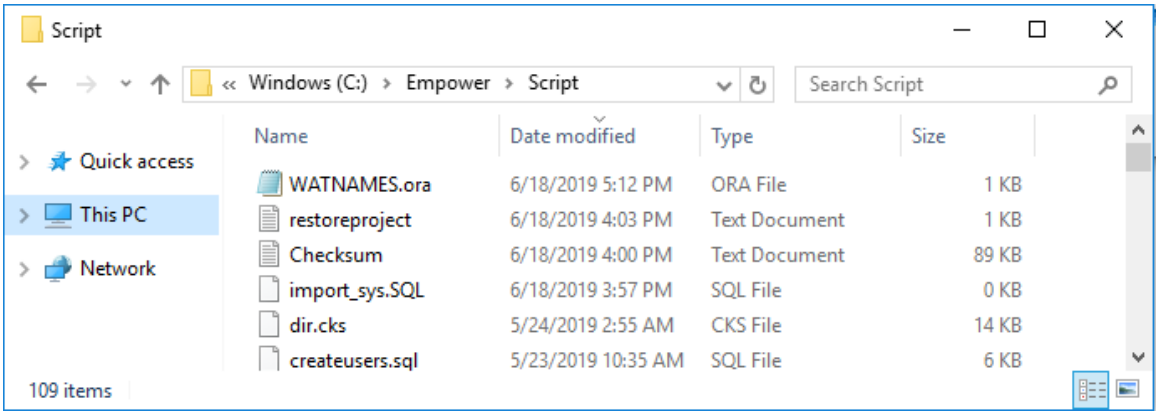


Figure 5–2: WATNAMES.ora file location



Result: When you log in to Empower 3.6.1 from a client, the database alias name is automatically populated in the Login dialog box if the service name prefix is *EMP*. Otherwise, you must type the name of the database in the **Database** field in the Empower Login dialog box.

5.6 Verifying your Empower software installation

5.6.1 Viewing the installation log

The installation log contains information about your Empower installation. You can read the log file to review your installation choices, the installation environment, and the status of the installation steps. In case of a partial or unsuccessful installation, review the installation log to check for errors.

The “Installation success or error status” value appears at the end of the installation log. If the value displayed is 0, the installation was successful. If the value displayed is anything other than 0, record the number, and contact Waters Technical Support.

To view the installation log:

1. From **Start**, click **Empower**, and then click **Empower Installation Log**.
2. Review the contents of the file.

   Tip: You can print a copy by selecting **File** > **Print**.
3. Click **File** > **Exit**.

5.6.2 Using the Verify Files Utility

The Verify Files Utility checks the integrity of the installed Empower program files.

After the Empower installation, run the Verify Files Utility to verify the Empower program files (not the database or data files):

- As part of your installation qualification, if you purchased an Empower Qualification option.
- To ensure that the Empower files did not change since installation.

5.6.2.1 Running the file verification utility

To run the file verification utility:

1. Click **Start** > **Empower** > **Verify Files**.

   Result: The Verify Files Utility compares the installed Empower files' checksum with a previously stored checksum, and then creates a file verification results log (for example, *checksum_date_timestamp.txt*).
2. Review the contents of the file and print or save a copy of the results.
3. Click **File** > **Exit**.

5.6.2.2 Viewing the file verification results

To view the file verification results:

1. Click **Start** > **Empower** > **View Verify Files**.

   Result: The *checksum.txt* file displays in Notepad.
2. Review the contents of the checksum file.

   Note: Your Empower 3.6.1 software installation passes the verification check when all files have a status of `OK` and the installation qualification summary on the final page states `No installation changes were detected`. If the *checksum.txt* file indicates any files marked as "changed", contact Waters Technical Support.

5.7 Setting the client time zone

Empower records the date and time of data acquisition and processing for different countries and time zones.

Note: Always restart the client after the following occurrences:

- You change the time zone of the operating system.
- The client loses its network connection.

In either of these situations, if you do not restart the client, the time stamps on all injections acquired during buffering may be incorrect. Changes made to the operating system time zone setting do not take effect until the client is restarted.

To specify the time zone for the client:

1. Log in to Empower software as a local administrator from any client.
2. Access Configuration Manager and click **Empower Nodes**.
3. Right-click the client and select **Empower Node Properties**.
4. Select the appropriate time zone for the client, and then click **OK**.

   Note: When you log into Empower the first time, you have to specify a database to connect to. If the database SID begins with the characters *WAT*, you can select the database from the list. If no databases appear in the list, you must type in the name of the database in the Database field in the Empower Login dialog box.

5.8 Empower programs and logs on a client or LAC/E

The Empower program folder contains these items:

Note: From **Start**, click **Empower**, and then click the Empower utility.

Table 5–2: Empower programs and logs

Item	Description
Empower Installation Log	Records information about the current installation.
Empower	Displays the Empower login page, which starts the Empower software. After you log in, you can select one of several Empower applications. For details, see “Starting and exiting from Empower” in the *Empower online Information System*.
Configure ICS for 64-bit OS	Use this utility if Instrument Component Software (ICS) was installed from a source other than Empower Instrument Driver Pack media.
Register Empower Node printers	Registers printers so you can print Empower reports.
Verify Files	Verifies the integrity of the Empower software files on your hard disk.
Remove Waters Instrument Component Software	Use this utility to uninstall instrument component software (ICS). You see this item only if instrument component software is installed.
View Verify Files	Opens the Checksum file in Notepad, which displays the results (checksums) of the verified files.
Waters Net Configuration Assistant	Opens the Waters Net Configuration Assistant. This utility allows you to configure the Empower database connection.
Waters Licensing Wizard	Starts the Waters Licensing Wizard, which you can use to initiate software license and option activation and deactivation.

Table 5–2: Empower programs and logs (continued)

Item	Description
Manage Waters Email Center	The Email Center facilitates troubleshooting because it allows the recipient to quickly respond to an Empower error without having to check the Message Center throughout the day. See *Empower online Information System* for details about configuring the Waters Email Center.

5.9 Registering printers

To print Empower reports, you must first register the printers you want to use.

To register printers for Empower reports:

1. Type `Empower` in the Windows Search box, and click **Empower** > **Register Empower Node Printer**.

   Requirement: You must be logged in to the Empower node as a local administrator or a user whose privileges allow you to write to the registry.
2. In the Register Empower Node Printers page, review the list of printers that are currently registered.

   Tip: The Register Empower Node Printers page shows only printers added using the **Add a printer** function.
3. If you must register additional printers, click **Get Printers**, select the printers, and then click **OK**.
4. Click **OK**, to save the changes, and close the page.

5.10 Uninstalling Empower 3.6.1 software

When you want to uninstall Empower 3.6.1 software, use the **Programs and Features** utility in the Windows Control Panel to remove the software.

Requirement: Before you uninstall Empower, remove Waters Instrument Control Software (ICS), and then deactivate the Empower licenses.

To uninstall Empower 3.6.1 software:

1. Open Windows Control Panel, click **Programs and Features**, and then double-click **Empower 3.6.1 Client**.

   Tip: From Windows 10, click **Start** > **All apps**, right-click **Empower 3.6.1 Client**, and then click **Uninstall**.

2. Follow the steps in the Deployment Manager wizard to uninstall Empower software.
3. Restart the computer.

6 Installing a LAC/E

Follow the instructions in this chapter to install the Empower 3.6.1 software on a Waters LAC/E device.

6.1 Preparing a LAC/E

Installing Empower 3.6.1 software on a LAC/E requires the hardware and software specified in Requirements for LAC/E devices (Page 19).

You can install Empower 3.6.1 as a new installation on a system where no Chromatography Data Software (CDS) is currently installed or as an upgrade from Empower 3.6.0.

Important: If you plan to change the name of the computer, follow these guidelines:

- Change the name before you install Empower software.
- Do not change the name of the computer after installing Empower.
- The computer name must begin with an alphabetic character (A to Z) and cannot begin with a numeric character (0 to 9). `Empower123` is acceptable for a computer name, but not `123Empower`.

Important: Your LAC/E is considered structurally validated by Waters when it is installed and configured per the instructions in this chapter. Configuring a LAC/E device otherwise can result in unknown operational behavior.

Follow these procedures to prepare the LAC/E:

- Ensure that the LAC/E is a member of the domain in which Empower software is running.
- You can connect remotely to a LAC/E by using Microsoft's Remote Desktop utility or, if the LAC/E has a keyboard and monitor, you can log on to it using an account that is part of the local Administrators group.
- Configure the system so that Windows automatically manages the virtual memory paging file size.
- Configure the system power options. See Configuring the power options (Page 34).
- Configure Windows Updates to notify you before downloading and installing new updates.

  Note: If you purchased a LAC/E device from Waters, the settings in sections 6.1.1, 6.1.2, and 6.1.3 are pre-configured.

Requirements:

- If you change domains after installing Empower and any ICS, ensure that the Empower-related ports and processes and Instrument component software processes are in the

Windows Firewall exception list. See Completing the installation on a LAC/E (Page 120). You must also review the DCOM settings if you change domains.

- If you use Dual or Quad LAC/E devices purchased from Waters, you must register them by typing their serial numbers in the LAC/E Acquisition Server field of the Waters Licensing Wizard online form. Doing so activates the system licenses purchased with each device.
- If you are using real-time virus scanning, during and after installation, exclude all Empower-related directories and their sub-directories from the scans. Some real-time virus scanners mistake normal data acquisition and instrument control for virus activity and interfere with proper operations. Full-system scans and live updates can be network-intensive, disk-intensive, and CPU-intensive, and can interfere with normal data acquisition. Certain antivirus program features such as "intrusion prevention" and "tamper protection" can also interfere with normal operation. If you observe issues with Empower, review and verify the antivirus logs. You may need to white-list any affected components.

6.1.1 Configuring .NET Framework

You must install Microsoft .NET 3.5 Framework manually on Windows 10. .NET 4.0 Framework is installed and enabled by default. .NET 4.8 is preinstalled and the .NET 4.8 is backward-compatible with all versions back to 4.0.

To install .NET 3.5 Framework:

1. From Windows **Control Panel**, click **Programs** > **Programs and Features** > **Turn Windows features on or off**.
2. In Windows Features, expand **.NET Framework 3.5 (include .NET 2.0 and 3.0)**, select the **Windows Communication Foundation HTTP Activation** and **Windows Communication Foundation Non-HTTP Activation** features, and then click **OK**.
3. After Windows completes the requested changes, click **Close**.

6.1.2 Configuring network discovery

You must enable the network discovery function and the file and printer sharing functions so that clients and servers can communicate. To enable the network discovery function on domain devices, you must start certain services.

6.1.2.1 Starting the required services

To start the required services:

1. Open the **Control Panel** and select **System and Security** > **Administrative Tools** > **Services**.
2. Change the start-up type to **Automatic** and start these services:

- DNS Client
- Function Discovery Resource Publication
- SSDP Discovery
- UPnP Device Host

Tip: When all services are running, you can modify the network discovery and printer sharing settings.

6.1.2.2 Turning on the network discovery and file and printer sharing functions

To turn on the network discovery and file and printer sharing functions:

1. In the Windows Search text box, type `Network` and then select **Network and Sharing Center**.
2. Click **Change advanced sharing settings** and turn on these functions:
   - **Network discovery**
   - **File and printer sharing**

6.1.3 Configuring power options

You must configure the power management settings to disable the power-saving features.

Note: If you obtain the computer from Waters, it has the power options already configured.

To configure the power options in Windows:

1. In the Windows Search text box, type `Power`, and then click **Power and Sleep settings**.
2. On the **Power and Sleep settings** tab, click **Additional power settings**.
3. On the **Power Options** tab, select **High performance**, and then click **Change plan settings**.
4. On the Edit Plan Settings page, perform these tasks:
   - Select **Never** from the **Turn off the display** field.
   - Select **Never** from the **Put the computer to sleep** field.
5. On the Edit Plan Settings page, click **Change advanced power settings**.
6. In the Power Options dialog box, verify the settings as listed in the **Power options settings** table, and then click **OK**.

Table 6–1: Power option settings

Power options	Settings
Expand **Hard disk** and **Turn off hard disk after**	Type `Never` in the Setting (Minutes) field

Table 6–1: Power option settings (continued)

Power options	Settings
Expand **Sleep** settings	
Sleep after	**Never**
Allow hybrid sleep	**Off**
Hibernate after	**Never**
Allow wake timers	**Disable**
Expand **USB settings** and **USB selective suspend setting**	**Disabled**
Expand **Display** and **Turn off display after**	**Never**

7. Go back to the **Power Options** tab, select **Choose what the power buttons do**, click **Change settings that are currently unavailable**, and clear the **Turn on fast startup (recommended)** check box.

6.1.4 Edgeport USB-to-serial converter cable

The Edgeport USB-to-serial converter cable provides a standard PC COM port connection with a serial instrument—usually by connecting a second cable with wiring that is specific to the instrument. For instructions, refer to this document: *Serial Communications Support Using the Edgeport USB-to-Serial Converter Cable* (716004684).

6.1.5 Synchronizing Empower and Windows time

Synchronize the Waters Empower software time zone and the time zone on the host Windows operating system to avoid any discrepancy, which typically can be one hour.

To synchronize Empower and Windows time:

1. In the Windows Search box, type `Time Zone`, and then select **Change the time zone**.
2. In the Settings window, click **Date and time**, and ensure that the Adjust for daylight saving time automatically option is **On**.

6.2 Installing Empower 3.6.1 software on a LAC/E

Follow the instructions in this section if this is a new installation of Empower 3.6.1. If you are upgrading to Empower 3.6.1, follow the instructions on upgrading Empower on a LAC/E (Page 123).

Waters supplies Empower 3.6.1 software on the Empower 3.6.1 software media.

You can perform a typical installation of the software on the system drive, or a custom installation specifying a different drive.

By default, the Empower installer (Deployment Manager) installs both the Oracle 19c client and Empower 3.6.1 software. If your site has its own Oracle license and prefers to install Oracle 19c as a separate application, the following considerations apply:

- Install Oracle 19c Enterprise Client software prior to installing Empower 3.6.1 software.

  Rule: Install the 32-bit client only. The 64-bit client is not supported.

- Change the language registry key value to `AMERICAN_AMERICA.WE8ISO8859P1`. The path to this key value depends on your environment:
  - For 32-bit environments, the path is *HKEY_LOCAL_MACHINE\Software\Oracle\KEY_EmpowerOracle19cClient\NLS_LANG*.
  - For 64-bit environments, the path is *HKEY_LOCAL_MACHINE\Software\WOW6432Node\Oracle\KEY_EmpowerOracle19cClient\NLS_LANG*.
- You must change the permissions on the Oracle Home directory (and subdirectories) to allow the Group Users all privileges except for **Full Control**.
- During installation of Empower, you are asked whether you want to use your installed Oracle software. Select **Yes** and specify the location of the Oracle program files.

6.2.1 Starting the installation on a LAC/E

To start the Empower 3.6.1 software installation on a LAC/E:

1. Ensure that the LAC/E is added to your domain.
2. Log in to the computer using an account that is part of the local Administrators group and ensure that no antivirus software is active during the deployment.
3. Navigate to the location of the Empower 3.6.1 software.
4. Browse to the main folder and double-click the **setup.exe** file.

   Tip: A *dism.exe* window opens after you double-click **setup.exe**. It will close automatically after several seconds.
5. On the main page, select **Install Empower Software**.
6. On the Select Product Type page, select **Enterprise** or **Workgroup**, depending on your environment.
7. On the Select Installation Type page, select **LAC/E**.
8. On the Customer Information page, specify your **username**, **organization**, and **Software Support ID number**, and then click **Next**.
9. On the End-User License Agreement page, read and accept the terms in the license agreement, and then click **Next**.
10. On the TNS_Admin Environment variable page, you can choose to set the *TNS_ADMIN* environment variable, which adds an environmental variable to the LAC/E that points to a

pre-configured *tnsnames.ora* file stored locally or in a network-accessible share. (A tnsnames.ora file contains the list of Empower databases the LAC/E can access.) The TNS_ADMIN environment variable allows large installations to maintain a single *tnsnames.ora* file in a share, eliminating the need to configure a *tnsnames.ora* file on each LAC/E computer.

