LSEG WORKSPACE

INSTALLATION AND CONFIGURATION GUIDE
Workspace 1.24

LSEG DATA & ANALYTICS

LSEG DATA & ANALYTICS

Version history

Workspace	Document	Summary
1.24	124.02	Updating links to point to new LSEG site.
	124.01	The following changes were made.
		− New digital certificates
		− The DPRM connection issue, affecting Workspace 1.23 only, has been fixed.
1.23	123.03	Added Appendix H: Unsupported packaging methods.
	123.02	Updated Appendix J: Known issues to include DPRM connection issue.
	123.01	The following changes were made:
		− Guide rebranded for initial LSEG Workspace pre-release.
		− Additional features added to the Configuration Manager
1.22	122.02	The following changes were made:
		− Added Admin configuration to the Configuration override order section
		− Added the disabled contribution sources setting to the shared configuration Settings table.
	122.01	The following changes were made:
		− The Refinitiv ribbon add-ins table was updated
		− Added the Alternative streaming servers section
		− Minor changes to the shared configuration Settings table
		− Removed a no longer supported feature from the Logging section
		− Removed a fixed shared configuration file issue from the Appendix I: Known issues section
1.21	121.05	The System Test app is now described in its own guide, which can be found here:
		− Workspace System Test Guide
	121.04	This release contains the following changes:
		− Added Configuring multiple servers section
		− Updated the Appendix J: Known issues section
	121.03	Minor URL amendments
	121.02	This version contains the following updates:
		− Added Uninstalling Workspace with custom paths to the Known issues section.
	121.01	This version contains the following updates:
		− Added Logs Viewer section
		− Updated the --help commands
		− Updated the Error codes section
		− Added Mass deployment section
		− Revised the Default folder structures section
		− Some additional Workspace executable statements
		− Minor changes throughout to cover the new Workspace installer
1.20	120.01	This version contains information about the following updates:
		− New appendix covering shared configuration file creation and settings
		− ADH documentation location added
		− Updated executable statement parameters
		− Updates to Security section, including addition of TLS subsection
		− Minor changes to the Example domain list
		− Minor update to the DPRM section
1.19	119.02	This version contains information about the following updates:
		− Added Appendix E
		− Added VMware Horizon installation guidance
		− Other minor changes
	119.01	This version contains information about the following updates:
		− New version of the embedded and standalone System Test application
		− Revised Workspace Help parameters
		− New Configuration Manager section and screenshot updates
		− Expanded information about the recommended LSEG Real-Time Advanced Distribution Server version
		− Configuration override order
		− Expanded list of Workspace executable statements
		− Added the Example domain list section
		− Screenshots depict the new Workspace UI
1.18	118.06	Added Example domain list section to Appendix F
	118.05	Added the Rolling back section to Appendix J: Known issues
	118.04	Addresses a minor PDF rendering issue.
	118.03	Minor change to the Shared configuration bug section.
	118.02	Footnote added to Server software versions.
	118.01	The following changes have been made to the guide:
		− Software release policy and contact details
		− System Test can now be run from Workspace
		− Post installation testing of Workspace – Excel data retrieval functions
		− Note regarding key letters - Special characters are not supported
		− Bandwidth test added to System Test
		− Updates to the Known issues section
		− Updated illustrations

Workspace	Document	Summary
1.17	117.06	Minor change to the Shared configuration file bug section.
	117.05	Footnote added to Server software versions.
	117.04	The following minor changes:
		− DPRM settings
		− Uninstallation note concerning peruser installations
		− Conflation rate footnote
	117.03	Added sections addressing a Real-Time server disconnection issue.
	117.02	Minor change to the known issues section regarding support for local contributions.
	117.01	This PRE-RELEASE version contains the following changes:
		− Configuration Manager > Advanced menu field name change
		− Executable file size
		− New, additional Refinitiv digital signature (related to PCN 13469)
		− Additional detailed qualified proxy information
		− Technical Roadmap added to documents list
		− Amendment to the Known issues > Shared configuration file bug section
		− Added Installation types summary table to Installing Workspace section
1.16	116.02	The global release version of installation guide, which contains the following minor textual changes:
		− System test download link provided
		− Clarification added to Workspace executable statements
		− Download path for COMODO certificate added
		− List of Excel add-ins for 1.16 added to Microsoft Office settings
		− RtContribute section added to Known issues
	116.01	The Pre-release version of installation guide, which may be subject to change:
		− Minor textual and graphical changes throughout
		− Updated bandwidth recommendations
		− Added section on –help parameter
		− Minor updates to configuration manager section
		− Updated documentation locations
		− Updated System Test tool descriptions
		− Added JSON coding changes to troubleshooting section
		− Created Known issues appendix
1.15	115.02	− Fixed rendering issues with the System Test screen illustration on page 6.
	115.01	− Removed content filtering section.
		− Minor textual changes.
		− Corrected note regarding verbosity in the uninstall command lines.
		− Changes and additions to Configuration Manager section:
		− Streaming conflation field.
		− Advanced tab content.
		− Updated illustrations.
		− Added Vendor Subservice Definitions document link.
		− Added About Refinitiv Workspace dialog section.
		− Added more Operating system tools.
		− Additions to Troubleshooting:
		− Added Shared configuration bug section.
		− Added Using the Video Recorder tool section.
1.14	114.03	− Removed content filtering section.
		− Amended note regarding --user uninstallation statement being verbose by default.
		− Updated the Troubleshooting section regarding known issues with automatically generated shared configuration files.
		− Corrected the introduction to the Log upload troubleshooting section.
	114.02	− Minor correction to fix a typographic error for some references to the `--sharedconfig` parameter.
	114.01	− Instructions for running both the standalone and embedded System Test apps
		− Shared configuration file recommendation for SSO installations
		− Instructions for running Workspace web access through Internet or private network
		− Machine installation command lines with `--sharedconfig` parameters
		− Expanded explanation of key letters and Office aliases
		− (Optional) Batch print service
		− Appendix B - added Export control classification, Data dictionary support, and Local mode support
		− New Appendix C: System Test - summarizing the tests performed by the app
		− Appendix E - amended Excel add-ins list, added Customer managed over Internet section
		− Appendix F - new Embedded Messenger section

Contents

About this document

This guide describes IT-managed installations to platforms running on the following environments[1]:

− Microsoft® Windows® directly

− Citrix® [2], specifically:

    − Windows application virtualization with Citrix XenApp® (published app or published desktop)
    − Windows desktop OS virtualization with Citrix XenDesktop®

− VMware[3], specifically:

    − Horizon 8 Connection Server, Agent, and Client
    − Blast display protocol

This document details the steps and any post-installation configuration and customization that is required to install the application.

Intended readership

The LSEG Workspace Installation and Configuration Guide is intended for IT specialists that are responsible for the installation and maintenance of Workspace and Messenger standalone.

LSEG Workspace rebranding

This first phase of LSEG Workspace rebranding is entirely cosmetic. For changes of a technical nature that may impact your installation and maintenance of Workspace, you will be given a minimum of nine months of notice, our standard obsolescence period, through the PCN system.

Software releases and end of life

Refer to the Workspace Support Policy, which can be found in the documentation section of the LSEG Workspace page.

For further information, see:

− PCN208374 – LSEG Workspace – Rolling obsolescence policy

− Workspace Support and Obsolescence FAQ

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[1] Instructions for macOS installation are provided in the Workspace Basic Installation Guide.
[2] LSEG currently provides limited testing support and technical advice on Citrix Virtual Apps and Desktops (CVAD) solutions. However, customers deploying a CVAD solution should consider the following when deploying, updating, and running Workspace:
    − The impact of network latency and equipment used.
    − The potential for virtualization machines to adversely affect performance for end users.
    − Legacy products such as Eikon will not work in parallel with Workspace
[3] As summarized for Citrix, above, LSEG currently provides limited testing support for VMware and the same considerations should be applied when deploying.

Contact information

To receive further assistance, contact Support.

You can also provide feedback regarding this document through DocFeedback@lseg.com.

Pre-requisites

This section summarizes the information of which you should be aware prior to commencing the installation of Workspace.

In this section

– Verifying system requirements

– Windows-specific environments

– Citrix-specific environments

Verifying system requirements

Before installing Workspace, ensure that your hardware and software meet the minimum requirements.

Important: For an installation, creating a Workspace test user ID is highly recommended to validate the installation. For further assistance, contact your account team or Customer Success Manager.

LSEG strongly recommends that 3D Graphics Processing Unit (GPU) acceleration is enabled. Workspace is based on Chromium, which uses the GPU for rendering environments.

System and network testing

The System Test application helps you determine whether your computer meets the minimum hardware, software, and connectivity requirements to run Workspace. No personal information is sent to LSEG during this process.

For further information regarding the System Test applications, refer to the System Test Guide.

Virtualized environments

When designing a deployed solution, individual utilization should be considered in the planning. If specific information is required, it is recommended that a selection of pilot users is monitored so benchmark testing can be performed by the relevant vendor support team.

Important: If you encounter an issue; LSEG requests that you confirm the issue has been reproduced in a non-virtualized environment.

VDI support

Support is included with your subscription, when Workspace is installed according to our system requirements on a standalone desktop PC for one user.

Due to the inherently complex and distributed nature of these solutions, we cannot offer the same unconditional support as a standard desktop for the following:

– Terminal/Citrix Server

– VMware Server

− Other multi-user or virtualized environments

Help with installing and/or operating our software in these environments is strictly limited to a commercially reasonable effort. While this document makes every attempt to highlight the issues you may encounter, we can make no guarantees regarding a successful outcome.

If you encounter problems, we cannot investigate or escalate unless the issue is reproducible on a standalone desktop running Workspace, in a single instance environment.

Installing Workspace

Workspace can be installed on Windows, as a User or Machine Installation, and deployed to CVAD.

However, it is recognized that there is much innovation and change in our marketplace. As such, the content of this document is updated, as warranted by future changes in the marketplace, and the evolving needs of our software products.

In this section

- PC installation
- Citrix installation
- Running browser-based Workspace
- Uninstalling Workspace

PC installation

This section discusses the installation of Workspace onto personal computers.

RELATED LINKS
- Command line statements
- Registry files
- Error codes

Installation method summary table

Parameter	Location		Updated automatically	Windows service required
	Installation[4]	Launch/Update		
--user	%LocalAppData%		●	-
--machine-autoupdate-service	%ProgramFiles%	%ProgramData%	●	●
--machine-autoupdate-no	%ProgramFiles%	%ProgramData%	-	-
--machine-autoupdate-peruser [5]	%ProgramFiles%	%LocalAppData%[6]	Launch / Update location only	-

Workspace Help parameter options

When installing Workspace, you can use the `--help` parameter to list all parameters that are available.

The Command Prompt also lists all error codes that could be displayed during a Workspace installation. These codes are listed in the Error codes section.

Command line statements have the following structure, where one or more *<option>* parameters are non-mandatory:

```
RefinitivWorkspace-installer_x.xx.xx.exe <operation> <option>
```

---

[4] Default locations. These are customizable during installation.
[5] See Important note in Uninstalling Workspace.
[6] A copy of the Installation (master image) will be created for each user when they first log into the machine. If the version of the master image changes, the local version is refreshed when a user next logs in.

All parameters are listed alphabetically in the following table:

Parameter	Purpose
<operation>	
`--machine-autoupdate-no`	Machine installation, with no auto-updates.
`--machine-autoupdate-peruser`	Machine installation, with an auto-update per user.
`--machine-autoupdate-service`	Machine installation, with an auto-update service.
`--uninstall`	Uninstall Workspace.
`--user`	User installation. This is the default installation option.
<option>	
`--cachepath="<Your cache path>"`	Specify the cache file path.
`--client-sso="<Your ClientSSO URL>"`	Allows you to set up Single Sign-On (SSO), once Workspace has completed installation. SSO settings are stored in either `user-settings.json` or `machine-settings.json`, depending on which installation mode was used for Workspace.
`--forceInstall` [7]	Skips the check to ensure your system meets the pre-requisites.
`--help`	Displays the list of parameters in a second command prompt window.
`--installpath="<Your install path>"`	Specify the installation path.
`--installerlogpath="<Your install log path>"`	Specify the installation log file path.
`--lang="<lang>"`	Allows you to specify the installation language. Where <lang> is: en English ja Japanese zh Chinese ko Korean
`--logpath="<Your log path>"`	Specify the log files path.
`--messengeronly`	Installs Workspace Messenger only. This installation mode will not share the login session with Workspace.
`--sharedconfig="<shared config file path>"`	Specify the path to a shared configuration file.
`--shortcut-excel=<FALSE / TRUE>`	Setting this parameter to `false` installs the product without the **Refinitiv Workspace - Excel** shortcut
`--shortcut-workspace=<FALSE / TRUE>`	Setting this parameter to `false` installs the product without the **Refinitiv Workspace** shortcut.
`--shortcuts="<"Your shortcuts path>"`	Specify the location of the **Refinitiv Workspace** and **Refinitiv Workspace - Excel** shortcuts. Enter `NONE` to hide the shortcuts.
`--silent` [8]	No information messages are displayed during installation.

Customizing paths

During the installation, you have the option of determining your own path for installation files, logs, cache files, and shortcuts. To do this, use one of the following commands:

Action	Command
Change install location	`RefinitivWorkspace-installer_x.xx.xx.exe --installpath="<folder_path>"`
Change log location	`RefinitivWorkspace-installer_x.xx.xx.exe --logpath="<folder_path>"`
Change cache location[9]	`RefinitivWorkspace-installer_x.xx.xx.exe --cachepath="<folder_path>"`
Change icon shortcut location	`RefinitivWorkspace-installer_x.xx.xx.exe --shortcuts="<folder_path>"`
Change installer log path	`RefinitivWorkspace-installer_x.xx.xx.exe --installerlogpath="<folder_path>"`

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[7] Do not use this flag without a clear purpose and understanding of the impacts, as it may result in degraded product experience.
[8] Silent mode is enabled when installing, updating, or uninstalling Workspace, using the command line.
[9] See Cache path definition in the Known issues section.

You can use multiple parameters in one command line. For example:

```
RefinitivWorkspace-installer_x.xx.xx.exe --installpath="<folder path>"
--cachepath="<folder_path>"
```

Performing a User installation

When you perform a user installation, files are created in the `%LocalAppData%\Refinitiv\Refinitiv Workspace\` folder.

To install Workspace on a user basis:

1. Download the Workspace package.

2. Run the `.exe` file or use the Workspace command lines using the command prompt app. In a user installation, administrator rights are not required.[10]

3. Follow the on-screen instructions to install Workspace [11]:
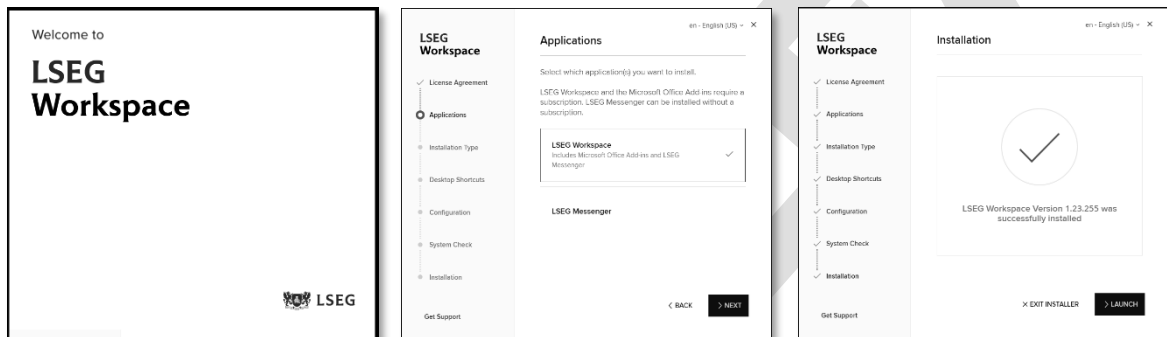
Performing a Machine installation [12]

With the auto-update Windows service

This is the recommended installation mode and is the preferred method for your organization, where:

− Users are not allowed to run programs from areas where they have no write permissions on `%ProgramFiles%`.

− Applications are reviewed before being approved across your organization, to ensure that they do not undermine application whitelisting. This is especially important for scripting languages, which have their own execution environment.

For this installation, files are created in the following folder:

| Type of OS	Installation	Path
Windows	Default	`%ProgramFiles%\Refinitiv\Refinitiv Workspace\`

---

[10] To review help for the `RefinitivWorkspace-installer_x.xx.xx.exe` command, add the parameter `--help`.

[11] For further details, see the Workspace Basic Installation Guide.

[12] To perform any *per machine* installation, you require administrator access rights.

To install Workspace on a machine basis:

1. Download the Workspace package

2. Do either of the following:

   a. Run the executable, taking the **Install for all users on this computer** option 13

− Or

   a. Open a Command Prompt window

   b. Run `RefinitivWorkspace-installer_x.xx.xx.exe --machine-autoupdate-service --sharedconfig="<file path>"` 17
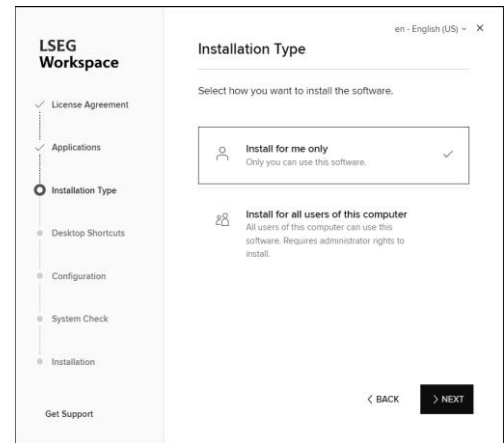
With auto-update per user

This installation mode 14 is the preferred method for your organization, where:

− Users are not allowed to run programs from areas where they have no write permissions on `%ProgramFiles%`.

− Applications are reviewed before being approved across your organization, to ensure that they do not undermine application whitelisting. This is especially important for scripting languages, which have their own execution environment.

For this installation, files are created in the following folders:

Type of OS	Installation	Path
Windows	Master image	`%ProgramFiles%\Refinitiv\Refinitiv Workspace\`
	Copy 15 16	`%LocalAppData%\Refinitiv\Refinitiv Workspace\`

Important: The master image must be updated on a regular basis – in accordance with the Support Policy – to avoid the situation where a new user on a machine can install a version of Workspace into their profile that is no longer supported.

To install Workspace on a machine basis:

1. Download the Workspace package

2. Open a Command Prompt window

3. Run `RefinitivWorkspace-installer_x.xx.xx.exe --machine-autoupdate-peruser --sharedconfig="<file path>"` 17

Without auto-updates

This installation mode is the preferred method for organization running hot-desking, gold images, non-Persistent VDIs, or Provisioning Services (PVS) with configuration to clear changes once user close their Windows sessions.

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[13] For further information, see the Workspace Basic Installation Guide.

[14] See Important note in Uninstalling Workspace.

[15] Copy installation location.

[16] Once the master image has been copied to the profile of the user, the user needs to restart their machine.

[17] Defining a shared configuration file (or files, for failover purposes) is optional but strongly recommended for mass configuration.

For this installation, files are created in the following folder:

Type of OS	Installation	Path
Windows	Default	%ProgramFiles%\Refinitiv\Refinitiv Workspace\

To install Workspace without auto-updates:

4. Download the Workspace package

5. Open a Command Prompt window

6. Run `RefinitivWorkspace-installer_x.xx.xx.exe --machine-autoupdate-no --sharedconfig="<file path>"` [17]

Performing an installation using your Single Sign On URL

Using a shared configuration file

Defining a shared configuration file (or files, for failover purposes) is optional but strongly recommended for mass configuration.

