



Waters™

# Empower 3.8.0

## Release Notes

# General information

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## About these release notes

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This document contains information about the features and functions introduced, changed, or removed in this version of the product. It contains a list of major feature changes as well as descriptions of known defects, resolved defects, and observed product behaviors (concessions) that Waters deems of importance to customers. This document does not include:

- An exhaustive list of all changes to this version of the product
- Descriptions of defects that were not known to Waters at the time of the product's release
- Descriptions of defects that cannot be reproduced by Waters
- Information about customer requests for enhancements to the product
- Specific details of changes to proprietary aspects of product components, features, computational algorithms, and software code

The changes listed in this document are relative to the previous version of the product. If you are updating an older version of the product, review the release notes for all the intervening versions to ensure that you understand the cumulative impact of the product changes.

Carefully review the information in this document before the product is installed. If you have questions about how installing this product might affect your environment or if you need more information about this product, contact your Waters representative.

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Contact Waters with technical questions regarding the use, transportation, removal, or disposal of any Waters product. You can reach us through the Internet, telephone, fax, or conventional mail.

| Contact method                                     | Information                                                                                                                    |
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| <a href="http://www.waters.com">www.waters.com</a> | The Waters website includes contact information for Waters locations worldwide.                                                |
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## Updated information

Refer to the Waters website ([www.waters.com](http://www.waters.com)) and click **Support > Support Documents and Downloads** for updates to this document.

## Obtaining Waters software and software updates

To digitally obtain the software application and licenses that you purchased, use the Waters Digital Software Delivery and License Entitlement platform. With an active Waters Software Maintenance Plan, the platform gives you email notifications of and immediate access to newly released software. This delivery platform allows you to securely search and share software entitlements and instrument drivers, and it provides a secure search document link to [www.waters.com](http://www.waters.com) that details all relevant documents for the specific software product and version.

To access the Digital Software Delivery and License Entitlement platform, contact the designated Software Manager for your organization. The Software Manager is typically a system administrator or someone responsible for implementing software and activating licenses, and they are the person responsible for the Waters digital entitlements (software and licenses) within your organization. From within the platform, the Software Manager can securely manage

and distribute software entitlements to others within your organization, providing organizational control of your software assets.

If you have not yet arranged for access to this platform, work with your Waters sales representative to begin the secure onboarding process.

Access the software delivery and license entitlement platform through your [www.waters.com](https://www.waters.com) user profile at **waters.com > My Account [Hello, *username*] > Profile > Download Software Entitlements**.

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# Empower 3.8.0

## Compliance recommendations

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Any time you install, change, or uninstall software or system modules in a regulated environment, Waters recommends that you follow your organization's approved change control procedure.

You should assess the impact of the changes described in the release notes on the qualification status and validation for the intended use of your system, including any impact on personnel, methods, laboratory workflows, or connected equipment, and scale your activities accordingly.

## Antivirus considerations

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Some real-time virus scanners mistake normal data acquisition and instrument control for virus activity, and thus interfere with proper operations. Full-system scans and live updates can be network-intensive, disk-intensive, and CPU-intensive, and they can also interfere with normal data acquisition. Schedule scans and updates for idle times when data acquisition does not occur.

Certain antivirus program features such as "intrusion prevention", "tamper protection", and "heuristic analysis" can also interfere with normal operation. If you observe issues with the software, review and verify the antivirus logs. It may be necessary to white-list any affected components.

## Empower software installations

For Empower software installations, exclude the Empower software installation folder (usually `C:\Empower`) and its sub-folders.

For full antivirus exclusion recommendations per installation type, consult the "Virus scanning" section in the *Empower System Administrator's Guide* corresponding to your Empower software version.

## Naming convention

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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.

**Note:** QQ digits occur only with actual hotfixes. All other release types omit QQ digits.

## Supported platforms and operating systems

Empower 3.8.0 software supports Windows 10 Professional and Enterprise (Personal, Acquisition Client, and LAC/E devices), Windows Server 2019 Standard or Windows Server 2022 Standard, and Red Hat Enterprise Linux Server 8.0.

For Empower non-acquisition Client platforms only, Empower 3.8.0 software also supports Windows 11 Professional or Enterprise version 21H2.

**Note:** Support includes English, Japanese, Simplified Chinese, and Korean distributions of Empower 3.8.0 software.

Specifically, Empower 3.8.0 supports these platforms and operating systems:

**Table 1: Supported platforms and operating systems**

| Platform           | Operating systems and components                                                                                                                                                                                                                                                                                                                                                                                                          |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Personal           | <ul style="list-style-type: none"> <li>• Windows 10 Professional or Enterprise, 64-bit version 21H1</li> <li>• Windows 10 Enterprise Long Term Servicing Channel (LTSC) 2021 (including IoT)</li> <li>• Windows 10 Enterprise Long Term Servicing Branch (LTSB) Build 1607</li> <li>• Oracle 19c<sup>a</sup></li> </ul>                                                                                                                   |
| Empower client     | <ul style="list-style-type: none"> <li>• Windows 10 Professional or Enterprise, 64-bit version 21H1</li> <li>• Windows 10 Enterprise Long Term Servicing Channel (LTSC) 2021 (including IoT)</li> <li>• Windows 10 Enterprise Long Term Servicing Branch (LTSB) Build 1607</li> <li>• Windows 11 Professional or Enterprise version 21H2 (for Empower non-acquisition Client platforms only)</li> <li>• Oracle 19c<sup>a</sup></li> </ul> |
| Citrix environment | <ul style="list-style-type: none"> <li>• Windows Server 2019 Standard</li> </ul>                                                                                                                                                                                                                                                                                                                                                          |

**Table 1: Supported platforms and operating systems (continued)**

| Platform            | Operating systems and components                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                     | <ul style="list-style-type: none"> <li>• Citrix Virtual Apps and Desktops 7 1912 Long Term Service Release (LTSR) CU6</li> <li>• Citrix receiver: Windows 10 Professional or Enterprise</li> <li>• Windows Server 2022 Standard <ul style="list-style-type: none"> <li>• Citrix Virtual Apps and Desktops 2203 Long Term Service Release (LTSR) CU1</li> <li>• Citrix receiver: Windows 10 Professional or Enterprise</li> </ul> </li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Database server     | <ul style="list-style-type: none"> <li>• Windows Server 2019 Standard or Windows Server 2022 Standard</li> <li>• Red Hat Enterprise Linux Server 8.0</li> <li>• Oracle 19c<sup>a</sup></li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| File server         | <ul style="list-style-type: none"> <li>• Windows Server 2019 Standard</li> <li>• Windows Server 2022 Standard</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Waters LAC/E device | <ul style="list-style-type: none"> <li>• Windows 10 Professional or Enterprise, 64-bit version 21H1</li> <li>• Windows 10 Enterprise Long Term Servicing Channel (LTSC) 2021 (including IoT)</li> <li>• Windows 10 Enterprise Long Term Servicing Branch (LTSB) Build 1607</li> <li>• Oracle 19c<sup>a</sup></li> </ul> <p><b>Notes:</b></p> <ul style="list-style-type: none"> <li>• Waters LAC/E devices Configuration 15 and Configuration 16 are both supported with Windows 10 Enterprise Long Term Servicing Branch (LTSB) Build 1607.</li> <li>• Waters LAC/E devices Configuration 16 and LAC/E 17 are supported with Windows 10 Enterprise Long Term Servicing Channel (LTSC) 2021.</li> <li>• Waters LAC/E device Configuration 16 comprises both eLAC/E and cLAC/E devices and the corresponding BC LAC/E option.</li> <li>• The Waters LAC/E 17 device comprises the BC LAC/E option.</li> </ul> |

**Table 1: Supported platforms and operating systems (continued)**

| Platform                  | Operating systems and components                                                                                                                                                                      |
|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Virtualization technology | <ul style="list-style-type: none"><li>• VMware vSphere ESXi 7.0.3 build number 21313628</li><li>• Microsoft Azure Virtual Desktop (English only)</li><li>• Amazon WorkSpaces (English only)</li></ul> |

- a. Embedded Oracle versions are 19.14.0.0.0. for the Oracle database and 19.3.0.0.0 for the Oracle client. The Oracle version required for Red Hat is 19.14.0.0.0. The Oracle database is installed on server and Empower Personal installations. Oracle clients are installed on Empower Server, Personal, Empower client, and LAC/E installations.

**See also:** The *Empower 3.8.0 Installation, Configuration, and Upgrade Guide* (715008196).

**Note:** Waters performs Oracle and Windows patch testing on the latest two released Empower versions and periodically releases Oracle patch installers and test results.

## Oracle software licenses

For Empower software installations on a Windows operating system, Waters embeds the required Oracle software components within the Empower software product.

For Empower software installations on other operating systems, contact your local Waters support representative or raise a support ticket for further information and to discuss your proposed installation.

**Important:** Empower software does not support Oracle's Transparent Application Failover (TAF). This option is known to cause undesired behavior. If you are configuring a High Availability deployment, do not enable the TAF option. As a customer, engage with Waters Professional Services for consultation on how to deploy supported High Availability options.

## Instrument support

### Changes in instrument support

Starting with version 3.7.0, Empower software uses an instrument catalog to identify which third-party instruments in your configured systems require instrument control licenses. For details about the introduction of the instrument catalog, see the *Empower 3.7.0 Release Notes* (715007561), and for information about upload and usage of the instrument catalog, see the *Empower 3.8.0 Installation, Configuration, and Upgrade Guide* (715008196).

### Ethernet and serial instruments

Empower 3.8.0 supports:

- Waters Driver Pack 2023 Release 1
- Instrument Control Framework Support Layer v3.6.1
- Alliance iS HPLC Instrument Control Software 1.0

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

- *Waters Driver Pack 2023 R1 Release Notes (analytical)* (715008470)
- *Waters Driver Pack 2023 R1 Installation and Configuration Guide* (715006278)
- *Instrument Control Framework Support Layer v3.6.1 Release Notes* (715008188)
- *Instrument Control Framework Support Layer v3.6.1 Installation Guide* (715008189)
- *Alliance iS HPLC System ICS Installation and Configuration Guide* (715008749)

**Note:** Customers can obtain the Alliance iS HPLC Instrument Control Software 1.0 from the Waters Digital Software Delivery and License Entitlement platform.

To further align its 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. Use of IEEE instrument control beyond Empower 3 Feature Release 5 Service Release 4 was not tested, will not be tested, and is not supported.

In addition to IEEE control support, Waters discontinued the following instruments.

**Table 2: 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 <sup>a</sup> | Empower 3 FR3       |
| Waters ZQ 2000 mass detector                       | Empower 3 FR3       |
| Waters ZQ 4000 mass detector                       | Empower 3 FR3       |
| 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       |

a. Agilent 7673B and 7673C automatic liquid samplers are supported via ICF Support Layer drivers.

## Support for Agilent 6850, 6890, and 7890 GC modules and Agilent 7697A and G1888 Headspace modules

Prior to Windows 10, the Agilent 6850, 6890, and 7890 GC modules and the Agilent 7697A and G1888 Headspace modules were controlled either by an instrument driver built directly

into Empower software or by a legacy Instrument Control Software (ICS) driver. Additionally, the 6850 and 6890 used either RS-232 serial control or RS-232 serial/edgeport USB driver control. To control these modules in an Empower Windows 10 environment, Waters recommends installing the Agilent drivers available with its Instrument Control Framework (ICF) Support Layer version 3.0 (minimum), which uses Ethernet communication. To enable Ethernet communication with the 6850 or 6890 modules, install the Ethernet conversion kits available from Agilent. For more information on ICF Support Layer drivers, see [www.waters.com](http://www.waters.com) > **Support** > **Support Documents and Downloads**, search for "ICF", and filter the search results by Content Type = Downloads.

## Driver compatibility

Waters expects no driver compatibility issues with either Waters or third-party instrument drivers with Empower 3.8.0 because no significant changes were made to the driver interfaces within Empower.

Empower 3.8.0 supports:

- Waters Driver Pack 2023 Release 1
- Instrument Control Framework Support Layer v3.6.1
- Alliance iS HPLC Instrument Control Software 1.0

**See also:** For information on the Waters drivers, refer to the following documents available on the Waters website ([www.waters.com](http://www.waters.com) > **Support** > **Support Documents and Downloads**):

- *Waters Driver Pack 2023 R1 Release Notes (analytical)* (715008470)
- *Waters Driver Pack 2023 R1 Installation and Configuration Guide* (715006278)
- *Instrument Control Framework Support Layer v3.6.1 Release Notes* (715008188)
- *Instrument Control Framework Support Layer v3.6.1 Installation Guide* (715008189)
- *Alliance iS HPLC System ICS Installation and Configuration Guide* (715008749)

For information on compatibility with chromatography instruments and drivers from other vendors, refer to the release notes for those instruments and drivers.

**Note:** Customers can obtain the Alliance iS HPLC Instrument Control Software 1.0 from the Waters Digital Software Delivery and License Entitlement platform.

## NuGenesis SDMS LMS compatibility

Empower 3.8.0 is compatible with NuGenesis LMS 9.3 (NG 9.3) components as follows:

- The NuGenesis LMS base kit (SDMS) requires NuGenesis SDMS 9.3 for printing functionality.
- The NuGenesis LMS Option kit (ELN and Connectors) for NG SDMS 9.3 requires NG LMS 9.3, NG LMS 9.3 Empower Interface 2.3, or NG 9.3 LMS Connectors 2.3.
- The NuGenesis SDMS 9.3 Data Adapters Release 6 (NG SDMS 9.3 DAR6).

**Note:** You must apply NuGenesis SDMS 9.3 DAR6 for Empower 3.8.0 support.

**See also:** The *NuGenesis LMS 9.3.0 Release Notes* (715007872), the *NuGenesis LMS 9.3.0 SDMS Data Adapters Release 6 Reference Guide* (715007870), and the *NuGenesis LMS 9.3.0 Installation and Configuration Guide* (715007873) for complete information.

Empower 3.8.0 is compatible with NuGenesis LMS 9.2 HF1 (Empower LMS 1.0.0.1) components as follows:

- The NuGenesis LMS base kit (SDMS) requires NuGenesis SDMS 9.2 HF2 for printing functionality.
- The NuGenesis LMS Option kit (ELN and Connectors) for NG SDMS 9.2 HF2 requires NG LMS 9.2 HF1 (Empower LMS 1.0.0.1), NG LMS 9.2 HF1 Empower Interface 2.2, or NG 9.2 HF1 LMS Connectors 2.2.
- The NuGenesis LMS 9.0-9.1 SDMS Data Adapters Release 5 (NG SDMS 9.0-9.1 DAR5).

**Note:** You must apply NuGenesis SDMS 9.0-9.1 DAR5 for Empower 3.8.0 support.

**See also:** The *Empower LMS 1.0.0.1 Release Notes* (715007906) and the *NuGenesis LMS 9.2 Installation and Configuration Guide* (715007261) for complete information.