- If you do not intend to use this option, do not check the box. Click **Next**.
- If you want to enable the *TNS_ADMIN* variable, select the check box and specify the network path to the share containing the pre-configured *tnsnames.ora* file (for example: *servername**sharename$*), and then click **Next**.

Note: Use the *TNS_ADMIN* directory that was set in Configuring a shared tnsnames.ora file (Page 88).

Tip: If the *TNS_ADMIN* variable is set, the client disregards local tnsnames.ora files.

11. On the Setup page, select one of the following options:
    - **Typical** – Select and then proceed to step 13, installing all Empower and Oracle files on the system drive, which is typically *C:*\.
    - **Custom** – Select and then proceed to step 12, installing the Empower and Oracle files on different drives.
12. On the Destination Folders page, select the appropriate drives from the list for the Empower Application and Empower Oracle files, and then click **Next**.

    Tip: If an Empower-related process triggers a Windows Security Alert message, click **Allow Access**.
13. On the Ready to Install page, click **Next** to begin the installation.

    Tip: If an Empower-related process triggers a Windows Security Alert message, click **Allow Access**.
14. On the Status page, click **Finish**.
15. When the restart message appears, click **Yes**.
16. After the computer restarts, log in using an account that is part of the local Administrators group.
17. If you are not using the *TNS_ADMIN* environmental variable, see Configuring a database net service name (Page 87) to configure a local tnsnames.ora file.

    Tip: If you created the *tnsnames.ora* file previously in another LAC/E or server, you can copy the master file and add it to the designated folder, for example, *C:\Empower\oracle\oracle19cClient\network\admin*.

6.2.2 Completing the installation on a LAC/E

After the computer restarts, perform the following tasks to complete the installation:

- Log in to the operating system using an account that is part of the local Administrators group.
- Install instrument drivers for one or more instruments. Visit www.waters.com for the most recent instrument driver packs. To install the instrument driver packs, follow the installation instructions in the driver pack installation guide.

Note: If you experience communication problems, review the firewall exceptions list. To do so, in **Control Panel**, double-click **Windows Firewall**, and then click the **Exceptions** tab. Ensure that the following exceptions are selected in the Programs and Services list:

- Empower-related ports and processes:
  - DCOM Port (135)
  - Empower
  - Empower Configuration Manager
  - Processing Monitor
  - Processing Server
  - Waters Instrument Server
  - Waters Service
  - WDHCP Server Configuration
  - WDHCP Server Svc.exe
- Instrument component software-related processes:

  Note: Depending on your system, there may be more instruments than those in this list.

  - ACQUITY ASM Server
  - ACQUITY BSM Server
  - ACQUITY CM Server
  - ACQUITY Console Client
  - ACQUITY Console Server
  - ACQUITY ELSD Server
  - ACQUITY MD Server
  - ACQUITY FLR Server
  - ACQUITY PDA Server
  - ACQUITY SM Server
  - ACQUITY SQ Server
  - ACQUITY TQ Server
  - ACQUITY TUV Server
  - Local Console Controller (LCC Handheld Controller)

- Trinity UI (if applicable)
- W2489 Server
- W2707 Server
- W2998 Server

6.2.3 DCOM settings installed by Empower 3.6.1

Empower 3.6.1 software sets the appropriate DCOM application settings and access and launch permissions during installation. The following table lists these settings and the paths to set them.

Note: You must set some of these settings manually. For example, you must add domain users after software installation. You can access these settings on the Local Security Page in Server Manager.

Table 6–2: DCOM settings and permissions set during installation

Path	Allow
Local Security Policy > **Local Policies** > **Security Options** > **DCOM: Machine Access Restrictions in Security Descriptor Definition Language (SDDL) syntax** > **Properties**	**Local Access** and **Remote Access** permissions for: • **Everyone** **Note:** In addition to the **Everyone** group, you can add a custom group of Empower users with security settings specific to your implementation. • **System** • **Domain Users** • **Performance Log Users** • **Distributed COM Users**
Local Security Policy > **Local Policies** > **Security Options** > **DCOM: Machine Launch Restrictions in Security Descriptor Definition Language (SDDL) syntax** > **Properties**	**Local Launch**, **Local Activation**, and **Remote Activation** permissions for **Everyone**. **Note:** In addition to the **Everyone** group, you can add a custom group of Empower users with security settings specific to your implementation. All permissions for: • **Administrators** • **Domain Users** • **Performance Log Users**

Table 6–2: DCOM settings and permissions set during installation (continued)

Path	Allow
Local Security Policy > **Local Policies** > **Security Options** > **Network Access: Let Everyone permissions apply to anonymous users**	**Enabled**
Component Services > **Computers** > **My Computer** > **DCOM Config** > **WatersService** > **Properties** > **Security**	Under **Launch and Activation Permissions**, set **Local Launch**, **Local Activation**, and **Remote Activation Permissions** for: • **Everyone** • **System** • **Administrators** • **Interactive** • **Domain Users**
Component Services > **Computers** > **My Computer** > **DCOM Config** > **WatersService** > **Properties** > **Security**	Under **Access Permissions**, set **Local Access** and **Remote Access Permissions** for: • **Everyone** • **SELF** • **System** • **Administrators** • **Domain Users**

6.3 Upgrading from earlier versions of Empower

Follow the instructions in this section to upgrade to Empower 3.6.1. If you are not upgrading, follow the instructions for a new Empower 3.6.1 installation (Page 118).

You can upgrade to Empower 3.6.1 from Empower 3.6.0.

Note: If you are using a version of Empower prior to Empower 3.6.0 software, you must completely uninstall the earlier version of Empower and ensure that your system meets the hardware and software requirements specified in Requirements for LAC/E devices (Page 19).

6.3.1 Upgrading to Empower 3.6.1 software

You can upgrade to Empower 3.6.1 from Empower 3.6.0.

To upgrade to Empower 3.6.1:

1. Mount the Empower 3.6.1 software ISO file.

   Alternative: Insert the Empower 3.6.1 software media into the DVD drive.
2. On the Maintenance Mode: Empower Personal page, select **Upgrade Empower Software**.
3. On the Ready to Upgrade page, click **Next**.
4. When the Windows Security Alert appears, select **Domain networks** and click **Allow access**.
5. On the Status page, when the upgrade is complete and the `Success` message appears, click **Finish**.
6. When the restart message appears, click **Yes**.

6.4 Bridging multiport network cards for Ethernet instruments

An acquisition client, LAC/E, or Personal workstation supports both single-port network cards and bridging multiport network cards. If you are using a single network card, refer to the Empower Help topic “Configuring DHCP settings”. When bridging ports for computers running on Windows 10, you must configure the instrument LAN as described below.

Note: This procedure was tested using Waters hardware. If you are using non-Waters computers, you may notice differences in this procedure. Contact Waters for assistance.

To configure the instrument LAN for bridging multiport network cards in Windows 10:

1. From **Control Panel** > **Network and Internet** > **Network and Sharing Center** > **Change Adapter Settings**, right-click the Local Area Connection to be used for the bridge.
2. In the Local Area Connection Properties dialog box, click **Configure**.
3. In the Properties dialog box, click the **Advanced** tab.

   Requirement: You must change these settings for every Local Area Connection that comprises the instrument LAN bridge.
4. From the Property list box, select these items, change the value to **Disabled**, and then click **OK**:
   - IPv4 Checksum Offload
   - TCP Checksum Offload (IPv4)
   - UDP Checksum Offload (IPv4)
5. From the Windows Network Connections page, select all the Local Area Connections that comprise the bridge, and then right-click and select **Bridge Connections**.

6. After the bridge is created, right-click it, select **Rename**, and then type `Instrument LAN`.
7. From **Control Panel** > **Device Manager** > **Network Adapters**, select **Microsoft Multiplexor Driver**, and then right-click **Properties**.
8. In the Microsoft Network Adapter Multiplexor Driver Properties dialog box, click the **Advanced** tab.

   From the Property list box, select these items, change the value to **Disabled**, and then click **OK**:

   - IPv4 Checksum Offload
   - TCP Checksum Offload (IPv4)
   - UDP Checksum Offload (IPv4)

   Result: The network card is properly configured. However, you must perform additional steps as described in the Empower Help topic “Configuring DHCP settings”.

6.5 Configuring a database net service name

You must configure a database net service name (previously called a database alias) on each client and LAC/E device to connect to the Empower database, unless you are using the *TNS_ADMIN* environment variable. A database net service name is a name for an individual Empower database. This name appears in the **Database** field of the Empower Login page.

Tip: The *TNS_ADMIN* variable points to the *tnsnames.ora* file. A *tnsnames.ora* file contains the list of Empower databases that can be accessed by the client or LAC/E device.

Use the following procedure to create a new database net service name or modify an existing net service name. You must define the same database net service name on each client or LAC/E device.

To configure a database net service name:

1. Select **Start** > **Empower** > **Waters Net Configuration Assistant**.

   Alternative: Click **Start** and type `Waters Net Configuration Assistant`.
2. On the Waters Net Configuration Assistant utility, click the first row to edit the column details.
3. In the **Alias** column, type the alternative name for the database service.

   Example: `WATWIN2016R2`

   Rule: The database service identifier must begin with a character, not a number.
4. In the **Server Name** column, type the computer name or IP address of the database server.
5. In the **Service Name** column, type the database service name. The database service name is the same as the PDB (pluggable database) name of the current server installation. By default, the PDB name is `EMPPDB1`.

Tips:

- If you do not know the service name, you can find it using the Listener Configuration on the database server. The Listener Configuration is disabled on the client. To perform the inspection on the database server, click **Configuration** > **Listener Configuration**. The Waters Net Configuration Assistant displays the CDB and the PDB service names, which are identified by the `CDB` or `PDB` suffix.
- The global database name is supplied during installation. The default value is <*SIDPDB*> and you can modify it with the note that the `PDB` suffix must be kept.

6. In the **Port Number** column, ensure that the default port selection is `1521`.
7. Click **Save**.

   Result: The *tnsnames.ora* file is created.
8. Select the row, right-click, and then select **Test**.
9. In the Change Login dialog box, verify that the username `System` and password are pre-populated, and then click **OK**.

   Note: The default Oracle System password is *Waters2!*.
10. When the connection test is successful, click **OK**.
11. **Note:** If you are using an Empower Personal workstation as a client, perform this procedure to force the use of the *TNSNames.ora* file. If not, skip this step.

    Create a WATnames.ora file that contains the database alias of the database in the *tnsnames.ora* file. Save this file to the *C:\Empower\Script* folder.

Figure 6–1: WATNAMES.ora file content

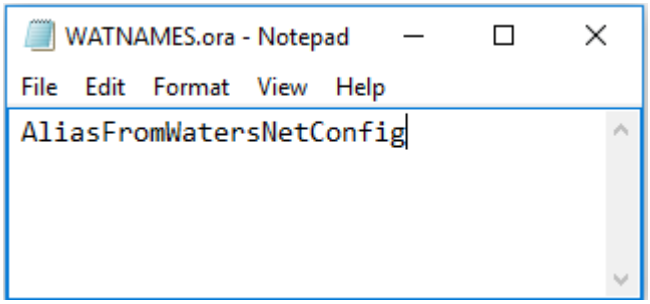
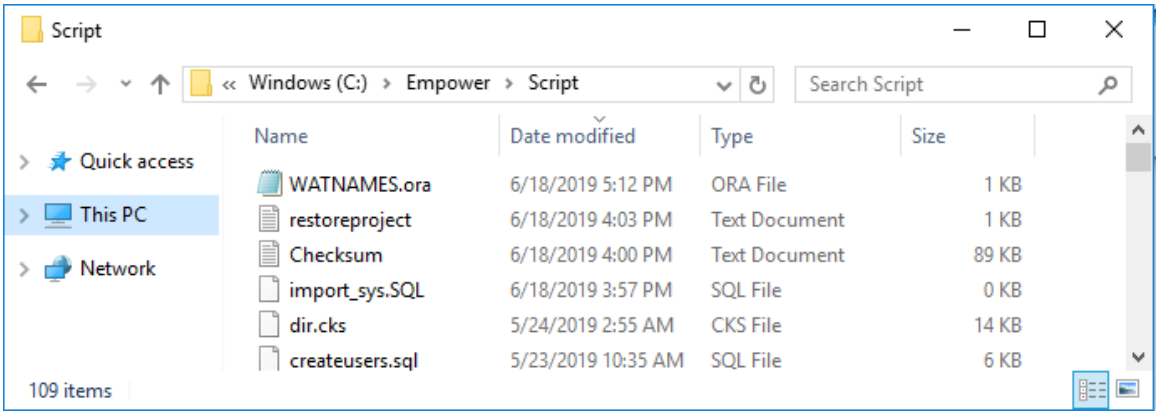


Figure 6–2: WATNAMES.ora file location



Result: When you log in to Empower 3.6.1 from a client, the database alias name is automatically populated in the Login dialog box if the service name prefix is *EMP*. Otherwise, you must type the name of the database in the **Database** field in the Empower Login dialog box.

6.6 Setting the LAC/E time zone

Empower records the date and time of data acquisition and processing for different countries and time zones.

Requirement: Always restart the LAC/E after the following conditions:

- You change the time zone of the operating system.
- The client loses its network connection.

If either of these conditions occurs and you do not restart the LAC/E, the time stamps on all injections acquired during buffering may display incorrectly. Changes made to the operating system time zone setting do not take effect until the LAC/E is restarted.

To specify the time zone for the LAC/E:

1. From any client, log in to Empower software as a local administrator.
2. Access Configuration Manager and click **Empower Nodes**.
3. Right-click the client and select **Empower Node Properties**.
4. Select the appropriate time zone for the LAC/E, and then click **OK**.

   Note: When you log into Empower the first time, you have to specify a database to connect to. If the database SID begins with the characters *WAT*, you can select the database from the list. If no databases appear in the list, you must type the name of the database in the Database field in the Empower Login dialog box.

6.7 Verifying your Empower software installation

6.7.1 Viewing the installation log

The installation log contains information about your Empower installation. You can read the log file to review your installation choices, the installation environment, and the status of the installation steps. In case of a partial or unsuccessful installation, review the installation log to check for errors.

The “Installation success or error status” value appears at the end of the installation log. If the value displayed is 0, the installation was successful. If the value displayed is anything other than 0, record the number, and contact Waters Technical Support.

To view the installation log:

1. From **Start**, click **Empower**, and then click **Empower Installation Log**.
2. Review the contents of the file.

   Tip: You can print a copy by selecting **File** > **Print**.
3. Click **File** > **Exit**.

6.7.2 Using the Verify Files Utility

The Verify Files Utility checks the integrity of the installed Empower program files.

After the Empower installation, run the Verify Files Utility to verify the Empower program files (not the database or data files):

- As part of your installation qualification, if you purchased an Empower Qualification option.
- To ensure that the Empower files did not change since installation.

6.7.2.1 Running the file verification utility

To run the file verification utility:

1. Click **Start** > **Empower** > **Verify Files**.

   Result: The Verify Files Utility compares the installed Empower files’ checksum with a previously stored checksum, and then creates a file verification results log (for example, *checksum_date_timestamp.txt*).
2. Review the contents of the file and print or save a copy of the results.
3. Click **File** > **Exit**.

6.7.2.2 Viewing the file verification results

To view the file verification results:

1. Click **Start** > **Empower** > **View Verify Files**.

   Result: The *checksum.txt* file displays in Notepad.

2. Review the contents of the checksum file.

   Note: Your Empower 3.6.1 software installation passes the verification check when all files have a status of `OK` and the installation qualification summary on the final page states `No installation changes were detected`. If the *checksum.txt* file indicates any files marked as “changed”, contact Waters Technical Support.