Using the command line

To install Workspace using your Single Sign On (SSO) URL, do the following:

1. Download the Workspace package.

2. Open a Command Prompt window.

3. Add the appropriate parameter from the table below [18], depending on your environment:

Environment	Additional installation parameters	Settings location
User	--client-sso=<client SSO URL>	user-settings.json
Machine	--client-sso=<client SSO URL>	machine-settings.json

Citrix installation

This section addresses the currently supported scenarios for Workspace deployment to CVAD. However, it is also recognized that there is much innovation and change in our marketplace. As such, the content is updated, as warranted by future changes in the marketplace, and the evolving needs of our software products.

Important! Workspace installers require administrator rights to create their own registry path entries.

Installing Workspace for Citrix XenApp

1. Check that no previous Eikon registry keys are set.

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[18] This parameter should be added to the installer executable, also in combination with additional parameters.

2. Ensure that the following registry keys are applied, to disable Citrix API hooks for a single executable file: [19]

Version	CVAD 7 1912 LTSR	XenApp 7.6 LTSR	XenApp 7.15 LTSR [20]
Key(s)	No modification to registry keys is required	HKLM\SOFTWARE\Citrix\CtxHook HKLM\SOFTWARE\Wow6432Node\Citrix\CtxHook	HKLM\SYSTEM\CurrentControlSet\services\CtxUvi
Value name		ExcludedImageNames	UviProcessExcludes
Type		REG_SZ	REG_SZ
Value to add [21]		RefinitivWorkspace.exe [22]	RefinitivWorkspace.exe Error! Bookmark not defined.

3. To show the Workspace context menu when right-clicking the Windows taskbar, refer to the Citrix Support Knowledge Center article CTX131995, User Cannot Launch Application in Seamless Mode in a Provisioning Services Server when XenApp Optimization Best Practices are Applied.

4. On the Citrix server, to change to installation mode, use the command line:

```
Change user /install
```

5. To install Workspace, use the following command line, which includes the log and cache paths [23], which must point to the same location from where RefinitivWorkspace.exe is run:

− `RefinitivWorkspace-installer_x.xx.xx.exe --machine-autoupdate-no --logpath="<folder_path>" --cachepath="<folder_path>"`

− However, it is recommended that you define a shared configuration file (or files, for failover purposes) using the `--sharedconfig="<file_path>"` parameter [24]. This is optional but strongly recommended for mass configuration.

6. Once the installation has finished, change back to execute mode, using the command line:

− `Change User /execute`

Publishing Workspace applications for XenApp

To complete the installation, you must publish both Workspace and Refinitiv Workspace - Excel applications in Citrix XenApp.

To do this, use your usual configuration software, whether Citrix or third party, with the following parameter settings:

Product	Parameter	Setting
Workspace	Path to the executable file	<installation_path>\RefinitivWorkspace.exe
	Working directory	<installation_path>
Workspace for Excel	Path to the executable file	<installation_path>\RefinitivWorkspace.exe
	Command line argument	--excel
	Working directory	<installation_path>

---

[19] For further information, see https:\\support.citrix.com\article\CTX107825.

[20] Reboot from the VDA required.

[21] Process names have a 14-character limit. For example, to exclude longappname.exe, you add longappname.ex.

[22] If you want to use the Session Sharing Chrome Extension, add Refinitiv-host.exe.

[23] See Cache path definition in the Known issues section.

[24] For further information, see step 3 of Setting up configuration manager.

Installing Workspace for Citrix XenDesktop

If you use gold images, non-Persistent VDIs, or Provisioning Services (PVS) with configuration to clear changes after the user closes a session, you must install Workspace in *without auto-updates* mode using the following argument:

```
RefinitivWorkspace-installer_x.xx.xx.exe --machine-autoupdate-no --sharedconfig="<file path>"
```

In most cases, the Per-Machine and Per-User installation modes of Workspace are also supported in Citrix XenDesktop.

ⓘ Log and Cache paths must point to the location from where `RefinitivWorkspace.exe` is run.

VMware installation

This section describes the installation of products that are required for Workspace deployment to VMware.

Installing Workspace for VMWare Horizon virtual app

1. Change to installation mode:

   On the Horizon server, use the command line:

   ```
   change user /install
   ```

2. Install Workspace:

   In a command-line interpreter, such as Command Prompt, type the following command line [25]:

   ```
   RefinitivWorkspace-installer_x.xx.xx.exe --machine-autoupdate-no --logpath="<folder_path>" --cachepath="<folder_path>" [26]
   ```

   Important! It is strongly recommended, particularly for mass configuration, that you define a shared configuration file (or multiple files, for failover purposes). This is done by using the `--sharedconfig="<file_path>"` parameter.

3. Return to execute mode:

   Once the installation has finished, change back to execute mode, using the following command line:

   ```
   change user /execute
   ```

---

[25] The command line is run from the folder where `RefinitivWorkspace.exe` file is located and contains paths to the required log and cache file locations.

[26] It is strongly recommended, particularly for mass configuration, that you define a shared configuration file (or multiple files, for failover purposes). This is done by using the `--sharedconfig="<file_path>"` parameter.
For further information about shared configuration files, see step 3 of the Setting up configuration manager and the Shared configuration file bug sections.

Configuring virtual applications on Windows Server

Installation is completed by publishing both Workspace and Refinitiv Workspace - Excel applications in the VMWare Horizon virtual app.

To publish the applications, perform the following steps using the Horizon Console:

1. In Horizon Console, select **Inventory > Applications**

2. In the Application Pools panel, select **Add > Add Manually**

3. For Workspace, in the **Add Application Pool** panel, complete the form using the following details:

In this field…	Type or select this …
ID	RefinitivWorkspace
Display Name	Refinitiv Workspace [27]
Path	*<install_path>*Refinitiv\Refinitiv Workspace\RefinitivWorkspace.exe
Start Folder	*<install_path>*\Refinitiv\Refinitiv Workspace\
Entitle Users after Adding Pool	Select this checkbox
Multi-Session Mode	Select **Disabled**

4. Click **Submit**

   The application appears in the **Application Pools** panel

5. Select **Add > Add Manually**

6. For Refinitiv Workspace - Excel, complete the form using the following details:

In this field…	Type or select this…
ID	RefinitivWorkspaceExcel
Display Name	Refinitiv Workspace - Excel [27]
Path	*<install_path>*\Refinitiv\Refinitiv Workspace\RefinitivWorkspace.exe
Start Folder	*<install_path>*\Refinitiv\Refinitiv Workspace\
Parameter	--excel
Entitle Users after Adding Pool	Select this checkbox
Multi-Session Mode	Select **Disabled**

7. Click **Submit**

   The application appears in the **Application Pools** panel

---

[27] The **Display Name** value is a free text field. However, the structure of the **ID**, **Path**, and **Start Folder** entries are a requirement.

8. In the Application Pools panel, click **Entitlements**

9. In the **Add Entitlements** panel, click **Add**

   The **Find User or Group** panel, opposite, is displayed

10. Use the fields in this panel – **Domain**, **Name/User Name**, and **Description** – search for existing VMware users and select the checkboxes next to their details

11. Click **OK**
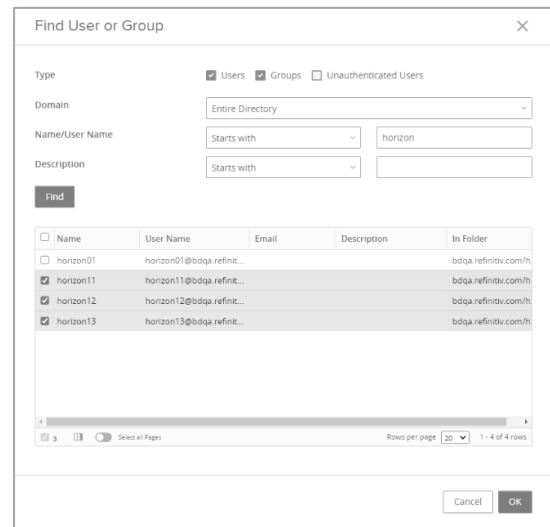
Installing Workspace for VMWare Horizon virtual desktop

If you use instant clone desktop pools (golden image), or automated full-clone desktop pools, configured to clear changes after the user closes a session, you must install Workspace using the no automatic update mode. To do so, use the following command line[28]:

```
RefinitivWorkspace-installer_x.xx.xx.exe --machine-autoupdate-no --sharedconfig="<file_path>"
```

In most cases, the Per-Machine and Per-User installation modes of Workspace are also supported for VMware Horizon virtual desktop.

Running Workspace web access

Workspace is also accessible through the Internet or private network.

RELATED LINKS
– Configuring Single Sign On (SSO) for browser-based Workspace

Accessing through the Internet

To access the Workspace sign-in page:

– Enter the following URL into your browser:

– https:\\workspace.refinitiv.com\web

Accessing through a private network

To access the Workspace sign-in page:

– Enter the following URL into your browser:

– https:\\workspace.extranet.refinitiv.biz\web

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[28] Although not shown in this example, as for the virtual app, the command line should include the log and cache paths, which must point to the same location from where RefinitivWorkspace.exe is run.

Post installation testing

Once Workspace has been installed, you can test the data retrieval functions using the testing tool provided in Refinitiv Workspace - Excel.

Downloading the tool

To download the testing tool, do the following:

1. Run Refinitiv Workspace - Excel

2. Under the **Workspace** menu:

    a. Sign in, if necessary

    b. Click **Templates**

    c. In **Search for templates…**, type test and press **Enter**

    d. In the first search result panel, Refinitiv Workspace – Microsoft Excel Functions Test, click the **Download** button
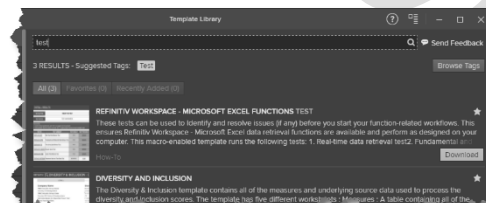
    Once downloaded, the tool template opens automatically:
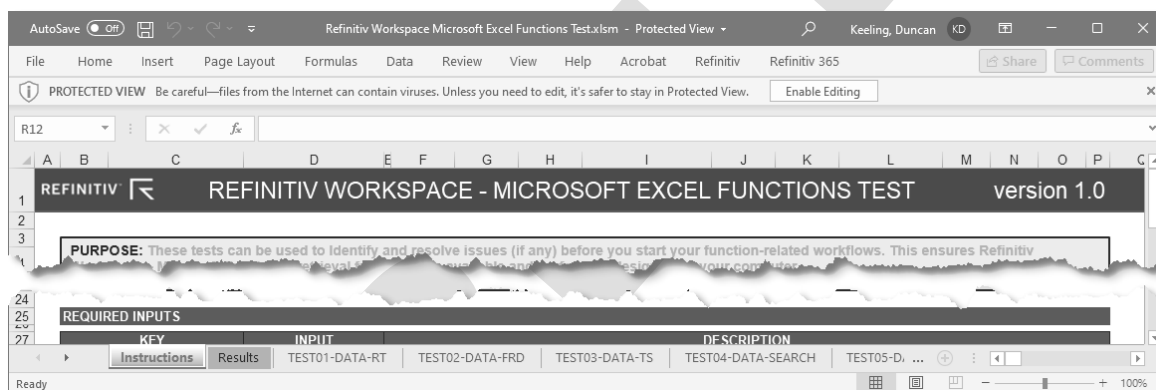
Running the tool

After checking the Prerequisites, listed in the Instructions section, do the following:

1. Click the **Results** worksheet tab

2. Click the **START THE TEST** button

    The tests usually take less than a minute to run and, should an error occur, you are presented with diagnostic data under the relevant tab.

Uninstalling Workspace

You can uninstall Workspace, by:

− Using the installer user interface, or

− Using a command

Using the installer user interface

You can uninstall Workspace using the standard add and remove functions in Windows and macOS [29]. For example:

1. In Windows, under **Settings > Apps & features**, select **Refinitiv Workspace** and click **Uninstall**

2. In the confirmation prompt, click **Uninstall** again to open the installer UI, opposite

3. Click **Uninstall**

4. Once the uninstallation is complete, click **Exit**
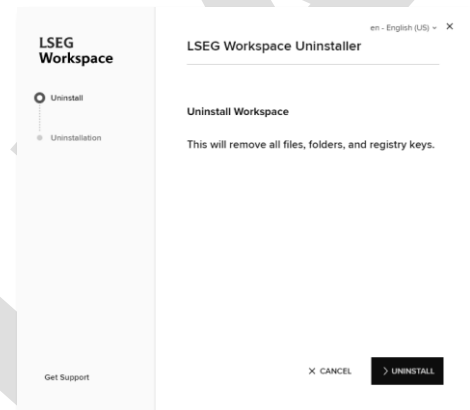
Using a command

You can uninstall Workspace using the following command line:

− `RefinitivWorkspace.exe --uninstall`

> **Important:** When the `--machine-autoupdate-peruser` installation method is used, running the uninstallation command removes the Workspace instance in the profile under which it is run. For instance, if the master image is removed, all clone images will remain installed.

Log file location

The uninstallation log file is stored in the `%Temp%\Refinitiv Workspace Uninstall Logs\` folder.

---

[29] The app removal function in macOS deletes the application folder without displaying the Workspace-specific UI.

Running a mass deployment

About mass deployment

You can deploy LSEG Workspace with your own mass deployment tool. To do so, follow the four stages summarized below:

Stage 1: Prepare installation and shared configuration files

Stage 2: Prepare the installation command line and create an install script

Stage 3: Ensure that the installation, shared configuration, and the install script files are in a shared location

Stage 4: Execute the install script or command line using your mass deployment tool

Prepare installation and shared configuration files

1. Download the Workspace Installer from the Workspace download page. The file has the following naming structure, where *x.xx.xx* is the version number:

–   `RefinitivWorkspace-installer_x.xx.xx.exe`

2. Create a `config.json` file

–   For example:

```
{
  "EIKON.CONNECTION.MODE": "private",
  "EIKON.LOG.TRACELEVEL": "warn",
  "REFINITIV.WORKSPACE.RUN ABOVE NORMAL PRIORITY": "true",
  "REFINITIV.WORKSPACE.TRADING.PRINTER NAME": "Microsoft Print to PDF",
  "EIKON.INTRANET OVERRIDE.URL": "C:\\Workspace\\config.json",
  "CLIENTSSO URL.ENABLED": "true",
  "CLIENTSSO URL": "https:\\myapps.testsso.com",
  "CLIENTSSO REFINITIV URL": "https:\\myapps.testsso.com",
  "EIKON.STREAMING.API.LOCAL.ENABLE": "true",
  "EIKON.STREAMING.API.LOCAL.SESSIONS": "[\"wss:\\test-ads-
sharedconfig.com:15000\WebSocket\"]",
  "EIKON.STREAMING.API.LOCAL.DACS.USERNAME": "permit all exchanges",
  "EIKON.STREAMING.API.LOCAL.DACS.POSITION":
"%USERDETAILS.LASTNAME% %USERDETAILS.UUID",
  "EIKON.STREAMING.API.LOCAL.DEFAULTSOURCE": "IDN RDF 2",
  "EIKON.STREAMING.JETQUOTES.DESKTOP.CONFLATION.ENABLE": "true",
  "EIKON.STREAMING.JETQUOTES.DESKTOP.CONFLATION": "3000",
  "EIKONPROTOCOL.ISDEFAULTAPPLICATION": "true"
}
```

Prepare the installation command line and an install script

For further information about installation command lines, refer to the Workspace Help parameter options section, under PC installation.

For an example of an install script (`install.cmd`), see the Script examples section.

Ensure all necessary files are in a shared location

The following files must be in a common location:

- RefinitivWorkspace-installer_x.xx.xx.exe
- config.json
- config_fallback.json (optional)
- install.cmd

Execute the install script using your mass deployment tool

Run the installation script using your deployment tool.

Script examples

This section contains examples of the following scripts for LSEG Workspace:

- Installation
- Update
- Rollback
- Uninstallation

Install (install.cmd) script example:

```
@echo off
:------ Identify the command's parameters to install the software
SET VERSION=1.20.38
SET REFINITIV WORKSPACE INSTALLER=C:\Workspace\RefinitivWorkspace-
installer_%VERSION%.exe
SET REFINITIV WORKSPACE SHARED CONFIG FILE=C:\Workspace\config.json
SET
REFINITIV WORKSPACE SHARED CONFIG FALLBACK FILE=C:\Workspace\config fallback.
json
SET DEPLOYMENT MODE=--machine-autoupdate-service
SET REFINITIV WORKSPACE INSTALL PATH=C:\rw\installpath
SET REFINITIV WORKSPACE LOG PATH=C:\rw custpath\log
SET REFINITIV WORKSPACE CACHE PATH=C:\rw custpath\cache
SET REFINITIV WORKSPACE SHORTCUTS PATH=C:\rw custpath\shortcuts
:: ----- Workspace Installation ------
"%REFINITIV WORKSPACE INSTALLER%" %DEPLOYMENT MODE% --
sharedconfig="%REFINITIV WORKSPACE SHARED CONFIG FILE%;%REFINITIV WORKSPACE S
HARED CONFIG FALLBACK FILE%" --silent;
:: "%REFINITIV WORKSPACE INSTALLER%" %DEPLOYMENT MODE% --
sharedconfig="%REFINITIV WORKSPACE SHARED CONFIG FILE%;%REFINITIV WORKSPACE S
HARED CONFIG FALLBACK FILE% --
installpath="%REFINITIV WORKSPACE INSTALL PATH%" --
cachepath="%REFINITIV WORKSPACE CACHE PATH%" --
logpath="%REFINITIV WORKSPACE LOG PATH%" --
shortcuts="%REFINITIV_WORKSPACE_SHORTCUTS_PATH%" ;
```

Workspace update (`update.cmd`) script example:

```
@echo off
:------ Identify the command's parameters to install the software
SET VERSION=1.21.365
SET REFINITIV WORKSPACE INSTALLER=C:\Workspace\RefinitivWorkspace-
installer_%VERSION%.exe
SET DEPLOYMENT MODE=--machine-autoupdate-service
:: ----- Workspace Software Update ------
"%REFINITIV WORKSPACE INSTALLER%" %DEPLOYMENT MODE% --silent;
:: "%REFINITIV WORKSPACE INSTALLER%" %DEPLOYMENT MODE% --
sharedconfig="%REFINITIV WORKSPACE SHARED CONFIG FILE%;%REFINITIV WORKSPACE SH
ARED CONFIG FALLBACK FILE% --installpath="%REFINITIV WORKSPACE INSTALL PATH%"
--cachepath="%REFINITIV WORKSPACE CACHE PATH%" --
logpath="%REFINITIV WORKSPACE LOG PATH%" --
shortcuts="%REFINITIV_WORKSPACE_SHORTCUTS_PATH%" ;
```

Rollback (`rollback.cmd`) script example:

```
@echo off
:------ Identify the command's parameters to rollback the software
SET REFINITIV WORKSPACE INSTALL PATH=C:\Program Files\Refinitiv\Refinitiv
Workspace
:: ----- Workspace Uninstallation ------
"%REFINITIV WORKSPACE INSTALL PATH%\RefinitivWorkspace.exe" –rollback --
silent;
```

Uninstallation (`uninstall.cmd`) script example:

```
@echo off
:------ Identify the command's parameters to uninstall the software
SET REFINITIV WORKSPACE INSTALL PATH=C:\Program Files\Refinitiv\Refinitiv
Workspace
:: ----- Workspace Uninstallation ------
"%REFINITIV WORKSPACE INSTALL PATH%\RefinitivWorkspace.exe" –uninstall --
silent;
```

Configuring Workspace

You can configure Workspace using the Configuration Manager, which is accessed by running the Workspace executable with the `--config-manager` parameter in a Command Prompt window or by selecting the **Help > Configuration Manager** option in Workspace.