**Legend:**

|                                 |                                                                                                                                                                                                                                                                                                                                                                            |
|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Tested                          | Both software entries were tested and structurally validated as part of a software release. The test was performed by either the Empower or the NuGenesis program, depending on the software release.                                                                                                                                                                      |
| Incompatible                    | The two software entries will not work together.                                                                                                                                                                                                                                                                                                                           |
| Supported under risk assessment | This is based on our knowledge of the software changes made at each release. If you encounter compatibility issues, Waters provides support in accordance with the terms of the Licenses, Warranties, and Support Services agreement. To resolve compatibility problems, you might need to upgrade to a supported platform or install a newer version of Empower software. |

**Table 3: NuGenesis SDMS and Empower compatibility matrix**

| NuGenesis SDMS version | Empower 3.8.0                   |
|------------------------|---------------------------------|
| NG 9.0 SDMS            | Incompatible                    |
| NG 9.0 DAR1            | Incompatible                    |
| NG 9.0 DAR2            | Incompatible                    |
| NG 9.0 DAR3            | Incompatible                    |
| NG 9.0 DAR4            | Incompatible                    |
| NG 9.1 SDMS            | Supported under risk assessment |
| NG 9.1 SDMS HF1        | Supported under risk assessment |
| NG 9.1 SDMS HF2        | Tested                          |
| NG 9.0-9.1 DAR4        | Incompatible <sup>a</sup>       |

**Table 3: NuGenesis SDMS and Empower compatibility matrix (continued)**

| <b>NuGenesis SDMS version</b> | <b>Empower 3.8.0</b>            |
|-------------------------------|---------------------------------|
| NG 9.0-9.1 DAR4 HF1           | Tested                          |
| NG 9.1.0 SDMS HF2 DAR4 HF1    | Tested                          |
| NG 9.2.0 DAR5                 | Supported under risk assessment |
| NG 9.2.0 SDMS HF1 DAR5        | Tested                          |
| NG 9.3.0 SDMS DAR6            | Tested                          |

a. The incompatibility is related to the DAR4 application's archiving functionality. The NG SDMS 9.0.2 and 9.1 are compatible with Empower 3.8.0, and the manual and automatic printing functionality works as expected.

**Table 4: NuGenesis LMS and Empower compatibility matrix**

| <b>NuGenesis LMS version</b>          | <b>Empower 3.8.0</b>            |
|---------------------------------------|---------------------------------|
| NG LMS 9.0                            | Supported under risk assessment |
| NG LMS 9.1 HF1                        | Supported under risk assessment |
| NG LMS 9.1 HF3                        | Tested                          |
| NuGenesis LMS Empower-Interface 2.0   | Supported under risk assessment |
| NG LMS Connectors 2.0                 | Supported under risk assessment |
| NG LMS 9.0.2                          | Supported under risk assessment |
| NG LMS Connectors 2.0.2               | Supported under risk assessment |
| NG LMS Connectors 2.1                 | Supported under risk assessment |
| NG LMS Connectors 2.1 HF1             | Supported under risk assessment |
| NG LMS Connectors 2.1 HF2             | Tested                          |
| NuGenesis LMS Empower-Interface 2.0.2 | Supported under risk assessment |
| NuGenesis LMS Empower-Interface 2.1   | Tested                          |
| NG LMS 9.1.0 HF2                      | Supported under risk assessment |
| NG LMS 9.1.0 HF3                      | Tested                          |
| NG LMS Connectors 2.1 HF2             | Tested                          |
| NG LMS 9.2.0                          | Supported under risk assessment |
| NG LMS 9.2.0 HF1                      | Tested                          |
| NG LMS Connectors 2.2                 | Tested                          |
| NG LMS Empower Interface 2.2          | Tested                          |
| NG LMS 9.3.0                          | Tested                          |
| NG LMS Connectors 2.3                 | Tested                          |
| NG LMS Empower Interface 2.3          | Tested                          |

**Note:** NuGenesis SDMS 8 and NuGenesis LMS 8 versions are not compatible with Empower 3.8.0.

## Waters Data Converter compatibility

Empower is compatible with Waters Data Converter 2.1 HF2 (WDC 2.1 HF2) and Waters Data Converter 3.2 (WDC 3.2) as follows:

**Table 5: Waters Data Converter and Empower compatibility matrix**

| WDC version | Empower 3.8.0                   |
|-------------|---------------------------------|
| WDC 2.1 HF2 | Supported under risk assessment |
| WDC 3.2     | Tested                          |

**Requirement:** When you install WDC 2.1 HF2 on Windows 10, you must run both the installer and the installation qualification *Check.bat* file using an account with the System Administrator role.

### Legend:

|                                 |                                                                                                                                                                                                                                                                                                                                                                            |
|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Tested                          | Both software entries were tested and structurally validated as part of a software release. Empower, NuGenesis, or WDC Programs performed the test, depending on the software release.                                                                                                                                                                                     |
| Incompatible                    | The two software entries do not work together.                                                                                                                                                                                                                                                                                                                             |
| Supported under risk assessment | This is based on our knowledge of the software changes made at each release. If you encounter compatibility issues, Waters provides support in accordance with the terms of the Licenses, Warranties, and Support Services agreement. To resolve compatibility problems, you might need to upgrade to a supported platform or install a newer version of Empower software. |

## Deployment notes

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### Compliance note

See [INFEMP-32328 \(CRI-6115\) \(Page 59\)](#) for a known issue that may affect you.

### Before you install the application

Starting with version 3.7.0, Empower uses an instrument catalog to define the chromatographic instruments that can be used and to verify which third-party instruments in your system require instrument control licenses. For more details, see the *Empower 3.7.0 Release*

*Notes* (715007561) and the *Empower 3.7.0 Installation, Configuration, and Upgrade Guide* (715007595).

You can install Empower 3.8.0 as a new installation on a system where no Chromatography Data System (CDS) is currently installed. You can also upgrade from Empower 3.7.0 to Empower 3.8.0.

### Important:

- To perform an upgrade, you must have Oracle database version 19.14.0.0.0 (minimum) installed.
- Due to Apache security vulnerability article CVE-2021-44228, when you perform an in-place upgrade from Empower 3.7.0 and apply an Oracle patch, verify that these folders are present and, if so, manually remove them before you install Empower 3.8.0 on Empower servers or Personal workstations:
  - `~\Empower\Oracle\Oracle19c\md`
  - `~\Empower\Oracle\Oracle19c\suptools\tfa`
  - `~\Empower\Oracle\Oracle19c\sqldeveloper`

### Restrictions:

- In-place upgrade is available only for existing Empower 3.7.0 installations.
- When you migrate from an earlier version of Empower, Waters recommends using the system object export and import utilities to move objects such as systems, users, nodes, and so on from your old installation to your new installation. Otherwise, you must manually recreate any objects you want to use with your new installation. Note that you can only perform a system object export on a Windows-based Empower database server.
- Empower Mobile is no longer supported.
- When you install Empower server, you can only perform a full installation, including Oracle software. If Oracle is already installed, the Empower server installer stops.

For information on restoring projects from previous versions of Empower, see "Restoring projects" in the Empower Online Information System.

Review the *Empower 3.8.0 Installation, Configuration, and Upgrade Guide* (715008196) for complete installation instructions and the *Waters Ethernet Instrument Getting Started Guide* (71500074403).

## Additional software components

Empower 3.8.0 deployment includes these additional software components:

**Table 6: Software components deployed with Empower**

| Component      | Version                                  |
|----------------|------------------------------------------|
| Oracle Product | Server platforms, Personal workstations: |

**Table 6: Software components deployed with Empower (continued)**

| Component                     | Version                                                                                        |
|-------------------------------|------------------------------------------------------------------------------------------------|
|                               | Oracle database version 19.14.0.0.0                                                            |
|                               | Personal workstations, Empower clients, and LAC/E devices:<br>Oracle client version 19.3.0.0.0 |
| Waters Database Manager (WDM) | 4.2                                                                                            |
| Java software                 | 1.8.0_201                                                                                      |
| Java SE Runtime Environment   | build 1.8.0_201-b09                                                                            |
| Java HotSpot 64-Bit Server VM | build 25.201-b09, mixed mode                                                                   |
| MSXML                         | 3.0<br>6.0                                                                                     |
| Microsoft Visual C++          | 2008 Redistributable<br>2015-2022 Redistributable                                              |

## Empower software bundle

Starting with Empower 3.8.0, the Empower software download area of the Digital Delivery Platform includes the Waters Edge Device Software installer.

To leverage waters\_connect Cloud System Monitoring for your Empower software-controlled instruments, including Alliance iS HPLC, you can deploy the Waters Edge Device Software onto your Empower LAC/E device.

Your onboarded LAC/E devices securely share instrument status and configuration information gathered from Empower software to the waters\_connect Cloud, which stores and makes that information available for display through the [System Monitoring cloud application](#) (sold separately).

For Waters Edge Device Software deployment instructions and requirements, see these documents:

- *Edge Device Software Installation Guide* (715007383)
- *Edge Device Software Release Notes* (715007381)

## Version information

You can view specific version information for Empower 3.8.0 in the following locations:

**Table 7: Empower component version information**

| Component        | Version      | Location                                                                                                                                                                                                |
|------------------|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Empower software | 3.8.0        | <ul style="list-style-type: none"><li>• <b>Help &gt; About</b></li><li>• Information icon on the Empower login screen</li></ul>                                                                         |
| Empower Product  | 7.0.3471.920 | <ul style="list-style-type: none"><li>• Installation Log</li><li>• <b>Control Panel &gt; Add/Remove Programs &gt; Empower</b></li><li>• <b>Settings &gt; Apps &amp; Features &gt; Empower</b></li></ul> |
| Database         | 7.80.00.00   | <ul style="list-style-type: none"><li>• <b>Help &gt; About</b></li><li>• Verify Files</li><li>• Information icon on the Empower login screen</li></ul>                                                  |

## Default projects

A default project containing example data for training and troubleshooting purposes is included with the software media when you purchase Empower software. Additional projects are also available on the Waters Marketplace (<https://marketplace.waters.com>).

## What's new?

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New features in this release include the items described in the following sections.

### Alliance iS HPLC System support

Empower 3.8.0 software includes specific additions and changes in support of the new Waters Alliance iS HPLC System.

### Actions recorded in the System Audit Trail

The Empower 3.8.0 System Audit Trail records these Alliance iS HPLC System configuration changes and installation events:

- Instrument Event
- Instrument Installation
- Instrument Software Modified
- Instrument Hardware Modified

The Empower Message Center records additional messages from the system.

**Note:** Other types of system logging reside with the instrument control software. The system's touchscreen and instrument console provide access to that information.

## Sample submission monitoring

The set of checks built into the system or checks that users enable at the instrument touchscreen ensure smooth sample runs. The Empower 3.8.0 Message Center informs about issues that prevent acquisition, so users can fix them before the instrument starts or continues acquiring data.

Two types of checks confirm system status and ensure that samples can run:

- Pre-run checks catch common user errors, such as missing vials, wrong column, qualification due, or preventive maintenance (PM) due.
- Run time checks add extra verifications that stop acquisition, such as plate availability, solvent levels, or method matching.

The Message Center reports all errors, warnings, and informational messages associated with sample submission checks.

**Note:** Only errors prevent an acquisition from starting.

## Separate Alliance iS HPLC bed layout

When users define or configure plates to run sample sets in Empower 3.8.0, the Define Plates for Sample Set dialog box features the three-position Alliance iS HPLC plate carrier and the twelve static vial locations that are available for inclusion in sample set methods.

## Chromatographic column usage information

Empower 3.8.0 software retains chromatographic column usage history for the Waters eConnect, RFID-enabled columns used with Alliance iS HPLC systems. During acquisition, Empower software automatically saves the column's usage history information in the Empower database.

## Columns section in Configuration Manager

The new Columns section in Configuration Manager presents information in table view formats, as follows:

- The Summarized Column History table lists columns used with ACQUITY UPLC (eCord columns) or Alliance iS HPLC systems (eConnect columns), as the Column Detect field indicates.
- The Column History table lists usage information specific to the selected column.
- The Column History table features the View As mechanism so users can review the associated project data.

## Information transferability between Empower databases

In addition to viewing, backing up, and deleting column data for Waters eCord and eConnect tagged columns, you can transfer column usage information between Empower databases, using drag-and-drop or copy-and-paste functions.

## Column information reports

Instrument information reports can now include column usage information that an Empower database stores while acquiring data from an Alliance iS HPLC system equipped with Waters eConnect tagged columns. Empower records sample set information at the end of each sample set run on an eConnect tagged column.

Using the Detected Column Information group in a report method, you can generate reports that contain summarized or individual column data. In the Information to Print section, select either of two options:

- Summarized column history data
- Column history data

Alternatively, you can include specific column information into chromatographic reports if you add the Detected Column fields to tables, plot legends, and other objects that reports can contain.

**Tip:** To report column usage information from the Summarized Column History table in Configuration Manager, select the relevant column rows to report and drag them onto the report method page in Preview.

## Allow use of LDAP username when creating an Empower software user

You can edit the Empower Software username when creating a new Empower Software user that is mapped to an LDAP user.

Reported as CRI-962.

## Changes in password reset

To enhance security during a password reset, you must type your current password and your new password in the same dialog box.

## Field "Purity (Vial)" renamed to "Purity % (Vial)"

Starting with Empower 3.8.0, the field "Purity (Vial)" is renamed to "Purity % (Vial)" to reflect that the field values are expressed in percentages.

### Notes:

- This change is due to solved issue [INFEMP-20568 \(CRI-3757\) \(Page 46\)](#).
- The field "Purity (Component)" was not renamed.

**Important:** This change requires updating all custom fields that use "Purity (Vial)" in the formula. You may have to modify the field mapping if used in a Laboratory Information Management System (LIMS).

## Mark Audit Trail records as reviewed

A new result sign-off system policy is available in the Result Sign Off tab: Allow 'Mark Audit Trail records as reviewed' at Sign Off 2. When you enable this policy, the "Mark Audit Trail Records as reviewed" check box is displayed in the Report Publisher Sign Off Results dialog at Sign Off 2. This check box allows you to certify that the appropriate audit trail records have been reviewed when you sign off results at level 2. If you do not select the check box, the system displays a message asking if you want to sign off the results without certifying that the audit trail records have been reviewed.

Two new columns are added to the Project window when the system policy for this feature is enabled:

- Result Audit Trail reviewed, in the Results tab: indicates that the appropriate audit trail records of that result were certified as being reviewed at least once by a signer who performed a Sign Off 2 action on that result.
- Sign Off Audit Trails Reviewed, in the Sign Offs tab: indicates that the signer who performed that Sign Off 2 action on the result certified that the appropriate audit trail records of that result have been reviewed.

**Requirement:** To have the Mark Audit Trail Records as reviewed check box available for selection in the Sign Off results dialog box, signers must also have the View Project Audit Trail and Sign Off Level 2 privileges enabled for their user type.

### Notes:

- This system policy applies to standard projects that have the Full Audit Trail option selected.
- This system policy is disabled by default.

For more information, see the following topics in the Empower 3.8.0 online Help:

- Setting Empower system policies
- Actions recorded in project audit trails
- Sign Off View Fields

## Intensity Label Level function for Spectrum Index and Mass Analysis Plots

You can adjust the intensity level for the Spectrum Index and Mass Analysis Plots in Report Publisher, and automatically display the spectra for integrated peaks and the lower intensity  $m/z$  spectra for the isotopes and adducts.