6.8 Empower programs and logs on a client or LAC/E

The Empower program folder contains these items:

Note: From **Start**, click **Empower**, and then click the Empower utility.

Table 6–3: Empower programs and logs

Item	Description
Empower Installation Log	Records information about the current installation.
Empower	Displays the Empower login page, which starts the Empower software. After you log in, you can select one of several Empower applications. For details, see “Starting and exiting from Empower” in the *Empower online Information System*.
Configure ICS for 64-bit OS	Use this utility if Instrument Component Software (ICS) was installed from a source other than Empower Instrument Driver Pack media.
Register Empower Node printers	Registers printers so you can print Empower reports.
Verify Files	Verifies the integrity of the Empower software files on your hard disk.
Remove Waters Instrument Component Software	Use this utility to uninstall instrument component software (ICS). You see this item only if instrument component software is installed.
View Verify Files	Opens the Checksum file in Notepad, which displays the results (checksums) of the verified files.
Waters Net Configuration Assistant	Opens the Waters Net Configuration Assistant. This utility allows you to configure the Empower database connection.

Table 6–3: Empower programs and logs (continued)

Item	Description
Waters Licensing Wizard	Starts the Waters Licensing Wizard, which you can use to initiate software license and option activation and deactivation.
Manage Waters Email Center	The Email Center facilitates troubleshooting because it allows the recipient to quickly respond to an Empower error without having to check the Message Center throughout the day. See *Empower online Information System* for details about configuring the Waters Email Center.

6.9 Registering printers

To print Empower reports, you must first register the printers you want to use.

To register printers for Empower reports:

1. Type `Empower` in the Windows Search box, and click **Empower** > **Register Empower Node Printer**.

   Requirement: You must be logged in to the Empower node as a local administrator or a user whose privileges allow you to write to the registry.
2. In the Register Empower Node Printers page, review the list of printers that are currently registered.

   Tip: The Register Empower Node Printers page shows only printers added using the **Add a printer** function.
3. If you must register additional printers, click **Get Printers**, select the printers, and then click **OK**.
4. Click **OK**, to save the changes, and close the page.

6.10 Uninstalling Empower 3.6.1 software on a LAC/E

When you want to uninstall Empower 3.6.1 software, use the **Programs and Features** utility in the Windows Control Panel to remove the software.

Requirement: Before you uninstall Empower, remove Waters Instrument Control Software (ICS), and then deactivate the Empower licenses.

To uninstall Empower 3.6.1 software:

1. Open Windows Control Panel, click **Programs and Features**, and then double-click **Empower 3.6.1 LAC/E**.

Tip: From Windows 10, click **Start** > **All apps**, right-click **Empower 3.6.1 LAC/E**, and then click **Uninstall**.

2. Follow the steps in the Deployment Manager wizard to uninstall Empower software.
3. Restart the computer.

7 Installing a BC LAC/E

To install Empower software as a BC LAC/E:

1. Follow the guidelines from Chapter 3: Installing an Empower Personal workstation (Page 32).
2. Configure the database net service name. See Configuring a database net service name (Page 87).
3. Follow the guidelines from the *Waters Business Continuity LAC/E (BC LAC/E) with SecureSync Installation and Configuration Guide* (715006885).

8 Installing an Empower file server

Follow the instructions in this chapter to install the Waters Service as a separate service on a server other than the Empower 3.6.1 database server.

Recommendation: Before installing any hardware or software, perform a full backup of your hard drives (see the instructions provided by the manufacturer of your computer). After installation, back up your Empower 3.6.1 data regularly.

8.1 Considerations and requirements

8.1.1 Considerations

An Empower file server allows you to store and retrieve Empower raw data on a computer other than the Empower database server.

The Waters Service allows computers on which it is installed to act as a file server. The file server contains the raw data shares configured within the Empower software. Users can store project raw data on these file shares. The service provides secure access to Empower raw data files via the Empower application. While the operating system permissions on the files can be set to Read-Only for the Empower users group you created, in the Configuring Empower projects directory (Page 90) procedure, write privileges are granted to these same users only through the Waters Service and only when they run Empower software.

If you plan to change the computer name, follow these guidelines:

- Change the name before you install Empower software.
- Do not change the computer name after Empower software is installed.
- The name of the computer must be less than 16 characters in length.
- The computer name must begin with an alphabetic character (A to Z), and cannot begin with a numeric character (0 to 9). For example, Empower123 is acceptable for a computer name, but not 123Empower.

Requirement: If you are using real-time virus scanning, during and after installation, exclude all Empower-related directories and their sub-directories from the scans. Some real-time virus scanners mistake normal data acquisition and instrument control for virus activity and interfere with proper operations. Full-system scans and live updates can be network-intensive, disk-intensive, and CPU-intensive, and can interfere with normal data acquisition. Certain antivirus program features such as "intrusion prevention" and "tamper protection" can also interfere with normal operation. If you observe issues with Empower, review and verify the antivirus logs. You may need to white-list any affected components.

8.1.2 File server requirements

Waters service requires the following items:

- Valid client and server network connections
- Windows Server 2016 or 2019 Standard
- Server contains at least two drives
- Configure power options: select High performance (see Configuring power options (Page 34))
- Ensure that the client, LAC/E, and file server are all in the same domain
- Configure the Event Viewer utility
- Configure .NET 3.5 framework (see Configuring .NET 3.5 Framework) (Page 33)
- Synchronize Empower and Windows time (see Synchronizing Empower and Windows time (Page 35))
- Configure Windows Updates to notify you before downloading and installing new updates
- Configure firewall settings for Waters Service (see Configuring firewall settings for Waters Service (Page 135))

  Note: You can deploy an Empower client as an alternative, because in this case, the Waters Service and the firewall exclusions are added automatically. After you install the Empower client, configure the DCOM settings.

8.2 Installing Waters Service

Before beginning the installation procedure, verify that all File Service Requirements are met.

To install the Waters Service on a server on which Empower software is not installed:

1. Navigate to the location of the Empower 3.6.1 software.
2. Browse to the main folder and double-click the **setup.exe file**.
3. Select a language from the list and click **OK**.
4. On the Main page, select **Install Optional Components**.
5. On the Select optional component page, select **Waters Service**.
6. On the Ready to Install page, click **Next**.

   Tip: If an Empower-related process triggers a Windows Security Alert message, click **Allow Access**.
7. On the Welcome page, click **Next**.
8. On the Custom Setup page, keep the default installation location and click **Next**.

Alternative: Click **Change** to change the installation location. Change the drive letter only. If you change anything in the location other than the drive letter, the installation path is lost. Click **OK**, and then click **Next**.

9. On the Empower Raw Data Share page, keep the default name (Waters_Projects$) or customize the name, and then click **Next**.

   Requirement: If you customize the name, you must use the same share name for the raw data files share (see Configuring raw data directory permissions (Page 140)). You must also put a `$` on the end of the name to hide the share from network browsing.

10. On the Ready to Install the Program page, click **Install**.

    Tip: If an Empower-related process triggers a Windows Security Alert message, click **Allow Access**.

11. On the InstallShield Wizard Completed page, click **Finish**.
12. On the Status page, click **Finish**.

    Note: It takes several seconds for this page to appear.

13. When the restart message appears, click **Yes**.

    Result: The computer restarts.

8.3 Configuring firewall settings for Waters Service

To avoid communication problems while using Empower, you must add the Waters Service and the Distributed Component Object Model (DCOM) Port (135) to the Windows Firewall exceptions in the Inbound Rules list.

8.3.1 Adding Waters Service and DCOM port to Inbound Rules

8.3.1.1 Adding Waters Service to Inbound Rules

To add Waters Service to Inbound Rules:

1. Open Server Manager, and click **Tools** > **Windows Firewall with Advanced Security**.
2. Click **Inbound Rules**, right-click, and then click **New Rule** in the right pane.
3. On the **New Inbound Rule Wizard** > **Rule Type page**, select **Program**.
4. Click **Next**, and then do the following:
   - On the Program page, select **This program path**, and then click **Browse**.
   - On the Open page, select **Waters Service** from *Empower\Bin,* and then click **OK**.
   - On the Program page, ensure that the path with *Empower\Bin\WatersService.exe* appears, and then click **Next**.
5. On the Action page, select **Allow the connection**, and then click **Next**.

6. On the Profile page, select all options for **When does this rule apply?**, and then click **Next**.
7. On the Name page, specify the desired name (e.g., WatersService), and then click **Finish**.

   Result: You are returned to the Windows Firewall with Advanced Security page.

8.3.1.2 Adding DCOM port to Inbound Rules

To add the DCOM port to Inbound Rules:

1. Click **Inbound Rules**, and then right-click and select **New Rule**.
2. On the New Inbound Rule Wizard > Rule Type page, select **Port**, and then click **Next**.
3. On the Protocol and Ports page, select **TCP and Specific local ports**.
4. In the Specific local ports field, type `135`, and then click **Next**.
5. On the Action page, select **Allow the connection,** and then click **Next**.
6. On the Profile page, select all options for **When does this rule apply?**, and then click **Next**.
7. On the Name page, type a name (for example, DCOM port), and then click **Finish**.

   Result: The Windows Firewall with Advanced Security page displays the DCOM Port and Waters Service in the Inbound Rules list.

8.3.2 Updating DCOM access and launch permissions

To update the DCOM access and launch permissions:

1. Open Server Manager, and click **Tools** > **Local Security Policy**.
2. On the Local Security Policy page, select **Local Policies** > **Security Options**.
3. Right-click **DCOM: Machine Access Restrictions in Security Descriptor Definition Language (SDDL) syntax**, and then select **Properties**.
4. Click **Edit Security,** and ensure that the **Allow** check boxes for both **Local Access** and **Remote Access** are selected for all users.
5. Click **OK** twice.
6. Right-click **DCOM: Machine Launch Restrictions in Security Descriptor Definition Language (SDDL) syntax**, and then select **Properties**.
7. Click **Edit Security**, ensure that the **Allow** check boxes for **all permissions** are selected for **all users**, and then click **OK** twice.

8.4 Updating security for Waters Services and component settings

To update the Waters Services and component settings:

1. Open Server Manager and click **Tools** > **Component Services**.
2. On the Component Services page, navigate to **Component Services** > **Computers** > **My Computer** and double-click **DCOM config**.
3. Scroll down to locate **Waters Service**, right-click **Waters Service**, and select **Properties**.
4. Click the **Security** tab.
5. On the **Security** tab of the Waters Service Properties page, under Launch and Activation Permissions, select **Customize**, and click **Edit**.
6. On the Launch and Activation Permission page, click **Add**.
7. On the Select Users or Groups page, type `domain users` in the **Enter the object names to select** field and click **OK**.
8. Select all four permissions and click **OK**.
9. On the Launch and Activation Permission page, click **Add**.
10. On the Select the Users or Groups page, type the name of the Empower users group you created in the Configuring the projects directory (Page 90) procedure in the **Enter the object names to select** field and click **OK**.
11. Select all four permissions and click **OK**.
12. On the Launch and Activation Permission page, select all permissions for **SYSTEM** and **INTERACTIVE**.
13. Click **OK** twice to exit and close **Component Services**.

8.5 Updating COM Security settings

To avoid communication problems while using Empower, you must update the COM Security settings.

To update the COM Security settings:

1. In Windows Server 2016 Standard, open Server Manager and click **Tools menu** > **Component Services**.
2. On the Component Services page, expand **Component Services**, expand **Computers**, right-click **My Computer**, and then select **Properties**.
3. In the My Computer Properties dialog box, select **COM Security**.
4. In the **COM Security** tab, click **Edit Default** in the Access Permissions section.
5. In the Access Permissions dialog box, click **Add**.

6. In the Select Users, Computers, Service Accounts, or Groups dialog box, perform these tasks:
   - Type `Everyone`, and then click **OK**.
   - Allow both permissions for all user groups, and then click **OK**.
7. In the **COM Security** tab, click **Edit Default** in the Launch and Activation Permissions section.
8. In the Launch and Activation Permissions dialog box, click **Add**.
9. In the Select Users, Computers, Service Accounts, or Groups dialog box, perform these tasks:
   - Type `Everyone,` and then click **OK**.
   - Allow all permissions for all user groups, apply changes, and then click **OK**.
10. Close all Windows dialog boxes.

8.6 DCOM settings installed by Empower 3.6.1

Empower 3.6.1 software sets the appropriate DCOM application settings and access and launch permissions during installation. The following table lists these settings and the paths to set them.

Note: You must set some of these settings manually. For example, you must add domain users after software installation. You can access these settings on the Local Security Page in Server Manager.

Table 8–1: DCOM settings and permissions set during installation

Path	Allow
Local Security Policy > **Local Policies** > **Security Options** > **DCOM: Machine Access Restrictions in Security Descriptor Definition Language (SDDL) syntax** > **Properties**	**Local Access** and **Remote Access** permissions for: • **Everyone** **Note:** In addition to the **Everyone** group, you can add a custom group of Empower users with security settings specific to your implementation. • **System** • **Domain Users** • **Performance Log Users** • **Distributed COM Users**
Local Security Policy > **Local Policies** > **Security Options** > **DCOM: Machine Launch Restrictions in Security Descriptor**	**Local Launch**, **Local Activation**, and **Remote Activation** permissions for **Everyone**.

Table 8–1: DCOM settings and permissions set during installation (continued)

Path	Allow
Definition Language (SDDL) syntax > **Properties**	**Note:** In addition to the **Everyone** group, you can add a custom group of Empower users with security settings specific to your implementation. All permissions for: • **Administrators** • **Domain Users** • **Performance Log Users**
Local Security Policy > **Local Policies** > **Security Options** > **Network Access: Let Everyone permissions apply to anonymous users**	**Enabled**
Component Services > **Computers** > **My Computer** > **DCOM Config** > **WatersService** > **Properties** > **Security**	Under **Launch and Activation Permissions**, set **Local Launch**, **Local Activation**, and **Remote Activation Permissions** for: • **Everyone** • **System** • **Administrators** • **Interactive** • **Domain Users**
Component Services > **Computers** > **My Computer** > **DCOM Config** > **WatersService** > **Properties** > **Security**	Under **Access Permissions**, set **Local Access** and **Remote Access Permissions** for: • **Everyone** • **SELF** • **System** • **Administrators** • **Domain Users**

8.7 Configuring raw data directory permissions

You specify which raw data share will store your Empower data on a per-project basis. You can specify the raw data share when creating projects, using the Name Entry page of the New Project wizard.

The raw data share on the file server is created with default security settings provided by the installed operating system. To ensure the proper level of access and security, set the security permissions exactly as described in the Configuring the projects directory (Page 90) procedure.

8.7.1 Configuring projects directory

The Empower projects directory is the location where raw data is stored.

Note: If you performed a system object import as part of your Empower installation and want to use the \Empower\Projects folder on the server as a raw data share, you must manually configure the share in Empower.

Requirement: To ensure the proper level of access and security for the projects directory, you must grant your Empower users read-only access to the share so that they can view the raw data. An easy way to perform this task is for your domain administrator to create a custom domain group and use this group to grant read access to Empower users.

To configure the Empower Projects directory:

1. From the **Sharing** tab in the Properties dialog box, share the folder, using *Waters_Projects $* as the share name with the following permissions:
   - System account **Full Control** permissions.
   - Grant **Read** permissions to the custom domain-user group your domain administrator created for Empower users.
2. From the **Security** tab:
   a. Specify the security settings for the *Waters_Projects$* as follows:
      - Disable inheritance and do not convert the inherited permission into explicit permissions.
      - Add System account and grant this account **Full Control**.
   b. Grant these **Effective permissions** to the custom domain-user group your domain administrator created for Empower users:
      - **Traverse folder / execute file**
      - **List folder / read data**
      - **Read attributes**

- **Read extended attributes**
- **Read permissions**

c. Ensure that the **Replace all child object permissions with inheritable permissions from this object** check box is selected.