In this section
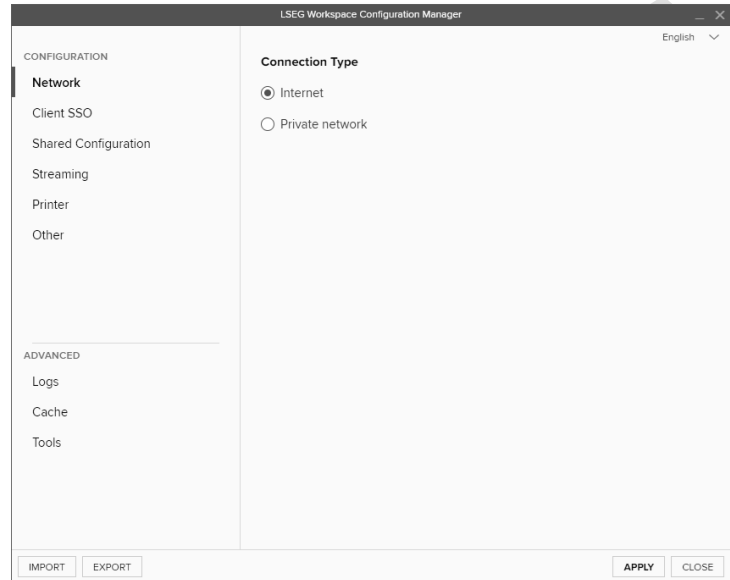
Configuration Manager command lines

The command line you use depends on the installation type:

– For User installations, use the command:

```
"<InstallDir>\Refinitiv\Refinitiv Workspace\RefinitivWorkspace.exe" --config-manager
```

– For Machine installations, use the command:

```
"<InstallDir>\Refinitiv\Refinitiv Workspace\RefinitivWorkspace.exe" --config-manager --machine
```

Setting up configuration manager

In the Configuration Manager, choose your settings for the following panels:

1. In the **Network** panel, set the connection type in your environment to either Internet (the default value) or private network.

2. In the **Client SSO** panel, if you have SAML 2.0 set up, enter the URL in the **Client Single Sign On (SSO)** field.

3. In the **Shared Configuration** panel, select whether you are using a shared configuration, which overrides other settings.

> **Important!** Defining a shared configuration file (or files, for failover purposes) is optional but strongly recommended for mass configuration, as it allows you to define configuration parameters for all users from a single location.

Workspace uses different `settings.json` files[30] based on the type of installation:

− For User installations, the file stores user-specific settings that are controlled by the user and can be found in the following location:

`%AppData%\Refinitiv\Refinitiv Workspace\Config\user-settings.json`

− For Machine or Hot-Desking installations, the file stores machine-specific settings that are controlled by elevated computer administrator rights and can be found in the following location:

`%ProgramData%\Refinitiv\Refinitiv Workspace\Config\machine-settings.json`

You can specify one or, for failover purposes, more configuration files that can be used across multiple desktops by putting these files on a shared drive or Web server (formerly Configuration Proxy concept).

To do this:

a. Click **Export** and navigate to the configuration file, `<override_settings>.json`, from the Configuration Manager.

b. Place this file on a shared drive or a Web server.

c. Enter the URL or UNC path of the file into the installation command line, or add this path into the Configuration Manager directly. For example:

`\\myserver\config\refinitiv\override-settings.json`

4. In the **Streaming** panel, you can choose streaming sources and whether to activate streaming conflation.

The **Streaming Conflation** rate[31] is used for desktop performance management by reducing CPU usage in downloading streaming data. In effect, it reduces data refresh rate from the default to every 1.5, 3, or 6 seconds.

5. Also, in the **Streaming** panel, choose your **Streaming Data Retrieval** source. Data can be streamed from either a Refinitiv Data Platform or by defining one or more local LSEG Real-Time Advanced Distribution Servers (formerly ADS).

---
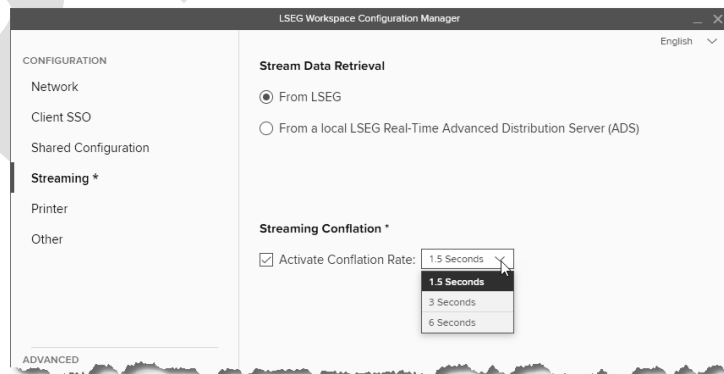
[30] A shared `<override_settings>.json` configuration file takes priority over local `user-settings.json` or `machine-settings.json` configuration files. When using the `--sharedconfig` parameter, Workspace reads the configuration from the specified location every time it is launched.
For further information, see Shared configuration file bug section.

[31] Currently, this capability is for Workspace desktop access only and will not affect the conflation settings of the Workspace add-in running under Microsoft Office.
On Workspace desktop, the highest generally supported conflation rate is 300ms. However, certain exceptions, such as news and chart apps, can run at higher update rates.

In Configuration Manager [32], you can configure the WebSocket [33] protocol to connect to the Workspace platform for streaming services:

- WebSocket Secure (`wss:\\`) for encrypted connections, and
- WebSocket (`ws:\\`) for unencrypted connections

Additional customer-managed sites use this connectivity to create a connection to the local LSEG Real-Time Advanced Distribution Server.

Some proxy servers may not support (or have disabled support for) the WebSocket protocol, which may cause Workspace streaming-related features not to work.

You must do the following:

a. For Internet, allow WebSocket connectivity to the following URLs:

   `*.refinitiv.com`

   `*.refinitiv.net`

b. For Delivery Direct, allow WebSocket connectivity to the following URLs:

   `*.refinitiv.biz`
   `*.refinitiv.net`

6. In the **Streaming > Servers** panel, enter the LSEG Real-Time Advanced Distribution Server IP address and hostname, together with the port [34]. The default LSEG Real-Time Distribution System (formerly TREP) port for WebSocket is 15000.

   Click **+** to add multiple servers, which are called in turn if connection to the Primary server fails.
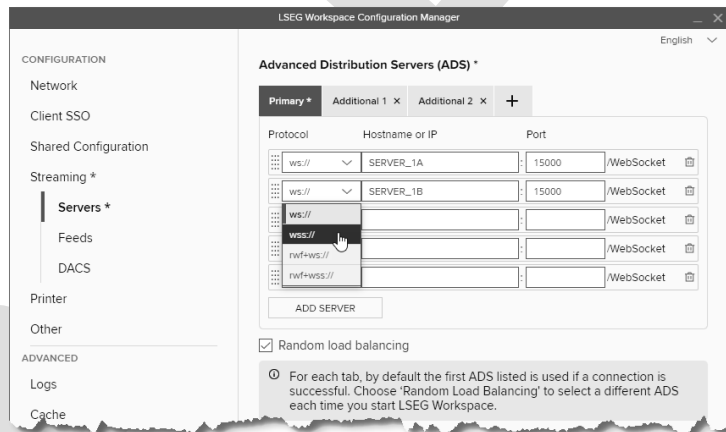
7. In the **Streaming > Feeds** panel, configure feeds provided by local LSEG Real-Time Advanced Distribution Server.

   In supported Workspace versions, key letters [35] can be used as single-character shortcuts to additional feed sources. For example, LSEG Real-Time Advanced Transformation Server (formerly ATS) is key letter A.

   For Office aliases [36], there is a limit of 32 characters.

8. In the **Streaming > DACS** panel, enter the LSEG Real-Time Data Access Control System username and position.

---

[32] Other protocols can be configured in your shared configuration file. For more information, see the Alternative streaming servers section.

[33] The WebSocket(ws) protocol provides full-duplex communication channels over a single TCP connection. For further information, see RFC 6455: The WebSocket Protocol (rfc-editor.org).

[34] Only one server or DNS can be entered for each line.

[35] Workspace supports only standard ASCII (Latin) alphabetic characters. That is, the values A-to-Z or a-to-z.

[36] A subset of ASCII printable characters is supported. That is, the values a-to-z, A-to-Z, and 0-to-9. Special characters (#, $, &, and so on) are not supported.

9. In the **Printers** panel, select the default printer or output mechanism that is to be used to print trading tickets silently. That is, without the need to select the printer each time.
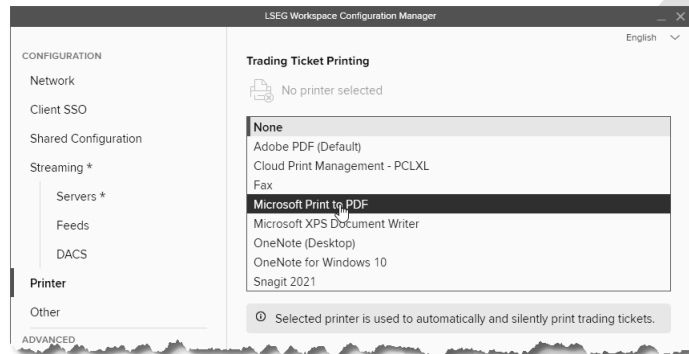
10. In the **Other** panel, you can choose whether Workspace is to run at above normal priority [37] by selecting the **Run At the highest Available Process Priority Level** checkbox. [38]

    You can also select whether links from LSEG apps open in Workspace or Eikon. [39]

    Finally, the **Select trading keypad mode** applies your chosen keypad lighting scheme to the trading keypad.
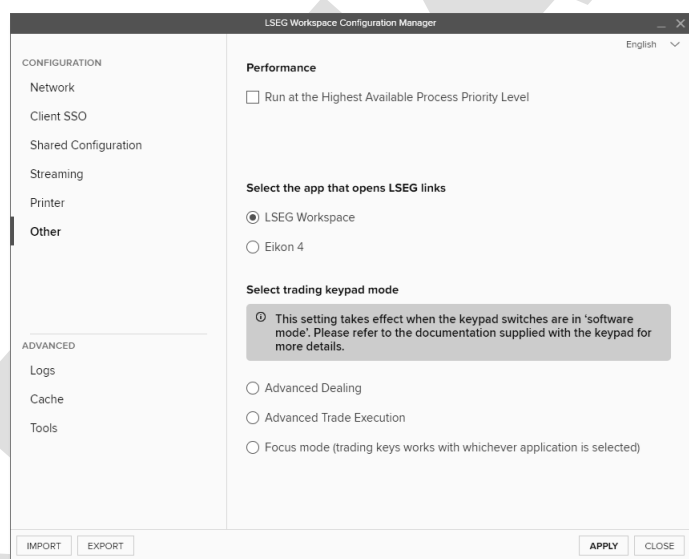
11. In the **Logs** panel, you can modify the default path for log files, changing from the folder path chosen during installation.

    You can choose the depth of logging required.

    You can also activate the web logger to troubleshoot networking issues.

---
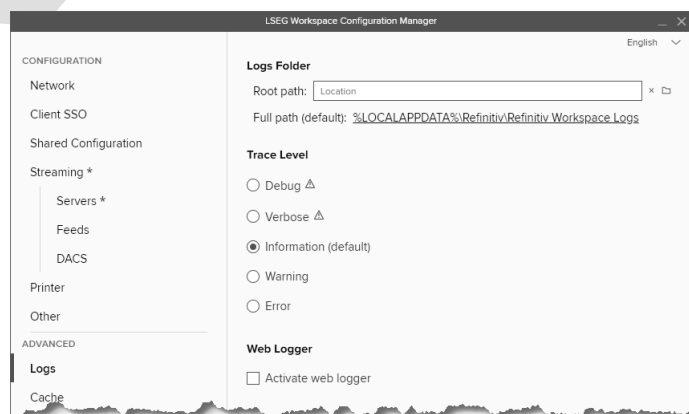
[37] Currently, this capability is for Workspace running on Windows only and will not affect the process priority of Workspace on macOS or the add-in running under Microsoft Office.

[38] This can also be achieved by using the command line parameter `--run-above-normal-priority`. For more information, see Workspace executable statements.

[39] You are unable to switch between Eikon 4.0 and Workspace where there was a Citrix installation of Workspace. In Citrix we do not support multiple applications to be installed concurrently (Jira ref: EFO-9593).

12. In the **Cache** panel, you can define
a new folder location for cache
files, changing from the folder path
chosen during installation.

You can also choose to clear all
cache folders or only those folders
of Electron or your Workspace
apps.
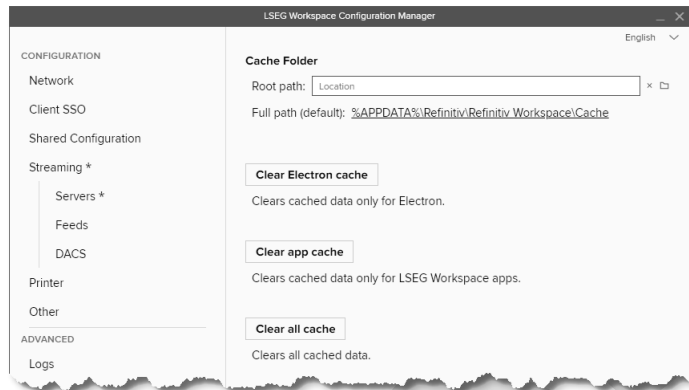
13. Finally, in the **Tools** panel, use the
Eikon 4 configuration converter tool
to convert an existing Eikon
configuration file to Workspace-
compatible `.json` format.

For further information, see the
section below.

Converting and modifying an Eikon configuration file

For test purposes, in the **Tools** panel of the Configuration Manager, you can use the **Eikon 4
configuration converter** to convert an existing `OverrideConfiguration.xml` file to `.json`
format.

To convert and modify an existing file:

1. Click Eikon 4 Configuration Converter.

2. Select your saved `.xml` file. For example:

   `\\myserver\config\refinitiv\OverrideConfiguration.xml`

3. Click **Open**.

   The file is converted, and the converted configuration file is then displayed.

4. Click **OK**.

5. [Optional] Change your Network and SSO configuration.

6. Check that the Streaming settings are correct and make any necessary changes.

7. Click **Export** to create a new file with a `.json` extension.

Warning: The converted `.json` file still contains legacy configuration settings from Eikon,
which could potentially raise issues.

Creating a new configuration file manually

To create a clean Workspace configuration file:

1. Delete your currently loaded configuration file.

2. Copy specific parameters from the Eikon Configuration Manager to the Workspace Configuration Manager.

Parameters in the Eikon Configuration Manager largely share the same names as their counterparts in Workspace. However, the following table lists the exceptions (parameter name and location):

Eikon	Workspace
Distributors Configuration: Customer Managed (Local Configuration Files) > Real-Time tab > ADS Connection – RSSL protocol	**Hostname or IP** Streaming > Servers
User Name Configuration: Customer Managed (Local Configuration Files) > Permissions tab > DACS Identification	**Username** Streaming > DACS

For more complex environments and further support, contact Workspace technical support, who can assist in converting the content of the `OverrideConfiguration.xml` and RFA.RFA-configuration-files.

Configuring Single Sign On (SSO) for Workspace web access

Required configuration for when LSEG is the Service Provider (SP):

− Embed the Workspace Web access URL within the Identity Provider (IDP) initiated login URL. This redirects to Workspace after a successful login.

For example:

```
https:\\id-abc.com\abc-
sso\eikonweb?RelayState=https:\\workspace.refinitiv.com\web
```

The appropriate attribute name must be used, as indicated by the IDP software, for example, `RelayState` or `TargetResource`.

Appendix A: Folders and files

In this section

Packages

This document can be used by IT to create an installation package and provide documentation for future updates to the application.

Download locations

You can download the latest version of the installation file, `RefinitivWorkspace-installer_x.xx.xx.exe`, from the locations listed in the table below.

Location	Link
Internet	https:\\workspace.refinitiv.com
Private network	https:\\workspace.extranet.refinitiv.biz

Executable file sizes

The installer executable size is operating system dependent:

Operating System	Size (Megabits)
Microsoft Windows	~100
Apple macOS	~200

Server software

Important: DACS Permission Synchronization for Workspace is recommended – rather than the Deployed Permissions Reconciliation Manager (DPRM) service - to prevent misconfiguration or permission issues between the Refinitiv Data Platform and local LSEG Real-Time Distribution System (formerly TREP).

While we recommend DACS, for information regarding the configuration of the DPRM service, refer to Appendix F: Settings.

Versions

The following table lists the LSEG Real-Time Distribution System (formerly TREP) server software version requirements:

Server software	Version
LSEG Real-Time Advanced Distribution Server (formerly ADS)	3.4[40] or higher
LSEG Real-Time Data Access Control System	7.2[41] or higher

Creating an internal connection

To create a connection to the LSEG Real-Time Distribution System, you must download the Data Dictionary from a LSEG Real-Time Connector (RTC) or LSEG Real-Time Advanced Distribution Server (formerly ADS).

However, to do so, you must do either of the following:

−   Set *maxOutputBuffers in the LSEG Real-Time Distribution System to 5000, or

−   Use the following multi-part dictionary setting [42] to enable the download to be performed:

    *<XYZ>*enableMultipartDictionary : True

Configuring multiple servers

Up to eight additional LSEG Real-Time Advanced Distribution Servers can be added to a custom[43] configuration. This is done by using the **Streaming > Servers** panel of the Configuration Manager or by using the following statement:

EIKON.STREAMING.API.LOCAL.ADDITIONAL.SESSIONS.<n>

Where <n> is a number between 1 and 8.

For example:

```
/*
Each server can have more than one URL, where each subsequent URL acts as a
failover for the specific server
*/
// Main server
//
"EIKON.STREAMING.API.LOCAL.SESSIONS":
"[\"ws://ads01:15000/WebSocket\",\"ws://ads02:15000/WebSocket\",\"ws://ads02:15
001/WebSocket\"]",
//
// Additional server
//
"EIKON.STREAMING.API.LOCAL.ADDITIONAL.SESSIONS.1":
"[\"ws://example01:15000/WebSocket\",\"ws://example02:15000/WebSocket\",\"ws://
example03:15001/WebSocket\"]"
```

Important: Additional servers work only if the main server connects successfully.

---

[40] Issues in the L1 and L2 releases of LSEG Real-Time Advanced Distribution Server version 3.5.2 prevent Workspace from functioning and cannot be used. However, these issues were subsequently addressed in the L3 release. As such, to run the Contribution function, installing version 3.5.2 L3 (or higher) is required. For further information, see the LSEG Real-Time Advanced Distribution Server version issues section.

[41] The specified version requirement is for DACS Permission Synchronization only.

[42] No change to the maxOutputBuffers parameter is required.

[43] Additional servers can only be configured in user-settings, machine-settings, or shared configuration files. Configuration Manager support will be made available in a future version.

Executable files

The core installation of Workspace has the following executables:

Process Name	Service
RefinitivWorkspace.exe	LSEG Workspace (the main Workspace process)
Refinitiv-host.exe	Session Sharing Chrome Extension
RWupdaterService.exe	Software update installation service
Refinitiv.Workspace.BatchService.UserInteraction.exe	(Optional) Batch print service [44]
Setup.exe	Called by the main processes to perform various sub-processes

Workspace uses `.zip` for updates. This may change in future releases, when smaller (delta) installation packages are introduced.

Digital signatures

The executable (`.exe`) and dynamic link library (`.dll`) files are digitally signed.

From Workspace version 1.24, these files will be signed using new digital certificates. This code signing certificate retains the same **Issuer** value but has different **Subject** and **Thumbprint** values. The new certificates do not impact builds of Workspace released prior to version 1.24.