Reported as CRI-4260 and INFEMP-27535.

## Method Validation Manager updates

Empower 3.8.0 includes a number of Method Validation Manager (MVM) updates.

### Segregated Validation Administrator privilege

The Validation Administrator privilege includes by default all method validation privileges, the Alter Project Type privilege, and the Lock Methods privilege, but you are now able to include or exclude these associated privileges as needed.

For more granular control, you can now assign individual method validation privileges to non-validation administrators, rather than assigning the Validation Administrator privilege.

As an option, you can automatically select or clear the privileges associated with the Validation Administrator privilege.

### Flexible method validation workflows

If your laboratory SOPs require two levels of sign-off in the Method Validation Manager, Empower 3.8.0 enables you to do the following:

- Process validation results before signing off result sets.
- Review result sets and validation results together.
- Ensure that the result sets are signed off before you sign off validation results.

The Approvals/Sign Offs tab in Method Validation Manager now includes a new check box: "Require sign-off of all Result Sets before creating Validation Results", selected by default. Select or clear the check box to define the workflow of creating Validation Results relative to signing off Result Sets, as follows:

- **Workflow: Process Result Sets > Process Validation Results > Review and sign off Result Sets and Validation Results**

An empty check box allows users to process validation results before designated staff sign off on the Result Sets.

**Tip:** In this streamlined workflow, validation processing need not wait for result set sign-off. Staff can review Result Sets and Validation Results together, and the Validation Results sign-off can follow immediately after the Result Sets sign-off.

- **Workflow: Process Result Sets > Review and sign off Result Sets > Process Validation Results > Review and sign off Validation Results**

A selected check box prevents users from processing validation results until designated staff sign off on the Result Sets.

**Tip:** This selection restricts the workflow so that Validation Results must be signed off separately from Result Sets.

## RSS field available in Linearity tests

You can now include the Residual Sum of Squares (RSS) field in acceptance criteria for Linearity tests and also include RSS values in granular result reports.

The Linearity Result table in MVM now displays RSS as a specific field that replicates Error information from the SS field in the Regression ANOVA table.

## Segregation of Administrator privileges

Empower 3.8.0 implements some changes to the privileges for the Administrator user type. For more granular control, you can now assign individual privileges, rather than assigning the Administrator privilege.

### Access All Nodes privilege added

The Access All Nodes privilege allows a user to view and access all existing nodes configured in Empower, regardless of the Allowed Access defined in node properties. You must combine this privilege with other privileges in order to allow the user to perform actions on a node (alter node properties, perform node-based tasks such as delete or create).

The addition of the Access All Nodes privilege brings these changes:

- The Configuration Manager Nodes table lists all existing nodes for users with the Access All Nodes privilege, regardless of the access set in the node properties.
- With the Access All Nodes and Delete Node privileges you can delete a node without having direct access to that node.
- With the Access All Nodes and Alter Node privileges you can alter the properties of a node without having direct access to that node.
- With the Access All Nodes privilege you can export to text any available node.
- With no direct access to the node where a system is created and with the Alter System privilege, you can access the system properties, but you cannot make any changes. With the Access all Nodes and Alter System privileges and without direct access to the node where a system is created, you can edit the system properties.
- With the Access all Nodes privilege and without direct access to a node where a system is created, you can access the Node Properties in the menu that opens when you right-click in the Systems tab.
- You cannot bring a system online with the Bring System Online privilege and no direct access to the node where that system is created. You can bring a system online without direct access to the node where that system is created if you have the Access all Nodes and Bring System Online privileges.
- With the Access All Nodes privilege, the Create New System (Pro interface) - New Chromatographic System Wizard window displays all existing nodes, regardless of the access set in the Node properties, for both Create New System and Connect to Existing Systems options.

For more information, see the following topics in the Empower 3.8.0 online Help:

- Assigning and modifying user type privileges
- Access tab (Empower Node)

#### Notes:

- The Access All Nodes privilege is granted to the built-in Administrator user type from an earlier Empower version by default.
- After an in-place upgrade from Empower 3.7.0 or a System Object Import, the Access All Nodes privilege is granted to user types with the Administrator privilege and can be assigned to other users. This ensures that existing user types remain equivalent to those in your previous Empower version.

### Access All Systems privilege added

The Access All Systems privilege allows a user to view and access all existing chromatographic systems configured in Empower, regardless of the Allowed Access defined in System Properties. You must combine this privilege with other privileges to allow the user to perform actions on a system (alter system properties or perform system-based tasks such as bring online, take offline, delete, and create).

The addition of the Access All Systems privilege brings these changes:

- Users with the Access All Systems privilege and without the Access All Nodes privilege can see and use all systems, including those from nodes they have no access to.
- Users with the Access All Nodes privilege and without the Access All Systems privilege can see and use only the systems to which they have direct access.
- System names cannot be changed if the system is online and you do not have the Alter System privilege.
- With the Access All Systems privilege you can rename any offline system if you have access to the hosting node or the Access All Nodes privilege and the Alter System privilege.
- With the Access All Systems and Delete System privileges you can delete a system to which you have no direct access, but only if you have direct access to the node where the system is created or if you have the Access All Nodes privilege.
- With the Access All Systems, Bring System Online, and Take System Offline privileges you can bring online and take offline any system to which you have no direct access, including systems with an instrument configured into another system that is currently online but not in use.
- For an Administrator user type and for users with the Access All Systems privilege, the Export to Text option in the Nodes tab lists all available systems.
- For an Administrator user type and for users with the Access All Systems privilege, the Export to Text option in the Users tab lists all available systems.
- The Export to text User Groups file displays all available systems if at least one member of the exported group is an Administrator user type or has the Access All Systems privilege.

- Users with the Access all Systems privilege can export to text all available systems.
- An Administrator user type and users with the Access All Systems privilege can open and change systems in Walk Up even without direct access to the systems.
- AutoConnect to a default system in Walk Up interface is possible with the Access All Systems privilege and without direct access to the default system.

For more information, see the following topics in the Empower 3.8.0 online Help:

- Assigning and modifying user type privileges
- Access tab (chromatographic system)
- New Chromatographic System wizard – Access Control page

#### Notes:

- The Access All Systems privilege is granted to the built-in Administrator user type by default.
- After an in-place upgrade from Empower 3.7.0 or a System Object Import, the Access All Systems privilege is granted to user types with the Administrator privilege and can be assigned to other users.

### Access All View Filters privilege added

The newly added Access All View Filters privilege allows users to view and use all existing view filters (public and private) in Configuration Manager and within projects to which they have access. Without this privilege, you can view and use only public view filters. This privilege does not provide the ability to perform other actions on the view filters (such as save, make public, and delete).

The addition of the Access All View Filters privilege brings these changes:

- Users with the Access All View Filters privilege can see all existing filters in the list displayed in the View filter editor when trying to open, delete, save, or save as an existing view filter.
- Applying view filters now takes into consideration other privileges as follows:
  - For Configuration Manager Projects table filters – The system checks if the user has the Access All Projects privilege when a filter is applied.
  - For Configuration Manager Systems table filters – The system checks if the user has the Access All Systems privilege when a filter is applied.
  - For Configuration Manager Nodes table filters – The system checks if the user has the Access All Nodes privilege when a filter is applied.
  - For Project Window View Filters table filters – The system checks if the user has the Access All View Filters privilege when a filter is applied.
  - For Message Center Search Messages table filters – The system checks if the user has the View Message Center for All Users privilege when a filter is applied.
- Copy view filters from another project via the following methods: Create new project, Clone project, Copy/Paste option in Project window, Copy to Project option in Project window.

Private filters are copied if the new project is created by a user with the Access All View Filters privilege. All view filters from the "copy from" project can be copied by a user with the Access All View Filters privilege.

For more information, see the following topics in the Empower 3.8.0 online Help:

- Assigning and modifying user type privileges
- Customizing the display of project information using view filters
- View Filters View Fields

#### Notes:

- The Access All View Filters privilege is granted to the built-in Administrator user type by default.
- After an in-place upgrade from Empower 3.7.0 or a System Object Import, the Access All View Filters privilege is granted to user types with the Administrator privilege and can be assigned to other users.

### Changes to the Alter System and Alter Node privileges

Previously, the owner of a system or node could only be changed by an Administrator user type or by the current system or node owner. Now, you can also change the owner of a system or node if you have the Alter System privilege or the Alter Node privilege, respectively.

### Delete All View Filters privilege added

The new Delete All View Filters allows you to delete any public view filters in Configuration Manager and within projects to which you have access. Without this privilege, you can delete only your own view filters (public and private). In association with the Access All View Filters privilege, you can delete any public or private view filters in Configuration Manager and within projects to which you have access.

The addition of the Delete All View Filters privilege brings these changes:

- All pre-v4.0 view filters are restored as public view filters, so any user can edit them. Users with the Delete All View Filters privilege can delete a pre-v4.0 view filter. When a pre-v4.0 view filter is edited, the user who edited it becomes the owner.

For more information, see the following topics in the Empower 3.8.0 online Help:

- Assigning and modifying user type privileges
- View Filters View Fields

#### Notes:

- The Delete All View Filters privilege is granted to the built-in Administrator user type by default.
- After an in-place upgrade from Empower 3.7.0 or a System Object Import, the Delete All View Filters privilege is granted to user types with the Administrator privilege and can be assigned to other users.

## Manage Licenses privilege added

This privilege provides full access to the Waters Licensing Wizard and all its functionality.

## Remove System Audit Trails privilege added

The Remove System Audit Trails user type privilege allows the removal of system audit trails after the audit trails are archived. Archiving and removing audit trail records requires two users, each with the following privileges: Archive System Audit Trails, View System Audit Trails, and Remove System Audit Trails.

## View All Allowed User Types privilege added

The View All Allowed User Types privilege allows you to view the Allowed User Types column in the Users table of Configuration Manager. The Allowed User Types field displays an alphabetized, concatenated list of all of the user types allowed for a given user. This privilege does not allow any change to the assigned user types without the appropriate privileges. For example, adding or removing an allowed user type is possible only with the Assign User Types and Alter User privileges. In addition, this privilege does not grant you user-related functionality or visibility over other elevated user types.

The addition of the View All Allowed User Types privilege brings these changes:

- The Configuration Manager Users table displays all allowed user types for each user in the new Allowed User Types column. The column is visible only for users with the View All Allowed User Types privilege, in the Default view and in the View Filter functionality.
- Export to text on the User tab lists in the Export User text file the allowed user types only if the user who performs the export (the logged in user) has the View All Allowed User Types privilege assigned to their logged in user type.

Reported as CRI-3223.

## View Audit Trails privilege split

The View Audit Trails privilege is now split into the View System Audit Trails and View Project Audit Trails privileges to allow separate views of system and project audit trails.

The following functionalities are affected:

- Administrator user types now have both the View System Audit Trails and the View Project Audit Trails privileges assigned.
- In the QuickStart and/or Pro interface, when you open a Full Audit Trail project, the Audit Trails related menus are only available if you have the View Project Audit Trails privilege.
- Read Only and Process Only hidden user types have both the View System Audit Trails and View Project Audit Trails privileges assigned.
- To archive and remove system audit trails, you must have the Archive System Audit Trails, View System Audit Trails, and Remove System Audit Trails privileges.

For more information, see the following topics in the Empower 3.8.0 online Help:

- Assigning and modifying user type privileges
- Accessing the Project Audit Trail
- Archiving and removing system audit trail records

**Note:** After an in-place upgrade from Empower 3.7.0 or a System Object Import, the View System Audit Trails and View Project Audit Trails privileges are granted to user types with the Administrator privilege and can be assigned to other users.

## View Message Center for All Users changes

The View Message Center for All Users privilege is updated as follows:

- Previously, Administrator user types had the All Messages, Search Messages, and E-Mail Queue tabs available. Now, Administrator user types have the All Messages, My Group Messages, My Messages, Search Messages, and E-Mail Queue tabs available. These tabs appear for all users with the View Message Center for All Users privilege.
- For users with the View Message Center for All Users privilege, the default view in Message Center is the All Messages tab.
- For users with the View Message Center for All Users privilege, View Menu also displays entries equivalent to the All Messages, My Group Messages, My Messages, Search Messages, and E-Mail Queue tabs.
- The Immediate attention pop-up message now appears for all users with the View Message Center for All Users privilege when the pop-up box is selected on the E-Mail tab of System Policies.
- All users with the View Message Center for All Users privilege receive notifications for all the errors generated by other users.

## System Suitability harmonization changes

Empower 3.8.0 underwent the following changes in System Suitability calculations (Resolution, Plate Count, and signal to noise) that reflect the latest international harmonization efforts to Pharmacopoeia standards.

- The existing Resolution field is now calculated for all the Pharmacopoeia choices, including ChP (Chinese Pharmacopoeia).
- A new Relative Resolution field is now calculated for all the Pharmacopoeia choices, using the same formula as the Resolution field when a Relative Resolution Reference peak is defined in the processing method.
- A new Plate Number field is calculated for all the Pharmacopoeia choices, using the same formula as the JP Plate Count and EP Plate Count fields.
- The existing Symmetry Factor field is now calculated for all the Pharmacopoeia choices, including ChP (Chinese Pharmacopoeia), using the same formula as the USP Tailing and ChP Tailing Factor fields.

- The new Relative Resolution and Plate Number fields are blank in existing results.
- The Resolution, Relative Resolution, Symmetry Factor, and Plate Number fields are automatically calculated for all Pharmacopoeia choices when using either new or existing processing methods.
- The new S86-S88 (Peak) processing codes report problems with peak widths or missing Rel Resol Reference peaks.

**See also:** Topic "Interpreting processing codes" in the *Empower online Information System* for descriptions of these codes.

#### Notes:

- With both new and existing processing methods, Empower still calculates all the existing System Suitability fields using the current formulas.
- The new Relative Resolution field has the same default precision (6) and units (none) as the other resolution fields.
- The new Plate Number field has the same default precision (6) and units (none) as the plate count fields.
- The new Symmetry Factor field has the same default precision (6) and units (none) as the other symmetry and tailing fields.
- The USP and EP Half Height Multiplier for s/n Noise Region parameters are unchanged in existing processing methods.

### Method Validation Manager's Stability, Specificity, and Filter Validation tests

These parameters and result field names underwent changes that affect the Stability, Specificity, and Filter Validation tests in Method Validation Manager.

**Table 8: Modified parameters**

| Location in Empower                                                                      | Changes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Processing and Acceptance tab > Component Type table > Relative Resolution Formula field | <ul style="list-style-type: none"> <li>• The Relative Resolution field name becomes Relative Resolution Formula.</li> <li>• USP using Half Height is now the default choice.</li> <li>• The USP choice becomes USP using Tangent.</li> <li>• With the USP using Half Height choice, calculations use the new USP Resolution formula based on the width at half height.</li> <li>• With the USP using Tangent choice, calculations use the old USP Resolution formula based on the width at tangent.</li> </ul> |

**Table 9: Modified result field names**

| Location in Empower                       | Changes                                                                                                                                                                                                                                                           |
|-------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Specificity result > Relative Peaks table | <ul style="list-style-type: none"><li>• The Relative Resolution field's name becomes "Relative Resolution To Component".</li><li>• The Absolute Value of Relative Resolution field's name becomes "Absolute Value of Relative Resolution To Component".</li></ul> |

### Special note for Asian languages

In the English versions of Empower software prior to Empower 3.8.0, the field for Relative Resolution is named Rel. Resol. In the Chinese, Korean, and Japanese languages, this field is called Relative Resolution.