Note: You can also use the Everyone user group to grant your Empower users read-only access to the share.

8.8 Adding the file service and raw data share in Empower

Requirement: Perform this procedure on the server or from a client, not on the file server.

Note: You can use the default system account that does not require a named user license to perform this task. This administrator account can be disabled but not removed from Empower 3.6.1 software. The default username is `system` and the default password is `manager`. Neither the username nor the password are case sensitive.

To add the file service and the raw data share in Empower:

1. Log in to Empower software as an administrator user, and then access Configuration Manager.
2. In Configuration Manager, click **View** > **Manage Raw Data Files**.
3. Click **Add File Service**.
4. In the **Node Name** field, specify the name or IP address of the file server on which you installed Waters Service (Page 134).
5. Click **Test File Service** to verify that the file server is reachable and properly configured.
6. In the **File server valid** message box, click **OK**.
7. In the Add File Service page, click **OK**.

   Note: If the test reported that the file server is invalid, confirm your entry in the Node Name field. Make any necessary corrections and repeat the test. If the file server is still reported as invalid, the cause may be configuration errors on the file server.
8. Click **Add Raw Data Share**.
9. On the Add Empower Raw Data Share page, type the name of the raw data share (*Waters_Projects$*) you created when you installed Waters Service (Page 134), and then click **OK**.

   Note: If the share name you typed was not pre-configured on the file server, you are prompted to specify a directory path for the raw data share (for example, *C:\QALab \Projects*). Do so, and then click **OK**.
10. To verify that the file share is reachable and properly configured, click **Test Share**.

    Note: For additional details, see “Managing raw data files in an Enterprise Client/Server configuration” in *Empower online Information System*.

Requirement: Restart the computer after installing Waters Service. If you install Waters Service from the Optional Components folder (on the Empower 3.6.1 software media) and you do not restart the computer, subsequent installations can fail.

8.9 Uninstalling Waters Service

Use the Windows Add/Remove feature to uninstall Waters Service.

9 Configuring Empower software in a Citrix environment

Refer to this chapter when installing Empower 3.6.1 software in a Citrix XenApp 7.15 LTSR CU2 or Citrix Virtual Apps and Desktops 7 1912 LTSR CU2 environment.

9.1 Introduction

To access Empower 3.6.1 software in a Citrix Virtual Apps server environment, load the Empower 3.6.1 client onto the Citrix server. Client computers can then connect to the Citrix server to access and run Empower 3.6.1 software.

Note: For information on how to install and configure Citrix servers, contact Citrix Systems, Inc.

If you plan to change the computer name, follow these guidelines:

- Change the name before you install Empower software.
- The computer name must be less than 16 characters in length.
- The computer name must begin with an alphabetic character (A to Z) and cannot begin with a numeric character (0 to 9). `Empower123` is acceptable for a computer name, but not `123Empower`.

9.2 Preparing the Citrix application server for Empower 3.6.1

Prerequisites: Verify that you are using one of the following configurations on the Citrix server:

- Citrix XenApp Server 7.15 software with Microsoft Windows Server 2016
- Citrix Virtual Apps and Desktops 7 1912 LTSR CU2 software with Microsoft Windows Server 2016 or 2019 Standard

Set up the system as follows:

- Configure .NET 3.5 Framework.
- Configure Network discovery.
- Configure the Event Viewer utility.
- Confirm regional settings.
- Synchronize Empower and Windows time zones.

- Disable User Access Control (UAC).
- Install the Empower 3.6.1 client on the Citrix server.
- Disable Waters Service and Waters DHCP Server.
- Configure database net service names.
- Publish Empower software in Citrix.

9.2.1 Configuring .NET 3.5 Framework on Windows Server 2016 and 2019 Standard

You must install Microsoft .NET 3.5 Framework manually on Windows Server 2016 or 2019 Standard. .NET 4.0 Framework is installed and enabled by default.

To install .Net 3.5 Framework on Windows Server 2016 or 2019 Standard:

1. Click **Start** > **Server Manager** and in the Manage menu, click **Add roles and features**.
2. Click **Next** in the Wizard, select **Role-based or feature-based installation**, and then click **Next**.
3. Select **Select a server from the server pool**, select the target server, and then click **Next**.
4. In **Server Roles**, skip this section, and then click **Next**.
5. In **Features**, select **.NET Framework 3.5 Features (1 of 3 installed)**, and then click **Next**.
6. In the **Confirm installations selections** page, select **Restart the destination server automatically if required**, and then click **Install**.

9.2.2 Configuring network discovery

You must enable the network discovery function and the file and printer sharing functions so that clients and servers can communicate. To enable the network discovery function on domain devices, you must start certain services.

9.2.2.1 Starting the required services

To start the required services:

1. Open the **Control Panel** and select **System and Security** > **Administrative Tools** > **Services**.
2. Change the start-up type to **Automatic** and start these services:
   - DNS Client
   - Function Discovery Resource Publication
   - SSDP Discovery
   - UPnP Device Host

Tip: When all services are running, you can modify the network discovery and printer sharing settings.

9.2.2.2 Turning on the network discovery and file and printer sharing functions

To turn on the network discovery and file and printer sharing functions:

1. In the Windows Search text box, type `Network` and then select **Network and Sharing Center**.
2. Click **Change advanced sharing settings** and turn on these functions:
   - **Network discovery**
   - **File and printer sharing**

9.2.3 Confirming regional settings

If you are installing Empower software on an English-language computer, you must confirm that your Windows regional settings are configured for English (United States). The symbols for English (United States) use decimal formatting, not comma formatting, which is important when displaying numeric values (12.56, not 12,56).

To confirm that the regional settings are correct:

1. From Control Panel (**Category** view), under **Clock, Language, and Region**, click **Change date, time, or number formats**.
2. In the Region dialog box, ensure that **English (United States)** is selected as the format in the **Formats** tab.

9.2.4 Synchronizing Empower and Windows time

Synchronize the Waters Empower software time zone and the time zone on the host Windows operating system to avoid any discrepancy, which typically can be one hour.

To synchronize Empower and Windows time:

1. In the Windows Search box, type `Time Zone`, and then select **Change the time zone**.
2. In the Settings window, click **Date and time**, and ensure that the Adjust for daylight saving time automatically option is **On**.

9.2.5 Disabling User Access Control

To disable User Access Control (UAC) on the Server:

1. Click **Start** > **Control Panel** > **System and Security** > **Change User Account Control settings**.

Tip: To access **Control Panel** in Windows Server 2016 or 2019 Standard, right-click the **Windows** icon and click **Control Panel**.

2. Drag the slider down to the lowest setting **(Never notify)** and click **OK**.

   Important: To fully disable User Access Control (UAC), you must disable the policy `User Account Control: Run all administrators in Admin Approval Mode`. For details, see How User Account Control works.

3. In the Windows search box, type `secpol.msc` and press `Enter`.
4. In the Local Security Policy window, navigate to **Local Policies** > **Security Options**.
5. Right-click the **User Account Control: Run all administrators in Admin Approval Mode** policy in the list and select **Properties**.
6. In the policy's properties window, select **Disabled** and click **OK**.

9.3 Installing Empower 3.6.1 client on a Citrix server

You can install Empower 3.6.1 as a fresh, new installation on a Citrix server where no Chromatography Data Software (CDS) is currently installed or as an upgrade from Empower 3.6.0.

Follow the instructions in this section if this is a new installation of Empower 3.6.1. If you are upgrading to Empower 3.6.1, follow the instructions on upgrading the Empower client on a Citrix server (Page 152).

Restrictions:

- Do not attempt to install the Empower 3.6.1 client on the Citrix server from a staged network location. Install the client on the Citrix server using the Empower 3.6.1 media either from a local or mapped drive or from a UNC path.
- Do not use Add/Remove programs (Uninstall or Change a program) to install Empower 3.6.1. You must put the Citrix server into Install mode (see Installing Empower 3.6.1 client software (Page 147) in the Empower 3.6.1 installation procedure).

Waters supplies Oracle software and Empower 3.6.1 software on the Empower 3.6.1 software media.

Procedures in this chapter assume that you want to install Oracle automatically using default settings. Allow approximately 30 minutes or more to install the software.

By default, the Empower installer (Deployment Manager) installs both Oracle 19c and Empower 3.6.1 software. If your site has its own Oracle license and prefers to install Oracle 19c software as a separate application, consider these installation issues:

1. Install Oracle 19c software only before installing Empower 3.6.1 software.
2. Install the 32-bit Oracle client only. The 64-bit client is not supported.

3. Change the language registry key value in *HKEY_LOCAL_MACHINE\Software \WOW6432Node\Oracle\KEY_EmpowerOracle19cClient\NLS_LANG to AMERICAN_AMERICA.WE8ISO8859P1*.
4. During installation, you are asked whether you want to use your installed Oracle software. Select **Yes**, and then type the location of the Oracle program files.

9.3.1 Installing Empower 3.6.1 client software

To install the Empower 3.6.1 client software:

1. Put the server into Install mode by opening a command prompt and typing `Change user/install`.

   Result: The response should indicate `User session is ready to install applications`.
2. Navigate to the location of the Empower 3.6.1 software.
3. Browse to the main folder and double-click the **setup.exe** file.

   Tip: A *dism.exe* window opens after you click **setup.exe**. The window closes automatically after appearing for several seconds.
4. Select a language from the list and click **OK**.
5. On the main page, select **Install Empower Software**.
6. On the Select Product Type page, select **Enterprise** or **Workgroup**, depending on your environment.
7. On the Select Installation Type page, select **Client**.
8. On the Customer Information page, type your user name, organization, and Software Support ID number, and then click **Next**.
9. On the End-User License Agreement page, accept the terms in the license agreement, and then click **Next**.
10. On the TNS_Admin Environment variable page, you can choose to set the *TNS_ADMIN* environment variable, which adds an environmental variable to the Citrix server that points to a pre-configured *tnsnames.ora* file located in a network-accessible share.

    Note: A *tnsnames.ora* file contains the list of Empower databases the client can access. This option allows large installations to maintain a single *tnsnames.ora* file in a share, eliminating the need to configure a *tnsnames.ora* files on each client computer.

    - If you do not intend to use this option, leave the checkbox clear and click **Next**.
    - If you want to enable the *TNS_ADMIN* variable, select the check box. Type the network path to the share containing the pre-configured *tnsnames.ora* file (for example: \ *servername**sharename$*), and then click **Next**.

    Tip: Use the *TNS_ADMIN* directory set in Configuring shared tnsnames.ora file (Page 88).

    Rule: If the *TNS_ADMIN* variable is set, the Citrix server disregards local *tnsnames.ora* files.

11. On the Installation Type page, select one of the following options:
    - **Typical** – Select and then proceed to step 13, installing all Empower and Oracle files to the system drive, which is typically *C:*.
    - **Custom** – Select and then proceed to step 12, installing the Empower and Oracle files on different drives.
12. On the Destination Folders page, select the appropriate drives from the list for the Empower Application and Empower Oracle files, and then click **Next**.
13. On the Ready to Install page, click **Next** to begin the installation.

    Tip: If an Empower-related process triggers a Windows Security Alert message, click **Allow Access**.
14. On the Status page, click **Finish**.
15. When the restart message appears, click **Yes**.

    Result: The computer restarts.
16. After the computer restarts, log in using an account that is part of the local Administrators group.

    Tip: If an Empower-related process triggers a Windows Security Alert message, click **Allow Access**.
17. If you are not using the *TNS_ADMIN* environmental variable, see Configuring a database net service name (Page 87) to configure a local *tnsnames.ora* file.

    Tip: If you want to install software support for one or more instruments, put the server into Install mode and use the latest Empower Instrument Driver Pack media. Visit the Waters website (www.waters.com) for the most recent instrument drivers and instructions.

    Note: Empower 3.6.1 software comes with a default system user account that does not require a named user license. However, the account does require an Empower 3.6.1 base license. You can disable this administrator account, but you cannot remove it from Empower software. The default user name is `system` and the default password is `manager`. Neither the user name nor the password are case sensitive.

9.3.1.1 Firewall exceptions

If you experience communication problems, review the firewall exceptions list. To do so, click **Start**, type `Windows Firewall`, select **Windows Defender Firewall**, click **Advanced settings**, and then click **Inbound Rules**.

Ensure that the following exceptions are listed.

- Empower-related ports and processes:
  - DCOM Port (135)
  - Empower
  - Empower Configuration Manager
  - Processing Monitor

    - Processing Server
    - Waters Instrument Server
    - Waters Service
    - WDHCP Server Configuration
    - WDHCP Server Svc.exe
- Instrument component software-related processes:
    - ACQUITY ASM Server
    - ACQUITY BSM Server
    - ACQUITY CM Server
    - ACQUITY Console Client
    - ACQUITY Console Server
    - ACQUITY ELSD Server
    - ACQUITY FLR Server
    - ACQUITY MD Server
    - ACQUITY PDA Server
    - ACQUITY QSM Server
    - ACQUITY SM Server
    - ACQUITY SQ Server
    - ACQUITY TQ Server
    - ACQUITY TUV Server
    - Local Console Controller (LCC Handheld Controller)
    - W2489 Server
    - W2707 Server
    - W2998 Server

9.3.1.2 DCOM settings installed by Empower 3.6.1

Empower 3.6.1 software sets the appropriate DCOM application settings and access and launch permissions during installation. The following table lists these settings and the paths to set them.

Note: You must set some of these settings manually. For example, you must add domain users after software installation. You can access these settings on the Local Security Page in Server Manager.

Table 9–1: DCOM settings and permissions set during installation

Path	Allow
Local Security Policy > **Local Policies** > **Security Options** > **DCOM: Machine Access Restrictions in Security Descriptor Definition Language (SDDL) syntax** > **Properties**	**Local Access** and **Remote Access** permissions for: • **Everyone** **Note:** In addition to the **Everyone** group, you can add a custom group of Empower users with security settings specific to your implementation. • **System** • **Domain Users** • **Performance Log Users** • **Distributed COM Users**
Local Security Policy > **Local Policies** > **Security Options** > **DCOM: Machine Launch Restrictions in Security Descriptor Definition Language (SDDL) syntax** > **Properties**	**Local Launch**, **Local Activation**, and **Remote Activation** permissions for **Everyone**. **Note:** In addition to the **Everyone** group, you can add a custom group of Empower users with security settings specific to your implementation. All permissions for: • **Administrators** • **Domain Users** • **Performance Log Users**
Local Security Policy > **Local Policies** > **Security Options** > **Network Access: Let Everyone permissions apply to anonymous users**	**Enabled**
Component Services > **Computers** > **My Computer** > **DCOM Config** > **WatersService** > **Properties** > **Security**	Under **Launch and Activation Permissions**, set **Local Launch**, **Local Activation**, and **Remote Activation Permissions** for: • **Everyone** • **System** • **Administrators** • **Interactive** • **Domain Users**

Table 9–1: DCOM settings and permissions set during installation (continued)

Path	Allow
Component Services > **Computers** > **My Computer** > **DCOM Config** > **WatersService** > **Properties** > **Security**	Under **Access Permissions**, set **Local Access** and **Remote Access Permissions** for: • **Everyone** • **SELF** • **System** • **Administrators** • **Domain Users**

9.3.2 Disabling Waters Service and Waters DHCP Server Service

By default, Waters Service and Waters DHCP Server Service are installed with the start-up type set to automatic. For better performance, disable Waters Service and Waters DHCP Server Service. Leaving them running queues processing jobs for execution, causing slower performance.

To disable Waters Service and Waters DHCP Server:

1. From the **Start** menu, type `Services`, and then select **Services**.

   Tip: In Windows Server 2016 Standard, open **Server Manager**, click the **Tools** menu, and then **Services**.
2. Right-click **Waters Service**, and then select **Properties**.
3. On the Properties page, click **Stop**.
4. On the Properties page, change the **Startup** type to **Disabled**. Click **Apply**, and then click **OK**.
5. Repeat step 2 through step 4 to disable Waters DHCP Server Service.