For further information, refer to PCN208112 - LSEG Workspace 1.24 - New digital certificate.

Digital certificates for Workspace 1.24 or higher

LSEG signature

Publisher	London Stock Exchange Group PLC
Subject	C=GB/S=London, City of/O=London Stock Exchange Group plc/CN=London Stock Exchange Group plc
Issuer	C=GB/O=Sectigo Limited/CN=Sectigo Public Code Signing CA R36
Thumbprint	5E56E4978E9D9F19C1298C55E1E6373DFAF44A6F
Expiration	Friday, April 24, 2026, 11:59:59 PM

macOS signature

Publisher	REFINITIV US LLC
Subject	C=US/O=REFINITIV US LLC/OU=YHNVBQZ486/CN=Developer ID Application: Refinitiv US LLC (YHNVBQZ486)/UID=YHNVBQZ486
Issuer	C=US/O=Apple Inc./OU= Apple Certification Authority/CN=Developer ID Certification Authority
Thumbprint	148A8BC109B61AB34D6688249545B40983E3DD44
Expiration	Friday, September 8, 2028, 03:17:30 GMT

Digital certificates for Workspace 1.23 or earlier

All Desktop and native apps files stamped with the previous or expired certificates are not affected by this change and will remain validly signed without any time limit.

---

[44] The Batch Print service is an optional download, used to print or save documents from the search results grid. The service can be downloaded using the following URL:
https:\\cdn.refinitiv.com\public\packages\batchsaveinstall\RefinitivWorkspaceBatchService.msi

Refinitiv signatures

Publisher	REFINITIV US LLC
Subject	C=US/PostalCode=10036/S=New York/L=New York/STREET=3 Times Square/O=REFINITIV US LLC/CN=REFINITIV US LLC
Issuer	C=GB/S=Greater Manchester/L=Salford/O=Sectigo Limited/CN=Sectigo RSA Code Signing CA

Publisher[45]	REFINITIV US LLC
Subject	C=US/S=New York/O=REFINITIV US LLC/CN=REFINITIV US LLC
Issuer	C=GB/O=Sectigo Limited/CN=Sectigo Public Code Signing CA R36
Thumbprint	faeb75e9e11605257a0c9b32c8c1f4aa61245276
Expiration	Friday, November 24, 2023, 11:59:59 PM

Microsoft signature

Publisher	Microsoft Corporation
Subject	C=US/S=Washington/L=Redmond/O=Microsoft Corporation/CN=Microsoft Corporation
Issuer	C=US/S=Washington/L=Redmond/O=Microsoft Corporation/CN=Microsoft Code Signing PCA 2010

macOS signature

Publisher	REFINITIV US LLC
Subject	C=US/O=REFINITIV US LLC/OU=YHNVBQZ486/CN=Developer ID Application: Refinitiv US LLC (YHNVBQZ486)/UID=YHNVBQZ486
Issuer	C=US/O=Apple Inc./OU= Apple Certification Authority/CN=Developer ID Certification Authority
Thumbprint	B69FD35BFD9D7FFE877DCF570A4EFC7D4E8ADCFA
Expiration	Wednesday, October 16, 2024, 14:47:34 GMT

Registry files

Installation mode	Description	Registry key	User
User	The registry is deployed only once, at installation time	HKCU[46]	Current user
Machine with an auto-update per user	The registry is deployed multiple times, as it depends on Active Setup	HKCU, HKLM	Every user (Separate user profile)
Machine with auto-update service or no auto-updates	The registry is deployed only once, at installation time.	HKLM[47]	Every user

Configuration file settings

The following settings are customizable in your `.json` configuration file.

Setting	Customization
EIKON.STREAMING.API.LOCAL.ALLOWHOSTEDFALLBACK	Defining this setting as `false`, indicates that you do not want Workspace to fall back to the Common Platform hosted streaming servers. In this case, if the connection to all configured local server URLs fails, Workspace is unable to retrieve streaming data. By default, Workspace systematically attempts to connect to the Common Platform hosted streaming servers, if no local connection can be made.

---

[45] For further information, refer to PCN 13469
[46] HKEY_CURRENT_USER
[47] HKEY_LOCAL_MACHINE

Setting	Customization
EIKON.STREAMING.API.LOCAL.DACS.APPLICATIONID	This setting allows you to customize the DACS application ID, for Workspace it is 56 by default.
CLIENTSSO_URL.ENABLED CLIENTSSO_URL	Support Client SSO service to allow the user to use company credentials to login.

Shortcuts

There are two shortcuts created under the **Refinitiv** folder, found under the Start menu:

− Refinitiv Workspace

− Refinitiv Workspace - Excel

Default folder structures

The following table contains the default folder structures for User and Machine installations, and includes the location under which the structures are created:

Service	Location	Structure
User installation		
n/a	%LocalAppData%	<pre>├──Refinitiv for Office
│   └──1.20.68
│   ├──config
│   │   └──addin.config.json
│   ├──Office_x64
│   │   └──refinitiv-shim.dll
│   └──Office_x86
│   └──refinitiv-shim.dll
├──Refinitiv Workspace
│   ├── com.refinitiv.workspace.sessionsharing.json
│   ├── install-settings.json
│   ├── installInfo.json
│   ├── Refinitiv-host.exe
│   ├── RefinitivWorkspace.exe
│   ├── locales
│   ├── resources
│   └── swiftshader
├──Refinitiv Workspace Install Logs
├──Refinitiv Workspace Logs
├──Refinitiv Workspace.versions
│   └──1.21.344
└──Refinitiv Workspace.ToInstall
├──RFVWWindows_Core_1_21_276.zip
└──Extract</pre>
	%AppData%	<pre>└──Refinitiv Workspace
├── Local State
└── Cache</pre>
Machine installation		
With auto-update service	%ProgramFiles%	<pre>├──Refinitiv for Office
│   └──1.20.68
│   ├──config
│   │   └──addin.config.json
│   ├──Office_x64
│   │   └──refinitiv-shim.dll
│   └──Office_x86
│   └──refinitiv-shim.dll
└──Refinitiv Workspace
├──install-settings.json
├──RefinitivWorkspace.exe
└──1.21.344
├──com.refinitiv.workspace.sessionsharing.json
├──installInfo.json
├──Refinitiv-host.exe
├──RefinitivWorkspace.exe
├──RWupdaterService.exe
├──locales
├──resources
└──swiftshader</pre>

Service	Location	Structure

	%ProgramData%	├──**Refinitiv Workspace**
		│ ├──pmInstallInfo.json
		│ └──userInfo.json
		├──**Refinitiv Workspace Install Logs**
		├──**Refinitiv Workspace.versions**
		│ └──1.21.344
		└──**Refinitiv Workspace.ToInstall**
		   ├──RFVWWindows_Core_1_21_276.zip
		   └──Extract

	%LocalAppData%	└──**Refinitiv Workspace Logs**

	%AppData%	└──**Refinitiv Workspace**
		   ├──Local State
		   └──Cache

With auto-update per user	%ProgramFiles%\Refinitiv	├──**Refinitiv for Office**
		│ └──1.20.68
		│ ├──config
		│ │ └──addin.config.json
		│ ├──Office_x64
		│ │ └──refinitiv-shim.dll
		│ └──Office_x86
		│ └──refinitiv-shim.dll
		└──**Refinitiv Workspace**
		   ├──com.refinitiv.workspace.sessionsharing.json
		   ├──install-settings.json
		   ├──installInfo.json
		   ├──Refinitiv-host.exe
		   ├──RefinitivWorkspace.exe
		   ├──locales
		   ├──resources
		   └──swiftshader

	%ProgramData%\Refinitiv	├──**Refinitiv Workspace** │ ├──pmInstallInfo.json │ └──userInfo.json │ └──**Refinitiv Workspace Install Logs** └──**Refinitiv Workspace.versions** └──1.21.344

	%LocalAppData%\Refinitiv	├──**Refinitiv for Office**
		│ └──1.20.68
		│ ├──config
		│ │ └──addin.config.json
		│ ├──Office_x64
		│ │ └──refinitiv-shim.dll
		│ └──Office_x86
		│ └──refinitiv-shim.dll
		├──**Refinitiv Workspace**
		│ ├──com.refinitiv.workspace.sessionsharing.json
		│ ├──install-settings.json
		│ ├──installInfo.json
		│ ├──Refinitiv-host.exe
		│ ├──RefinitivWorkspace.exe
		│ ├──locales
		│ ├──resources
		│ │ ├──app.asar
		│ │ ├──deployment.asar
		│ │ ├──package.zip
		│ │ ├──REFINITIVEXCEL.ico
		│ │ ├──REFINITIVMESSENGER.ico
		│ │ ├──REFINITIVWORKSPACE.ico
		│ │ ├──versionInfo.json
		│ │ └──app.asar.unpacked
		│ └──swiftshader
		├──**Refinitiv Workspace Logs**
		└──**Refinitiv Workspace.ToInstall**
		   ├──RFVWWindows_Core_1_21_276.zip
		   └──Extract

	%AppData%\Refinitiv	└──**Refinitiv Workspace**
		   ├──Local State
		   └──Cache

	%Temp%	└──**Refinitiv Workspace Uninstall Logs**
Without auto-update service	%ProgramFiles%\Refinitiv	├──**Refinitiv for Office** │ └──1.20.68 │ ├──config │ └──addin.config.json