Starting with Empower 3.8.0, the Relative Resolution field in Asian languages is renamed to Legacy Relative Resolution. With this approach, the new Relative Resolution field has the same name in all languages.

### Enforce Single Logon for Sign Off system policy

Waters is not aware of any regulatory requirement to enforce a single logon during result sign-off. For this reason, and because electronic practices have evolved over time, Waters removed the "(ES)" designation, which previously indicated that the system policy Enforce Single Logon for Sign Off is recommended for use with electronic signatures.

Reported as CRI-5457 and INFEMP-29271.

### Waters Database Manager enhancements

Empower 3.8.0 includes Waters Database Management 4.2, which offers the following enhancements.

#### SMTP authentication and SSL/TLS encryption (CRI-2578, CRI-2712)

You can now send emails from Waters Database Manager using authentication through SMTP servers and SSL (Secure Sockets Layer)/TLS (Transport Layer Security) encryption. To enable SMTP authentication, go to **Administration > Configure SMTP Server and Port**, select the SMTP Authentication check box, and type a username and a password. To enable SSL/TLS encryption, select in the same window the SSL/TLS Enabled box and choose a certificate file to register.

#### Forever incremental backup (CRI-1326)

The 4.2 version of the Waters Database Manager supports the use of Oracle-suggested backup strategy (forever incremental backup). To schedule a forever incremental backup, go to **Backups**

> **Backup and Recovery** > **Manage Scheduled Backups** > **Schedule Backup** and select "copy incremental" from the Backup Type drop-down list.

**Note:** All other backup schedules should be disabled when you use the "copy incremental" backup type.

## Issues resolved in this release

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This section lists the problems resolved in this release. The numbers identify issues that Waters personnel monitor within a system change request tracking tool.

### INFEMP-3855

Previously, when using System Suitability summary plot with an x axis other than Run Number, the upper and lower limits of the valid range for the curve were not set correctly, causing the line to be drawn incorrectly through zero.

Now, this is fixed.

Also reported as PCS 56098.

### INFEMP-5231

Previously, when you used a processing method to background process a list that included both 2D and 3D channels, processing stopped when it reached a 3D channel, and any remaining 2D channels in the list were not processed.

Now, Empower correctly processes the 2D channels in the background processing, and processing does not stop after encountering a 3D channel.

### INFEMP-5414 (CRI-218)

Previously, when you unlocked a method and canceled the action without typing a comment, the method incorrectly unlocked. For the action, Empower recorded either no comment or a comment from a previous audit trail.

Now, you can unlock a locked method, if you have the Unlock Methods privilege, only if you type comments.

Also reported as PCS numbers 56723 and 56728.

### INFEMP-5435 (CRI-362)

Previously, in QuickStart, when you opened an instrument method, modified the method, and then clicked **Save**, the `Cannot save as <method name> is currently being edited by <user name>` error message appeared, and Empower did not save the method.

Now, if you modify the instrument method and click **Save**, it saves as expected.

## INFEMP-6984 (CRI-601)

Previously, when you restored a backed up project, all available project options became enabled in the restored project, including options not previously enabled in the project.

Now, this issue is fixed.

Also reported as PCS numbers 54503 and 48763.

## INFEMP-6987 and INFEMP-12361 (CRI-958, CRI-2141, and CRI-3364)

Previously, the summary values that appeared in report tables were incorrect when **Include Criteria in Report** was selected in the table properties and limits or acceptance criteria were set for the results in the table.

Now, this issue is fixed.

Also reported as PCS 53713.

## INFEMP-6997 (CRI-508)

Previously, in the Instrument Method Report, the W2690/5 Column Event Table incorrectly displayed a default value of 0.10 when the Function column was blank. No value should appear in the report if the Function column is blank.

Now, this issue is fixed for newly saved instrument methods.

## INFEMP-7003 (CRI-1103)

Previously, exporting and then importing *.cdf* files failed with non-uniform data and caused changes in the retention time. (Non-uniform data is data for which the data rate is not consistent throughout the file.)

Now, when the *.cdf* file is exported and then imported back into Empower, it does not change the retention time.

## INFEMP-7148 and INFEMP-7205 (CRI-1430 and CRI-1470)

Previously, when Empower Analytics ran a Manual Integration report, the manual peak count and the manual result count were incorrect, because the Group and Missing peaks were counted as manual peaks and peaks with deleted drop lines (I04 processing code) were not.

Also, results with deleted peaks (I03 processing code) were not counted as manual results.

Now this is fixed.

Also reported as PCS 53724 and 54826.

## INFEMP-7150 (CRI-1431)

Previously, when a result was in Review with the **Result Audit Viewer** (RAV) opened, if the sample information for the results channel was altered in Alter Sample, the **Result Difference** tab in the RAV was incorrectly cleared and the link between the result and the previous results was severed.

Now, this issue is fixed.

Also reported as PCS 53785.

## INFEMP-7160 (CRI-1439)

Previously, when you tried to use the target mass functionality to process a sample set with both positive and negative masses, the negative mass produced fewer results than expected when the total number of target masses was greater than 2.

Now, this issue is fixed.

Also reported as PCS 53946.

## INFEMP-7163 and INFEMP-7185 (CRI-1444 and CRI-1448)

Previously, when you reprocessed a result set using an existing integration where the sample set method had bracketing with overlap, the results for the standards that were processed twice in the original result set ended up being processed four times in the new result set.

This defect caused only duplicate standard results to be saved. It had no effect on the calibration curves or the unknown results, because before a point was added to a calibration curve, if there was a point with the same channel ID, it was removed.

Now, this is fixed.

Also reported as PCS 54108 and 54317.

## INFEMP-7187 (CRI-1450)

Previously, when using a custom field for the Impurity Response where impurity groups were present, Empower did not calculate the total impurity response for the individual impurity groups.

Now, this issue is fixed, and Empower calculates the total impurity response as expected.

Also reported as PCS 54354.

## INFEMP-7198 (CRI-1463)

Previously, blank subtraction did not work properly in process-only and acquired sample sets if the user modified the blank label or if the injection was placed on a different line in the process-only sample set.

Now, this is fixed.

Also reported as PCS 54662.

## INFEMP-7200 and INFEMP-7202 (CRI-1465 and CRI-1467)

Previously, when using the Processing Method Wizard, you were forced to type a comment when saving the method if the audit trail setting for method changes was silent mode.

Now, this issue is fixed.

Also reported as PCS 54699 and 54717.

## INFEMP-7210 (CRI-1474)

Previously, when you restored a project with custom fields from Empower 2 into Empower 3, there were rare instances where the Result Set was blank and not viewable when opened in Review. Sample Sets, Injections, and Results appeared correctly when opened in Review.

Now, this is fixed, and the Result Set displays data as expected.

Also reported as PCS 54941.

## INFEMP-7212 (CRI-1476)

Previously, in Configuration Manager, the eCord Sample Sets table might not have listed all the Sample Set rows for the selected eCord.

This happened because the number of rows to display was incorrectly used as the number of rows to search. Changing the number of rows to display increased the number of rows to search.

Now, this is fixed.

Also reported as PCS 55044.

## INFEMP-7244 (CRI-1497)

Previously, in Validation Manager, for the Specificity test, if the Processing and Acceptance Criteria for one of the Component types had the **Do Not Fault If Missing** check box selected, the Validation test status was set to test complete and the VR status had a green check mark, without the validation process for that test actually being performed.

Now, the Validation test status and the Validation result status function correctly when the **Do Not Fault If Missing** check box is selected.

Also reported as PCS 55494.

## INFEMP-7253 (CRI-1506)

Previously, when you copied custom fields to another project, if any custom field contained a space, the copy would not work consistently.

From Project properties Custom fields, you could copy any custom field to another project. However, if you opened the project and went to the **Custom field** tab, you could not copy the custom fields.

Now, this is fixed.

Also reported as PCS 56214.

## INFEMP-7289 (CRI-759)

Previously, customers reported seeing an incorrect error stating `Raw data file xxxx.dat does not match database entry`. This was generated when a data file was being read either for processing or for display while there was a temporary network communications issue.

Now, when this happens, the error reported in the message center is `Unable to read from raw data file 'xxxx.dat'`.

## INFEMP-7306 (CRI-1122)

Previously, the QuickStart interface recorded method revision history using the names of other types of methods that were being edited at the same time.

Now, when you save or modify a method, the revision history is saved as expected.

## INFEMP-8357 (CRI-1762)

Previously, when the process of cloning a parent and its sub-projects was interrupted, the system audit trail may have incorrectly indicated that the cloning was complete, but there was no audit trail record indicating that the parent project was cloned. If this occurred, you needed to delete any projects that were cloned during the interrupted cloning process and start the cloning process again.

Now, this issue is fixed. New Started Clone information messages are now written to the Message Center at the start of the cloning process, and new Completed Clone information messages are now written to the Message Center at the end of a successful cloning process.

If there are issues cloning a project, there is a new dialog box that appears when cloning fails, and new Error messages are written to the Message Center.

Also reported as PCS 53097, 55814.

## **INFEMP-10899, INFEMP-19912, and INFEMP-20914 (CRI-1320, CRI-1746, and CRI-3945)**

Previously, if you modified the list of default Result Signoff 1 strings so that there was a default string that started with the same text as a string lower in the list, then when the System Policy dialog was reopened and the Result Sign Off tab's Valid Sign Off Reason(s) list box was reopened, all the strings below the modified string that were substrings of the modified string were automatically unchecked in the Signoff 1 list. For example, if the strings Test11, Test1, and Test were already in the list of valid Signoff 1 strings and the string Test111 was added at the top of the list, the substrings Test11, Test1, and Test were incorrectly unchecked in the Signoff 1 list when the System Policy dialog was opened.

Also, you were previously able to modify (or delete) a default string that was listed as a valid reason for level 1 sign-off, causing issues when attempting to use the modified or deleted string when signing off at level 1.

Now, these issues are fixed. If you attempt to modify or delete a default string that is a valid reason for level 1 sign-off, the following message appears:

`Cannot modify (or delete) this string because it is a valid reason for level 1 sign off.`

`To modify (or delete) a default string that is listed as a Valid Sign Off Reason, a privileged user must first open the Result Sign Off tab in System Policies and remove the string in the Valid Sign Off 1 Reasons list box.`

Also reported as PCS 41977, 42597, and 53948.

## **INFEMP-10911 (CRI-1768)**

Previously, when more than one user were connected to a system, the changes made during an acquisition by any user were recorded in the project audit trail as being done by the user who initiated the sample set.

Now, the project audit trail records the changes for the correct user, and the changes are intentionally logged in the Message Center for the user who started the acquisition. This is intended to alert the initiating user to changes made to the sample set by other users.

## **INFEMP-10934 (CRI-1983)**

Previously, locking or unlocking a method updated the lock status, but it incorrectly changed the Method Modified User for all versions of the method.

Now, this issue is fixed

## INFEMP-11386 (CRI-705)

Previously, when background processing multiple large 3D data files, the error message `Not Enough Memory to Process Command` may appear.

Now, this issue is fixed.

Also reported as PCS 54642 and PCS 55352.

## INFEMP-11988 (CRI-1310)

Previously, in Review, clicking **Apply** or **OK** in the MS 3D Subtraction dialog box correctly created a new MS 3D channel, but then Review incorrectly reapplied the method set to the original channel. This caused the new baseline subtracted channel to be deleted.

Now, clicking **Apply** or **OK** in the MS 3D Subtraction dialog box properly creates the new 3D MS channel and processes it to extract a 2D channel.

## INFEMP-12114 (CRI-2151)

Previously, when creating a method set using the Method Set Wizard, in a Full Audit Trail Project where method comments are required, while on the Name Method Set page, if the user clicked in another application outside the Method Set Editor before completing the method and audit trail comments, they would be stuck in an endless loop of the message `A comment is required when Full Audit Trail is enabled`. The user could not exit the application or perform any other operation. The only option was to use Task Manager to end the application.

Now, this issue is fixed.

## INFEMP-12211

Previously, for projects with the GPC or the GPC and GPC/LS options enabled, the Type drop-down list in the View Filter Editor does not include the Molecular Weight Distributions option.

Now, the **Type** drop-down list in the View Filter Editor includes the Molecular Weight Distributions option.

## INFEMP-12360 (CRI-2248)

Previously, for RF Internal Standard samples with Timed, Named, and/or Impurity Groups, the %Area and %Height values were incorrectly calculated for both single and group peaks.

Now, this issue is fixed.

## INFEMP-12448 (CRI-2703, CRI-2708)

Previously, the functionality used for alerting users to new error messages in the Message Center (via the icon turning red) did not work.

Now, this is fixed.

## INFEMP-12606 (CRI-2718)

Previously, while background processing, if a peak was faulted due to an acceptance criterion with "ignore null values" disabled and an inter-sample formula as its left side, summarize **Custom** fields correctly cleared the **Peak Faults** flag, but failed to clear the **Result Faults** flag when there were no longer any faults in the result.

Now, this is fixed.

## INFEMP-12620 (CRI-2590)

Previously, if a sample set method was copied into another project and the destination project contained sample Custom Fields with no default values, the blank default values in the sample Custom Fields incorrectly changed to zero.

Now, this issue is fixed.

## INFEMP-13317 (CRI-2815)

Previously, if an already superseded result was processed (without calibration) in Review and saved, all the results for that results channel were superseded.

Now, this is fixed and the last result saved for the channel is no longer superseded.

## INFEMP-13451 (CRI-2635)

Previously, you could not export data when acquiring data with the Run and Report option.

Now, you can use the Run and Report option to export data.

## INFEMP-13452 (CRI-2116, CRI-3432, and CRI-3472)

Previously, for a quantitated unknown peak named using the "RT Reference Used to Name Unnamed Peaks by RRT", the peak was incorrectly quantitated by default, using the peak used to name the peak instead of the Default peak.

Now, this is fixed and the Default peak is used to quantitate the unknown peak.

## INFEMP-14724

Previously, when you selected rows in a sample set to run in random or reverse order, the sample rows were always run in their order in the sample set method, not in the order in which they were selected.

Now, this issue is fixed.

## INFEMP-14907 (CRI-3095)

Previously, you were unable to create a peak custom field with the formula YValue[Baseline Start].

Now, this is fixed.

## INFEMP-15463 (CRI-2094)

Previously, in Citrix environments, when you saved a PDF copy of a report generated in Report Publisher to the destination folder, the PDF took longer to save than in previous versions of Empower software.

Now, the Microsoft Print to PDF driver replaces the Waters UNIFI Printer in Empower and the time to save a PDF report to the destination folder in Citrix environments is reduced.