9.3.3 Configuring the database net service names

To configure the database net service names, see Configuring a database net service name (Page 87). On the Net Service Name page, you must define the same net service name on both the Citrix server and the LAC/E devices, as well as any clients with Empower 3.6.1 software installed (FAT or traditional clients).

If you are using multiple databases and multiple Citrix servers configured in a server farm, you can configure roaming profiles to ensure that each Windows user's default database is set correctly. The last database a user successfully logged in to is the default database.

9.3.4 Publishing Empower 3.6.1 software in Citrix

For information on how to install and configure Citrix servers, contact Citrix Systems, Inc.

9.4 Upgrading from earlier versions of Empower

Follow the instructions in this section to upgrade to Empower 3.6.1. If you are not upgrading, follow the instructions for a new Empower 3.6.1 installation (Page 146).

You can upgrade to Empower 3.6.1 from Empower 3.6.0.

Note: If you are using a version of Empower prior to Empower 3.6.0 software, you must completely uninstall the earlier version of Empower and ensure that your system meets the hardware and software requirements specified in Requirements for the Citrix server support (Page 22).

9.4.1 Upgrading to Empower 3.6.1 software

You can upgrade to Empower 3.6.1 from Empower 3.6.0.

To upgrade to Empower 3.6.1:

1. Mount the Empower 3.6.1 software ISO file.

   Alternative: Insert the Empower 3.6.1 software media into the DVD drive.
2. On the Maintenance Mode: Empower Personal page, select **Upgrade Empower Software**.
3. On the Ready to Upgrade page, click **Next**.
4. When the Windows Security Alert appears, select **Domain networks** and click **Allow access**.
5. On the Status page, when the upgrade is complete and the `Success` message appears, click **Finish**.
6. When the restart message appears, click **Yes**.

9.5 Verifying your Empower 3.6.1 software installation

Requirement: To view Empower reports, you must have PDF viewer software installed on the Citrix server.

9.5.1 Viewing the installation log

The installation log contains information about your Empower installation. You can read the log file to review your installation choices, the installation environment, and the status of the installation steps. In case of a partial or unsuccessful installation, review the installation log to inspect for errors.

The `Installation success or error status` value appears at the end of the installation log. If the value displayed is 0, then the installation was successful. If the value displayed is anything other than 0, record the number and contact Waters Technical Support.

To view the install log:

1. Select **Start** > **Empower** > **Empower Installation Log**.

   Result: The program displays the *empower.log* file in Notepad.
2. Review the contents of the file.
3. Click **File** > **Exit**.

9.5.2 Using the Verify Files Utility

The Verify Files Utility checks the integrity of the installed Empower program files.

After the Empower installation, run the Verify Files Utility to verify the Empower program files (not the database or data files):

- As part of your installation qualification, if you purchased an Empower Qualification option.
- To ensure that the Empower files did not change since installation.

9.5.2.1 Running the file verification utility

To run the file verification utility:

1. Click **Start** > **Empower** > **Verify Files**.

   Result: The Verify Files Utility compares the installed Empower files' checksum with a previously stored checksum, and then creates a file verification results log (for example, *checksum_date_timestamp.txt*).
2. Review the contents of the file and print or save a copy of the results.
3. Click **File** > **Exit**.

9.5.2.2 Viewing the file verification results

To view the file verification results:

1. Click **Start** > **Empower** > **View Verify Files**.

   Result: The *checksum.txt* file displays in Notepad.

2. Review the contents of the checksum file.

   Note: Your Empower 3.6.1 software installation passes the verification check when all files have a status of `OK` and the installation qualification summary on the final page states `No installation changes were detected`. If the *checksum.txt* file indicates any files marked as “changed”, contact Waters Technical Support.

10 Installing Empower Enterprise database on a Red Hat server

Deploying an Empower 3.6.1 database on a Linux Server requires Red Hat Enterprise Linux 8.0. Follow the procedures in this chapter to perform the standard installation of the Oracle software and the Empower database. For detailed information about configuring the environment for the Oracle Enterprise Edition 19c installation, refer to *Oracle Database Installation Guide 19c for Linux E96432-11*.

Note: Before you create the database server, ensure that a file server is installed and configured, because you must specify the raw data share path (*Path to the Fileshare*) when you run *fillempowerdb.sh.*

Recommendation: Before installing any hardware or software, perform a full backup of your hard drives (see the instructions provided by your computer manufacturer).

10.1 Installing the Empower 3.6.1 on a Linux server

10.1.1 Oracle installation

Waters supplies the Empower database software on a DVD. Procedures in this chapter assume that you want to install Empower using the recommended settings.

Important: If you plan to change the name of the computer, do so before you install Empower. Do not change the computer name after Empower is installed.

You must set certain environmental conditions before configuring the database.

Installing Oracle 19c and creating an Empower 3.6.1 database instance on a Linux server consists of these tasks:

10.2 Installing Oracle Enterprise Edition 19c for Linux

To properly install Oracle on the Linux Red Hat Enterprise 8.0 server where you want to deploy an Empower 3.6.1 database:

1. Install the base Oracle Enterprise Edition Release version 19.0.0.0 on the server.

   Note: Select **Enterprise Edition** and software only. Do not create a database instance at this time.
2. Install the Oracle April CPU patch p30783543 to upgrade to Production Version 19.7.0.0.
3. Install the Oracle time zone patch p29997937 to update the Oracle Database time zone to DST v34.

10.3 Creating a Container Database (CDB)

To create a CDB:

1. Open the Database Configuration Assistant.
2. Log in to the Oracle account and run the DBCA tool.
3. On the Database Configuration Assistant: Database Operations page, select **Create a Database** and click **Next**.
4. On the Database Configuration Assistant: Creation Mode page, select **Advanced Configuration** and click **Next**.
5. On the Database Configuration Assistant: Deployment Type page, select these two options: Database type as Oracle Single Instance database, and Template name as **Custom Database**, and then click **Next** to create the database.
6. On the Database Configuration Assistant: Database Identification page, specify the Global database name and the `SID` prefix, select the **Create as Container database**, **Use Local undo tablespace for PDBs** and **Create a Container database with one or more PDBs** boxes. Click **Next**. At this point, you do not have to create a PDB.
7. On the Database Configuration Assistant: Storage Option page, perform the following tasks, and then click **Next**:
   - Select **Use following for the database storage attributes**.
   - For Database files storage type, select **File System**.
   - Specify the database files location.
8. On the Database Configuration Assistant: Fast Recovery Option page, perform the following tasks, and then click **Next**:
   - Select the **Specify Fast Recovery Area**.
   - For Recovery files storage type, select **File System**

- Specify the path of the Fast Recovery Area.
- Increase the size for the Fast Recovery Area (FRA) to 30 GB or at least two times your database's estimated size. The FRA should be on a different hard drive than the database.
- Select **Enable archiving**.

9. On the Database Configuration Assistant: Network Configuration page, configure a new listener. Provide a name and specify `1521` as the listening port. If you already have a listener configured, select it from the list and proceed to the next step.

   Note: If you use a port other than the default port (1521), ensure that you use the same port on the clients.

10. On the Database Configuration Assistant: Database Options page, there are no mandatory options.
11. On the Database Configuration Assistant: Configuration Options page, perform the following tasks, and then click **Next**:
    - On the **Memory** tab, select **Use Automatic Shared Memory Management**. Slide the cursor to 66%.
    - On the **Sizing** tab, set the block size operator to 8192 bytes and increase the number of processes to a minimum of 1,500.
    - On the **Character Sets** tab, select **Choose from the list of character sets** and ensure that the database character set is **WE8ISO8859P1**.

      Requirement: Ensure that the **Show recommended character sets only** check box is cleared.

    - Select the default **National Character Set** and set to **AL16UTF16**.
    - On the **Connection Mode** tab, select **Dedicated Server mode**.
    - On the **Sample Schemas** tab, ensure that the **Add sample schemas to the database** check box is cleared.
12. On the Database Configuration Assistant: Management Options page, these selections are optional: **Configure Enterprise Manager (EM) Database Express** and **Register with Enterprise Manager (EM) Cloud Control**.
13. On the Database Configuration Assistant: User Credentials page, supply the password for all three accounts: SYS, SYSTEM, and PBDADMIN.

    Requirement: Ensure that you note the passwords, which you will need for configuring the Empower database instance.

14. On the Database Configuration Assistant: Creation Options page, select **Create database**. Click **Customize Storage Locations** and click the **Redo Log Groups** tab. Specify at least four Redo Log Groups, each with a minimum **File Size** of 250 MB.
15. When the Database Configuration Assistant: Summary page appears, review the options to ensure that they are correct, and then click **OK**.

Result: The Database Configuration Assistant displays the progress of the database creation. When database creation is complete, the Database Configuration Assistant displays the new database information.

10.3.1 Recommended CDB Oracle parameters

The following table lists the recommended Oracle parameters to specify for the CDB.

Note: The Waters test environment used the values listed in the following table.

Table 10–1: Recommended Oracle parameters

Parameter name	Begin value (if different)
audit_sys_operations	FALSE or Customer value
audit_trail	DB
cluster_database	FALSE
compatible	19.0.0.0
_cursor_obsolete_threshold	1024
cursor_sharing	EXACT
database character set	WE8ISO8859P1
db_block_size	8192
db_name	Any (For example: WAT19)
deferred_segment_creation	FALSE
enable_pluggable_database	TRUE
local_listener	(*DESCRIPTION*=(*ADDRESS_LIST*=(*ADDRESS*=(*PROTOCOL*=`TCP`)(*HOST*=`Host name`)(*PORT*=`1521`))))
log_archive_format	*%t_%s_%r.dbf*
max_pdbs	3 or Customer license value
national character set	AL16UTF16
open_cursors	400
optimizer_index_caching	90
optimizer_index_cost_adj	40
optimizer_mode	FIRST_ROWS_100
processes	1500
remote_listener	
remote_login_passwordfile	EXCLUSIVE
sec_case_sensitive_logon	TRUE

Table 10–1: Recommended Oracle parameters (continued)

Parameter name	Begin value (if different)
service_names	Any (For example: WAT19)
sessions	2272 **Note:** Automatically set based on the process parameter setting.
sga_target	66% of installed RAM. 70% is the recommended value. However, adjust this percentage based on the number of concurrent Empower users. **Note:** The amount specified depends on how much RAM is available in the system.
spfile	*[oracle home]/dbs/spfile<db_name>.ora*
undo_tablespace	UNDOTBS1

Table 10–2: Oracle Security settings

Parameter name	Begin value (if different)
sqlnet.encryption_server	Required
sqlnet.encryption_types_server	AES256

Note: Empower requires that you use the same time zone version for both Oracle Client and Oracle Database. Use the time zone patch 29997937 to update the Oracle Database time zone to DST v34 to match the time zone on Oracle Client.

10.4 Creating a Pluggable Database (PDB)

To create the PDB:

1. Log in to RedHat with a user account that is allowed to run and configure Oracle software, and then run the DBCA tool.
2. On the Database Configuration Assistant: Database Operation page, select **Manage Pluggable database** and click **Next**.
3. On the Database Configuration Assistant: Manage Pluggable Database page, select **Create a Pluggable database** and click **Next**.
4. On the Database Configuration Assistant: Select database page, select the CDB created following the instructions from Creating a Container Database (CDB) (Page 156), specify the database credentials if needed, and click **Next**.

5. On the Database Configuration Assistant: Create Pluggable Database page, select **Create a new Pluggable database from another PDB**, select `PDB$SEED` in the **Select Pluggable database** box, and then click **Next**.
6. On the Database Configuration Assistant: PDB Identification page, type the pluggable database name, specify the administrator username and password, and then click **Next**.
7. On the Database Configuration Assistant: Pluggable Database Options page, perform the following tasks, and then click **Next**:
   - For storage type, select **File System**.
   - For database location, keep the default path or click **Browse** to select a new path.
8. When the Database Configuration Assistant: Summary page appears, review the options to ensure that they are correct, and then click **Finish**.

   Result: The Database Configuration Assistant displays a message informing you that the pluggable database was plugged successfully.
9. Set the PDB to OPEN.
10. Save the state of the PDB.
11. Create three tablespaces in the newly created PDB:
    - An index tablespace that must be named `INDEX_DATA`
    - A users tablespace that must be named `USER_DATA`
    - A temporary tablespace that must be named `TEMPORARY_DATA`.

    Requirements:
    - These tablespaces are used by Empower and you must name them exactly as listed.
    - All Empower tablespaces must have these definitions:
      - EXTENT MANAGEMENT LOCAL AUTOALLOCATE
      - SEGMENT SPACE MANAGEMENT AUTO

    Note: Each tablespace must start with nine datafiles and you must configure each to autoextend from a size of 19999 MB minimum to 32000 MB maximum.

    Examples:
    - Adding datafiles: `# ALTER TABLESPACE INDEX_DATA ADD DATAFILE '/ora/u01/app/oracle/oradata/TESTCDB/emppdb1/INDEX08.dbf' SIZE 100M REUSE AUTOEXTEND ON NEXT 100M MAXSIZE 19999M;`
    - Creating the tablespace: `# CREATE TABLESPACE INDEX_DATA DATAFILE '/ora/u01/app/oracle/oradata/TESTCDB/emppdb1/INDEX01.DBF' SIZE 400M REUSE AUTOEXTEND ON NEXT 100M MAXSIZE 19999M EXTENT MANAGEMENT LOCAL AUTOALLOCATE SEGMENT SPACE MANAGEMENT AUTO`

10.4.1 Recommended PDB Oracle parameters

The following table lists the Oracle parameters that are set for the PDB instance.

Note: The Waters test environment used the values listed in the following table.

Table 10–3: Recommended PDB Oracle parameters

Parameter name	Begin value (if different)	When it is set
_cursor_obsolete_threshold	1024	At CDB level
cursor_sharing	EXACT	At fillempowerdb.sh execution
database character set	WE8ISO8859P1	At CDB level
deferred_segment_creation	FALSE	At fillempowerdb.sh execution
national character set	AL16UTF16	At CDB level
open_cursors	400	At fillempowerdb.sh execution
optimizer_index_caching	90	At fillempowerdb.sh execution
optimizer_index_cost_adj	40	At fillempowerdb.sh execution
optimizer_mode	FIRST_ROWS_100	At fillempowerdb.sh execution
recyclebin	OFF	At fillempowerdb.sh execution

10.5 Configuring the system before installing the database instance

Before you install the database instance, ensure that no instances of *ORACLE_SID* are in the *.bash_profile* file and that *ORACLE_HOME* is set properly in your environment. The *.bash_profile* must be correct for the installation to work.

Note: If you have more than one *ORACLE_SID*, ensure that each is set up properly.

To verify that no *ORACLE_SID* exists and that *Oracle_Home* is set properly:

1. In a terminal window, type the command `echo $ORACLE_SID`.

   Rationale: This command returns either a blank value indicating that no *SID* is set, or the value of the database on which to install. If an *SID* does exist, remove it from the file.

2. Type the command `echo $ORACLE_HOME` to ensure that *ORACLE_HOME* is set properly.

   Rationale: This command should display the correct path for your Oracle home.

   Tip: The default path is the path to *u01/app/oracle/product/19.0.0/db_1*.