Service	Location	Structure
| | | ```
            ├──Office_x64
            │       └──refinitiv-shim.dll
            └──Office_x86
                    └──refinitiv-shim.dll
  └──Refinitiv Workspace
        ├──com.refinitiv.workspace.sessionsharing.json
        ├──install-settings.json
        ├──installInfo.json
        ├──Refinitiv-host.exe
        ├──RefinitivWorkspace.exe
        ├──locales
        ├──resources
        └──swiftshader
``` |
| | %ProgramData%\Refinitiv | ```
├──Refinitiv Workspace
├──pmInstallInfo.json
└──userInfo.json
├──Refinitiv Workspace Install Logs
└──Refinitiv Workspace.versions
      └──1.21.344
``` |
| | %LocalAppData%\Refinitiv | `└──Refinitiv Workspace Logs` |
| | %AppData%\Refinitiv | ```
└──Refinitiv Workspace
      ├──Local State
      └──Cache
``` |
| | %temp% | `└──Refinitiv Workspace Uninstall Logs` |

Proxies

Qualified Proxy

Workspace is qualified with the following authenticated proxy:

Proxy	Authentication Method
Squid 2.7	− No authentication − Basic − Digest − NTLM − Kerberos
Squid 3.5.28	− Basic − Digest

HTTP/1.1 (or above) Compliant Proxy

Workspace requires HTTP/1.1. Workspace can attempt to use HTTP/2 but falls back to HTTP 1.1 if it is not viable.

It is vital that you use an HTTP/1.1+ Compliant Proxy to have the best connection between the Workspace key station and the LSEG Platform on the head end.

Important: The Streaming Service requires a *keep alive* or *persistent* connection, which is supported in the HTTP/1.1 specification.

Appendix B: Software information and support

In this section

- Documentation locations
- Export control classification
- Hosted connection item limits
- About LSEG Workspace dialog
- Data dictionary support
- Local mode support

Documentation locations

Workspace technical content can generally be found in two locations:

- The documentation section of the LSEG Workspace page. These documents are searchable using all popular search engines (such as Google or Bing).
- Under the Workspace section of MyRefinitiv, the authenticated website.

Where documents are to be found in other locations, these are provided in the table below:

Documentation	Location(s)
Workspace Administration Panel Configuration	A description of the functions of the Workspace Administration Panel can be found in the Configuration Guide.
Workspace System Requirements	The system requirements documentation can be found in the System Requirements document.
LSEG Real-Time Data Access Control System (formerly DACS)[48]	The DACS permission synchronization requirements can be found in the DACS Permission Synchronization Configuration Guide, under the DACS section of the authenticated website.
LSEG Real-Time Advanced Distribution Server (formerly ADS)	An overview of the ADS WebSocket connection configuration can be found in the ADS Software Installation Manual, under the Advanced Distribution Server (ADS) section of the authenticated website.
LSEG Real-Time Advanced Distribution Hub (formerly ADH)	Content covering the installation and configuration of the LSEG Real-Time Advanced Distribution Hub can be found in the Advanced Distribution Hub section of the authenticated website.
Financial Community Network (FCN) and Delivery Direct	For further information about FCN and Delivery Direct, see the Private Network Overview section of the authenticated website.
Chrome Extension	For further information about the Google Chrome extension, see the Chrome Extension Installation Guide.
Release Notes	A summary of the features in the latest release of Workspace can be found in the Release Notes document.
Service Description	The Workspace Service Description document can be found in the Service Description document.
Workspace Vendor Subservice Definitions	A list of the Products, Exchanges, and Specialist Data definitions can be found in the Vendor subservice definitions document. These are managed using the LSEG Real-Time Data Access Control System (DACS).

[48] DACS Permission Synchronization for Workspace is recommended – rather than the DPRM service - to prevent misconfiguration or permission issues between the Refinitiv Data Platform and local LSEG Real-Time Distribution System (formerly TREP).
While we recommend DACS, for information regarding the configuration of the DPRM service, refer to Appendix F: Settings.

Documentation	Location(s)
Technical Roadmap	A tabular summary of known significant changes to upcoming releases of Workspace can be found in the Technical roadmap document.

Export control classification

The following table contains export control classification details for Workspace:

Program Name	Refinitiv Workspace
ICOS Reference	6420
Program Version	1.x
Sub-Products	6413 for Windows & 6414 for macOS

ECCN (United States)	EAR99
ECCN (European Union)	None
Refinitiv Export Code	NL
Export Note	This export code means 'Not Licensable' and is applied to items that can be exported 'no license required', under both EU and US regulations. Exports of NL items can be made to all countries except embargoed countries (Iran, Syria, North Korea, Cuba, or Crimea).
US Commerce, BIS CCATS number	self-classified

Hosted connection item limits

For the deployed desktop hosted connection, the Item limit is 2500. This can be extended to 5000, with a fee-liable Product Line Item (PLI) add-on.

Once the limit is reached, a message is displayed in the **About LSEG Workspace > Streaming** panel.

About LSEG Workspace dialog

The **About LSEG Workspace** dialog box provides information about the viewed Workspace installation and environment.

To open the **About LSEG Workspace** dialog, In Workspace:

− Click **Help > About Refinitiv Workspace**

The dialog box divides information over five panels:

− **System Status** contains Workspace version and variant information, together with service connection

details and an overview of the computer on which this iteration of Workspace is running.

- **Streaming** contains information about real-time data sources, including the primary feed used, RICs used[49] (subscriptions), and any other feeds provided through a local LSEG Real-Time Distribution System.

- **User Details** contains information about the currently logged in user, including their email address, their user unique identifier (UUID), job role, and location information.

- Along with the proxy URL and version, the **Data API Proxy** panel also contains information about the status of the proxy, indicating whether it is available for external connections.

- **Services & Apps** contains version information about services and apps that have been made available to the user.

Data dictionary support

Access to a Data Dictionary is only supported from a LSEG Real-Time Advanced Distribution Server (formerly ADS).

Local mode support

The Local Mode feature, as found in Eikon, is not supported.

---

[49] See the Hosted connection item limits section.

Appendix C: Command line statements

In this section

-
-
-
-

Installation statements

The table below list command line statements that can be used to install Workspace:

RELATED LINKS
- Performing an installation using your Single Sign On URL

Installation mode	Command
Base commands	
User [50]	`RefinitivWorkspace-installer_x.xx.xx.exe --user`
Machine	`RefinitivWorkspace-installer_x.xx.xx.exe --machine-autoupdate-peruser`
Machine without Auto-Update	`RefinitivWorkspace-installer_x.xx.xx.exe --machine-autoupdate-no`
Machine with Update Service	`RefinitivWorkspace-installer_x.xx.xx.exe --machine-autoupdate-service`
SSO	`RefinitivWorkspace-installer_x.xx.xx.exe --client-sso=<client SSO URL>`
Installation help page	`RefinitivWorkspace-installer_x.xx.xx.exe --help`
Run Messenger only	`RefinitivWorkspace-installer_x.xx.xx.exe --messengeronly`
Shared configuration [51] [52]	
Additional parameter	`--sharedconfig="<file path>"`
Failover	`--sharedconfig="<file path-1>";"<file path-2>";"<file path-3>"`

Uninstallation statement

The table below list command line statements that can be used to uninstall Workspace:

Command
`RefinitivWorkspace.exe --uninstall`

Configuration Manager parameters

The table below list command line statements that can be used to configure Workspace:

Installation mode	Command
User	`"<InstallDir>\Refinitiv\Refinitiv Workspace\RefinitivWorkspace.exe" --config-manager`
Machine or Hot-Desking	`"<InstallDir>\Refinitiv\Refinitiv Workspace\RefinitivWorkspace.exe" --config-manager --machine`

---

[50] This is the default method of installing Workspace. As such, the `--user` parameter is not a requirement.

[51] For example, `RefinitivWorkspace-installer_x.xx.xx.exe --machine-autoupdate-peruser --sharedconfig="<file path>"` is the command line for a machine installation with a shared configuration.

[52] The content of the file(s), identified by the `--sharedconfig` parameter, could change from version-to-version. So, refer to the appropriate documentation for amendments to this parameter when there is a new release.

Workspace executable statements

There are various parameters you can add to the Workspace executable, located in the `%ProgramFiles%\Refinitiv\Refinitiv Workspace\<version>\` folder.

The command line structure is:

`RefinitivWorkspace.exe <Parameter>`

For example:

`RefinitivWorkspace.exe --connection=internet`

The following parameters are available:

Parameter	Purpose
--clearCache	Clear the Electron cache of Workspace
--clearLogs	Clear the logs folder of Workspace
--clearRememberMe	Delete the automatic login cookie
--client-sso=<url>	Set the URL for your SSO
--dumpApps	Dump available Apps of Workspace into the logs folder
--dumpConfig	Dump the configuration of Workspace into the logs folder
--excel	Start Excel with the **Workspace** ribbon add-in
--log-level=<level>	Set the level of detail for log files, where *<level>* is: – error – warning – information – verbose – debug
--resetCache	Reset the product cache of Workspace to its default state
--systemtest	Run the embedded System Test [53]
--uninstall	Uninstall Workspace
--update-office-registry=<value>	Used to update the office registry key, where *<value>* is either HKLM or HKCU. For further information, see Excel add-in loading issue.
--upload-logs	Upload log files
--version	Show the version of Workspace [54]
--versions	Display the version of underlying components of Workspace, for example: --versions=electron, node (or simply --versions)
--nofile	Start system tray icon only

Installer command line statements

Currently, only the following command line statement is available, which enables Workspace to run at a higher processing priority:

`RefinitivWorkspace-installer_x.xx.xx.exe --run-above-normal-priority`

---

[53] For further information regarding the System Test applications, refer to the Workspace System Test Guide.

[54] On macOS, for this command to work as intended, go to the `/Applications/Refinitiv Workspace.app/Contents/MacOS` folder and run the command, `./RefinitivWorkspace --args --version`.

Appendix D: Automatic update workflow

The content in this appendix applies to the following installation types:

- `--user`
- `--machine-autoupdate-peruser`[55]
- `--machine-autoupdate-service`

The `--machine-autoupdate-no` installation mode is not discussed, as automatic update functionality is disabled for that mode.

Device and installation registration

1. Login into Workspace
2. During the first minute after login, `RefinitivWorkspace.exe` retrieves installationGUID from `installinfo.json`.
   - If installationGUID is not found in `installinfo.json`, it is created using `guid.json`[56]
   - If `installinfo.json` does not exist, it is created automatically
   - Depending on the installation method, `installinfo.json` is in one of the following locations:

Method	Location
User	C:\Users\%Username%\AppData\Roaming\Refinitiv\Refinitiv Workspace\
Machine with auto update per user	<install path>\Refinitiv\Refinitiv Workspace\
Machine with auto update service	%programdata%\Refinitiv\Refinitiv Workspace\

3. `RefinitivWorkspace.exe` sends a request to **Desktop Deployment Portal** to do the following:

   a. Check whether the device is registered on Desktop Deployment Portal and, if not, add the new device

   b. Add a login history record

Checking new version availability

Randomly, between 5-60 minutes after login, `RefinitivWorkspace.exe` checks[57] the availability of the new target version for the current user. Version checks are then scheduled daily, at 00:*<randomMinutes>*.

4. Checks the new version with **Admin Panel**[58]
5. Checks the new version with **Desktop Deployment Portal**

---

[55] For `--machine-autoupdate-peruser` mode only: To update the master installation automatically (bulk autoupdate), the administrator should get the latest version and reinstall Workspace. All users, that have a lower version than the master installation, are updated to the new version of master installation automatically, with the active setup, once they log off from Windows, and log in again.

[56] Guid.json is located under C:\Users\%Username%\AppData\Roaming\Refinitiv\Refinitiv Workspace\

[57] This check can also be triggered by opening the **About Box**.

[58] For further information, see the Administration Panel Configuration Guide.

Changing the update time

To change update time after login, use the command `--checkupdateTime=<n>`, where:

- `--checkupdateTime=0` – Checks for a new version instantly after login
- No parameter set – Checks for a new version randomly between 5-60 minutes after login

Setting up a custom scheduler

To set up a custom scheduler to check for new versions, use the command:

`--autocheckupdatetime=<a> <b> <c> <d> <e>`

Where:

<a>	Day of week (0 – 7, where 7 is Sunday). You can also use names, that is, Monday, and so on.
<b>	Month (1 - 12)
<c>	Day of month (1 - 31)
<d>	Hour (0 - 23)
<e>	Minute (0 - 59)

For example, for an update check to be performed every Sunday, at 5:30 PM, use the command:

`--autocheckupdatetime=7 * * 17 30`

If a new version is detected see the next steps.

Downloading a version and preparing for upgrade

1. Workspace receives the target version information (including URL) and automatically downloads the zipped package.

Calling process	RefinitivWorkspace.exe
URL	https:\\cdn.refinitiv.net\public\packages\RFVWWindows\RFVWWindows_Core_x_xx_xxx.zip

Installation type	Download location
--user --machine-autoupdate-peruser	%AppData%\Local\Refinitiv\Refinitiv Workspace.ToInstall
--machine-autoupdate-service	%programdata%\Refinitiv\Refinitiv Workspace\Refinitiv Workspace.ToInstall

2. Workspace extracts the files from the zipped file to a newly created `Extract` folder

Calling process	RefinitivWorkspace.exe
Unzip tool	yauzl node_module [59]
Extract location	*<Download location>*\Extract

[59] https:\\www.npmjs.com\package\yauzl

Checking new package with Desktop Deployment Portal

1. Checks whether the content in the `Extract\checkUpdateInfo.json` matches the content received from the Desktop Deployment Portal (by checking the file hash code):

If…	Then…
Yes	Skip downloading the new package and wait for the upgrade initiation
No	Delete the downloaded package and `Extract` folder

2. Download the new package, with the updated `Extract\CheckUpdateInfo.json` content (see Downloading a version and preparing for upgrade)

Initiating an update

1. The persons required to perform this step depend on the installation type:

Installation type	Performed by
`--user`	The user of the machine where Workspace was installed
`--machine-autoupdate-peruser`	Each Workspace user on the machine where the application was installed
`--machine-autoupdate-service`	Any user of the machine(s) where Workspace was installed

− To begin the upgrade, do one of the following:

  − Select the **Help** menu, choose **About Refinitiv Workspace**, and click the **Upgrade now** button.
  − Select the **Refinitiv Workspace** menu and choose:

  − **Sign Out**, or

  − **Exit Refinitiv Workspace**

2. `RefinitivWorkspace.exe` runs an `Extract\setup.exe` command, with arguments based on `setupArgs`, defined in `CheckUpdateInfo.json`.

Installation type	Example command
`--user` `--machine-autoupdate-peruser`	`setup.exe --update --rerun --silent --forceInstall --calledByCheckupdate --execute=RefinitivWorkspace.exe --appLocation= C:\\Users\\%Username%\\AppData \\Local\\Refinitiv\Refinitiv Workspace`
`--machine-autoupdate-service`	`setup.exe --update --rerun --silent --forceInstall --calledByCheckupdate --execute=RefinitivWorkspace.exe -- appLocation=C:\\Program Files\\Refinitiv\Refinitiv Workspace\\1.19.447`

−

Upgrade workflow

The following actions are performed by `Extract\Setup.exe`:

1. Waits for several seconds until `RefinitivWorkspace.exe` is terminated[60]

2. Performs a backup of installation folders, based on the information in the `files` section of `InstallInfo.json`

---

[60] If `RefinitivWorkspace.exe` has not been terminated, `Setup.exe` force-kills the process.
For `--machine-autoupdate-service` mode: Only the instigating user is required to terminate their Workspace session.

a. `--machine-autoupdate-service` only: Checks whether Workspace is in use by another user:

If…	Then…
Yes	Go to step 2.c.
No	Go to step 2.b.

b. Backs up the Workspace installation folder:

Installation type	Installation folder	Backup location
`--user` `--machine-autoupdate-peruser`	`Refinitiv Workspace`	*`<install_path>`*`\Refinitiv Workspace.Backup`
`--machine-autoupdate-service`	`Workspace `*`<Version>`*	*`<install_path>`*`\Refinitiv\Refinitiv Workspace\`*`<Version>`*`.Backup`

c. `--machine-autoupdate-service` mode only: Checks whether Microsoft Office is in use by another user on the same machine:

If…	Then…
Yes	Go to step 2.e.
No	Go to step 2.d.

d. Backs up the Refinitiv for Office installation folder:

Installation type	Installation folder	Backup location
`--user` `--machine-autoupdate-peruser`	`Refinitiv for Office`	*`<install_path>`*`\Refinitiv for Office.Backup`
`--machine-autoupdate-service`	`Office `*`<Version>`*	*`<install_path>`*`\Refinitiv for Office\`*`<Version>`*`.Backup`

e. `--machine-autoupdate-service` mode only: Performs a backup of the Update Service installation folder:

Installation type	Installation folder	Backup location
`--machine-autoupdate-service`	`Update Service `*`<Version>`*	*`<install_path>`*`\Refinitiv Workspace Update Service\`*`<Version>`*`.Backup`

3. Backs up the `shortcuts` folder, based on the information in the `shortcutsFolder` section of `InstallInfo.json`:

Installation type	Backup location
`--user` `--machine-autoupdate-peruser`	`%appdata%\Refinitiv\Refinitiv Workspace\Backup\`*`<randomname>`*`-backupShortcut\`
`--machine-autoupdate-service`	`%programdata%\Refinitiv\Refinitiv Workspace\Backup\`*`<randomname>`*`-backupShortcut\`

4. Creates new folders and installs files:

Installation type	Workspace location	Office location	Update Service location
`--user` `--machine-autoupdate-peruser`	*`<install_path>`*`\Refinitiv Workspace`	*`<install_path>`*`\Refinitiv for Office`	n\a
`--machine-autoupdate-service`	*`<install_path>`*`\Refinitiv Workspace\`*`<Version>`*	*`<install_path>`*`\Refinitiv for Office\`*`<Version>`*	*`<install_path>`*`\Refinitiv Workspace Update Service\`*`<Version>`*

5. Installs shortcuts:

Installation Type	File location
`--user`	`%AppData%\Microsoft\Windows\Start Menu\Programs\Refinitiv`
`--machine-autoupdate-peruser`	– `%AppData%\Microsoft\Windows\Start Menu\Programs\Refinitiv` – `%ProgramData%\Microsoft\Windows\Start Menu\Programs\Refinitiv`
`--machine-autoupdate-service`	`%ProgramData%\Microsoft\Windows\Start Menu\Programs\Refinitiv`

6. Installs Add Remove Programs (ARP) registry entries for Workspace

7. Checks whether Workspace was installed with `–messengeronly` parameter:

If…	Then…
Yes	Go to step 9
No	Go to step 8

8. Installs Office Registry and Office Add-ins

9. Creates `install-settings.json`, containing settings for Microsoft Office, providing the location for Workspace and Office add-ins:

Installation Type	File location
`--user` `--machine-autoupdate-peruser`	`<install_path>\Refinitiv\Refinitiv Workspace\`
`--machine-autoupdate-service`	`<install_path>\Refinitiv\Refinitiv Workspace\<version>`

10. Creates `com.refinitiv.workspace.sessionsharing.json`, providing Chrome extension settings and the location of the `Refinitiv-host.exe` file:

Installation Type	File location
`--user` `--machine-autoupdate-peruser`	`<install_path>\Refinitiv\Refinitiv Workspace\`
`--machine-autoupdate-service`	`<install_path>\Refinitiv\Refinitiv Workspace\<version>`

11. Checks whether the installation was completed successfully:

If…	Then…
Yes	Removes backup folders [61]
No	Removes all newly installed files and restores backup folders. Ends the installation with an error message.

12. Creates `InstallInfo.json`, in a mode-specific location, and writes new installation information, such as installation paths, shortcut paths, and so on:

Installation Type	File location
`--user` `--machine-autoupdate-peruser`	`<install_path>\Refinitiv\Refinitiv Workspace\`
`--machine-autoupdate-service`	`<install_path>\Refinitiv\Refinitiv Workspace\<version>`

13. If the update was triggered by signing out, it relaunches Workspace with `--startApp`

---

[61] For the `machine-autoupdate-service` only: If Workspace is in use at the time of update, the previous `<Version>` folders under `Refinitiv Workspace` and `Refinitiv for Office` are preserved. Once all users have logged out of their devices and logged in again, access to the new Workspace version is facilitated using Active Setup.

Appendix E: Settings

In this section

– Networking
– Microsoft Office settings
– Security

Networking

Ports

Workspace uses the following connections:

API [62]	Connection	Port [63]
Desktop Data API	http:\\localhost:9000\api\	9000
Side by Side API [64]	http:\\localhost:9000\sxs\	9000
Refinitiv Workspace Bus	http:\\localhost:49152\	49152

Communication protocols

Protocol	Port Number	Workspace Services	Required For
TCP	1024+ → 443 1024+ ← 443	LSEG Workspace Platform	Administration Services View Service Search & Navigation Service Time Series Service Workspace Messenger Service, Trading Service Update Service Thomson Reuters Remote Support (TRRS) Datastream Service Newscasts (internet only) FXall Flextrade Spark Real-Time Data
TCP	1024+ → 15000 1024+ ← 15000	Real-Time Data	LSEG Real-Time Advanced Distribution Server (formerly ADS)
TCP\UDP	1024+ → 53 1024+ ← 53	DNS Server	Domain Name Resolution from Domain Name Server

Services

This section summarizes the services and features related to connectivity and provides links to further information.

---

[62] You can find further information regarding APIs on the Developer Community website.

[63] 9000 and 49152 are internal ports. If the port is already in use, Workspace increments until a free port number is found:
  – for Desktop Data and Side by Side, from 9000, and
  – for Workspace Bus, from 49152

[64] For further information, see Workspace Web Side by Side API on the Developer Community website.

Financial Community Network and Delivery Direct

To access new AWS service endpoints, customers using a private network must whitelist the following new IP addresses, which impact Delivery Direct, FCN, and CMC users:

− 159.43.192.0/23 (AMERS)

− 159.43.200.0/23 (EMEA)

− 159.43.208.0/23 (APAC)

For further information about Finance Community Network (FCN) and Delivery Direct, see the Private Network Overview section of the authenticated website, containing the following documents:

− Customer Connectivity DNS Migration Guide

− FCN Customer Connectivity Guide

Internet

LSEG will not divulge IP address information under any circumstances. Doing so prevents us from changing IP addresses, as and when needed, without a notification period. These IP addresses may not always be under our direct control.

Transport Layer Security protocol

From 01 June 2023, to continue to use LSEG Real-Time services, you must ensure that use of TLS version 1.2 is enabled for all Workspace users.

To enable TLS 1.2:

1. In Windows, click Start

2. Open the Control Panel app and choose **Network and Internet**

3. In the Network and Internet panel, choose **Internet Options**

4. In the Internet Properties dialog, shown opposite, select the **Advanced** tab

5. Scroll to the Security section (at the end of the settings list) and select **Use TLS 1.2**

For further information, refer to PCN205244-Change in supported TLS protocols for Eikon and Workspace.

Web hosted services

The following services and features are accessed through the Internet and not reached through a private network:

MyRefinitiv (my.refinitiv.com)	The authenticated documentation repository.
Contact Us	For raising questions, issues, and other topics.
Desktop crash dump upload utility	Sends data to the LSEG support platform. This is in case a user has a session crash. The crash data is sent from the user session to Refinitiv, so we can investigate the crash.

GetSupport or interactive Chat	Where feedback / support issues are logged, and you can establish a chat dialogue with an agent.
Messenger Traffic	All traffic will be over internet, by default. [65]
Portal SDK starter kit (cdn.refinitiv.com)	Software Development Kit (SDK) is a toolkit that you can use to interact with the app and our platform. This is hosted on CloudFront.
Chrome Extension	This is accessed from an external web site, either by the user going to the Google store, or through enterprise set-up.

Content filtering domains

You need to whitelist the domains for content that can be accessed through Workspace.

Important: Third Party apps in Workspace may require access to specific domains. For information about specific access requirements, it is advisable to contact the app developer directly.

Example domain list

The following list of domains is not exhaustive and is for illustrative purposes only.

ⓘ Many of the domains listed in the table below are wildcard values, where a subdomain may prepend and/or append the listed domain.

DNS	Workspace services
autex.com autexnow.com	Autex
authenticator.pingone.com idpxnyl3m.pingidentity.com	Multi-factor Ping Authenticator app
bit.ly reut.rs tmsnrt.rs	Bit.ly Integration Information
trmcs-documents.s3.amazonaws.com	Central Bank Polls
session.rservices.com	Contribution address, News documents
cnbc.com ft.com moodys.com	Miscellaneous external content
googleapis.com	Google
chrome.google.com	Workspace Chrome Extension
virtualearth.net thomsonreuters.wdtinc.com	Interactive Map
lipperweb.com	Lipper Market Insight
loanconnector.com	Loan Connector
loanpricing.com	Loan Pricing
depth.finance	Market Depth
cdn.mathjax.org	MathJax JavaScript display engine
storage.tr.191.it thomsonone.com ws.platts.com	News Documents
reuters.com breakingviews.com	News URL link

---

[65] This is not the case when private line connectivity is enabled for Workspace Messenger. For further information, see Appendix E: Workspace Messenger standalone.

DNS	Workspace services
refinitiv.com refinitiv.net refinitiv.biz thomsonreuters.com thomsonreuters.net thomsonreuters.biz	LSEG
globalrelay.com	Workspace Messenger Compliance
salesforce.com webtrendslive.com	Refinitiv Migration Tools
kaltura.com reuters.tv vmnd.tv	Newscasts (formerly Reuters Insider)
cxvid-livecapture.s3.amazonaws.com	Newscasts (formerly Reuters Insider): Recording Video and Images
thomson.112.2o7.net	Newscasts (formerly Reuters Insider): Analytics and user interaction reporting
gstatic.com apis.google.com bv-predictions2021.com cloudfront.net google-analytics.com googletagservices.com product.datastream.com themes.googleusercontent.com trust.org views.rkd.reured.com	Reuters Interactive graphics
bing.com	Search engine
media-server.com	Street Event content
comodo.com	TLS/SSL Client Certificate (HTTPS)
tradeweb.com	Tradeweb
fxall.com	Trading Service
pbs.twimg.com twitter.com	Twitter integration
wom.finance	Wealth Order Management
awsglobalaccelerator.com avatars.stocktwits.com	Social Media Monitor
img.en25.com eloqua.com	LSEG Training
salesforceliveagent.com	Support
oneaccess.io	OneAccess
dtn.com	Weather layers in InteractiveMap app

Trusted root certification

You can download and verify the COMODO certificate from the appropriate location, defined in the table below:

Internet	https:\\cipher-test.refinitiv.com\
Private network	https:\\cipher-test.extranet.refinitiv.biz\

Certificate details:

	Issued by	CN	O	C
COMODO	COMODO RSA Certification Authority	COMODO RSA Certification Authority	COMODO CA Limited	GB

Microsoft Office settings

Workspace for Excel VSTO add-in

For the Microsoft Excel Visual Studio Tools for Office (VSTO) add-in, Workspace installs a single DLL file under the Windows operating system, `refinitiv-shim.dll`. This supports the core features of the Refinitiv Workspace - Excel (**Workspace** ribbon) add-in.

MS Office	File location
32-bit	*<Install_path>*\Refinitiv\Refinitiv for Office\x.x.x\Office_x86
64-bit	*<Install_path>*\Refinitiv\Refinitiv for Office\x.x.x\Office_x64

There is no linking, presentation tools, or deal analytics package.

Workspace add-in

The Refinitiv Workspace - Excel (**Workspace** ribbon) add-in changes are listed in the table below:

Version	Add-ins
1.22	No changes
1.21	=RDP.FxSwpToSwp() =RDP.FxDepToSwp() =RDP.FxSwpToDep() =RDP.FxSpot() =RDP.FxInfo() =RDP.FxZcToFra() =RDP.DateAdjToWD() =RDP.DateCountPeriods() =RDP.DateFindDate() =RDP.DateIsWD() =RDP.DateLastWD() =RDP.DateListHolidays() =RDP.Adinterp()
1.20	No changes
1.19	No changes
1.18	No changes
1.17	No changes
1.16	=RDP.Publish() =RtContribute()[66] =RDP.PublishChain() =RtContributeChain() =DSCHART()
1.15	No changes
1.14	No changes
1.13	No changes
1.12	=TRAggregate() =RDP.Aggregate() =RDP.Analytics() =RDP.Data() =RDP.HistoricalPricing() =RDP.Price()
1.11	=RDP.Today() =RDP.Now()
1.10	=RtToday() =RtNow()

---

[66] See Contributions (RtContribute) in the Known issues section.

Version	Add-ins
1.9	Refinitiv.EmbeddedApplication (financial chart) =DSGRID() =Thomson.Reuters.AFOSpreadSheetFormulas.DSGRID() =RDP.Search()
1.8	=RHistory() =RtGet() =TR()

Customer managed over Internet

Customer managed over Internet mode is a sub deployment, where Workspace connects the real time data on a user's own local LSEG Real-Time Distribution System (formerly TREP) infrastructure, while other content is sourced from the Refinitiv Data Platform, through the Internet.

To configure this:

1. In Workspace, open Configuration Manager.

2. In the **Network** panel, under **Connection Type**, select **Internet**.

3. In the **Streaming** panel, under **Streaming Data Retrieval**, select **From a local LSEG Real-Time Advanced Distribution Server (ADS)**.

4. This opens three separate panels – **Servers**, **Feeds**, and **DACS** – where you can add your server and feed information.

Security

FIPS

Workspace is not supported in a 140 series Federal Information Processing Standards (FIPS) environment.

User Agent

A User Agent is an application that retrieves and presents Web content for users or is implemented using Web technologies.

Workspace identifies connections to the ADS User Agent. For example, this could contain the following string and version:

`RFV-Workspace\<version>`

Where the `<version>` is updated to match the Workspace executable version.

Enabling the DPRM service

Important: In Workspace 1.23, there is a known issue with the DPRM service that affects a small minority of installations. This has been fixed in Workspace 1.24.

For those Workspace desktop customers who want to use the optional DPRM service in their local LSEG Real-Time Distribution System, the settings in the following table can be added to the <*override_settings*>.json file.

Setting	Description
EIKON.STREAMING.API.LOCAL.DACS.DPRM.PORT [67]	This allows you to specify the port to use to retrieve the entitlements used for DPRM. In general, the port should be set to either of the following modes[68]: – 8261 - Permission proxy mode, or – 8302 - Permission service mode[69]
EIKON.STREAMING.API.LOCAL.DACS.DPRM.INTERVAL	This allows you to set the interval, in milliseconds, between each reconciliation of DACS entitlements with the DPRM service. Default value: 86400000 (24 hours).
EIKON.STREAMING.API.LOCAL.DACS.DPRM.DELAY	This allows you to set the delay, in milliseconds, between Workspace initialization after login and the reconciliation of DACS entitlements with the DPRM service. Default value: 60000 (60 seconds).
EIKON.STREAMING.API.LOCAL.DACS.DPRM.SERVERS	This parameter is used when running permission service mode only. This allows you to specify a list of servers to use for DPRM and should be set for permission service mode only (port 8302).[70] This setting is defined as a JSON-encoded array of permission service hostnames. For example: "[\"dacs01\",\"dacs02\",\"dacs03\"]"

DPRM settings example