## INFEMP-16621 (CRI-2225)

Previously, when using Impurity processing with Expected mass and RRT, for RRT peaks with retention times after a found impurity peak, the **Expected Mass Found** fields for RRT peaks with retention times after a found impurity peak were incorrectly set to Not Found and faulted.

Now, this is fixed.

## INFEMP-17721 (CRI-3413)

Previously, when a formula or symbol was added to a formula containing Japanese characters, the Japanese characters became garbled and the formula could not be used.

Now, this issue is fixed.

## INFEMP-18224 (CRI-2792)

Previously, when using the ApexTrack integration algorithm, users were unable to manually integrate peaks after a missing peak. They could perform manual integration to the left of the missing peak but not to the right.

Now, this issue is fixed.

## INFEMP-18311 (CRI-3642)

Previously, in Empower, Oracle SQL Developer was incorrectly installed in the Oracle19c Home with its own version of Java.

Now, this is fixed, and sqldeveloper.exe is no longer deployed with an Empower installation.

## INFEMP-18344 (CRI-493)

Previously, when you did not have the Save Processing Method privilege enabled but did have the Modify Integration Parameters, Modify Component Times, or Modify Component Constants/Default Amounts privilege, you could incorrectly click **Auto Peak Label** on the Components tab of processing methods, modify the peak label, and then save the processing method.

Now, this is fixed and Auto Peak Label is disabled when you do not have the Save Processing Method privilege.

## INFEMP-18444 (CRI-3625)

Previously, when you added an Inject line to a sample set method in Run Samples, Empower mistakenly updated the last label in the label reference of the **Calibrate** or **Quantitate** line directly above the added Inject line.

Now, this is fixed.

## INFEMP-18588 (CRI-3568)

Previously, when using a toolkit application with Empower, an audit trail similar to `Modified project -> Modified file Space Free 0,00 -> 28529,68` was sometimes incorrectly recorded.

Now, this is fixed.

## INFEMP-18735 (CRI-3708)

Previously, when you altered an injection or channel that was acquired as part of a sample set, the samples were correctly indicated as altered; however, the sample set altered flag did not indicate the sample set as altered.

Now, this is fixed.

Also reported as PCS 56713.

## INFEMP-19161 (CRI-3787)

Previously, if the connection to the database was lost while Empower was updating project information, the information about the project was lost, causing the project to be inaccessible.

Now, this is fixed.

## INFEMP-19372 (CRI-3390 and CRI-5478)

Previously, if a user logged in to Empower from multiple nodes and then logged out of one of the nodes, Empower may not have recognized or processed the successful logoff event and considered that connection still active. This could prevent the user from being able to perform Sign Off if the **Enforce Single Log On for signoff** system policy was enabled.

Now, this defect has been addressed.

## INFEMP-19445 (CRI-3870)

Previously, in Empower, the LAC/E Reboot command did not work if the **Node Name** field was not in the first column in the Node view.

Now, this is fixed.

## INFEMP-19882 (CRI-2502 and CRI-2071)

Previously, the MessageCenter.exe memory utilization could climb to the point where the Citrix server had no available RAM, Empower users with current sessions experienced poor performance, and some users could not log in.

Now, this is fixed.

## INFEMP-20045 (CRI-3963)

Previously, if the System Policies setting "Don't allow user to change default 'Require User Comments On' setting" was enabled, users could not see the status of the **Confirm Identity** fields when creating a new project.

Now, this issue is fixed.

## INFEMP-20064 and INFEMP-21628 (CRI-3997)

Previously, if you did not have the Restore Projects privilege, you could still restore an Empower project using the Restore Pre 3.0 Library option.

Now, the restore privilege is verified for both Restore projects and Restore Pre 3.0 Library options.

## INFEMP-20259 (CRI-3926)

When performing an installation of Empower on a Linux server, if you do not enclose the path arguments in single quotes, the script "fillemPOWERdb.sh" fails and the failure messages are not helpful.

**Solution:** The path arguments must be enclosed in single quotes.

## INFEMP-20558 (CRI-4061)

Previously, when a method was locked or unlocked, the User Type was not included with the Username in the **Method Modified User** field.

Now, this is fixed, and the User Type is included.

## INFEMP-20568 (CRI-3757)

Previously, when you added a component name with a blank purity value in the **Component Amounts** table, the blank purity value was considered to be a purity of 100. The processing ignored the purity value in the **Default Amounts** table and processed the component using a purity of 100 instead of the purity value in the processing method.

Now, this issue is fixed.

## INFEMP-20692

Previously, when a method was saved, the User Type was not always included with the Username in the **Method Modified User** field in Project Properties.

Now, this is fixed.

## INFEMP-20695

Previously, the Method Properties dialog box, Revision History displayed all versions of a method instead of only the revision history of the selected version of the method.

Now, this is fixed.

## INFEMP-20918 (CRI-3887)

Previously, when there were multiple instruments of the same type in a system, the shutdown method was only downloaded to the first instrument of that type.

Now, this is fixed.

## INFEMP-21177

Previously, when using **Save As Current**, the **Method Modified User** field was not updated with the User name and User Type of the user who saved the method as current.

Now, this is fixed.

## INFEMP-21606 (CRI-4158)

Previously, in Review, when you modified a specific workflow involving relative acceptance criteria in the processing method and then manually calibrated or quantitated a previously saved result, the relative acceptance criteria in the processing method was modified without the processing method being saved.

Now, this is fixed.

## INFEMP-21839 (CRI-1163)

Previously, when copying a method into a project where a method with the same name and same method type existed, a message appeared to inform the user about the existing method and confirm that they wanted to proceed and overwrite the method and all of its versions. If the user proceeded with the deletion of the original method, its versions were not audit trailed.

Now, the audit trail includes entries for the deletion of all versions of the method.

## INFEMP-21983 (CRI-4278)

Previously, in the method history for a cloned project, Empower incorrectly appended the user type of the user performing the cloning to all pre-existing method history entries that were missing a user type.

Now, this is fixed.

## INFEMP-22067

Previously, when running SQT for software in a client server environment, an Administrator user who had no access via the Node properties could not generate reports containing the Software Qualification report group.

Now, this issue is fixed and the Software Qualification report group displays node information when used by any user with access to at least one node (Direct Access or Access all Nodes privilege).

## INFEMP-22160

Previously, at login to the Walk-up interface, a user without access to any system was not notified that they had no access.

Now, a message informs the user that they have no access.

## INFEMP-22226

Previously, when using the Walk-Up interface, an Administrator with no direct access to any systems in the Walk-Up interface could not access any systems.

Now, an Administrator or a user with the Access All Systems privilege can access all the systems when using the Walk-Up interface.

## INFEMP-22732 (CRI-4316)

Previously, when running a report in Empower Analytics, the reports for the Reprocessing Analysis and the Number of Injections per System values displayed incorrect results.

Now, the reports display correct results.

## INFEMP-22757

Previously, in View As, the **Audit Records** for **Custom Fields** could appear when they should not or not appear when they should. For the former, the Audit Records were correctly not displayed; when the user selected the menu, the `Encountered improper argument` message appeared.

This happened only when, on the Project Properties **Access** tab, multiple groups were selected within the **Allowed Access to Groups** area and the Group or World User Type setting was a value other than **User's Own Type**.

Now, in this scenario, access to the Audit Records based on User Type is correct.

## INFEMP-22823 (CRI-2368)

Previously, when you used the Manually Identify Peaks function, if multiple peaks were manually identified, only the last identified peak was labeled as expected with a Peak Code of Q15 or Q16. The prior peaks were not given the Q15 or Q16 Peak Codes and were not labeled as manually identified.

Now, this is fixed.

## INFEMP-22962 (CRI-2839)

It is normal Empower software behavior to not record a username in the Audit Trail when a sample set abort happens due to an instrument failure, a loss of communication, or a user action at the instrument level. To better discriminate between the types of aborts, Empower now records "User Abort" for an abort action initiated by the user in Run Samples and "Abort" for abort actions that are not initiated by the user. This information is displayed as the Reason within the Details column of the Project Audit Trail record.

Furthermore, to alert the current user about the sample set abort issue, a Message Center message includes the username of the user who initiated the acquisition, but this does not indicate or imply that the same user initiated the abort.

## INFEMP-23111 (CRI-4386)

Previously, when the Oracle Listener Log files became too large, database issues occurred.

Now, this is fixed. The listener file size and number of log files are set at installation. After the file reaches the specified file size of 10 MB, the file is renamed, a new log file is created, and the oldest log files are deleted after the limit of 30 files is reached.

## INFEMP-23374, INFEMP-23375, and INFEMP-23376 (CRI-4464, CRI-4456, and CRI-4454)

Previously, in Empower, when you selected multiple nodes, plate types, or user groups for deletion, you could delete all or delete one by one. If you chose **Yes to All** but then canceled the comments, the deletion continued for all but one node, plate type, or user group.

Now, this is fixed, and if you attempt to delete multiple nodes, plate types, or user groups but then cancel the comments, this cancels the deletion for all nodes, plate types, or user groups.

## INFEMP-23513 (CRI-4390)

Previously, peak and/or calibration curve related fields were incorrectly included in the Component Summary group in Report Publisher.

Now, this is fixed and peak and/or calibration curve related fields cannot be included in a Component Summary group.

## INFEMP-25110

Previously, when you copied a custom field using **Save to Project** in the Project Properties window, there was no Audit Trail entry to verify that you copied the custom field into the target project if the custom field already existed in the target project.

Now, when a custom field is copied to a target project where the custom field already exists, a `Modified Custom Field` entry is added to the Audit Trail in the target project if the copied custom field differs from the existing custom field. If there is no difference in the copied custom field, a message similar to the following will appear: `Custom field was not copied because it is the same as a custom field already in the project.`

## INFEMP-25143 (CRI-4400)

Previously, Clear Calibration did not work properly when processing sample sets created from imported data, and the System field in the Calibration Curve window was empty.

Now, this is fixed.

## INFEMP-25144 (CRI-4614)

Previously, when you processed a result set, modified the sample name associated with one of the results in the result set, and then took the result set into Review, the modified name appeared incorrectly in the tree.

Now, this is fixed.

## INFEMP-25747

Previously, when using “Copy to Project” to copy a custom field to a project that contained a locked custom field with the same name, the locked custom field was incorrectly overwritten.

Now, this is fixed, and copying a custom field to a project will not proceed if a locked custom field by the same name exists in the destination project.

## INFEMP-26495

Previously, when you set up Relative Acceptance Criteria on a **Validation Data** type field comparing it to a **Validation Summary** type field, the wrong Summary value might have been used in the comparison when the validation result contained multiple summary points.

Now, this is fixed.

## INFEMP-26517 (CRI-4810)

Previously, it was possible for two Empower projects to be assigned the same Raw Data directory.

Now, Empower ensures that all projects are assigned a unique Raw Data directory.

## INFEMP-27341 (CRI-5016)

Previously, when you logged in with a user type other than the default user type, any changes you made to custom fields were incorrectly recorded in the Project Audit Trail with the default user type instead of the logged in user type.

Now, this is fixed, and the user types are recorded correctly.

## INFEMP-27535 (CRI-4260)

Previously, if you wanted to adjust the intensity level for the Spectrum Index and Mass Analysis Plots in Report Publisher, you could automatically display the spectra for integrated peaks but not the lower intensity *m/z* spectra for the isotopes and adductions.

Now, this issue is resolved, and you can adjust the Spectrum Index and Mass Analysis Plots to display lower intensity  $m/z$  spectra.

### INFEMP-27598 (CRI-5060)

Previously, when you copied a Sample Set Method to another project, the Method Sets associated with special functions like Condition Column, Equilibrate, Sys Prep, Wash Needle, and others were not copied into the destination project.

Now, this is fixed.

### INFEMP-27837 (CRI-4972)

Previously, the software version listed in Help, About, Install Log, Verify Files, and elsewhere was not updated for each new release of Empower.

Now, this is fixed and the software version listed in Empower functionalities like "Empower 3 Software Build 3471" are updated to reflect the correct software version (3.8.0) and build number.

### INFEMP-27843 (CRI-5000)

Previously, when the processing method had a **RT Reference** and a **Rel RT Reference** defined, Review stopped working if you selected **Manually Identify Peaks**.

Now, this is fixed.

### INFEMP-27844 (CRI-4645)

Previously, when using an existing integration, some versions of the processing method were incorrectly used to reprocess the results in a result set. If the history of the processing method was branched, there were methods that descended from the result set's processing method in more than one branch.

Now, this is fixed.

### INFEMP-28168 (CRI-5049)

Previously, when using ApexTrack integration, the ApexTrack integration could stop working if the processing method contained a Set Peak Width integration event at the end of the chromatogram with a value many times higher than the auto-calculated peak width value.

Now, this is fixed. However, the recommended range for the Peak Width is between 1/2 and 2 times the auto-peak width value that Empower calculates.

## INFEMP-28675 (CRI-4569)

Previously, project backup could fail and the error message `EXP-00008: ORACLE error 600` encountered would appear.

**Note:** This was due to invalid objects in the database.

Now, during the installation of Empower, Deployment Manager checks for, and attempts to fix, any invalid objects. If any invalid objects remain after the installation, a message appears and directs the user to the location of a log file that can assist Waters support in addressing the issue.

## INFEMP-28906 (CRI-5314)

Previously, in Empower, the checksum.txt file generated during an installation was not updated correctly. For example, the copyright and LAC/E name were not up to date.

Now, this is fixed.

## INFEMP-29027 (CRI-5076)

Previously, when reporting an individual result that was not part of a Sample Set or Result Set, if the report included the **Sample Set Method Group**, which includes reporting a component table, the report did not include the Component table.

Now, this is fixed and the same report includes the Component table.

## INFEMP-29104 (CRI-5167)

Previously, in Review, saving a processing method and copying the calibration curve resulted in a saved calibration curve with a calibration point that was associated with a result that was not in the database.

Now, this is fixed, and if a calibration point's standard result is not in the database, the following message appears:

Cannot copy the calibration curves, because unsaved results generated additional calibration points that are not yet associated with the existing calibration.

Save all results before you save the processing method using the 'Copy curves' option.

## INFEMP-29553 (CRI-5479, CRI-5591)

Previously, when a user logged in with a user type other than the default user type and created an MVM validation study in a validation working project based on a Validation Protocol Method within a validation template project, the user type indicated in the title bar of the Validation Manager window was the default user type rather than the logged on user type. Additionally,

the resulting audit trails for the Copied Method, Created Validation Study, and Created Method actions were appropriately attributed to the intended user, but incorrectly attributed to the default user type rather than the logged on user type.

Now, this is fixed.

## INFEMP-29628 (CRI-5531)

Previously, when a user logged in with a user type other than the default user type and created a project and chose the option to copy methods, custom fields, and preferences into the new project during project creation, the Audit Trails for the copied objects listed the default user type instead of the logged in user type.

Now, this is fixed.

## INFEMP-30384 (CRI-5535)

Previously, starting with Empower 3.6.0, the legacy backup scripts cs\_cold\_gen.bat and cs\_hot\_gen.bat produced incomplete backups and should have been removed from the \Empower\Script directory.

Now, this is fixed and the scripts have been removed.