3. Restart the server.

10.6 Configuring the database for Empower software

Run the *fillempowerdb.sh* script to configure the database for Empower software by creating the Empower schema and adding the standard data to the instance with these parameters:

```
./fillempowerDB.sh <ORACLE_HOME> <CDB_NAME> <EMPOWER_PDB_NAME>
<path_to_the_AdminstratorScriptsdir> <Database Language> <SysPwd>
<PATH_TO_FILESHARE> <ANALYTICSPASS> <MILLOGINPASS> <MILLENNIUMPASS>
<ACQUITYPASS> <MILLBIMPASS>
```

- *ORACLE_HOME*
- *CDB_NAME*
- *EMPOWER_PDB_NAME*
- Path to *AdministratorScripts* directory
- Database language (`en`, `ja`, `ko`, `zh-CHS`)
- Oracle Sys password
- Path to the Fileshare
- Analytics user password
- MILLOGIN user password
- MILLENNIUM user password
- ACQUITY user password
- MILL_BIM user password

Example:

```
./fillempowerDB.sh /u01/app/oracle/product/19.3/db-1 EmpowerCDB
EmpowerPDB /home/oracle/Downloads/AdminstratorScripts en
<SomeComplexSysPassword123> \\FileServerMachineName\Waters_Projects$
unity unity unity VISTA milbim
```

Requirement: You can run *fillempowerdb.sh* only from the database server. Set the *$TWO_TASK* local environment variable to the database, specify the Empower script directory, and execute the *fillempowerdb.sh* file. Open this script for execution instructions.

When the execution of *fillempowerdb.sh* is complete, the Empower database is ready for the first client connection.

The process creates an *Empower_Install_{PDB_SID}_{DATE}.log* file in the folder from which you ran the *fillempowerdb.sh* script.

Restriction: Do not include trailing spaces in the paths.

Note: After you run the *fillempowerdb.sh* script, you can use passwords with less than six characters to create Empower schemas.

10.7 Setting the database to start up on system restart

You can configure the system to automatically start up and shut down the database when the system starts up and shuts down. To do so, see *Oracle Database Administrator's Reference 19c for Linux and UNIX-Based Operating Systems E96356-04* and the section on "About Automating Database Shutdown and Startup".

10.8 Creating a password file for sysdba connections

If you want to connect to your sysdba, you must create a password file.

To create a password file, specify the parameters for Oracle_Home, Oracle_SID, and Oracle Sys passwords. in a pwds.sh file as follows:

```
./pwds.sh<ORACLE_HOME><ORACLE_SID><SysPwd>
```

where `SysPwd` is the password for the Sys account.

Note: Create the password file to also connect remotely to your database.

10.9 Configuring the firewall for Oracle listener

You must configure the firewall to allow inbound/outbound sqlnet traffic for the Oracle Listener port.

See also: Creating a Container Database (CDB) with recommended Oracle parameters (Page 156).

10.10 Setting the database connection on the Empower Client

Ensure that an entry is added for the PDB in the *TNSNames.ora* file on the Empower Client machine that is linked with the Linux Red Hat 8.0 Oracle Database.

See also: Configuring a database net service name (Page 87).

11 Administrative (push) installation instructions

Follow the instructions in this chapter to silently deploy Empower 3.6.1 software to clients, LAC/E devices, Citrix servers, and Empower servers, or to upgrade from Empower 3.6.0.

Restriction: You cannot perform push installations on clients, LAC/E devices, and Citrix servers that have Oracle installed.

11.1 Preparing for push installation

11.1.1 Push installation introduction

Empower 3.6.1 software can accommodate push installations of the Empower 3.6.1 software and instrument component software onto clients, LAC/E devices, Citrix servers, and Windows servers. To accomplish this, the Empower 3.6.1 Deployment Manager (installation program) supports silent installation. (Silent or unattended installation does not require user interaction.) During a silent installation, no interactive user interface is displayed. Instead, user or installation information is stored as predefined properties in a response file, which can then be called by a command line or from a batch file.

You can use silent installation to install Empower 3.6.1 software on a single machine on the same computer you are using, with no user interaction. You can also use silent installation to install Empower 3.6.1 software on several machines (different computers, with no user interaction), but you must use a host computer to “push” the installation silently onto the other machines.

11.1.2 Push installation requirements

Empower 3.6.1 software supports push installations using a Microsoft tool called *PsExec.exe*. This utility is not included in the Empower 3.6.1 media, but you can download it using the following link: http://technet.microsoft.com.

Important: This link points to the latest version of PsExec.

Using PsExec in Empower 3.6.1 requires the following tasks:

- Creating the Empower 3.6.1 response file
- Installing the *PsExec.exe* tool
- Creating a text file containing the node information (one line for each computer)
- Obtaining local administrator privilege on each client and LAC/E

- Executing the silent installation using the system account only (specify the option *-s*)
- Running the PsExec command in DOS or from a batch file

Restriction: When you perform a push installation on multiple computers, the computers must share the same installation type (all clients, all LAC/E devices, or all Citrix servers). You cannot push installations onto a mix of computer types.

Important: If you plan to change the computer name, do so before you install Empower. Do not change the computer name after Empower is installed.

11.1.3 Creating the response file

To perform a push installation of Empower 3.6.1 software, first create a response file. The response file must be in XML format, using correct XML syntax. Two template files are available on the Empower 3.6.1 software media in *\Push Install\Empower*:

- *E_Response_ClientLACE.config* contains the parameters required for clients, LAC/E devices, and Citrix servers.
- *E_Response_Server.config* contains the parameters required for Empower servers.

The parameters in the response files define how the Empower 3.6.1 software is installed. The software applies these settings to all computers during push installation.

The template response files provided on the Empower 3.6.1 media accept the Waters Software License Agreement by default.

Note: You can rename the response files, but the file extension must be *.config*.

The response files must contain the following information.

Table 11–1: Contents of the response files

Option	Description	Valid value	Default value
Property			
USERNAME	Name of the system user	Optional; type desired name or leave default	Windows system user
COMPANYNAME	Name of the company	Optional; type desired name or leave default	OS registered organization
PIDKEY	Software support ID number	Required for validation of support plan; type number supplied	None
AGREETOLICENSE	Agree to Waters software license	**Yes** or **No** **Note:** If you select **No**, Empower 3.6.1 will not install.	Yes

Table 11–1: Contents of the response files (continued)

Option	Description	Valid value	Default value
ORACLE_MEDIA	Path to Oracle media	Optional; provide desired path or leave blank	None
INSTALL_TYPE	Empower 3.6.1 install type (client, LAC/E, or server)	• `C/S` or `LACE32` for clients, LAC/E devices, and Citrix servers • `Server with Client` for Windows servers	• `C/S` for the client and LAC/E config file • `Server with Client` for server config file
ServerInSilent [a]	Silent installation mode	Required **true** **Note:** If you specify **false** or if you leave the field blank, Empower 3.6.1 will not install.	**true**
USE_TNS	Use *tns_admin*	True or False • If **True**, use the *TNS_ADMIN* variable. See Configuring shared tnsnames.ora file (Page 88), Starting the installation (Page 67), and Installing Empower 3.6.1 software on a LAC/E (Page 118). • If **False**, this variable is ignored, but you must create a *tnsnames.ora* file. See Configuring shared tnsnames.ora file (Page 88).	**true**
TNS_ADMIN_ PROPERTY	Path to the *tnsname.ora* file	Optional	None

Table 11–1: Contents of the response files (continued)

Option	Description	Valid value	Default value
		Note: If used, provide a path. Use format */ TNS_ADMIN_PROPERTY*.	
LANGID	Installation and Empower 3.6.1 language	English Japanese Korean Chinese	English
EMPOWER_APP_DIR	Destination path for Empower 3.6.1 software	Optional **Note:** If used, supply only the drive letter for the path.	*C:*\ If drive is not specified or does not exist, installation will be Windows drive.
PROJECTS_DIR [a]	Destination path for Empower projects	Any valid drive letter. **Note:** If used, supply only the drive letter for the path.	*C:*\ If drive is not specified or does not exist, installation will be Windows drive.
ORACLE_CLIENT_DIR	Destination path for Oracle client	Optional **Note:** If used, supply only the drive letter for the path.	*C:*\ If drive is not specified or does not exist, installation will be Windows drive.
ORACLE_DIR [a]	Destination path for Oracle client and database	Any valid drive letter. **Note:** If used, supply only the drive letter for the path.	*C:*\ If drive is not specified or does not exist, installation will be Windows drive.
EMPOWER_DB_DIR [a]	Destination path for Empower database	Any valid drive letter. **Note:** If used, supply only the drive letter for the path.	*C:*\ If drive is not specified or does not exist, installation will be Windows drive.
MIRROR_DB_DIR [a]	Destination path for Waters CDS Mirror database	Any valid drive letter. **Note:** If used, supply only the drive letter for the path.	*C:*\ If drive is not specified or does not exist, installation will be Windows drive.

Table 11–1: Contents of the response files (continued)

Option	Description	Valid value	Default value
ARCHIVE1_DB_DIR [a]	Destination path for Waters CDS Archive 1 database	Any valid drive letter. **Note:** If used, supply only the drive letter for the path.	*C:*\ If drive is not specified or does not exist, installation will be Windows drive.
ARCHIVE2_DB_DIR [a]	Destination path for Waters CDS Archive 2 database	Any valid drive letter. **Note:** If used, supply only the drive letter for the path.	*C:*\ If drive is not specified or does not exist, installation will be Windows drive.
SID [a]	Oracle instance identifier	Optional	`WAT19` If you leave the variable blank, the Deployment Manager repopulates it.
LOG_FILE_NETWORK_LOCATION	Network destination for copying the Empower 3.6.1 installation log file. (Places a copy of the log into the network share. This share must be writable by Everyone.)	Optional **Note:** If specified, use format *computername_datetime_empower3.log*.	None
Command Line			
ACTION	Installation, upgrade, or removal	`Install`, `Upgrade`, or `Remove` **Note:** You can upgrade only from Empower 3.6.0.	Install
SkipRequirements	Skip the system requirement check	`True` or `False`	`False` (do not skip)
RESTART	Restart the system after installation or removal	`True` or `False`	`False` (do not restart system)

a. Unique to Windows server installations

The following is a sample response file:

```
<?xml version="1.0" encoding="utf-8" ?>
        <Configuration>
        <Properties>
        <!--May be left blank. It defaults to the windows user on
the
        client-->
        <USERNAME></USERNAME>
        <!--May be blank. Default is the OS registered Organization--
>
        <ORGANIZATION></ORGANIZATION>
        <!--Software Support ID-->
        <PIDKEY></PIDKEY>
        <!--You must agree for installation to proceed - Agreed by
        default-->
        <AGREETOLICENSE>Yes</AGREETOLICENSE>
        <!--Path to the oracle media - May be blank.-->
        <ORACLE_MEDIA></ORACLE_MEDIA>
        <!--C/S OR LACE32-->
        <INSTALL_TYPE>C/S</INSTALL_TYPE>
        <!--false ignore, true use the location and set tns-admin
        property-->
        <USE_TNS>true</USE_TNS>
        <!--Path to tnsnames.ora-->
        <TNS_ADMIN_PROPERTY></TNS_ADMIN_PROPERTY>
        !--English Japanese Korean Chinese-->
        <LANGID>English</LANGID>
        <!--Destination path for Empower Application - Drive letter
        only-->
        <EMPOWER_APP_DIR>C:\</EMPOWER_APP_DIR>
        <!--Destination path for Oracle Client - Drive letter only--
>
        <ORACLE_CLIENT_DIR>C:\</ORACLE_CLIENT_DIR>
        <!--Network destination for Empower log file to be copied-->
        <LOG_FILE_NETWORK_LOCATION></LOG_FILE_NETWORK_LOCATION>
        </Properties>
        <CommandLine>
        <!--Install/Upgrade/Remove-->
        <ACTION>Install</ACTION>
        <!--true/false-->
        <SkipRequirements>false</SkipRequirements>
        <!--true/false-->
        <RESTART>False</RESTART>
        </CommandLine>
        <Product>
        </Product>
        </Configuration>
```

Tip: Specifying a `LOG_FILE_NETWORK_LOCATION` places a copy of the installation log for each individual installation into the network share.

- For a successful installation, the log file name is: `computername_datetime_empower3.log`.
- If the installation is not successful, the name is: `ERR_computername_datetime_empower3.log`.
- If the share is not accessible for any reason, this is noted in the local installation log (in the Windows directory).
- If no `LOG_FILE_NETWORK_LOCATION` is supplied, then the log is only created on each computer where Empower 3.6.1 software is installed.

11.1.4 Installing PsExec.exe

To install PsExec.exe:

1. Download *PsExec.exe* using the following link: http://technet.microsoft.com.
2. On the site, type `psexec` in the search box and click **Search**.
3. Click the PsExec link and follow the instructions for downloading and installing PsExec.
4. Install PsExec on the computer from which you will execute the push or silent installation.

11.1.5 Creating the client text file

Create a text file that contains the names or IP addresses of all the clients, LAC/E devices, or Citrix servers where you want to install Empower 3.6.1. Place the text file on the computer from which the push installation will be executed. Use a separate line in this file for each computer. A sample text file is available on the Empower 3.6.1 media, in *\Push Install \Empower3.6.1\Node_List.txt*.

Important: Ensure that all computers referenced by name can be accessed using those names by the computer from which the push installation is executed.

The following is a sample client list:

- Client1
- Client2
- 10.3.7.142
- Client77
- Client23
- ResearchLab1
- ResearchLab2
- 10.3.7.77

11.2 Push installation of Empower clients or LAC/E devices

You can install Empower 3.6.1 as a fresh, new installation on a client or LAC/E that has no Chromatography Data Software (CDS) installed or as an upgrade from Empower 3.6.0.

11.2.1 Silent installation (on one computer)

Begin silent installation from the computer where you are installing Empower 3.6.1 (destination computer). You can install the following files locally or to a network share: *<path to media>* and *<path to response file>*.

Note: If you are performing a silent installation on a Citrix server, see Silent installation (on one Citrix server) (Page 177).

To perform a silent installation from a command line:

1. Modify the *E_Response_ClientLACE.config* response file and set all the appropriate properties, see Creating the response file (Page 165).

   Tip: Ensure that the *ACTION* command line property in the response file is set to `Install` (for a new installation) or `Upgrade` (for an upgrade from Empower 3.6.0) and modify the install type to:

   - `C/S` for an Empower client
   - `LACE32` for an Empower acquisition machine

2. Run *Setup.exe* from a DOS command line or in a batch file that includes the response file.

   ### Use the following syntax:

   ```
   <path to media>\Setup.exe /responseFile <path to response file>
   \E_Response_ClientLACE.config
   ```

   Where,

   - *<path to media>* is the location of the Empower media installer files on a local machine or a network share.
   - *<path to response file>* is the path to the location of the *E_Response_ClientLACE.config* file on a local machine or a network share.

   Requirement: You must use the universal naming convention (UNC) to represent the path to media and location of the Empower response file.

For example:

```
\\host or IP\Share\<file to execute>

\\10.1.105.123\Push\E_Response_ClientLACE.config
```

Where,
10.1.105.123 is the computer hosting the push installation.
Push is the name of the shared folder.
E_Response_ClientLACE.config is the name of the file you want to execute.
Examples:

```
C:\EmpVersion\Setup.exe /responseFile C:\PushEmpVersion
\E_Response.config

\\10.1.105.123\EmpVersion\Setup.exe /responseFile \
\10.1.105.123\PushEmpVersion\E_Response_ClientLACE.config
```

Result: Empower 3.6.1 installs on the computer.

Tip: The computer restarts automatically if *RESTART* is set to **true** in the response file.

11.2.2 Push installation (to multiple computers from a host)

Requirements:

- You must execute the push installation from a host computer.

  Restriction: Do not install Empower on the host.
- All computers must be in the same domain.
- The administrator must have local administrator privileges or must be a domain administrator on all the computers to which they push the Empower 3.6.1 installation.

The response file can be on a different network share. Create a client list (in a file named *Node_List.txt*) that contains the names of appropriate client or LAC/E devices where you want to install Empower 3.6.1.

Tip: When you run *PsExec*, the response file is called as a command line argument after the *setup.exe* file.

To perform a push installation using *PsExec*:

1. Modify the Node_List file to include all the appropriate client or LAC/E names.
2. Modify the *E_Response_ClientLACE.config* response file and set all the appropriate properties. See Creating the response file (Page 165).