```
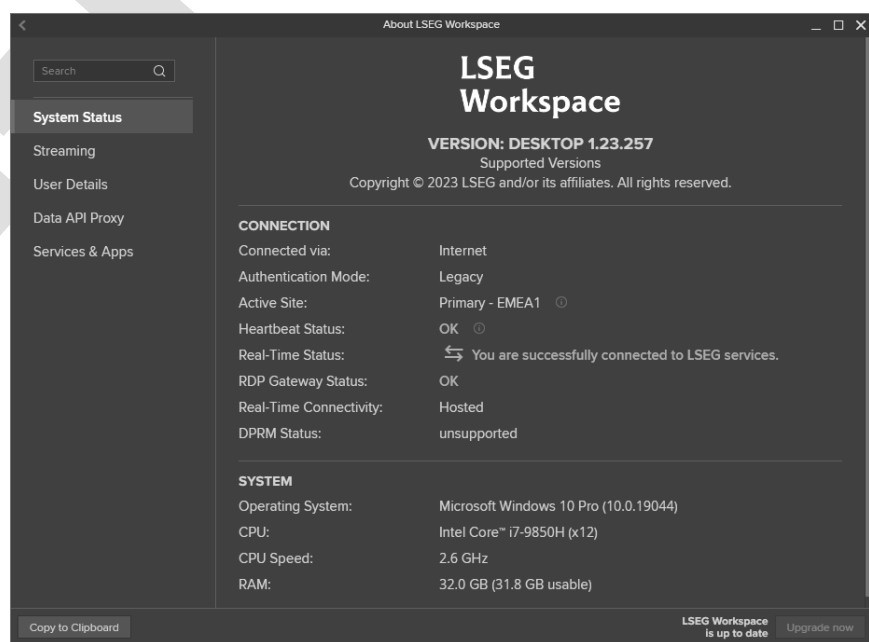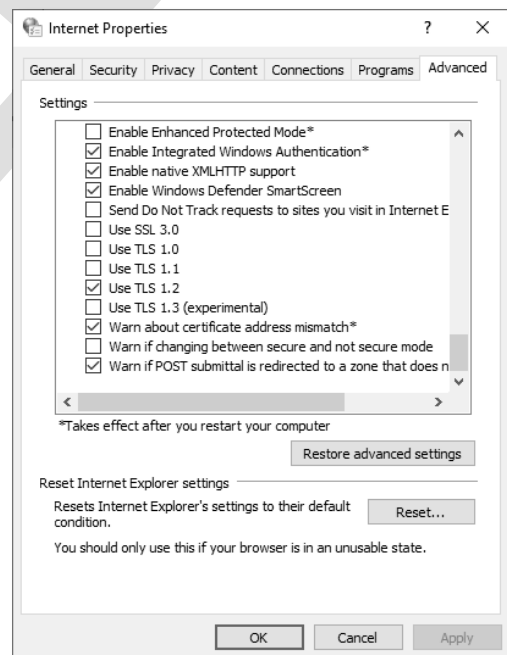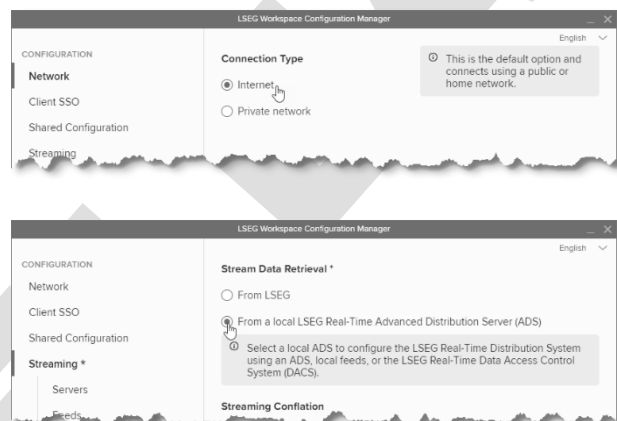"EIKON.STREAMING.API.LOCAL.DACS.DPRM.PORT": "8261",
"EIKON.STREAMING.API.LOCAL.DACS.DPRM.INTERVAL": "43200000",
"EIKON.STREAMING.API.LOCAL.DACS.DPRM.DELAY": "50000",
"EIKON.STREAMING.API.LOCAL.DACS.DPRM.SERVERS":
"[\"dacs01\",\"dacs02\",\"dacs03\"]"
```

Important: DACS Permission Synchronization for Workspace is recommended – rather than the DPRM service - to prevent misconfiguration or permission issues between the Refinitiv Data Platform and local LSEG Real-Time Distribution System (formerly TREP).

---

[67] The EIKON.STREAMING.API.LOCAL.DACS.DPRM.PORT parameter is mandatory.
[68] If not set to one of these values, DACS synchronization is not performed.
[69] In permission proxy mode, the list of servers in the EIKON.STREAMING.API.LOCAL.SESSIONS setting is used.
[70] If not set, the list of servers defined in the EIKON.STREAMING.API.LOCAL.SESSIONS setting is used.

Appendix F: Shared configuration files

Configuration override order

The illustration below shows the override order for configuration settings, where commands issued using the command line have the highest level of priority:

Creating a shared configuration file

ⓘ The Admin level shared configuration file is created using the Administration Panel tool. For further information, refer to the Administration Panel Configuration Guide.

Once you have made your settings using the Configuration Manager dialog, do the following:

1. click **Export**

2. Use the **Save As** dialog to define the file name and location

Settings

The following table contains a shared configuration file example, showing where the setting is found, and the selection or entry that was made in the example:

Setting example	Description\Source
`{`	
Configuration Manager > Network menu	
`"EIKON.CONNECTION.MODE": "private",`	Options: – Internet – Private network
Configuration Manager > Advanced menu	
`"REFINITIV.WORKSPACE.RUN_ABOVE_NORMAL_PRIORITY": "true",`	Option: – Run at the Highest Available Process Priority Level
Configuration Manager > Printer menu	
`"REFINITIV.WORKSPACE.TRADING.PRINTER_NAME": "Microsoft Print to PDF",`	Options: – Configured printers[71] – Fax – Microsoft Print to PDF – Microsoft XPS Document Writer – OneNote (Desktop) – OneNote for Windows
Configuration Manager > Shared Configuration menu	
`"EIKON.INTRANET_OVERRIDE.ENABLED": "true",`	Options: – Use a shared configuration
`"EIKON.INTRANET_OVERRIDE.URL": "C:\\RWTest\\Shared config\\MAIN.json",`	– Location path or URL (defined as `C:\\RWTest\\Shared config\\MAIN.json`) – This can be multiple location paths or URLs, delimited using a semi-colon (;)
Configuration Manager > Client SSO menu	–
`"CLIENTSSO_URL.ENABLED": "true",`	Options: – Use a client SSO
`"CLIENTSSO_URL": "https:\\myapps.testsso.com",`	– Thomson Reuters (defined as `https:\\myapps.testsso.com`)
`"CLIENTSSO_REFINITIV_URL": "https:\\myapps.testsso.com",`	– Refinitiv (defined as `https:\\myapps.testsso.com`)
Configuration Manager > Streaming menu	–
`"EIKON.STREAMING.API.LOCAL.ENABLE": "true",`	Stream Data Retrieval options: – From Refinitiv – From a local LSEG Real-Time Advanced Distribution Server (ADS)
`"EIKON.STREAMING.JETQUOTES.DESKTOP.CONFLATION.ENABLE": "true",`	Streaming Conflation option: – Activate Conflation Rate
`"EIKON.STREAMING.JETQUOTES.DESKTOP.CONFLATION": "3000",`	– Conflation rate value drop down (3 seconds selected)
Configuration Manager > Streaming > Servers menu[72]	
`"EIKON.STREAMING.API.LOCAL.SESSIONS": "[\"wss:\\test-ads-sharedconfig.com:15000\WebSocket\"]",`	LSEG Real-Time Advanced Distribution Server (formerly ADS) options: – Protocol (selected `wss:\\`)

---

[71] Network or connected directly

[72] Up to eight additional servers can be configured. For further information, refer to the Configuring multiple servers section.

Setting example	Description\Source
	– Hostname or IP (defined as `test-ads-sharedconfig.com`)
	– Port (defined as `15000`)
	For additional servers that may be configured in the shared configuration file only, see the Alternative streaming servers section, below.
Configuration Manager > Streaming > DACS menu	
`"EIKON.STREAMING.API.LOCAL.DACS.USERNAME": "permit_all_exchanges",`	Options:
	– Username (defined as `permit_all_exchanges`)
`"EIKON.STREAMING.API.LOCAL.DACS.POSITION": "%USERDETAILS.LASTNAME%_%USERDETAILS.UUID",`	– Position (defined as `%USERDETAILS.LASTNAME%_%USERDETAILS.UUID`)
Configuration Manager > Streaming > Feeds menu	
`"EIKON.STREAMING.API.LOCAL.DEFAULTSOURCE": "IDN_RDF_2",`	Main Feed options:
	– Feed Name (defined as `IDN_RDF_2`)
	– Key Letter(s)
	– Alias(es)
`"EIKON.STREAMING.API.LOCAL.DESKTOP.ALIASES": "{\"Test Internal feed 1\":[\"Z\"]}",`	Other Local Feeds options:
	– Feed Name (defined as `Test Internal feed 1`)
	– Key Letter(s) (defined as `Z`)
`"EIKON.STREAMING.API.LOCAL.DESKTOP.ALIASES": "{\"Test Internal feed 1\":[\"INF_1\"]}",`	– Feed Name (defined as `Test Internal feed 1`)
	– Alias(es) (defined as `INF_1`)
`"EIKON.STREAMING.API.LOCAL.DISABLEDCONTRIBUTIONSOURCES": "[\"ATS_GLOBAL_1\",\"NO_CONTRIB_ALLOWED\"]"`[73]	By default, contribution is allowed on all sources. This setting is used to list sources on your local LSEG Real-Time Advanced Distribution Server where contributions are not allowed.
	Any subsequent attempt to contribute data to one of the listed sources is then rejected.
	This setting should be defined to a JSON-encoded array, where each array entry is a real source name. For example: `["ATS_GLOBAL_1","NO_CONTRIB_ALLOWED"]`
Configuration Manager > Other menu	
`"EIKONPROTOCOL.ISDEFAULTAPPLICATION": "true"`	Select the app that is used to open LSEG links:
	– LSEG Workspace
	– Eikon 4
`}`	

For further information on the creation of a shared configuration file, refer to the Configuring Workspace section.

Alternative streaming servers

In Workspace 1.22[74], additional Refinitiv Wire Format protocols for LSEG Real-Time Advanced Distribution Server may be configured in your shared configuration JSON file[75]:

Protocol[76]	Transport	Example
rwf+ws:\\	WebSocket	`rwf+ws:\\ads01.example.com:15000\WebSocket`
rwf+wss:\\	Secure WebSocket	`rwf+wss:\\ads01.example.com:443\WebSocket`

---

[73] This feature becomes available at the beginning of August 2023.

[74] Workspace version 1.22 is the first release to support the new protocols and some features still use the WebSocket protocol instead of the new Refinitiv Wire Format protocols.

[75] These server options will be added to the Configuration Manager in a future version of Workspace.

[76] LSEG Real-Time Advanced Distribution Server version 3.7 is required for `rwf+ws` and `rwf+wss`.

To retrieve streaming data, Workspace attempts connection with the first of the provided URLs. If the connection fails, Workspace tries each defined URL until it succeeds. For example:

```
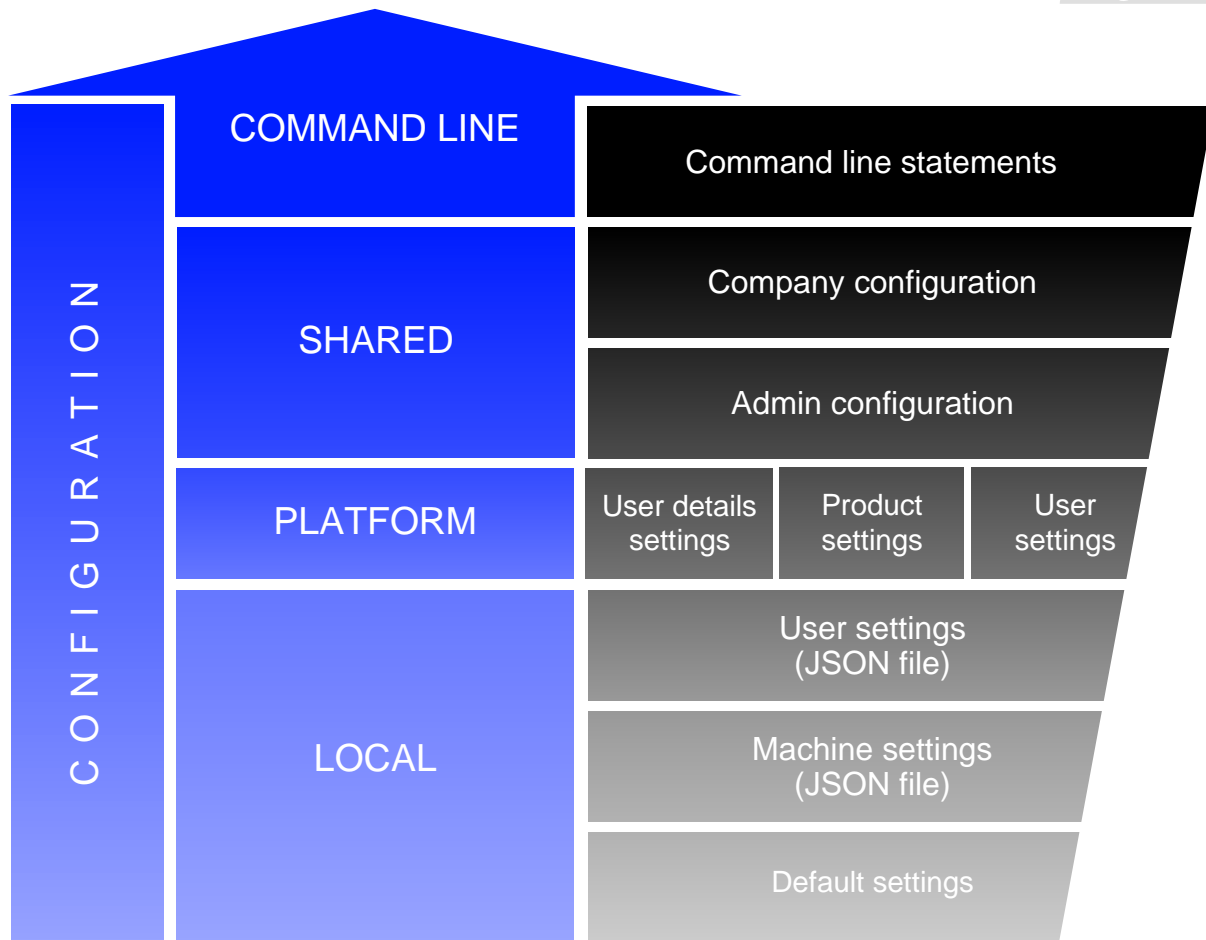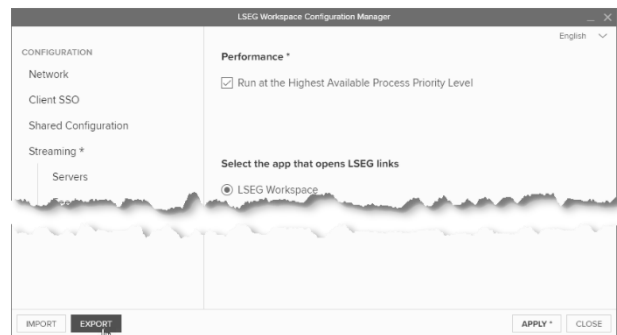["ws:\\ads01.example.com:15000\WebSocket","rwf+wss:\\ads02.example.com:4
43\WebSocket"]
```

Protocol support

The new protocols are currently supported for use through your Local LSEG Real-Time Distribution System only. Refer to the following table for a summary of planned protocol support:

Connection	ws	wss	rwf+ws	rwf+wss
Local Real-Time Distribution System			-	-
Hosted Market Data System				
Refinitiv Contributions Channel				

Where:

- Supported
- Supported but requires LSEG Real-Time Advanced Distribution Server version 3.7
- Supported in a future release of Workspace

Appendix G: Workspace Messenger

Standalone

Workspace Messenger private line connectivity

You can use Workspace Messenger to send and receive text messages, photos, and stock prices.

Once you have installed Workspace Messenger, if you require connectivity through a Private Line, do the following:

1. Navigate to the **Refinitiv Workspace** shortcut:
   a. Click **Start**
   b. Scroll to **Refinitiv > Refinitiv Workspace**
   c. Right-click **Refinitiv Workspace** and select **More > Open file location**
2. In File Explorer, right-click the **Refinitiv Workspace** shortcut and select **Properties**
3. Add the following parameters to the end of the Target field:

   – `--messenger-url="https:\\collab.platform.refinitiv.biz\eikonmessenger"`

Embedded

Running Messenger traffic through a private network

To allow Workspace Messenger to route traffic through a private delivery network, you need to request that Workspace is permissioned for Messenger Private Delivery, using the following values:

Product code	100464
Permission Object name	COLLRMPRIVATE

Appendix H: Unsupported packaging methods

> **Important**: The Unsupported methods section describes packaging methods that are neither recommended nor supported by LSEG.

Supported methods

LSEG supports the installation of Workspace, using the downloadable executable file:

− On an individual basis. See the Basic Installation Guide.

− Using a command line statement. See Installing Workspace, in this document.

Unsupported methods

Customers may choose to deploy Workspace using the methods summarized below. While we neither recommend nor, on an ongoing basis, support[77] these approaches, the steps outlined below are understood to work.

Packaging support

Customers are entitled to a session of up to two hours of free packaging support, provided by one of our Technical Implementation Specialists (TIS). During this time, our specialist focuses on providing guidance and offers expert advice on packaging Workspace.

Packaging support beyond this session will be chargeable. Should you require further assistance from LSEG, contact your Implementation Relationship Manager (IRM).

Installing using an MSI installer

You may choose to use the MSI installer method in situations where you are blocked from downloading and/or installing executable files, due to:

− A policy that is enforced on the your computer, for example, by an antivirus product, or

− Your corporate firewall preventing access through their network

To do this:

1. Convert the `RefinitivWorkspace-installer_x.xx.xx.exe` file to an MSI installer. This can be done using tools such as MSI Wrapper or Advanced Installer.

2. Open PowerShell[78], with admin privileges, and navigate to the folder containing the `.msi` file.

3. To install Workspace using the quiet install

---

[77] Refer to the Packaging Support section. LSEG does not maintain test environments for these methods.
[78] For further information, refer to the online Microsoft PowerShell documentation.

method, use the command[79]:

```
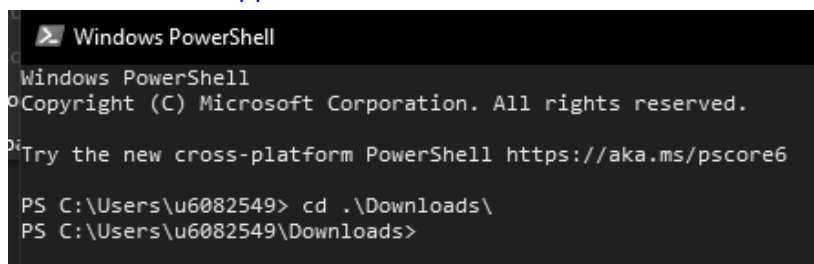Start-Process RefinitivWorkspace-installer_x.xx.xx.msi -ArgumentList
"/quiet"
```

A system test is performed and LSEG Workspace is installed.

Deploying using Microsoft Intune

Using Microsoft Intune, you may be able to deploy Workspace to users in your organization.

Pre-requisites

The following are the pre-requisites for machines on which Microsoft Intune is used and applies to the machines to which Workspace is to be deployed. These requirements may not align with those of LSEG Workspace[80]:

− Use Windows 10 version 1607 or later (Enterprise, Pro, or Education editions)[81]

− Machines (or devices) to which Workspace is to be deployed must be

  − Enrolled in Intune, and

  − One of the following[82]:

    − An Azure AD registered device

    − An Azure AD joined device

    − A hybrid Azure AD joined device

− The installation file size must not be greater than 8GB.

Deployment overview

The Workspace installer file, RefinitivWorkspace-installer_x.xx.xx.exe, must be converted to a file with an .intunewin extension. The tool used to do this can be found on the Prepare Win32 app content for upload page.

Creating the temporary folders

1. Download the Content Prep Tool zip file and extract the tool (IntuneWinAppUtil.exe).

2. In the Windows %temp% folder, create the following folders:

   − 1-LSEG_Workspace

   − 2-IntuneAppsLSEG_Workspace [83]

   − 3-IntuneWinAppUtil

3. In the LSEG_Workspace folder, add the following files:

   − RefinitivWorkspace-installer_x.xx.xx

   − install.cmd

---

[79] This command line instruction is used to install Workspace on one machine. For mass deployment, add the command to your deployment portal (Microsoft System Center Configuration Manager, for instance).

[80] For further information, refer to the Workspace System Requirements.

[81] This requirement applies to all machines that are to be managed by Intune.

[82] For further information about Azure device categories, refer to the Concept section under Azure AD device identity documentation.

[83] The 2-IntuneAppsLSEG_Workspace folder acts as the repository for the converted installation file.

– uninstall.cmd

Sample install.cmd script:

```
START %temp%\1-LSEG_Workspace\RefinitivWorkspace-installer x.xx.xxx.exe --
user --silent --installpath="%localappdata%\Refinitiv\Refinitiv Workspace" -
-cachepath="%localappdata%\Refinitiv\Refinitiv Workspace\cachepath" --
installerlogpath="%localappdata%\Refinitiv\Refinitiv
Workspace\installerlogpath" --logpath="%localappdata%\Refinitiv\Refinitiv
Workspace\logpath" --shortcuts="%localappdata%\Refinitiv\Refinitiv
Workspace\shortcuts"
```

Sample uninstall.cmd script:

```
START %temp%\1-LSEG_Workspace\RefinitivWorkspace-installer 1.22.303.exe --
uninstall --silent
```

4. In the 3-IntuneWinAppUtil folder, save the IntuneWinAppUtil.exe tool.

Running the conversion tool

Once the folders have been created, use the IntuneWinAppUtil.exe tool to create the Intune file.

1. Open the 3-IntuneWinAppUtil folder and double-click the IntuneWinAppUtil.exe tool.

2. At the Please specify the source folder prompt, type the path to the first temporary folder and press **Enter**.

For example:

C:\temp\1-LSEG_Workspace

3. At the Please specify the setup file prompt, type the name of the Workspace installation file and press **Enter**.

For example:

RefinitivWorkspace-installer-win32-x64_1.23.269.exe

4. At the Please specify the output folder prompt, type the path to the second temporary folder and press **Enter**.

For example:

C:\temp\2-IntuneAppsLSEG_Workspace

5. For the Do you want to specify catalog folder prompt, type N and press **Enter**.

The conversion tool starts converting the installation file to .intunewin format.

Installing through Intune

Once the `.intunewin` file has been created in the `2-IntuneAppsLSEG_Workspace` folder, follow the instructions in the Add, assign, and monitor a Win32 app in Microsoft Intune page.

Use the information in the following table as a reference when configuring Intune:

Intune Name	Mode	Command
Refinitiv Workspace - user mode	--user	RefinitivWorkspace-installer-win32-x64_1.19.448.exe --user --silent
Refinitiv Workspace - machine-autoupdate-peruser mode	--machine-autoupdate-peruser	RefinitivWorkspace-installer-win32-x64_1.19.448.exe --machine-autoupdate-peruser
Refinitiv Workspace - machine-autoupdate-service mode	--machine-autoupdate-service	RefinitivWorkspace-installer-win32-x64_1.19.448.exe --machine-autoupdate-service
Refinitiv Workspace - machine-autoupdate-no mode	--machine-autoupdate-no	RefinitivWorkspace-installer-win32-x64_1.19.448.exe --machine-autoupdate-no

Appendix I: Troubleshooting

In this section

– Crash information uploads

– Shared configuration file bug

– Installer help parameter

– Error codes

– Logging

– Networking issues

– Using the Video Recorder tool

– Known issues in Citrix environments

Crash information uploads

If a crash occurs, Workspace sends the dump file to the internal Support platform.

Whenever possible, Workspace also uploads session logs to provide more information to the support teams.

Crash and log files are sent to the following internal Support platform:

https:\\dst.platform.refinitiv.com\

JSON coding changes

The following additional, advanced syntax changes have been made to the coding of JSON files:

– Add single line comments, using `//` at the beginning of the line

– Multiple line comments, using `/* text text text */`

– Empty lines are permitted

– Indentation errors are skipped and do not cause interruptions

– The last line of the file is not required to end with a comma

Error codes

The following error codes may be reported during an installation failure:

Error reported	Code	Summary
UNSUPPORT_PLATFORM	100	Unsupported Platform.
FAILED_TO_INSTALL	101	Failed to install Workspace.
FAILED_TO_COPY_FILES	102	Failed to copy files to %AppData%\Refinitiv.

Error reported	Code	Summary
CANNOT_GET_FOLDER_SIZE	103	Cannot get folder size for stamping to Add/Remove program.
FAILED_TO_INSTALL_ADD_REMOVE_PROGRAM	104	Failed to install Add/Remove program.
FAILED_TO_INSTALL_WINDOWS_REGISTRY	105	Failed to install Windows registry.
FAILED_TO_CONFIG_PRODUCT	107	Failed to create/update config product.
FAILED_PREREQUISITE_CHECK	108	Failed prerequisites check.
ALREADY_INSTALLED	109	Already installed
NO_INSTALLATION_FOUND	110	No installation found
FAILED_TO_UNINSTALL	201	Failed to uninstall
FAILED_TO_UNINSTALL_CANNOT_REMOVE	202	Failed during uninstall process. Cannot remove **Refinitiv Workspace** folder
UNSUPPORT_PLATFORM	300	Unsupported operating system.
INVALID_COMMAND_ARGUMENT	301	Invalid parameter used in installation command line.[84]
INVALID_ARGUMENT_VALUE	302	Invalid parameter used in installation command line
CUSTOM_PATH_NOT_ALLOW	303	Make sure that the path(s) entered in parameter(s) are compatible with the chosen installation mode
ALREADY_INSTALL	310	Workspace is already installed
ALREADY_INSTALL_DIFFERENT_MODE	311	You cannot proceed with the installation, as Workspace is already installed with a different installation mode
OFFICE_REGISTRY_CLI_NOT_SUPPORT	321	You must update Workspace to version 1.21 or higher to use the --office-registry command
UPDATE_OFFICE_REGISTRY_CLI_NOT_SUPPORT	322	You must update Workspace to version 1.21 or higher to use the --update-office-registry command.
UPDATE_BLOCKED_BY_OFFICE_REGISTRY	323	Update is blocked because your office registry is set to HKCU. Reset using --update-office-registry=HKLM before performing the update again.
NOT_ALLOW_ROLLBACK_BY_OFFICE_REGISTRY	324	Rollback is blocked because your office registry is set to HKCU. Reset using --update-office-registry=HKLM before performing the update again.
SYSTEM_CHECK_FAILED	350	The installer was unable to run the system test successfully
SYSTEM_CHECK_UNKNOWN_RESULT	353	The installer was unable to run the system test successfully
NOT_ENOUGH_DISKSPACE	351	Insufficient disk space on which to install Workspace
NO_ADMIN_RIGHT	352	Workspace installation requires Administrator privileges
FILE_IS_LOCKED	400	Process stopped as Workspace file(s) in use
FILE_IS_MISSING	401	Workspace installation executable does not contain all required files
INSTALLER_FILE_CORRUPT	451	Workspace installation executable is corrupt
NO_INSTALLATION_FOUND	500	Workspace installation file was not found
MS_OFFICE_PROCESS_IS_RUNNING	501	Installation stopped as Microsoft Office applications are running
FAILED_TO_HANDLE_FILE	801	Unable to access Workspace installation files
FAILED_TO_CONFIG_PRODUCT	802	Unable to configure product [85]
FAILED_TO_ADD_REMOVE_PROGRAM	810	Unable to update Add/Remove Programs
FAILED_TO_ADD_WINDOWS_REGISTRY	811	Unable to update Windows registry
UNKNOWN_ERROR	999	Unknown error

Logging

Uploading Workspace logs

You can upload Workspace logs by using:

− A menu option

---

[84] See Workspace Help parameter options.
[85] In this event, contact Support. You will also be asked to provide your installation log file.

– Excel launcher

Menu option

– From the **Help** menu, select **Upload logs**.

Excel launcher

If you are logged into Excel:

1. Press **Shift+Ctrl+Space**.
2. In the Search window, type /log.

3. Click **Upload Logs**.

Log upload workflow

By user request or if a crash occurs, Workspace sends the contents of the application logs folder to the internal Support platform:

https:\\dst.platform.refinitiv.com\

To save bandwidth, log uploads are sent in chunks of no more than 5Mb. Additionally, logs that have already been uploaded are not uploaded again.

You can also upload log files to the desktop support site using the following command line:

```
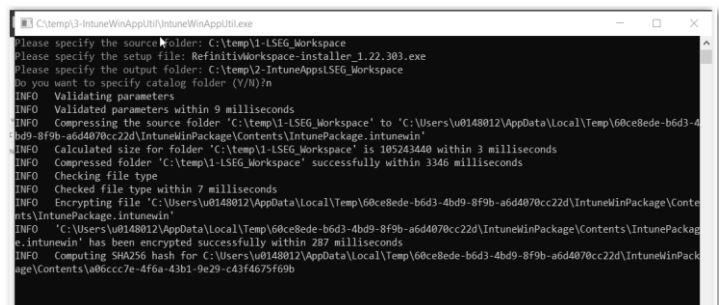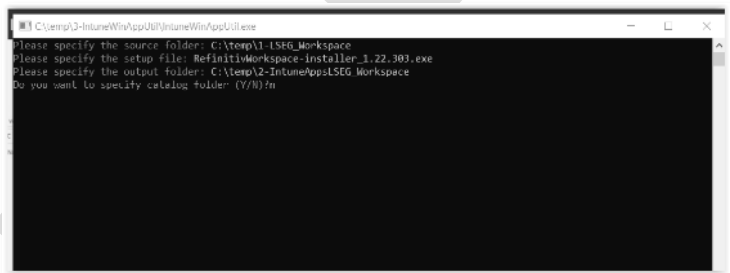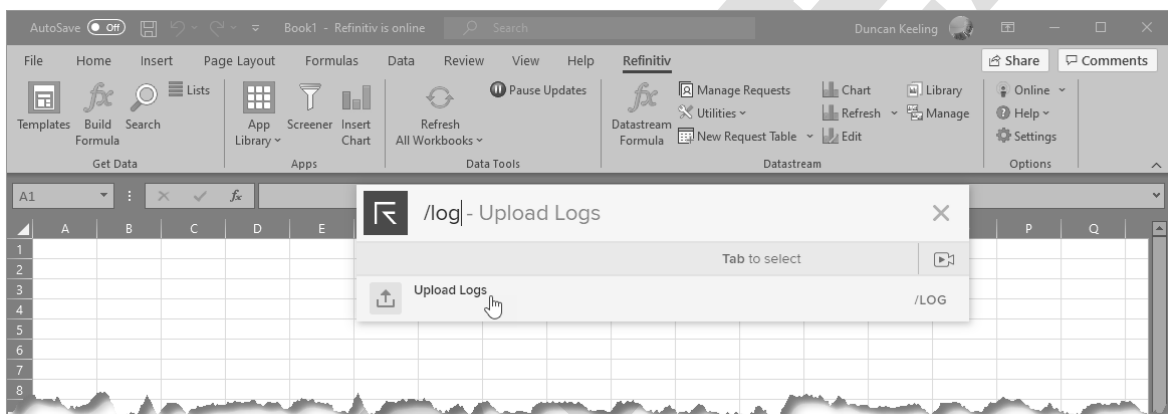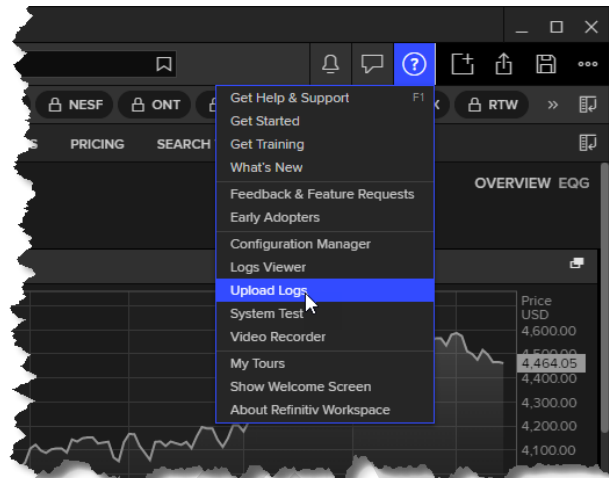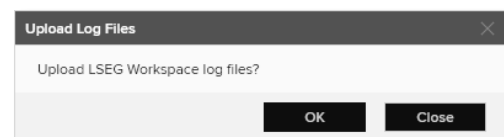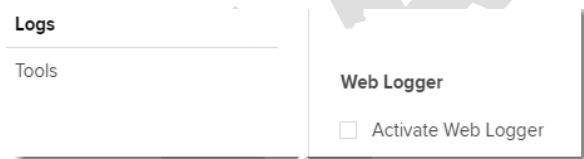RefinitivWorkspace.exe --upload-logs
```

Log upload troubleshooting

For troubleshooting purposes, the settings[86] shown in the table below can be written to the `user-settings.json` or `machine-settings.json` file:

Setting	Purpose
EIKON.LOGSUPLOAD.VERBOSEOUTPUT	set to true to have some output generated in the console.
EIKON.LOGSUPLOAD.DEACTIVATEENCRYPTION	set to true to send the logs without encryption.
EIKON.LOGSUPLOAD.WRITETEMPFILESONDISK	set to true to write the original and the crypted zips in the %TEMP% folder.
EIKON.LOGSUPLOAD.TESTDECRYPTIONLOCALLY	set to true to test that decryption works locally (useful with VERBOSEOUTPUT and/or WRITETEMPFILESONDISK).

Networking issues

After installing Workspace, you have the option of using the web logger command to troubleshoot networking issues. To do this:

Logs

Tools

Web Logger

☐ Activate Web Logger

–   Use the command `RefinitivWorkspace.exe --web-logger`, or

–   Activate it using the Web Logger checkbox under **Configuration Manager > Logs**:

To troubleshoot networking issues:

1. Launch Workspace with the `--web-logger` parameter, using the Command Prompt, or through the Configuration Manager.

2. Enter your credentials and login.

3. Navigate to the `log` folder location.

4. Open the most recently created desktop log file (`web-requests.log`) [87]. This file is created and available with all captured web calls from Workspace.

Resetting Electron application data

You can use the following parameters to delete application data – configuration files, caches, preferences, and settings – resetting Electron.

Close all Workspace applications before running these commands.

To do this, depending on your requirements:

–   Run `RefinitivWorkspace.exe` with a parameter, or

–   Select a cache clearing function under **Configuration Manager > Cache**

Depending on the option chosen, resetting the cache has the following effect:

Configuration Manager function	Parameter	Effect
Clear all cache	--resetCache	Resets the **product** cache of Workspace to its default state. That is, as it would be after a fresh installation.
Clear Electron cache	--resetElectronCache	Reset the **Electron** cache of Workspace to its default state

.

---

[86] By default, all these settings are set to FALSE.

[87] When Workspace shuts down, it generates both the `web-requests.log` file and a HAR-based topology log file.

Using the Video Recorder tool

The Video Recorder tool allows you to capture and save video footage of your entire desktop or a particular screen. This is particularly useful for capturing issues you are experiencing with your environment to provide additional information to Support.

You can start the tool from the Help menu or by using a parameter.

Starting the tool from the Help menu

To do this:

1. Open the Help menu by clicking the **?** icon.
2. Select **Video Recorder** from the menu.

Starting the tool using a parameter

Run Workspace with the `--video-recorder` parameter. This can be done either by:

− adding the parameter to the application shortcut by editing its properties, or

− using the appropriate command line statement:

Windows	`"%LOCALAPPDATA%\Refinitiv\Refinitiv Workspace\RefinitivWorkspace.exe" --video-recorder`
macOS	`"/Applications/Refinitiv Workspace.app/Contents/MacOS/RefinitivWorkspace" --args --video-recorder`

The following dialog is displayed:

Capturing a video

To capture a video, do the following:

1. Click **Start**.

2. In the dialog that is displayed, choose whether to capture video of your whole desktop or of a specific screen.

While the video is recording, a dialog is displayed which shows the current size of the video file, as it is recording.

3. Once you have captured the content you require, click **Stop**.

4. Then, in the main dialog, click **Save**.

A Windows Explorer dialog is displayed, with the **Downloads** folder open, by default.

5. Optionally, navigate to a different download folder.

6. Click **Save**.

7. Contact Support, who will guide you regarding the submission of this file.

Using the Logs Viewer

The Logs Viewer facility allows you to view a comprehensive and filterable list of log entries that were captured in the main and other files.

You can start the facility from the Help menu or by using a parameter.

Opening the facility from the Help menu

To do this:

1. Open the Help menu by clicking the **?** icon.

2. Select **Logs Viewer** from the menu.

Opening the facility using a parameter

Run Workspace with the `--logs-viewer` parameter [88]. This can be done either by:

− adding the parameter to the application shortcut by editing its properties, or

− using the appropriate command line statement:

Windows	`"%LOCALAPPDATA%\Refinitiv\Refinitiv Workspace\RefinitivWorkspace.exe" --logs-viewer`
macOS	`"/Applications/Refinitiv Workspace.app/Contents/MacOS/RefinitivWorkspace" --args --logs-viewer`

---

[88] See the Logs Viewer parameters section.

Logs Viewer parameters

The table below lists valid parameters for the `--logs-viewer` command line statement:

Parameter	Description
`--logs-viewer`	Select the *main* file, which is the log of the current Workspace session, in the current log folder
`--logs-viewer=*`	Select all files in the current log folder
`--logs-viewer=<prefix>`	Select the files in the log folder that have the defined <prefix>. Where <prefix> is one of the following: – `main` – Workspace desktop log – `excel` – Workspace for Excel log – `renderer` – Workspace window rendering log – `node` – Node.js log
`--logs-viewer=<file>`	Select the specified log file. For example: `--log-viewer="%LOCALAPPDATA%\Refinitiv\Refinitiv Workspace Logs\Desktop.20230104.151635.p8956\renderer-1-r6.20230104.p22728.log"`
`--logs-viewer="<folder path>"`	Select the main log file from the specified <folder>. For example: `--log-viewer="%LOCALAPPDATA%\Refinitiv\Refinitiv Workspace Logs"`
`--logs-viewer="<folder path>\*"`	Select all files from the specified <folder>. For example: `--log-viewer="%LOCALAPPDATA%\Refinitiv\Refinitiv Workspace Logs\*"`
`--logs-viewer="<folder path>\<prefix>"`	Select files with the specified <prefix> from the specified <folder>. For example: `--log-viewer="%LOCALAPPDATA%\Refinitiv\Refinitiv Workspace Logs\renderer"`

Overview of the Logs Viewer panel

What – the type of file. That is, main, excel, renderer, and so on.

Where – file name, if more than one of that type, and line number

When – date and time stamp (local or UTC)

Shift – time variance from first log entry

Level – error, warning, info, debug, or verbose

Tags – [XYZ] markers found in the log entry

The contents of the selected files are saved to a .csv file in %LOCALAPPDATA%\Temp\Refinitiv

Tags are extracted from the log text when there is an info, error, warn, and so on, prefix

Select from a list of all log files, then click **GO** to confirm your selections

Header – Containing file name and length

Log entry list, where the background color indicates the type of entry:
- Error
- Warn
- Info
- Debug
- Verbose

Textual search of all filtered log records

Show dates as UTC – date and time is converted to UTC time zone.

Show Dates as Local – Default. Date and time shown in local time zone.

Auto-scroll – Updates to a single selected file are tracked and the new data is added. Select this to scroll automatically to the bottom when an update occurs.

Importing files

Under the **Files** filter, log files held in folders that are not listed in the Logs Viewer can be imported into the viewer.

To do so:

1. In Windows Explorer, open the folder containing the file(s) to import.

2. Select the file(s).

3. Drag the files into the Logs Viewer panel [89].

− When you release your pointing device, the files are added to the viewer under the folder in which they were located.

Using the Actions menu

The **Actions** menu, an ellipsis found under the Actions column, can be used to copy the contents of specific log file entries.

To open the **Actions** menu:

1. Hover your cursor over the Actions column of the entry to copy.

− An ellipsis appears.

2. Click the column to display the menu.

Choose from the following options:

Copy raw line	Copy the original data from the log file to the clipboard. This copies the entire contents of the line, including date, time, and so on.
Copy Text Column	Copy the content of the **Text** column to the clipboard.

---

[89] You can copy the files into the existing folder by holding the Ctrl key before releasing your pointing device.

Appendix J: Known issues

DPRM connection issue

If DPRM-related settings are read incorrectly, it may result in DPRM failing. In this case, the `No working server available for DPRM` log file error message.

> **Important**: The workaround, below, is only required for installations of Workspace 1.23 and has been fixed in the Workspace 1.24 release. Therefore, if you have upgraded to 1.24, these settings will need to be removed.

As a workaround, the following settings should be added to your configuration file:

```
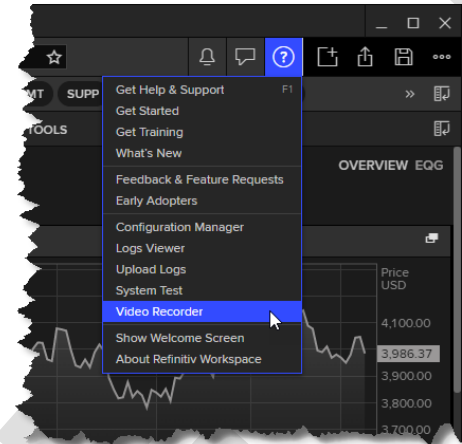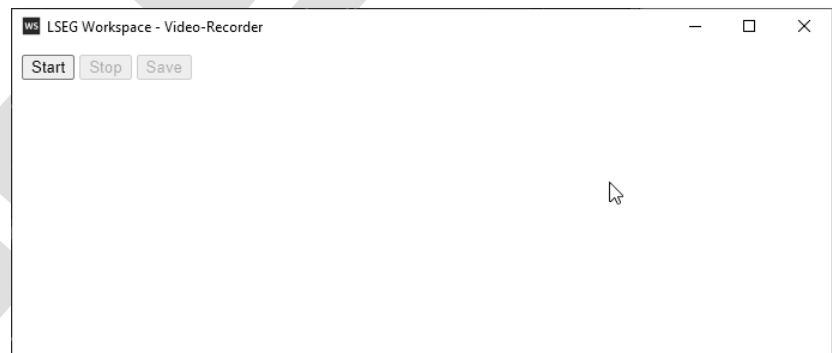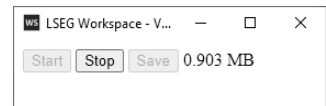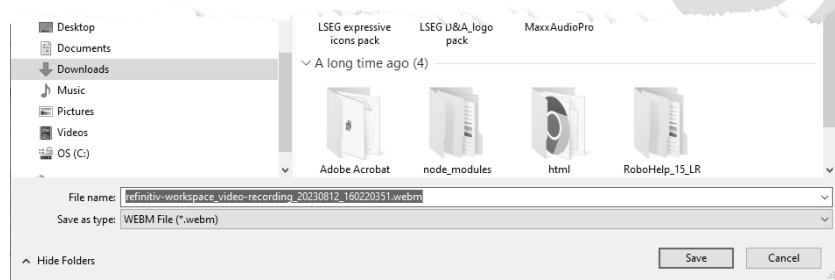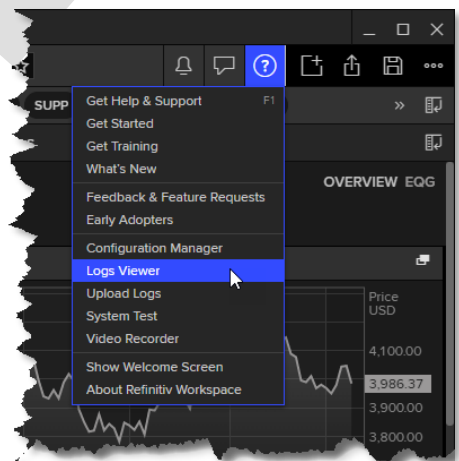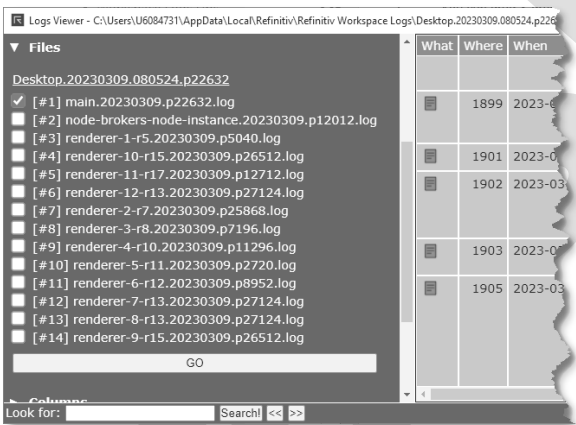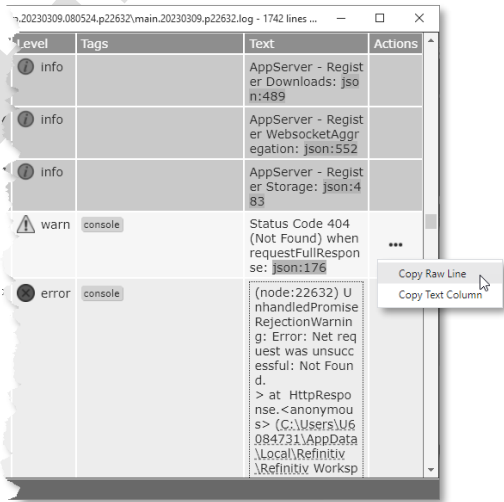{
"EIKON.STREAMING.API.  CORE  .PLUGINS.ADDITIONAL.LOCAL": "%.7%,%.8%",
"EIKON.STREAMING.API.LOCAL.ADDITIONAL.SESSIONS.1":
"%EIKON.STREAMING.API.LOCAL.DACS.DPRM.SERVERS%",
"EIKON.STREAMING.API.LOCAL.ADDITIONAL.SESSIONS.2":
"%EIKON.STREAMING.API.LOCAL.DACS.DPRM.PORT%",
"EIKON.STREAMING.API.LOCAL.ADDITIONAL.SESSIONS.3":
"%EIKON.STREAMING.API.LOCAL.DACS.USERNAME%",
"EIKON.STREAMING.API.LOCAL.ADDITIONAL.SESSIONS.4":
"%EIKON.STREAMING.API.LOCAL.DACS.FORCECASE%",
"EIKON.STREAMING.API.LOCAL.ADDITIONAL.SESSIONS.5": "%USERDETAILS.UUID%",
"EIKON.STREAMING.API.LOCAL.ADDITIONAL.SESSIONS.6":
"%EIKON.STREAMING.API.LOCAL.DACS.DPRM.INTERVAL%"
}
```

Retrieving permissions

If you use this workaround, the default for retrieving permissions from the LSEG Real-Time Advanced Distribution Server, to which you are currently connected, will not work. As such, you need to specify a value for the following setting:

```
EIKON.STREAMING.API.LOCAL.DACS.DPRM.SERVERS
```

Limitations

There are several impacts of these additional settings that are described below.

Defining additional local connections

If you use additional local connections, you will be limited to two. These are the connections configured using the following settings:

```
EIKON.STREAMING.API.LOCAL.ADDITIONAL.SESSIONS.7
EIKON.STREAMING.API.LOCAL.ADDITIONAL.SESSIONS.8
```

Using Configuration Manager

This workaround will severely impact use of Configuration Manager.

Certain components of Configuration Manager – Streaming feeds, for instance – will not initialized properly. As such, any changes made in Configuration Manager will not persist and, therefore, will have no effect on Workspace.

Exporting data to Excel

This affects users who are not permitted to access the Windows operating system tool[90], PowerShell, only.

An error message may be displayed when attempting to export data to Excel.

ⓘ This has been noted to impact users of the SDC PLATINUM application especially.

Excel add-in loading issues

Trust Center policies

If the Group and/or Microsoft 365 Trust Center policies are set to deny the use of Web add-ins, certain **Workspace** add-in menu ribbon items, such as Deals BI, may not load.

To resolve this issue, do the following:

1. Open a Microsoft 365 file (Word document, Excel spreadsheet, …)

2. Open the **File** menu

3. Select **Options**

4. In the Options dialog, select **Trust Center**

5. Click the **Trust Center Settings…** button

6. Select **Trusted Add-in Catalogs**

7. Uncheck the **Don't allow any web add-ins to start** checkbox

Workspace installations without automatic update[91]

For users installing Workspace using `--machine-autoupdate-no`, the Excel add-in does not load correctly on non-virtual machines. This is because the default location of the Office registry key is registered at HKLM.

To correct the registry key location, use the command:

`<install path>\RefinitivWorkspace.exe --update-office-registry=HKCU`

---

[90] For a list of required operating system tools, refer to Operating system tools
[91] PCN206237 provides more information about this fix.

Installing standalone Workspace Messenger

For Workspace 1.21 only, installation or update of Workspace Messenger alone is done using command line statements. That is:

Action	Command
Installation	`RefinitivWorkspace-installer_x.xx.xx.exe --<mode> --messengeronly`
Update	`RefinitivWorkspace-installer_x.xx.xx.exe --<mode> --messengeronly`
Uninstallation	`<install path>\Refinitiv Workspace\RefinitivWorkspace.exe --uninstall`

Contributions (RtContribute)

The Refinitiv Workspace - Excel (**Workspace** ribbon) add-in was added in Workspace version 1.16. The following list summarizes the known issues and their solutions or when they are to be addressed.

Issue	Solution/To be addressed in
RTDS requires updating to a new Data Dictionary version.	
LSEG Real-Time Advanced Distribution Server (formerly ADS) version 3.5.2 L1 does not support the contribution from Workspace Excel.	Install version 3.5.2 L3 [92] or higher.
POS and LANGUAGE parameters are not supported. Requires sending data in RMTES encoding.	Only UTF-8 is supported by the API

LSEG Real-Time Advanced Distribution Server version issues

There were several issues with the handling of WebSocket connections in the initial release of version 3.5.2, which were only partially resolved in 3.5.2 L2.

Further issues concerning WebSocket connections were addressed in the L3 release, together with minor changes to the default settings, which improved the handling of larger messages.

Virtualized environment issues

Important: If you encounter an issue; LSEG requests that you confirm the issue has been reproduced in a non-virtualized environment.

CVAD environments

This section lists all known issues for running Workspace on a CVAD environment:

Subject	Jira reference	XenApp pub. app	XenApp pub. d'top	Xen Desktop
RTGet template which has 10k functions is not responding on applying "save as val- agreeues-Workbook"	EFO-8412			
Refinitiv Workspace - Excel is not automatically sign in and retrieve the data when Open saved Functional template + native excel via command line	EFO-8579		●	●
HelpApi request doesn't work	HELP-5828	●		

[92] See also Creating an internal connection.

Subject	Jira reference	XenApp pub. app	XenApp pub. d'top	Xen Desktop
All menus are displayed as separate entry in taskbar	SAP-9231	●		
Toast UI is displaying as separate entry in taskbar	SAP-9233	●		
Notification Centre: Toast still appears when user activate Focus Assist on local machine	SAP-9617	●		
There is a small black area around toasts	SAP-9620	●		
Shortcut (ALT + S) doesn't work	SAP-10009			●
RW in XenApp does not support custom protocols	SAP-10157	●		
Black areas are shown near guidelines and snapping lines	SAP-10399	●		
Snapping/grouping features breaks after moving a tile (moving frame)	SAP-10368	●		
Black screen is displayed around opened window for area and full screen screenshot	SAP-10785	●		
Messenger on Citrix XenApp environment intermittently freeze while typing in the text box	SAP-11267	●		
File type is not added into save dialogue	SAP-14187			
Unknown container type and app-name into UsTracking evet for Tile, Modal window	SAP-18302			
If the 'Position of Toast' sets as 'Bottom - Right or Left', it's not working as expected	SAP-24424	●		
Three horizontal dots (ellipsis) option is not appearing in the toast notification	SAP-24438	●		
Not able to close the popped-out conversation in the system task bar	SAP-24439	●		
Deep links are not opened on virtual desktop machines	SAP-25517			
[Widely:] Palo Alto Networks TS Agent can raise problems - whitelisting	---			

VMware environments

This section lists all known issues for running Workspace on a VMware Horizon 8 environment:

Subject	Jira reference	Horizon virtual apps
There's only 'Close window' in the task bar	SAP-10823	●
Published Apps - Do not disturb option is activated on Published Apps when Focus assist is OFF in OS settings	SAP-10972	●
Published Apps - Impossible to copy screenshot to clipboard for Virtual App	SAP-11011	●
Tiles - Snapping line and guideline are visible only after dropping a tile	SAP-11025	●
Tiles - Group movement is not working properly	SAP -11026	●
Tiles - Single tile resizing works for snapped or grouped tiles	SAP-11027	●
Impossible to open deep link	SAP-11955	●
Published Apps - RW desktop 1.19 is not resized	SAP-22571	●
Tiles - Pinned tile manager can be moved	SAP-22620	●

SSL inspection support

LSEG does not support or enforce SSL inspection, sometimes referred to as TLS/HTTPS Interception.

If clients use SSL inspection, they must configure URL filtering profiles **not** to enforce SSL inspection on LSEG domains, such as *.refinitiv.com, *.refinitiv.net, *.refinitiv.biz.

Real-Time server disconnections

In the event where the LSEG Real-Time Distribution System disconnects immediately following a successful mount, refer to Creating an internal connection.

Cache path definition

An alternative cache path can be defined for Workspace during its installation, using the parameter:

```
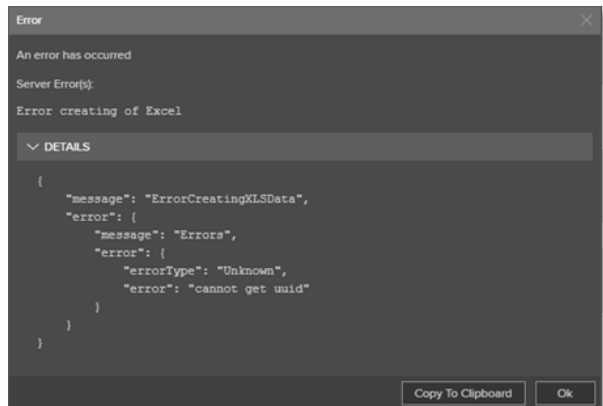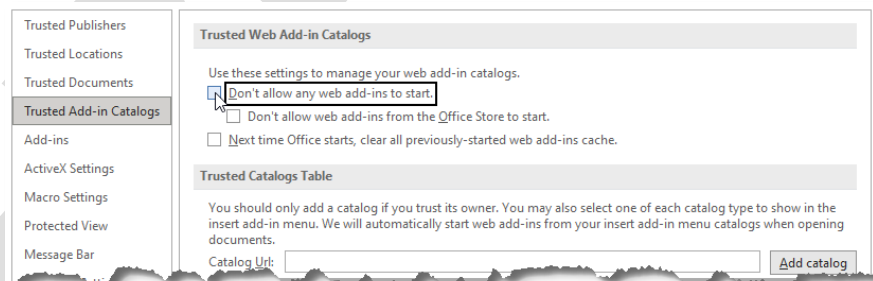RefinitivWorkspace-installer_x.xx.xx.exe --cachepath="<folder_path>"
```

However, currently, this does not re-route the entire content of the `Refinitiv Workspace` folder in the cache. That is, while the `electron` folder is moved to the new location, the following subfolders are not:

- Config
- Dictionaries
- Data API Proxy
- File Links

Signing in automatically

When users first log into Workspace, they have the option of choosing to sign in automatically in future, which creates a cookie in the electron cache for the user.

However, if electron is upgraded to a higher version, the cache is cleared and users are expected to sign in again.

ⓘ As this may occur many months later, users may have lost their credentials.

Rolling back

If your instance of Workspace was upgraded automatically, you can return to the previous version of Workspace by using the rollback parameter in the command line:

```
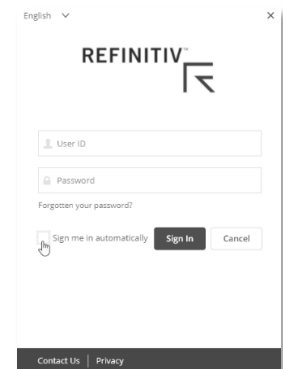"<Install Path>\Refinitiv\Refinitiv Workspace\RefinitivWorkspace.exe"
--rollback
```

However, this command also disables the automatic update feature for subsequent releases of Workspace.

Rolling forward command support

Due to changes to the Workspace architecture, the `--rollforward` command line parameter is only valid for version 1.19 or higher. Also, this command can only be used after a `--rollback` operation has been performed.