## INFEMP-31333

SYS users cannot be locked in Waters Database Manager. Previously, the error message that appeared when you tried to lock the SYS user was not explicit. Now, the error message correctly states `Cannot lock the user SYS, this is not supported by Waters.`

## INFEMP-31334

Previously, in Waters Database Manager, when you clicked **Server > Tablespaces > Manage Datafiles**, and then selected the Create OMF datafile option, a Filename text box appeared indicating that you could type a name for the datafile when, in fact, Oracle creates the OMF datafile name.

Now, when performing the same steps, the Filename text box no longer appears.

## INFEMP-31335

Previously, in the Waters Database Manager, the APEX\_PUBLIC\_USER user had the Default profile assigned and the password for this user expired in 180 days.

Now, the APEX\_PUBLIC\_USER has the EmpowerDefault profile assigned and the password no longer expires in 180 days.

## INFEMP-31336

It is no longer possible to alter the APEX\_PUBLIC\_USER user in the Waters Database Manager.

## INFEMP-31337

Now, when you set Oracle user passwords in the Waters Database Manager, you can only use these characters: a-z, A-Z, 0-9, and the ~!#\*\_+{}:?. special characters.

## INFEMP-31760

Previously, in Run Samples and QuickStart, for sample sets with an injection volume exceeding the instrument's maximum allowed range, the tooltip message did not correctly reflect that the injection volume was outside the allowed range.

Now, this is fixed.

## Known issues in this release

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This section lists the known issues and solutions for this release. The numbers identify issues that Waters personnel monitor within a system change request tracking tool.

### INFEMP-5474 (CRI-466)

When you rename a Sample Set or modify a Sample Set custom field associated with the sample set, instead of versioning the Sample Set, Empower software incorrectly creates a new Sample Set with a new ID.

Also reported as PCS numbers 56686, 54069, 53506, 53433, 54487, 54947, 54698, 55905, 56713, 56710, 56335, 55851, 56499, 53560, 56034, and 56683.

### INFEMP-8221

In the Japanese version, in Run Samples, when using the In-Needle Auto Additions editor, if a user specifies incomplete information in the Vial or InjVol column, the system correctly displays the Entry in row %d is incomplete. Enter a valid location and a volume message. However, the error message incorrectly refers to the %d rather than indicating the row number that is incomplete. Due to an error in translating the message, the %d value is not converted into the row number.

## INFEMP-10862 (CRI-691)

In the Review window, for 3D PDA data, when "Multiple Lambda Max" is selected for extracted chromatograms, some lambda max labels are missing from the Spectrum Index window.

## INFEMP-11774

In the Chinese, Japanese, and Korean versions, when you launch the Waters Email Service installer, some text does not display correctly because the following translation is missing:

"The installer starts the Waters Email Service on this computer. You must double-click the **Manage Waters Email Center** shortcut, which is created by this installer in order to configure the Waters Email Service on your Empower computer. If you want to continue, press Install, otherwise press Cancel."

## INFEMP-13017

In the Korean version of Empower software, when you type the Group Name in the New User Group dialog field, the first letter of the second character overwrites the first character and the following error appears:

`Enter a value for this field or press ESC to refresh.`

**Workaround:** Type the user group name in a text file, copy, and then paste the user group name into the Empower Group Name field.

## INFEMP-15114

During the Empower installation, Verify Files produces an initial checksum.txt report. If Verify Files is then executed by the user after the system reboots, Verify Files incorrectly overwrites the initial report with a new time-stamped report, causing both checksum.txt and checksum\_timestamp.txt to contain the same information.

## INFEMP-15722

When you edit an instrument method for an Alliance system and modify an existing gradient table by changing values in random or backward order of columns, Empower software removes values in any unedited columns and replaces recently edited values, auto-populating them with values that autosum to 100%.

**Tip:** When populating the gradient table, methodically edit the gradient table in a left-to-right, top-to-bottom fashion.

## INFEMP-18221 (CRI-1098)

When you manually integrate a smoothed derived channel with the smoothing parameters specified in the processing method, the system recreates the derived channel and deletes the

peaks. The same issue occurs if you manually integrate a derived channel with a time offset specified in the processing method.

**Workaround:** If you need to do a manual integration, specify the smoothing and/or time offset parameters in the derived channel, not in the processing method, or in the 2D channel table in Review, which also edits the smoothing and/or time offset parameters in the processing method.

## INFEMP-18589 (CRI-3668)

In Report Publisher, when you sign off at level 2 on a result with **Lock channels after Sign Off** selected, you are prompted for a sample information comment associated with the lock channels action. If you click **Cancel**, the sign-off continues, but the channels do not lock. You also may need to select **Cancel** several times for the dialog box to close and the sign-off to continue.

**Recommendation:** Do not press **Cancel** after you initiate the sign-off.

Also reported as PCS 51590.

## INFEMP-20175 (CRI-3168)

In Empower software, when you use the **Export Method Editor** to export data or results, the export method fails if the Sign-off table is included in the report method.

## INFEMP-20733 (CRI-3024)

Starting with Empower 3 SR3, when using Waters or third-party instruments controlled via Ethernet, IEEE, or RS-232 communication protocols, an instrument failure may occur with one or both of the following error messages in the Empower Message Center:

- Instrument Failure - Failed at the end of run

**Workaround:** Inspect the voltage on the CPU board, remove the instrument LAN bridge, and use an external switch to connect the instrument modules.

- Instrument Failure - End of run wait timed out at xxx.x seconds. No reply from [Module Name]#xxxxxx

**Workaround:** Exclude Waters instruments from the firewall, and do not push group policy during acquisition.

This problem typically occurs when multiple channels are acquired for each injection, especially when one of the channels acquired is a pressure channel from the pump. The resulting Injection and Channel statuses for the affected data may appear as `Instrument Failure` and `No Data Acquired`, respectively.

Data that was successfully acquired in the same sample set may appear with the statuses `Instrument Failure` and `Acquisition Finished`.

## INFEMP-20904 (CRI-4083)

When you click Alter Running Sample, a message indicates that the acquisition is paused until you abort the run or click Run. However, acquisition resumes without user interaction about three hours after clicking Alter Running Sample.

## INFEMP-20947

You cannot open or preview a report method in the NuGenesis LMS Empower browser.

**Workaround:** For each project you use in the NuGenesis LMS Empower browser, manually create an empty export method named `ELN_Report_Export` in Empower.

## INFEMP-21174

When you configure a Red Hat 8.0-based Oracle database for the Chinese or Korean version of Empower 3.8.0 via the *fillemPOWER.sh* script, Empower software does not correctly parse localized characters, and you cannot log in with the system user account.

**Workaround:** Create and configure the database as indicated in the *Empower 3.8.0 Installation, Configuration, and Upgrade Guide* (715008196), establish a connection from an Empower Client/Microsoft Windows OS, and, while connected to the Red Hat-based Oracle database, do the following:

1. Execute the *fillemPOWERdb.bat* provided on the Empower 3.8.0 media at `~\AdministratorScripts\Windows`.
2. Use a sysdba connection and execute the *MakeExternalTablesDir.sql* provided on the Empower 3.8.0 media at `~\AdministratorScripts\Linux\AdministrativeScripts.zip`.

## INFEMP-22074

When a node has a password set in the properties and SQT is run for that node (in a personal or an enterprise environment), the **Installation Qualification SQT** reports show **No** instead of **Yes** in the **Password required** field.

## INFEMP-25984 (CRI-4753)

With a configuration of e2695, 2489, and eSAT/IN, if you create the instrument method in the 2489, no parameters appear and the instrument method is blank.

If you then select the eSAT/IN and Alliance system parameters, the `MFC Application Error` appears and the window closes.

**Workaround:** Add the instruments to the method in the reverse order.

## INFEMP-26626 (CRI-4867)

Starting with Empower 3 SR3, when you drag and drop data acquired prior to Empower 3 SR3 into an Empower project, the application sets the Injection Status to "Instrument Failure" instead of "Pre-Empower 3 SR3".

The project restore feature does not present this issue. It correctly sets the expected Injection Status to "Pre-Empower 3 SR3" for data in projects restored from a version prior to Empower 3 SR3.

**Workaround:** To confirm that it was truly an instrument failure, report the data using an **Acquisition Log** report group. Empower reports actual instrument failures at the end of the log.

## INFEMP-27597 (CRI-5048)

In Configuration Manager, if you perform a Project Integrity check on a project that contains one or more badly formed data files, Configuration Manager stops working.

This affects Project Integrity checks that happen during project backup and restore and those that are initiated manually.

Because the Integrity check also happens before the project backup, the project cannot be backed up.

## INFEMP-28170 (CRI-5141)

If data consisting of multiple injections from the same vial was buffering, and then during data recovery there was a momentary database connection issue, it is possible that one or more replicated injections are not viewable in the sample set.

However, when viewing the sample set as injections, only the first injection from the vial is present. The second injection from the vial appears to have lost its association with the sample set, even though both injections have the same Vial ID.

## INFEMP-28318 (CRI-4962)

View Filter names allow more than fifteen two-byte Japanese characters. This results in the name ending with a dot symbol. You cannot edit or delete this view filter.

Empower limits View Filter names to thirty single-byte characters.

**Workaround:** Limit your View Filter names to thirty single-byte or fifteen two-byte characters.

## INFEMP-30731

WDM does not install if the Group Policy setting from **Computer Configuration/User Configuration > Administrative Templates > Windows Components > Windows PowerShell > Turn on Script Execution > Execution Policy** is "Allow only signed scripts".

**Workaround:** Set the Group Policies to "Allow all scripts".

## INFEMP-31868

With Empower 3.8.0 and an Alliance iS HPLC system, in the Walk-Up interface, the "Run Samples Only" and "Run Samples Using A Template" run modes do not prevent exceeding the system's maximum allowed injection volume of 50 µL. This leads to instrument failure.

## INFEMP-31886

Starting with NuGenesis SDMS 9.3.1, Empower fails to connect to SDMS because this requires an endpoint with a dedicated port, a type of connection that Empower does not support.

## INFEMP-32328 (CRI-6115)

If Empower 3.8.0 has the "Don't allow user to change default 'Require User Comments On' settings" system policy enabled, all newly created projects will have Comments set to Silent and No Confirmation of Identity for all objects, regardless of the default settings displayed during project creation.

This issue does not affect the following projects:

- New projects created by the cloning process
- Existing projects and restored projects
- Projects that Empower updates by an in-place upgrade from Empower 3.7.0 to 3.8.0

[Waters Knowledge Base article WKB265525](#) summarizes this issue.

### **Workarounds:**

- Disable the setting "Don't allow user to change default 'Require User Comments On' settings" on the New Project tab in System Policies and, if necessary, implement a procedural control on new project creation that advises users not to change the new project default settings until a fix is available and the setting can be re-enabled.
- Clone from a project known to have the expected project-level Comment and Confirm Identity settings, because this behavior does not affect cloned projects.

## INFEMP-33551 (CRI-6364)

In Empower 3.8.0 and 3.8.0.1, the use of LDAP Authentication disallows the creation of user accounts with less than four characters in the username.

## INFEMP-33596 (CRI-6331)

With the following system configurations, Empower 3.8.0 software reports an instrument failure that prevents acquisition:

- Waters 2414 Refractive Index (RI) detector connected to an Alliance iS HPLC system and running in W410 emulate mode

### Notes:

- This issue does not impact systems when the 2414 detector runs in native 2414 mode.
- The Alliance 2414 SQT (System Qualification Tool) projects are configured to use the 2414 detector in emulate W410 mode and, as a result, the SQT version cannot be used with Empower 3.8.0.
- Agilent 6890 GC system running without Instrument Control Framework (ICF) Support Layer
- Waters systems with an Alliance 2695 installed (and no other instruments installed in the system)

**Note:** Systems that contain a module that uses an external ICS (Instrument Control Software) driver are not impacted, except for an Alliance HPLC Instrument, which uses a combination of ICS and embedded drivers.

**Workarounds:** If you are planning an Empower software upgrade to Empower 3.8.0 and your environment includes chromatographic systems listed here, consider the following:

- Do not migrate the affected systems to Empower 3.8.0. Retain an environment of your previous Empower software version and continue to use the affected systems on the older version.
- Evaluate whether you can use the 2414 RI detector in native 2414 mode, rather than emulate W410 mode. You can qualify the 2414 RI detector in native mode using the Empower 2414 Qualification Workbook. Note that running in native mode causes a change in detector response compared to running in emulate W410 mode.
- Configure Agilent 6890 GC systems to run via ICF Support Layer.

## INFEMP-34938

When you acquire data in Run Samples using Interactive System Suitability, the number of reinjections that you set in Reinject on Fault mode is not applied in systems configured with more than one module.

Further, the reinjection limit you set does not take effect, and Empower software stops all acquisition even if the maximum number of reinjections on fault is not reached. All queued

samples and sample sets do not continue. If a shutdown method is in place before the sample set is started, after acquisition stops, the shutdown method runs. If there is no shutdown method in place before acquisition begins, the pump continues at the initial instrument method flow rate.

**Important:** Alliance iS HPLC systems are configured as one module in Empower software and work as expected when you do not configure additional detectors.

## Test configurations

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This application update was tested on the following system configurations.