Tip: Ensure that the *ACTION* command line property in the response file is set to `Install` (for a new installation) or `Upgrade` (for an upgrade from Empower 3.6.0).

3. Run the following command from a DOS command line or in a batch file and ensure that the path in the DOS prompt is set to the location of the *psexec* executable file.

Use this syntax:

```
psexec @<path to node list>\Node_List.txt -s -d <path to media>
\Setup.exe /responseFile<path to response file>
\E_Response_ClientLACE.config
```

Where:

- *<path to node list>* is the network location where the node list text file resides (this file contains the names of the destination clients or LAC/E devices to install).

  Tip: If using the IP address results in an `Access Denied` error, use the machine name instead.

- File is the name of the node list text file.
- *-s* specifies to run the remote process using the System account. Only the System account can be used for push installs. Must be specified.
- *-d* specifies to not wait for the process to terminate. Allows the installation to launch simultaneously on multiple systems.
- *<path to media>* is the location of the Empower 3.6.1 media installer files.
- *<path to response file>* is the path to the location of the *E_Response_ClientLACE.config* file.

Requirement: You must use the universal naming convention (UNC) to represent the path to media and location of the Empower response file.

For example:

```
\\host or IP\Share\<file to execute>

\\10.1.105.123\Push\E_Response_ClientLACE.config
```

Where:

- *10.1.105.123* is the computer hosting the push installation.
- *Push* is the name of the shared folder.
- *E_Response_ClientLACE.config* is the name of the file you want to execute.

Example:

```
c:\PushEmpVersion\psexec @C:\PushEmpVersion\Node_list.txt -s -d \
\10.1.105.123\EmpVersion\Setup.exe /responseFile \
\10.1.105.123\PushEmpVersion\E_Response_ClientLACE.config
```

Result: Empower 3.6.1 installs on the specified computers.

11.3 Push installation of Empower servers

You can install Empower 3.6.1 servers as a fresh, new installation on computers that have no Chromatography Data Software (CDS) installed or as an upgrade from Empower 3.6.0.

11.3.1 Silent installation (on one computer)

To perform a silent installation from the command line:

1. Modify the *E_Response_Server.config* response file and set all the appropriate properties. See Creating the response file (Page 165).

   Tip: Ensure that the following conditions exist in the response file:

   - The *ACTION* property is set to `Install` (for a new installation) or `Upgrade` (for an upgrade from Empower 3.6.0).
   - The *ServerInSilent* property is set to `true`.
2. Run *Setup.exe* from a DOS command line or in a batch file that includes the response file.

   ### Use the following syntax:

   ```
   <path to media>\Setup.exe /responseFile <path to response file>
   \E_Response_Server.config
   ```

   Where:

   - *<path to media>* is the location of the Empower installer files on a local machine or a network share.
   - *<path to response file>* is the path to the location of the *E_Response_Server.config* file on a local machine or a network share.

Requirement: You must follow the universal naming convention (UNC) when you specify the path to the media and location of the Empower response file. For example:

```
\\host or IP\Share\<file to execute>

\\10.1.105.123\Push\E_Response_Server.config
```

Where:

- *10.1.105.123* is the computer hosting the push installation.
- *Push* is the name of the shared folder.
- *E_Response_Server.config* is the name of the file you want to execute.

Examples:

```
C:\EmpVersion\Setup.exe /responseFile C:\PushEmpVersion
\E_Response.config

\\10.1.105.123\EmpVersion\Setup.exe /responseFile \
\10.1.105.123\PushEmpVersion\E_Response_Server.config
```

Result: Empower 3.6.1 installs on the computer.

Tip: The computer restarts automatically if *RESTART* is set to **true** in the response file.

11.3.2 Push installation (to multiple computers from a host)

Requirements:

- You must execute the push installation from a host computer.

  Restriction: Do not install Empower on the host.
- All computers must be in the same domain.
- The administrator must have local administrator privileges or must be a domain administrator on all the computers to which the Empower 3.6.1 installation is pushed.

The response file can be on a different network share. Create a server list (in a file named *Node_List.txt*) that contains the names of the Windows servers on which you want to install the Empower 3.6.1 server.

Tip: When you run *PsExec*, the response file is called as a command line argument after the *setup.exe* file.

To perform a push installation of Empower servers using *PsExec*:

1. Modify the Node_List file to include all the appropriate Windows server names or IP addresses.

2. Modify the *E_Response_Server.config* response file and set all of the appropriate properties. See Creating the response file (Page 165).

   Tip: Ensure that the following conditions exist in the response file:

   - The *ACTION* command line property is set to `Install` (for a new installation) or `Upgrade` (for an upgrade from Empower 3.6.0).
   - The *ServerInSilent* property is set to **true**.

3. Run the following command from a DOS command line or in a batch file, and ensure that the path in the DOS prompt is set to the location of the *psexec* executable file.

   Use this syntax:

   ```
   psexec @<path to node list>\Node_List.txt -s -d <path to media>
   \Setup.exe /responseFile<path to response file>
   \E_Response_Server.config
   ```

   Where:

   - *<path to node list>* is the network location where the node list text file resides (this file contains the names of the destination clients or LAC/E devices you will install).

     Tip: If using the IP address results in an `Access Denied` error, use the machine name instead.

   - File is the name of the node list text file.
   - *-s* specifies to run the remote process using the System account. Only the System account can be used for push installs. Must be specified.
   - *-d* specifies to not wait for the process to terminate. Allows the installation to launch simultaneously on multiple systems.
   - *<path to media>* is the location of the Empower 3.6.1 installer files.
   - *<path to response file>* is the path to the location of the *E_Response_Server.config* file.

   Requirement: You must follow the universal naming convention (UNC) when you specify the path to the media and location of the Empower response file. For example:

   ```
   \\host or IP\Share\<file to execute>

   \\10.1.105.123\Push\E_Response_Server.config
   ```

   Where:

   - *10.1.105.123* is the computer hosting the push installation.
   - *Push* is the name of the shared folder.
   - *E_Response_Server.config* is the name of the file you want to execute.

Example:

```
c:\PushEmpVersion\psexec @C:\PushEmpVersion\Node_list.txt -s -d \
\10.1.105.123\EmpVersion\Setup.exe /responseFile \
\10.1.105.123\PushEmpVersion\E_Response_Server.config
```

Result: Empower 3.6.1 installs on the specified computers.

11.4 Push installation of Empower on Citrix servers

You can install Empower 3.6.1 as a fresh, new installation on a Citrix server that has no Chromatography Data Software (CDS) installed or as an upgrade from Empower 3.6.0.

11.4.1 Silent installation (on one Citrix server)

Requirement: The Citrix server must be in Install mode.

To perform a silent installation from a command line:

1. Put the server into Install mode by opening a command prompt and typing `Change user /install`.
2. Modify the *E_Response_ClientLACE.config* response file and set all the appropriate properties. See Creating the response file (Page 165).

   Tip: Ensure that the *ACTION* property in the response file is set to `Install` (for a new installation) or `Upgrade` (for an upgrade from Empower 3.6.0).
3. Run *Setup.exe* from a DOS command line or in a batch file that includes the response file. Ensure that the path in the DOS prompt is set to the location of the Empower 3.6.1media.

   #### Use this syntax:

   ```
   <path to media>\Setup.exe /responseFile <path to response file>
   \E_Response_ClientLACE.config
   ```

   Where:

   - *<path to media>* is the location of the Empower media installer files.
   - *<path to response file>* is the path to the location of the *E_Response_ClientLACE.config* file.

Examples:

```
\\10.1.105.123\EmpVersion\Setup.exe /responseFile \
\10.1.105.123\PushEmpVersion\E_Response_ClientLACE.config

C:\EmpVersion\Setup.exe /responseFile C:\PushEmpVersion
\E_Response_ClientLACE.config
```

Requirement: You must use the universal naming convention (UNC) to represent the path to media and location of the Empower response file.

For example:

```
\\host or IP\Share\<file to execute>

\\10.1.105.123\Push\E_Response_ClientLACE.config
```

Where:

- *10.1.105.123* is the computer hosting the push installation.
- *Push* is the name of the shared folder.
- *E_Response_ClientLACE.config* is the name of the file you want to execute.

Examples:

```
\\10.1.105.123\EmpVersion\Setup.exe /responseFile \
\10.1.105.123\PushEmpVersion\E_Response_ClientLACE.config

C:\EmpVersion\Setup.exe /responseFile C:\PushEmpVersion
\E_Response_ClientLACE.config
```

Result: Empower 3.6.1 installs on the server.

Tip: The computer restarts automatically if the **Restart** option is set to **True** in the response file.

11.4.2 Push installation (to multiple Citrix servers from a host)

Requirements:

- The Citrix server must be in install mode before any installation of Empower 3.6.1. You perform a push installation slightly differently than a regular push installation to a client or LAC/E.
- All computers must be in the same domain.
- The administrator must have local administrator privileges or must be a domain administrator on all the computers to which they push the Empower 3.6.1 installation.

The response file can be on a different network share. Create a client list (in a file named *Node_List.txt*) that contains the names of the Citrix servers where you want to install Empower 3.6.1.

To perform a push installation on Citrix servers:

1. Modify the Node_List file to include all the appropriate Citrix server names or IP addresses.
2. Modify the *E_Response_ClientLACE.config* response file and set all of the appropriate properties. See Creating the response file (Page 165).
3. Create and save a batch file (for example, *PushCitrix.bat*) that contains the following information:

   #### Use this syntax:

   ```
   change user /install <path_to_media>\Setup.exe /responseFile
   <path to response file>\E_Response_ClientLACE.config change
   user /execute
   ```

   Where:

   - *<path to media>* is the path to the Empower 3.6.1 software media and must be accessible by the Citrix server.
   - *<path to response file>* is the path to the location of the *E_Response_ClientLACE.config* file.

   Example:

   ```
   change user /install \\10.1.105.123\EmpVersion\Setup.exe /
   responseFile \\10.1.105.123\PushEmpVersion
   \E_Response_ClientLACE.config change user /execute
   ```

   Requirement: You must use the universal naming convention (UNC) to represent the path to media and location of the Empower response file.

For example:

```
\\host or IP\Share\<file to execute>

\\10.1.105.123\Push\E_Response_ClientLACE.config
```

Where:

- *10.1.105.123* is the computer hosting the push installation.
- *Push* is the name of the shared folder.
- *E_Response_ClientLACE.config* is the name of the file you want to execute.

4. Run the following command from a DOS command line. Ensure that the path in the DOS prompt is set to the location of the *psexec* executable file.

Use this syntax:

```
PsExec @\\local_machine or IP address\File <path to node list>
\Node_List.txt -s -d CMD /C <path to PushCitrix.bat>
\PushCitrix.bat
```

Where:

- *local_machine* or IP address is where the node list text file resides (this file contains the names of the destination Citrix servers you install to).

Tip: If using the IP address results in an `Access Denied` error, use the machine name instead.

- *-s* specifies to run the remote process using the System account. Only the System account can be used for push installs. Must be specified.
- *-d* specifies to not wait for the process to terminate, allowing the installation to launch simultaneously on multiple systems.
- *<path to PushCitrix.bat>* is the network location where the batch file resides (this is the file created in step 3).

Example:

```
c:\PushEmpVersion\psexec @C:\PushEmpVersion\Node_list.txt -s -d
CMD /C \\10.1.105.123\PushEmpVersion\PushCitrix.bat
```

Result: Empower 3.6.1 installs on the specified Citrix servers.

11.5 Push uninstallation of Empower clients or LAC/E devices

11.5.1 Silent uninstallation (from one computer)

Note: If you are performing a silent uninstallation on a Citrix server, see Silent uninstallation (from one Citrix server) (Page 185).

To perform a silent uninstallation from a command line:

1. Modify the *E_Response_ClientLACE.config* response file and set all the appropriate properties.

   Tip: Ensure that the *ACTION* command line property in the response file is set to **Remove**.

2. Run *Setup.exe* from a DOS command line or in a batch file that includes the response file.

   Requirements:

   - Ensure that the command is executed using a local administrator account by specifying the options *-u* (user name) and *-p* (password).
   - Ensure that the path in the DOS prompt is set to the location of the Empower media.

   Example:

   ```
   <path to media>\Setup.exe /responseFile <path to response file>
   \E_Response_ClientLACE.config
   ```

   Where,

   - *<path to media>* is the location of the Empower media installer files.
   - *<path to response file>* is the path to the location of the *E_Response_ClientLACE.config* file.

   Requirement: You must use the universal naming convention (UNC) to represent the path to media and location of the Empower response file.

   For example:

   ```
   \\host or IP\Share\<file to execute>
   ```

   ```
   \\10.1.19.25\Push\E_Response_ClientLACE.config
   ```

   Where,

- *10.1.19.25* is the computer hosting the push installation.
- *Push* is the name of the Shared folder.
- *E_Response_ClientLACE.config* is the name of the file you want to execute.

Result: Empower 3.6.1 is removed from the computer and, if the **Restart** option is set to **True** in the response file, the computer restarts.

11.5.2 Push uninstallation (from multiple computers via a host)

To uninstall Empower software using push uninstallation:

1. Modify the Node_List file to include all the appropriate computer names and IP addresses from which you want to uninstall Empower.
2. Modify the *E_Response_ClientLACE.config* response file to specify the *INSTALL_TYPE* property (Empower clients or LAC/E devices) where you want to uninstall Empower software.
3. Modify the *E_Response_ClientLACE.config* response file to specify that the *ACTION* command line property is set to **Remove**.
4. Run one of the preceding push installation commands in DOS or in a batch file, ensuring that the command is executed using a local administrator account by specifying the options `-u` (user name) and `-p` (password).

```
<path to media>\Setup.exe /responseFile <path to response file>
\E_Response_ClientLACE.config
```

Where,

- *<path to media>* is the location of the Empower media installer files.
- *<path to response file>* is the path to the location of the *E_Response_ClientLACE.config* file.

Requirement: You must use the universal naming convention (UNC) to represent the path to media and location of the Empower response file.

For example:

```
\\host or IP\Share\<file to execute>
```

```
\\10.1.105.123\Push\E_Response_ClientLACE.config
```

Where,

- *10.1.105.123* is the computer hosting the push installation.
- *Push* is the name of the Shared folder.
- *E_Response_ClientLACE.config* is the name of the file you want to execute.

Example:

```
c:\PushEmpVersion\psexec @C:\PushEmpVersion\Node_list.txt -s -d \
\10.1.105.123\EmpVersion\Setup.exe /responseFile \
\10.1.105.123\PushEmpVersion\E_Response_ClientLACE.config
```

Result: Empower 3.6.1 is removed from the computer and, if the `Restart` option is set to `True` in the response file, the computer restarts.

11.6 Push uninstallation of Empower servers

11.6.1 Silent uninstallation (from one computer)

To perform a silent uninstallation of an Empower server from the command line:

1. Modify the *E_Response_Server.config* response file and set all the appropriate properties.

   Tip: Ensure that the following conditions exist in the response file:

   - The *ServerInSilent* property is set to **true**.
   - The *ACTION* command line property is set to **Remove**.
2. Run *Setup.exe* from a DOS command line or in a batch file that includes the response file.

   Requirements:

   - Ensure that the command is executed using a local administrator account by specifying the options *-u* (user name) and *-p* (password).
   - Ensure that the path in the DOS prompt is set to the location of the Empower media.

   Example:

   ```
   <path to media>\Setup.exe /responseFile <path to response file>
   \E_Response_Server.config
   ```

   Where,

   - *<path to media>* is the location of the Empower media installer files.
   - *<path to response file>* is the path to the location of the *E_Response_Server.config* file.

Requirement: You must follow the universal naming convention (UNC) when you specify the path to the media and location of the Empower response file.

For example:

```
\\host or IP\Share\<file to execute>

\\10.1.19.25\Push\E_Response_Server.config
```

Where,

- *10.1.19.25* is the computer hosting the push installation.
- *Push* is the name of the Shared folder.
- *E_Response_Server.config* is the name of the file you want to execute.

Result: Empower 3.6.1 is removed from the computer and, if the **Restart** option is set to **True** in the response file, the computer restarts.

11.6.2 Push uninstallation (from multiple computers via a host)

To uninstall Empower servers using push uninstallation:

1. Modify the Node_List file to include all the appropriate Windows server names and IP addresses from which you want to uninstall Empower servers.
2. Modify the *E_Response_Server.config* response file to ensure that:
   - The *ServerInSilent* property is set to **true**.
   - The *ACTION* command line property is set to **Remove**.
3. Run one of the preceding push installation commands in DOS or in a batch file, ensuring that the command is executed using a local administrator account by specifying the options `-u` (user name) and `-p` (password).

```
<path to media>\Setup.exe /responseFile <path to response file>
\E_Response_Server.config
```

Where,

- *<path to media>* is the location of the Empower media installer files.
- *<path to response file>* is the path to the location of the *E_Response_Server.config* file.

Requirement: You must use the universal naming convention (UNC) to represent the path to media and location of the Empower response file.

For example:

```
\\host or IP\Share\<file to execute>

\\10.1.105.123\Push\E_Response_Server.config
```

Where,

- *10.1.105.123* is the computer hosting the push installation.
- *Push* is the name of the Shared folder.
- *E_Response_Server.config* is the name of the file you want to execute.

Example:

```
c:\PushEmpVersion\psexec @C:\PushEmpVersion\Node_list.txt -s -d \
\10.1.105.123\EmpVersion\Setup.exe /responseFile \
\10.1.105.123\PushEmpVersion\E_Response_Server.config
```

Result: Empower 3.6.1 is removed from the computer and, if the **Restart** option is set to **True** in the response file, the computer restarts.

11.7 Push uninstallation of Empower from Citrix servers

11.7.1 Silent uninstallation (from one Citrix server)

Requirement: The Citrix server must be in Install mode before you can perform a silent uninstallation.

To perform a silent uninstallation from a command line:

1. Put the server into Install mode by opening a command prompt and typing `Change user /install`.
2. Modify the *E_Response_ClientLACE.config* response file and set all the appropriate properties.

   Tip: Ensure that the *ACTION* command line property in the response file is set to **Remove**.
3. Run *Setup.exe* from a DOS command line or in a batch file that includes the response file. Ensure that the path in the DOS prompt is set to the location of the Empower media.

For example:

```
<path to media>\Setup.exe /responseFile <path to response file>
\E_Response_ClientLACE.config
```

Where,

- *<path to media>* is the location of the Empower media installer files.
- *<path to response file>* is the path to the location of the *E_Response_ClientLACE.config* file.

Requirement: You must use the universal naming convention (UNC) to represent the path to media and location of the Empower response file.

For example:

```
\\host or IP\Share\<file to execute>

\\10.1.105.123\Push\E_Response_ClientLACE.config
```

Where,

- *10.1.105.123* is the computer hosting the push installation.
- *Push* is the name of the shared folder.
- *E_Response_ClientLACE.config* is the name of the file you want to execute.

Result: Empower 3.6.1 is removed from the computer and, if the **Restart** option is set to **True** in the response file, the computer restarts.

11.7.2 Push uninstallation (from multiple Citrix servers via a host)

Requirement: The Citrix server must be in Install mode before you can perform a push uninstallation.

To perform a push uninstallation from Citrix servers:

1. Modify the Node_List file to include all the appropriate Citrix server names and IP addresses from which you want to uninstall Empower.
2. Modify the *E_Response_ClientLACE.config* response file to specify that the *ACTION* command line property is set to **Remove**.

3. Create and save a batch file (for example, *PushCitrix.bat*) that contains the following information:

```
change user /install <path_to_media>\Setup.exe /responseFile
<path to response file>\E_Response_ClientLACE.config change
user /execute
```

Where,

- *<path to media>* is the path to the Empower software media and must be accessible by the Citrix server.
- *<path to response file>* is the path to the location of the *E_Response_ClientLACE.config* file.

Requirement: You must use the universal naming convention (UNC) to represent the path to media and location of the Empower response file.

For example:

```
\\host or IP\Share\<file to execute>

\\10.1.105.123\Push\E_Response_ClientLACE.config
```

Where,

- *10.1.105.123* is the computer hosting the push installation.
- *Push* is the name of the shared folder.
- *E_Response_ClientLACE.config* is the name of the file you want to execute.

4. Run the following command from a DOS command line. Ensure that the path in the DOS prompt is set to the location of the *psexec* executable file.

```
PsExec @<path to node list>\Node_List.txt -s -d CMD /C <path to
PushCitrix.bat>\PushCitrix.bat
```

Where,

- *<path to node list>* is the network location where the node list text file resides (this file contains the names of the destination Citrix servers you will uninstall to).

Tip: If using the IP address results in an `Access Denied` error, use the machine name instead.

- *-s* specifies to run the remote process using the System account. Only the System account can be used for push installs. Must be specified.
- *-d* specifies to not wait for the process to terminate, allowing the installation to launch simultaneously on multiple systems.
- *<path to PushCitrix.bat>* is the network location where the batch file resides (this is the file created in step 3).

Result: Empower 3.6.1 uninstalls from all the specified Citrix servers.

A Deployment of Empower on cloud infrastructure

A.1 Getting Started

A.1.1 Overview of the deployment of Empower on cloud infrastructure

Waters supports the manual deployment of Empower in a cloud environment for an Enterprise client/server configuration starting with Empower 3 Feature Release 4. With this release, Waters provides deployment instructions for Empower 3.6.1.

Infrastructure as a Service (IaaS) contains the basic building blocks for cloud Information Technology (IT) infrastructure and can provide access to networking features, computers, and storage space. IaaS provides flexibility and management control over IT resources in a similar way to on-premises infrastructure.

Because network strategies vary for interconnectivity between on-premises and globally dispersed wide area network (WAN) resources, the manner in which the interconnectivity is configured with cloud-based resources may impact the performance of the Empower application. This is true regardless of whether this is deployed on-premises, across a WAN, or under the IaaS cloud model. Because Waters does not determine how sites are interconnected, Waters recommends that you use a dedicated, high-speed, low-latency network link for connecting to the cloud. The network connection serves as a means of transferring the data being generated between on-premise resources and resources running in the cloud. The connection should be private and should not be shared with Internet traffic.

Note: Update the *SQLNET.ORA* file on the Empower server to ensure that SQL connections are kept alive. Some IT hardware (routers and firewalls) may limit the connection time for any connection made with on-premise resources. Updating the *SQLNET.ORA* file on the database server creates a "heartbeat" signal that may resolve any loss in connectivity. Always work with your IT organization when experiencing networking connectivity issues. Failure to do so may result in future connectivity problems.

Tip: In Notepad, from <*Oracle Home*>, open the *sqlnet.ora* file and type the following command:

```
SQLNET.EXPIRE_TIME = X
```

where *X* equals the number of minutes after which you want the database to confirm that client and server connections are still active (for example, every 5 or 10 minutes).

Important: Waters tests and trains its Informatics personnel in deploying Empower using Amazon Web Services. Based on analysis compared to Amazon Web Services, Waters considers that you can deploy Empower using Microsoft Azure or Amazon Web Services, depending on your corporate policies, geography, or preference.

A.1.2 Getting started with cloud services

To use Empower in the cloud environment, you must have an account with the cloud provider of your choice.

Requirement: You must obtain, secure, and maintain ownership of your cloud account. Waters does not provide, establish, or maintain cloud accounts and does not set up or configure cloud environments for customers.

A.2 Prerequisites

A.2.1 Empower system requirements

Waters supports the manual deployment of Empower in a cloud environment for an Enterprise client/server configuration starting with Empower 3 Feature Release 4. Once you install Empower, you can then use the cloud deployment instructions specific to the Empower version you installed. With the release of Empower 3.6.1, Waters provides instructions for deploying this version in a cloud environment.

English is the only Empower version you can deploy in the cloud.

See also: For complete details about all Empower system requirements, known issues, and driver compatibility, see the Installation, Configuration, and Upgrade Guide specific to the Empower version you are using. For Empower 3.6.1, see:

- *Empower 3.6.1 Installation, Configuration, and Upgrade Guide* (715007289)
- *Empower 3.6.1 Release Notes* (715007302)
- *Waters Driver Pack 2020 Release 1 Installation and Configuration Guide* (715006278)

A.2.1.1 Empower requirements

The recommendations are the same for running Empower on-premise as they are for running Empower in a cloud environment. You still need the same CPU, memory, and disk sizes in both environments. These recommendations are provided as a guide for selecting an appropriate instance in your cloud environment. Consider your current and future needs when setting up your environment. If you add more RAM, contact Waters personnel to make the proper adjustments needed for Oracle to take advantage of the newly added RAM.

Minimum requirements for a cloud environment Empower database server should comply with the minimum requirements specified for the Empower version you are installing.

For complete details about all Empower 3.6.1 system requirements, see Chapter 1 (Page 16) of the present guide.

Table A–1: Supported configurations for Empower Cloud deployment

Deployment option	Supported configuration
AWS WorkSpace bundles	• Power with Windows 10 **Note:** The Power with Windows 10 bundle is configured with 16GB of RAM. This amount of memory (16GB RAM) is recommended for clients running Windows 10 Experience.
Azure Windows Virtual Desktop	**Minimum:** D4a v4 or greater **Recommended:** D16d v4 or greater
Elastic Compute Cloud (EC2) instance type (database server)	c4.2xlarge, c4.4xlarge, c4.8xlarge, c5.xlarge, c5.2xlarge, c5.4xlarge, c5.9xlarge, c5.18xlarge **Important:** Changing to an unsupported instance type produces an error in the AWS console. **Recommendation:** Use instance types that meet or exceed the supported configurations for the Empower version you are installing.
Azure instance type (database server)	**Minimum:** D4s v3 **Recommended:** D8 v4

Important: Waters tests and trains its Informatics personnel in deploying Empower using Amazon Web Services. Based on analysis compared to Amazon Web Services, Waters considers that you can deploy Empower using Microsoft Azure or Amazon Web Services, depending on your corporate policies, geography, or preference.

A.2.1.2 Cloud infrastructure prerequisites

Requirement: You must set up, secure, administer, and maintain a Windows Server 2016 deployed in a virtual network and a subnet with an outgoing Internet connection. This instance must match the requirements specified in the Empower Installation Guide specific to the Empower version you are installing.

You must have the following resources created in your cloud account prior to deploying Empower:

- Virtual network with at least one public subnet, two private subnets, Network Access Translation (NAT) Gateway or Network Access Translation (NAT) Instance (remapping of IP address spaces for private subnets), an Internet Gateway, configured Route Tables, Security Group for access to your cloud hosting tools [a Web service or Command Line Interface (CLI) that enables you to launch and manage Windows server instances, for example Elastic

Compute Cloud (EC2) for an AWS environment or Azure virtual machines], and Network Access Control List for subnet access.

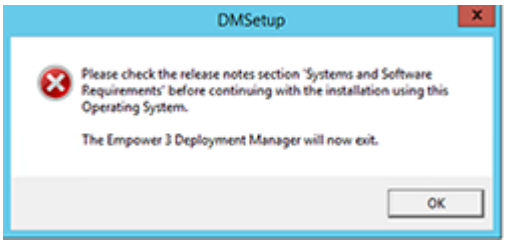
- Microsoft AD Directory Service for cloud-based AD Directory Services or AD Connector. A directory service is required for client-server operation, for example, AWS Directory Service for the AWS environment and Virtual Desktop for Azure. The service connects to an existing Active Directory Controller on-premise or in the cloud.
- A dedicated, private line connecting your on-premise sites to your cloud services provider.
- One server instance (Windows-based) for the Empower Database Server. Consult your local deployment specialist on the specifications needed for the server.
- One security group that must be assigned to the Empower Database Server with corresponding Empower-related exclusions.
- Identity management and roles for use with the instance management system.

  Tip: Most cloud services provide monitoring solutions to manage resource allocation. You can use these solutions in accordance with your business needs.

A.2.1.3 Client prerequisites

For the Empower client/server to work successfully, .NET Framework 3.5 Features and its sub-components must be installed on client computers. If you deploy Empower in an AWS environment, .NET Framework 3.5 Features must be installed on the client AWS WorkSpace.

Tip: If .NET Framework 3.5 is not installed, the following error message appears when you try to install Empower.



A.2.1.4 NuGenesis SDMS LMS compatibility

For information on the compatibility of Empower with NuGenesis SDMS components, consult the Release Notes specific to the Empower version you are using.

For Empower 3.6.1, see *Empower 3.6.1 Release Notes* (715007302).

A.2.2 Cloud connection

To achieve the highest performance in network connectivity, Waters recommends using a dedicated, high-speed, low-latency connection to connect your on-premises network to your VPC.

Note: To use Empower in the Amazon Web Services (AWS) cloud environment, Waters recommends that you use Direct Connect as your means of connectivity. To use Empower in an Azure environment, Waters recommends that you use ExpressRoute.

A.2.3 Active Directory established

To manually install Empower in a cloud environment, you must ensure that a federated identity (Active Directory, or AD) is established between on-premises and cloud-based resources. The Empower Enterprise application requires operation in a domain environment. This means that computing resources must traverse into and out of the on-premises location into the virtual network.

Note: If you use your own AD servers, you must configure an AD Connector to access the clients and the server in the cloud.

For details about using Microsoft Active Directory, consult the Microsoft cloud documentation.

A.2.4 Security groups

Create a Security Group in AWS or a Network Security Group in Azure that allows only the ports needed for the Empower Database Server to communicate.

The security groups created or assigned to the individual instances must be restricted as much as possible while allowing access to the various functions needed by the Empower database, as well as the server components.

Recommendation: Once the instances are up and running, Waters recommends that you carefully review these security groups to further restrict access and ensure that there is no conflict with your security practices.

Important: The security group settings are in addition to the firewall that might be provided at Windows level. Even if the security groups allow communication to some ports, the Windows firewall is still active and can restrict access.

Note: The same ports that are opened on the machine's firewall must be opened in the security groups used to connect to that machine.

A.2.4.1 Creating a custom security group

When you launch an instance, you associate one or more security groups with the instance. You can add rules to each security group that allow traffic to or from its associated instances. You can modify the rules for a security group at any time. You can also create custom security groups to apply rules that are applicable to your business practices.

Note: Security groups for AWS WorkSpaces are created as part of the setup process.

For details about creating a custom security group, consult the specific documentation.

A.3 Installing process

A.3.1 Installing Empower in a cloud-based instance

For complete details about the installation and configuration of Empower in a cloud-based instance, see the Installation, Configuration, and Upgrade Guide specific to the Empower version you are using.

A.3.2 Configuring NuGenesis SDMS printing

Using NuGenesis Unify from an Empower client installed in a cloud environment, you can print an Empower report manually or automatically after performing the eSignature. You can use automatic printing without logging in to NuGenesis SDMS. For instructions on how to install the Unify print driver, see "Installing NuGenesis Unify" in the *NuGenesis LMS 9.1 Installation and Configuration Guide* (715006816).

A.3.3 Connecting an on-premise LAC/E device to an Empower cloud-based instance

You can connect an on-premise LAC/E device to an Empower server in the cloud starting with Empower 3 Feature Release 4. To do so, you must prepare the LAC/E to connect to the network, and then install Empower software on the on-premise LAC/E device. A trust relationship must exist between the network that the LAC/E is connected to and the cloud resources.

See also: For complete instructions and detailed information about installing Empower software on a LAC/E device, see Chapter 6 in the *Empower 3 Installation, Configuration, and Upgrade Guide* (715005266), available on (www.waters.com), or Chapter 6 in the present guide.