### Empower File Server

#### Microsoft Windows Server 2019 Standard

Microsoft Windows versions and hotfixes

| Microsoft OS version       | Microsoft hotfixes                                                                                                                                                                                                                                                                      |
|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 10.0.17763 N/A Build 17763 | KB5008873,KB4535680,KB4549947,KB4570332,KB4577586,KB4587735,KB4589208,KB4598480,KB4601393,KB5003711,KB5009557,KB5008287,KB5005701,KB5022511,KB4558997,KB4566424,KB5003243,KB5005112,KB5012170,KB5022840,KB5015896,KB5020374,KB5010351,KB5009642,KB5005114,KB4580325,KB5023702,KB5023789 |

#### Microsoft Windows Server 2022 Standard

Microsoft Windows versions and hotfixes

| Microsoft OS version       | Microsoft hotfixes                                                                                                                |
|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| 10.0.20348 N/A Build 20348 | KB5020877,KB5012170,KB5014856,KB5022291,KB5020373,KB5017028,KB5017381,KB5017399,KB5022507,KB5025230,KB5025314,KB5014858,KB5014831 |

### Empower Server

#### Windows database server

#### Microsoft Windows Server 2016 Standard

Microsoft Windows versions and hotfixes

| Microsoft OS version       | Microsoft hotfixes                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 10.0.14393 N/A Build 14393 | KB4049065,KB4494175,KB4535680,KB4550994,KB4562561,KB4565912,KB4576750,KB4601392,KB5001078,KB5011570,KB4601318,KB3186568,KB3192137,KB3199986,KB4035631,KB4093137,KB4132216,KB4465659,KB4498947,KB4509091,KB4540723,KB4589210,KB5001402,KB5005698,KB5011495,KB4091664,KB4598243,KB5020873,KB4486129,KB5012170,KB5017396,KB5021235,KB5017095,KB4541329,KB5014026,KB5019964,KB5016058,KB5015808,KB5016622,KB5009546,KB5007192,KB5003197,KB5006669,KB5010359,KB4485447,KB5012596,KB5010790 |

### Microsoft Windows Server 2019 Standard

Microsoft Windows versions and hotfixes

| Microsoft OS version       | Microsoft hotfixes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 10.0.17763 N/A Build 17763 | KB5008873,KB4494174,KB4535680,KB4549947,KB4558997,KB4566424,KB4570332,KB4580325,KB4462930,KB4537759,KB4561600,KB4587735,KB5005112,KB5011503,KB5009642,KB5009472,KB5016623,KB4577586,KB4589208,KB5014692,KB4598480,KB5003711,KB5009616,KB5008287,KB5005114,KB5000859,KB5003243,KB5006754,KB5005701,KB4601393,KB5010351,KB5004335,KB5019966,KB5020374,KB4562562,KB5013641,KB5018419,KB5017400,KB5016713,KB4523204,KB4577667,KB5012170,KB5016690,KB5011574,KB5012675,KB5014031,KB5014797,KB5015896,KB5020866,KB5022286,KB5021237,KB5009557,KB5001404,KB5022511,KB5022840,KB5013892,KB5015811,KB5015736,KB5015880,KB5007295,KB5008218,KB5006368,KB4601394,KB4601395,KB4601396,KB4601397,KB4601398,KB4601399,KB4601400,KB4535681,KB4535682,KB4535683,KB4535684,KB4535685,KB4535686,KB4535687,KB4535688,KB4535689,KB4535690,KB4535691,KB4535692,KB4535693,KB4535694,KB4535695,KB4535696,KB4535697,KB4486153,KB4486168,KB5012647,KB4586875,KB4580326,KB4580327,KB5005543,KB5005625,KB5005102,KB5012128,KB4592440,KB5023702,KB5006754,KB5020374,KB5023789,KB5017263,KB5022504,KB5026362 |

### Microsoft Windows Server 2019 Datacenter (Amazon WorkSpaces and Elastic Computer Cloud)

Microsoft Windows versions and hotfixes

| Microsoft OS version       | Microsoft hotfixes                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 10.0.17763 N/A Build 17763 | KB5005540,KB4470502,KB4470788,KB4480056,KB4486153,KB4493510,KB4499728,KB4504369,KB4512577,KB4512937,KB4521862,KB4523204,KB4535680,KB4539571,KB4549947,KB4558997,KB4562562,KB4566424,KB4570332,KB4577667,KB4587735,KB4589208,KB4598480,KB4601393,KB5000859,KB5001404,KB5003243,KB5003711,KB5005112,KB5006672,KB5005701,KB5025229,KB5012170,KB5023702,KB5006754,KB5008287,KB5009642,KB5011574,KB5012675,KB5022504,KB5014031,KB5014797,KB5015896,KB5017400,KB5020374,KB5023789 |

### Microsoft Windows Server 2022 Standard

Microsoft Windows versions and hotfixes

| Microsoft OS version       | Microsoft hotfixes                                                                                                                                                                                                                                                  |
|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 10.0.20348 N/A Build 20348 | KB5017265,KB5012170,KB5017316,KB5016704,KB5020877,KB5022291,KB5020373,KB5017381,KB5017399,KB5021249,KB5022507,KB5022842,KB5022947,KB5017028,KB5014856,KB5018331,KB5018485,KB5023705,KB5023793,KB5018421,KB5025230,KB5025314,KB5014831,KB5014858,KB5026370,KB5026493 |

### Microsoft Windows Server 2022 Datacenter (Azure Virtual Desktop and Virtual Machines)

Microsoft Windows versions and hotfixes

| Microsoft OS version       | Microsoft hotfixes                                          |
|----------------------------|-------------------------------------------------------------|
| 10.0.20348 N/A Build 20348 | KB5020877,KB5022291,KB5020373,KB5022507,KB5012170,KB5023705 |

### Red Hat Linux database server

Red Hat Enterprise Linux release 8.0 packages

powershell-7.3.4-1.rh.x86\_64,unixODBC-devel-2.3.11-1.rh.x86\_64,unixODBC-2.3.11-1.rh.x86\_64,jdk-11.0.10-11.0.10-ga.x86\_64,gpg-pubkey-be1229cf-5631588c,openldap-clients-2.4.46-15.el8.x86\_64,openldap-2.4.46-15.el8.x86\_64,samba-client-4.12.3-14.el8\_3.x86\_64,openssl-1.1.1g-12.el8\_3.x86\_64,krb5-libs-1.18.2-5.el8.i686,sssd-kcm-2.3.0-9.el8.x86\_64,sssd-2.3.0-9.el8.x86\_64,samba-4.12.3-14.el8\_3.x86\_64,oddjob-mkhomedir-0.34.5-3.el8.x86\_64,sssd-ipa-2.3.0-9.el8.x86\_64,python3-sssdconfig-2.3.0-9.el8.noarch,openssl-libs-1.1.1g-12.el8\_3.i686,oddjob-0.34.5-3.el8.x86\_64,libipa\_hbac-2.3.0-9.el8.x86\_64,sssd-

proxy-2.3.0-9.el8.x86\_64,sssd-ldap-2.3.0-9.el8.x86\_64,sssd-krb5-  
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pdf-20180407-1.el8.noarch,gnome-user-docs-3.28.2-1.el8.noarch,ghc-srpm-  
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macros-5-4.el8.noarch,mariadb-connector-c-config-3.0.7-1.el8.noarch,libX11-  
common-1.6.7-1.el8.noarch,libwacom-data-0.31-1.el8.noarch,ipxe-roms-  
qemu-20181214-1.git133f4c47.el8.noarch,hplip-common-3.18.4-7.el8.x86\_64,go-srpm-  
macros-2-16.el8.noarch,poppler-data-0.4.9-1.el8.noarch,perl-srpm-macros-1-25.el8.noarch,vte-  
profile-0.52.2-2.el8.x86\_64,tigervnc-license-1.9.0-9.el8.noarch,thai-scalable-fonts-  
common-0.6.5-1.el8.noarch,smc-fonts-common-6.1-10.el8.noarch,rust-srpm-  
macros-5-2.el8.noarch,qt5-srpm-macros-5.11.1-2.el8.noarch,python-srpm-  
macros-3-37.el8.noarch,python3-rpm-macros-3-37.el8.noarch,khmeros-fonts-  
common-5.0-25.el8.noarch,google-droid-sans-fonts-20120715-13.el8.noarch,liberation-mono-  
fonts-2.00.3-4.el8.noarch,dnf-data-4.0.9.2-5.el8.noarch,dejavu-sans-mono-  
fonts-2.35-6.el8.noarch,dejavu-sans-fonts-2.35-6.el8.noarch,adobe-mappings-cmap-  
deprecated-20171205-3.el8.noarch,geolite2-city-20180605-1.el8.noarch,adobe-mappings-  
cmap-20171205-3.el8.noarch,yelp-xsl-3.28.0-2.el8.noarch,mozilla-  
filesystem-1.9-18.el8.x86\_64,langtable-  
data-0.0.38-5.el8.noarch,langtable-0.0.38-5.el8.noarch,google-noto-cjk-fonts-  
common-20170602-9.el8.noarch,geolite2-country-20180605-1.el8.noarch,xkeyboard-  
config-2.24-3.el8.noarch,libreport-filesystem-2.9.5-6.el8.x86\_64,liberation-sans-  
fonts-2.00.3-4.el8.noarch,liberation-fonts-common-2.00.3-4.el8.noarch,hyperv-daemons-  
license-0-0.27.20180415git.el8.noarch,gnu-free-fonts-common-20120503-18.el8.noarch,gnome-  
control-center-filesystem-3.28.2-4.el8.noarch,dejavu-fonts-common-2.35-6.el8.noarch,cups-  
filesystem-2.2.6-25.el8.noarch,cmake-filesystem-3.11.4-3.el8.x86\_64,abattis-cantarell-  
fonts-0.0.25-4.el8.noarch,libgcc-8.2.1-3.5.el8.x86\_64,hwdata-0.314-8.0.el8.noarch,google-noto-  
fonts-common-20161022-7.el8.noarch,fontpackages-filesystem-1.44-22.el8.noarch,emacs-  
filesystem-26.1-5.el8.noarch

## Empower client

### Microsoft Windows Server 2019 Datacenter (Amazon WorkSpaces and Elastic Computer Cloud)

Microsoft Windows versions and hotfixes

| Microsoft OS version       | Microsoft hotfixes                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 10.0.17763 N/A Build 17763 | KB5008878,KB4470502,KB4470788,KB4480056,KB4486153,KB4493510,KB4499728,KB4504369,KB4512577,KB5012170,KB5021237,KB5009642,KB5011574,KB5012675,KB5014031,KB5014797,KB5015896,KB5017400,KB5020374,KB4512937,KB4521862,KB4523204,KB4535680,KB4539571,KB4549947,KB4558997,KB4562562,KB4566424,KB4570332,KB4577667,KB4587735,KB4589208,KB4598480,KB4601393,KB5000859,KB5001404,KB5003243,KB5003711,KB5005112,KB5010791,KB5006754,KB5008287,KB5005701,KB5020874 |

### Microsoft Windows Server 2019 Standard

Microsoft Windows versions and hotfixes

| Microsoft OS version       | Microsoft hotfixes                                                                                                                |
|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| 10.0.17763 N/A Build 17763 | KB5008873,KB4535680,KB4549947,KB4570332,KB4577586,KB4587735,KB4589208,KB4598480,KB4601393,KB5003711,KB5009557,KB5008287,KB5005701 |

### Microsoft Windows 10 Professional

Microsoft Windows versions and hotfixes

| Microsoft OS version       | Microsoft hotfixes                                                                                                                                                                                                                                                                                           |
|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 10.0.18363 N/A Build 18363 | KB4576484,KB4497165,KB4513661,KB4516115,KB4517245,KB4521863,KB4535680,KB4537759,KB4541338,KB4552152,KB4559309,KB4560959,KB4561600,KB4569073,KB4576751,KB4574727,KB4576947,KB4515871,KB4517389                                                                                                                |
| 10.0.19042 N/A Build 19042 | KB5008876,KB4562830,KB5009543,KB5006753,KB5007273,KB5005699                                                                                                                                                                                                                                                  |
| 10.0.19043 N/A Build 19043 | KB5012117,KB5000736,KB5012599,KB5011352,KB5011651,KB5005699,KB5008876,KB5009543,KB5007273,KB5004331,KB5004237,KB5003742,KB4562830,KB4577586,KB5005033,KB5005260,KB5013624,KB5013942,KB5014032,KB5005565,KB5009467,KB5010342,KB5007289,KB5008212,KB5009636,KB5017266,KB5016592,KB5011048,KB5012170,KB5017308, |

| Microsoft OS version       | Microsoft hotfixes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                            | KB5014035,KB5014671,KB5015895,KB5016705,KB5018332,KB5016592,KB5000736,KB5003791,KB5015684,KB5018410,KB5014036,KB5014037,KB5014038,KB5014039,KB5020623,KB5017262,KB5006753                                                                                                                                                                                                                                                                                                                                                     |
| 10.0.19044 N/A Build 19044 | KB5020872,KB5003791,KB5012170,KB5021233,KB5014035,KB5014671,KB5015895,KB5016705,KB5020372,KB5005699,KB5022502,KB5020683,KB5022834,KB5011352,KB5013624,KB4570334,KB4598481,KB5011651,KB5015730,KB5015878,KB5013887,KB5015807,KB5009467,KB5000736,KB5009596,KB5007401,KB5014699,KB5007273,KB5009636,KB5005260,KB4562830,KB4577586,KB5025221,KB5023794,KB4589212,KB5004331,KB5005101,KB5014032,KB5020613,KB5019959,KB5018506,KB5017022,KB4580325,KB5018410,KB5022282,KB5016616,KB5026361,KB5025315                               |
| 10.0.19045 N/A Build 19045 | KB5020872,KB4562830,KB4577586,KB4580325,KB5000736,KB5003791,KB5012170,KB5015684,KB5021233,KB5007273,KB5014032,KB5020372,KB5005260,KB5022408,KB5017022,KB5011048,KB5019275,KB5006753,KB5011352,KB5016705,KB5005699,KB5007401,KB5022834,KB5022502,KB5023696,KB5022924,KB5018332,KB5016592,KB5015684,KB5018410,KB5011651,KB5011652,KB5011653,KB5011654,KB5011655,KB5011656,KB5011657,KB5022405,KB5022498,KB5025221,KB5014035,KB5025801,KB5026361,KB5025315,KB5014671,KB5015895,KB5023794,KB5025221,KB5014032,KB5016705,KB5023773 |

## Microsoft Windows 10 Enterprise LTSC

Microsoft Windows versions and hotfixes

| Microsoft OS version       | Microsoft hotfixes                                                                                                                                                        |
|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 10.0.17763 N/A Build 17763 | KB4601558,KB4465065,KB4470788,KB4487038,KB4577586,KB4580325,KB5001404,KB4487044,KB5009472,KB4486153,KB4535680,KB4589208,KB5010351,KB5008287,KB5009642                     |
| 10.0.19044 N/A Build 19044 | KB5015730,KB5003791,KB5012170,KB5016616,KB5014035,KB5014671,KB5015895,KB5005699,KB5015807,KB5020872,KB5022282,KB5011651,KB5014032,KB5020372,KB5022502,KB5022906,KB5022924 |

## Microsoft Windows 10 IoT Enterprise LTSC

Microsoft Windows versions and hotfixes

| Microsoft OS version       | Microsoft hotfixes                                                    |
|----------------------------|-----------------------------------------------------------------------|
| 10.0.19044 N/A Build 19044 | KB5020872,KB5003791,KB5012170,KB5021233,KB5011651,KB5020372,KB5005699 |

## Microsoft Windows 10 Enterprise 2016 LTSC

Microsoft Windows versions and hotfixes

| Microsoft OS version       | Microsoft hotfixes                                                                                                                                                                                      |
|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 10.0.14393 N/A Build 14393 | KB4132216,KB4465659,KB4535680,KB4589210,KB5005698,KB5011570,KB5011495,KB5008877,KB3186568,KB4033631,KB4049065,KB4049411,KB4054507,KB4486129,KB4346087,KB4471331,KB5012170,KB5017396,KB5017305,KB5001402 |

## Microsoft Windows 11 Professional

Microsoft Windows versions and hotfixes

| Microsoft OS version       | Microsoft hotfixes                                                                                                      |
|----------------------------|-------------------------------------------------------------------------------------------------------------------------|
| 10.0.22000 N/A Build 22000 | KB5022505,KB5012170,KB5019448,KB5022836,KB5019385,KB5022369,KB5020875,KB5022287                                         |
| 10.0.22621 N/A Build 22621 | KB5020880,KB5012170,KB5022303,KB5020487,KB5022404,KB5022360,KB5022610,KB5022497,KB5023778,KB5023796,KB5022913,KB5022948 |

## Microsoft Windows 11 Enterprise (Azure Virtual Desktop)

Microsoft Windows versions and hotfixes

| Microsoft OS version       | Microsoft hotfixes                      |
|----------------------------|-----------------------------------------|
| 10.0.22621 N/A Build 22621 | KB5022497,KB5012170,KB5023778,KB5023796 |

## Microsoft Windows 11 Enterprise

Microsoft Windows versions and hotfixes

| Microsoft OS version       | Microsoft hotfixes                                                                                  |
|----------------------------|-----------------------------------------------------------------------------------------------------|
| 10.0.22621 N/A Build 22621 | KB5020880,KB5012170,KB5022303,KB5020487,KB5022404,KB5022360,KB5022610,KB5022497,KB5023778,KB5023796 |

## Citrix Server

### Citrix App Server

#### Microsoft Windows Server 2019 Standard (Citrix Virtual Apps and Desktops 7 1912 LTSR CU6)

Microsoft Windows versions and hotfixes

| Microsoft OS version       | Microsoft hotfixes                                                                                                                                                                                                                                                                                                              |
|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 10.0.17763 N/A Build 17763 | KB5008878,KB4486153,KB4530742,KB4535680,KB4549947,KB4558997,KB4566424,KB4570332,KB4577586,KB4587735,KB4589208,KB5003243,KB5003711,KB5005112,KB5011503,KB5006754,KB5008287,KB5009642,KB5005701,KB5022511,KB4494174,KB4580325,KB5012170,KB5022840,KB5020374,KB5009557,KB5013892,KB4598480,KB5000859,KB5014692,KB5012675,KB5014031 |

#### Microsoft Windows Server 2022 Standard (Citrix Virtual Apps and Desktops 7 2203 LTSR CU1)

Microsoft Windows versions and hotfixes

| Microsoft OS version       | Microsoft hotfixes                                                                        |
|----------------------------|-------------------------------------------------------------------------------------------|
| 10.0.20348 N/A Build 20348 | KB5020877,KB5012170,KB5014856,KB5022291,KB5020373,KB5016704,KB5017028,KB5017381,KB5017399 |

### Citrix Presentation Server

#### Microsoft Windows Server 2019 Standard (Citrix Virtual Apps and Desktops 7 1912 LTSR CU6)

Microsoft Windows versions and hotfixes

| Microsoft OS version       | Microsoft hotfixes                                                                                                                                                                                                                                                                                                                                  |
|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 10.0.17763 N/A Build 17763 | KB5008878,KB4486153,KB4530742,KB4535680,KB4549947,KB4558997,KB4566424,KB4570332,KB4577586,KB4584642,KB4587735,KB4589208,KB5000859,KB5001404,KB5001407,KB5003243,KB5003711,KB5005112,KB5012170,KB5022840,KB5011503,KB5006754,KB5008287,KB5009642,KB5005701,KB5022504,KB5011574,KB5012675,KB5014031,KB5014797,KB5015896,KB5017400,KB5020374,KB5008218 |

#### Microsoft Windows Server 2022 Standard (Citrix Virtual Apps and Desktops 7 2203 LTSR CU1)

Microsoft Windows versions and hotfixes

| Microsoft OS version       | Microsoft hotfixes                      |
|----------------------------|-----------------------------------------|
| 10.0.20348 N/A Build 20348 | KB5020877,KB5012170,KB5022291,KB5020373 |

## Citrix Client

### Microsoft Windows 10 Enterprise 2016 LTSC (Interface Citrix Workspace 2206)

Microsoft Windows versions and hotfixes

| Microsoft OS version       | Microsoft hotfixes                                                    |
|----------------------------|-----------------------------------------------------------------------|
| 10.0.14393 N/A Build 14393 | KB4132216,KB4465659,KB4535680,KB4589210,KB5005698,KB5011570,KB5011495 |

### Microsoft Windows 10 Professional

Microsoft Windows versions and hotfixes

| Microsoft OS version       | Microsoft hotfixes                                                                                                                                                                                                                                                                                                                                                      |
|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 10.0.14393 N/A Build 14393 | KB3176937,KB3186568,KB3199986,KB3211320,KB4033393,KB4033407,KB4033631,KB4033637,KB4035631,KB4049065,KB4049411,KB4054855,KB4093137,KB4132216,KB4134659,KB4462930,KB4486129,KB4486143,KB4093120                                                                                                                                                                           |
| 10.0.19043 N/A Build 19043 | KB5008876,KB5000736,KB5009543,KB5007273,KB5005699                                                                                                                                                                                                                                                                                                                       |
| 10.0.19045 N/A Build 19045 | KB5022408,KB5016592,KB4561600,KB4570334,KB4577266,KB4580325,KB4584642,KB4586864,KB4593175,KB4598481,KB5000736,KB5003791,KB5011048,KB5012170,KB5015684,KB5019275,KB5006753,KB5007273,KB5011352,KB5011651,KB5014032,KB5014035,KB5014671,KB5015895,KB5016705,KB5018506,KB5020372,KB5005699,KB5022405,KB4562830,KB4577586,KB5005260,KB5022498,KB4566785,KB5023319,KB5022834 |

## Standalone/Personal Workstation

Testing was performed using the Waters Empower Workstation.

### Microsoft Windows 10 Enterprise LTSC

Microsoft Windows versions and hotfixes

| Microsoft OS version       | Microsoft hotfixes                                                                        |
|----------------------------|-------------------------------------------------------------------------------------------|
| 10.0.17763 N/A Build 17763 | KB4601558,KB4465065,KB4470788,KB4486153,KB4487038,KB4577586,KB4580325,KB5001404,KB4487044 |

| Microsoft OS version       | Microsoft hotfixes                                                                                                      |
|----------------------------|-------------------------------------------------------------------------------------------------------------------------|
| 10.0.19044 N/A Build 19044 | KB5017262,KB5003791,KB5012170,KB5018410,KB5014035,KB5014671,KB5015895,KB5016705,KB5005699,KB5015730,KB5016616,KB5011651 |

## Microsoft Windows 10 Enterprise 2016 LTSC

Microsoft Windows versions and hotfixes

| Microsoft OS version       | Microsoft hotfixes                                                                                                                                                                                                                               |
|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 10.0.14393 N/A Build 14393 | KB4033631,KB4049411,KB4535680,KB4589210,KB5001402,KB5012170,KB5014026,KB5016058,KB5017095,KB5017396,KB5019964,KB4132216,KB4346087,KB4465659,KB4471331,KB5005698,KB5011570,KB5017305,KB5011495,KB3186568,KB4049065, KB4054507,KB4520724,KB5005573 |

## Microsoft Windows 10 Professional

Microsoft Windows versions and hotfixes

| Microsoft OS version       | Microsoft hotfixes                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 10.0.18363 N/A Build 18363 | KB4552931,KB4497165,KB4513661,KB4516115,KB4517245,KB4524569,KB4537759,KB4552152,KB4559309,KB4560959,KB4561600,KB4560960,KB4576484,KB4521863,KB4541338,KB4569073,KB4576751,KB4574727                                                                                                                                                                                                                                                                               |
| 10.0.19043 N/A Build 19043 | KB5009467,KB4562830,KB4577586,KB5000736,KB5009543,KB5007273,KB5005260,KB5017025,KB5016592,KB5011048,KB5012170,KB5018410,KB5011352,KB5011651,KB5014032,KB5014035,KB5014671,KB5015895,KB5016705,KB5005699,KB5008876,KB5013624,KB5013942,KB4580325,KB5004331,KB5005033,KB5012117,KB5012599,KB5020872,KB5016616,KB5025315                                                                                                                                             |
| 10.0.19044 N/A Build 19044 | KB5017022,KB5003791,KB5012170,KB5017308,KB5011352,KB5014035,KB5014671,KB5015895,KB5016705,KB5015730,KB5015807,KB5016616,KB5020613,KB5019959,KB5011651,KB5018506,KB5020881,KB5016592,KB5000736,KB5011048,KB5015684,KB5022282,KB5007273,KB5014032,KB5020372,KB5005699,KB5009467,KB4562830,KB4577586,KB4589212,KB5009596,KB5009636,KB5005260,KB5015878,KB5020872,KB5020683,KB5022502,KB5000736,KB5003791,KB5012170,KB5017308,KB5006753,KB5026361,KB5025315,KB5017262 |
| 10.0.19045 N/A Build 19045 | KB5022502,KB5003791,KB5012170,KB5015684,KB5022834,KB5011352,KB5014035,KB5014671,KB5015895,KB5016705,                                                                                                                                                                                                                                                                                                                                                              |

| Microsoft OS version | Microsoft hotfixes                                                                                                                                                                                                          |
|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                      | KB5018506,KB5020372,KB5020872,KB5020683,KB5021233,KB5022498,KB5016592,KB5000736,KB5011048,KB5025221,KB5007273,KB5011651,KB5014032,KB5022924,KB5023794,KB5005699,KB4562830,KB5007401,KB5017022,KB5020435,KB5025183,KB5026361 |

## Microsoft Windows 10 Pro (Amazon Elastic Computer Cloud)

Microsoft Windows versions and hotfixes

| Microsoft OS version       | Microsoft hotfixes                                                                        |
|----------------------------|-------------------------------------------------------------------------------------------|
| 10.0.19045 N/A Build 19045 | KB5022502,KB5003791,KB5007401,KB5012170,KB5015684,KB5023696,KB5011651,KB5016705,KB5022924 |

## Microsoft Windows 10 Professional (Azure Virtual Machines)

Microsoft Windows versions and hotfixes

| Microsoft OS version       | Microsoft hotfixes                                |
|----------------------------|---------------------------------------------------|
| 10.0.19045 N/A Build 19045 | KB5017022,KB5015684,KB5020435,KB5014032,KB5016705 |

## Microsoft Windows 10 IoT Enterprise LTSC

Microsoft Windows versions and hotfixes

| Microsoft OS version       | Microsoft hotfixes                                                    |
|----------------------------|-----------------------------------------------------------------------|
| 10.0.19044 N/A Build 19044 | KB5020872,KB5003791,KB5012170,KB5021233,KB5011651,KB5020372,KB5005699 |

## LAC/E device

Testing was performed using the Waters Empower LAC/E device.

## Microsoft Windows 10 Professional

Microsoft Windows versions and hotfixes

| Microsoft OS version       | Microsoft hotfixes                                                                                                      |
|----------------------------|-------------------------------------------------------------------------------------------------------------------------|
| 10.0.18363 N/A Build 18363 | KB4533002,KB4532938,KB4565633,KB4569751,KB4576484,KB4601056,KB4513661,KB4516115,KB4517245,KB4521863,KB4524569,KB4530684 |

| Microsoft OS version       | Microsoft hotfixes                                                                                                                                                                                                                                                                                                                                                                                                        |
|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 10.0.19042 N/A Build 19042 | KB5005539,KB4562830,KB4570334,KB4577586,KB4580325,KB4586864,KB5005565,KB5005699                                                                                                                                                                                                                                                                                                                                           |
| 10.0.19043 N/A Build 19043 | KB5012117,KB5000736,KB5012599,KB5011651,KB5005699,KB5009467,KB5011543,KB5007273,KB5004331,KB4562830,KB4577586,KB5005033,KB5005260,KB5007289,KB5008212,KB5008876,KB5009543,KB5011352                                                                                                                                                                                                                                       |
| 10.0.19044 N/A Build 19044 | KB5009467,KB4562830,KB4577586,KB4589212,KB5003791,KB5009596,KB5007273,KB5009636,KB5005260                                                                                                                                                                                                                                                                                                                                 |
| 10.0.19045 N/A Build 19045 | KB5022502,KB5012170,KB5015684,KB5020683,KB5025801,KB5025221,KB5014032,KB5016705,KB5022924,KB5023794,KB5003791,KB5022834,KB5011352,KB5014035,KB5014671,KB5015895,KB5018506,KB5020372,KB4562830,KB5007401,KB5022498,KB5016592,KB5000736,KB5011048,KB5012170,KB5015684,KB5025221,KB5007273,KB5011352,KB5011651,KB5014032,KB5014035,KB5014671,KB5015895,KB5016705,KB5020372,KB5022924,KB5023794,KB5005699,KB5026361,KB5025315 |

## Microsoft Windows 10 Enterprise 2016 LTSC

Microsoft Windows versions and hotfixes

| Microsoft OS version       | Microsoft hotfixes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 10.0.14393 N/A Build 14393 | KB2693643,KB5012118,KB3186568,KB4033631,KB4049065,KB4049411,KB4054507,KB4486129,KB4509091,KB4550993,KB4550994,KB5001402,KB5011264,KB5011570,KB5012596,KB4132216,KB4465659,KB4471331,KB5017305,KB5008877,KB4346087,KB5023788,KB5025228,KB5011495,KB5014026,KB5016058,KB5017095,KB5016622,KB5020873,KB4577586,KB5022289,KB4580325,KB5001078,KB5003638,KB5015808,KB5010460,KB4485447,KB4487038,KB4493470,KB4520724,KB4535680,KB5022503,KB5012170,KB4486143,KB5021235,KB5018411,KB4054508,KB4054509,KB4054510,KB4054511,KB4054512,KB4054513,KB4054514,KB4054515,KB4535680,KB4589210,KB5005698,KB5017396,KB5022838,KB5014630,KB5014702,KB5026363 |

## Microsoft Windows 10 Enterprise LTSC

Microsoft Windows versions and hotfixes

| Microsoft OS version       | Microsoft hotfixes                                                                                                                                              |
|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 10.0.17763 N/A Build 17763 | KB5009472,KB4470788,KB4486153,KB4487038,KB4535680,KB4577586,KB4589208,KB5001404,KB5010351,KB5008287,KB5009642,KB4601558,KB4465065,KB4580325,KB4487044           |
| 10.0.19044 N/A Build 19044 | KB5015730,KB5003791,KB5015807,KB5014035,KB5014671,KB5005699,KB5012170,KB5016616,KB5015895,KB5022502,KB5023696,KB5011352,KB5022924,KB5022906,KB5018506,KB5020372 |

## Microsoft Windows 10 IoT Enterprise LTSC

Microsoft Windows versions and hotfixes

| Microsoft OS version       | Microsoft hotfixes                                                                                            |
|----------------------------|---------------------------------------------------------------------------------------------------------------|
| 10.0.19044 N/A Build 19044 | KB5020613,KB5003791,KB5019959,KB5018506,KB5005699,KB5011352,KB5014671,KB5022502,KB5012170,KB5022834,KB5020372 |

## Microsoft Windows 10 Enterprise

Microsoft Windows versions and hotfixes

| Microsoft OS version       | Microsoft hotfixes                                                                                                                          |
|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| 10.0.19045 N/A Build 19045 | KB5022502,KB5012170,KB5015684,KB5022834,KB5014032,KB5016705,KB5020372,KB5026513,KB5020683,KB5025801,KB5026361,KB5022924,KB5023794,KB5025315 |

## Microsoft Windows 11 Professional

Microsoft Windows versions and hotfixes

| Microsoft OS version       | Microsoft hotfixes                                                              |
|----------------------------|---------------------------------------------------------------------------------|
| 10.0.22000 N/A Build 22000 | KB5020875,KB5012170,KB5019448,KB5022287,KB5019385                               |
| 10.0.22621 N/A Build 22621 | KB5022404,KB5012170,KB5022360,KB5022610,KB5020487,KB5020880,KB5022497,KB5022845 |