



LSEG WORKSPACE

OPENFIN INSTALLATION AND CONFIGURATION
GUIDE



LSEG DATA &
ANALYTICS

Version history

Software version	Document version	Summary of Changes
2.16	216.02	Single and Multi-Tenant configuration descriptions were reversed.
	216.01	Initial version of the LSEG Workspace OpenFin Installation and Configuration Guide.

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About Workspace

To create a cutting-edge customer experience, the productivity-enhancing technology of the OpenFin platform will be a core component of our long-term strategy for LSEG Workspace. OpenFin itself is used by 90% of the major global banks and deploys more than 3,500 desktop applications to more than 3,800 buy-side and sell-side firms.

With Workspace powered by OpenFin technology, LSEG customers will be able to:

- Create rich and interactive desktop experiences tailored to their needs
- Integrate their applications with Workspace using the interoperability layer of OpenFin
- Experience a zero-install delivery model
- Ensure they always have the latest version of Workspace through instant update technology

Forthcoming features

By mid-2025, the following major features will be integrated into Workspace on the OpenFin platform:

- Microsoft Entra for SSO authentication (introduced in version 2.10)
- LSEG Messenger 2.0
- Standalone LSEG Workspace add-in for Microsoft Office products

In this guide

This guide describes IT-managed installations to platforms running on Microsoft® Windows® or Apple® macOS®. This document also details the steps and any post-installation configuration and customization that is required to install the application.

Intended readership

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

Contact information

To:

- Receive further assistance, contact [Support](#).
- Provide feedback on Workspace technical content, contact DocFeedback@lseg.com.

Pre-installation tasks

The following verification checks should be performed before implementation of LSEG Workspace for the OpenFin platform (hereafter, Workspace).

Reviewing documentation

Before installing Workspace, ensure that your hardware and software meets the requirements summarised under the [OpenFin-specific System Requirements](#).

Important: Workspace versions 2.10 and higher have been qualified on both Citrix and VMWare Horizon virtualised environments. Further to this, support for the Azure Virtual Desktop will be introduced in 2025.

Whitelisting

The following digital certificates, which are obtained using the processes described in the sections below, must be whitelisted:

- LSEG Workspace
- OpenFin
- Node services

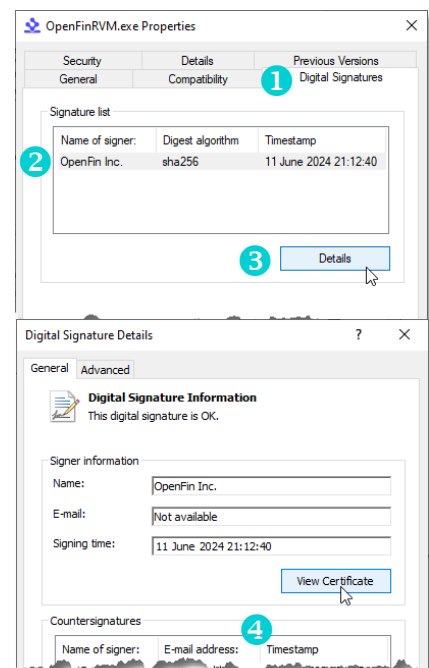
Extracting and installing the digital certificate

LSEG Workspace runs in a secure environment, provided by the OpenFin runtime. For further information, see [Security overview \(openfin.co\)](#).

Exporting the OpenFin digital certificate

OpenFin binaries and libraries are signed by DigiCert RSA CA. To extract the digital certificate and install them in your security agent, do the following:

1. Open %LOCALAPPDATA%\OpenFin.
2. Right-click the OpenFinRVM.exe file and select **Properties**.
The OpenFinRVM.exe Properties dialog appears (opposite).
3. Select **Digital Signatures** tab ①.
4. In the Signature list pane, select the **OpenFin Inc.** certificate ② and click the **Details** button ③.
The Digital Signature Details dialog appears (opposite).
5. Click the **View Certificate** button ④.

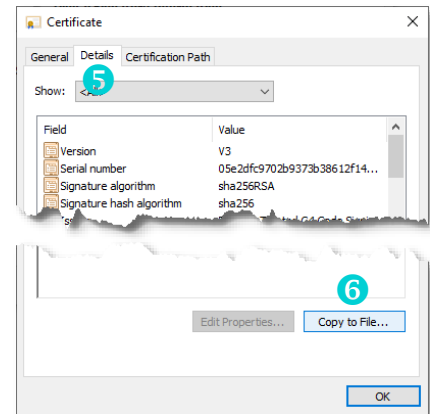


The Certificate dialog appears.

6. Select the **Details** tab **5** and click the **Copy to File...** button **6**.

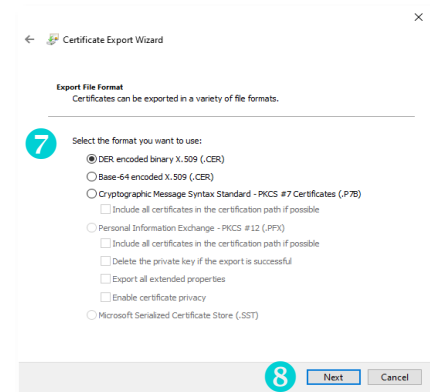
The Certificate Export Wizard opens.

7. Click the **Next** button.



The Export File Format panel appears (opposite).

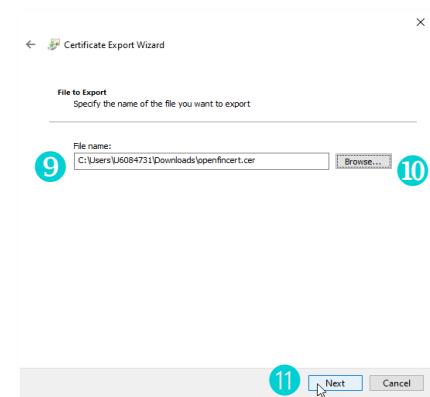
8. From the list of options, choose the file format in which you want the certificate to be exported **7**.
9. Click the **Next** button **8**.



The File to Export panel appears (opposite).

10. Either:
 - a. In the **File name** field **9**, enter the path and file name manually, or
 - b. Click the **Browse...** button **10**, use a standard Windows **Save as** dialog, allowing you to choose the location, and enter the file name to save.
11. Click the **Next** button **11**.

The exported OpenFin certificate is saved in your chosen location.



Exporting the Windows node service certificate

The Windows node service, which is the LSEG Workspace third party app asset, is digitally signed by DigiCert RSA CA.

If you already have OpenFin application running, you only need to whitelist the Windows node services certificate in your App Locker and/or security tools.

To export the node service certificate, do the following:

1. Open


```
C:\Users\U6084731\AppData\Local\OpenFin\apps\LSEG_Workspace_<xxxxxxxxxxx>\assets\workspace-node-service-win\1.0.1.
```

Where <xxxxxxxxxxx> is a hash value of the manifest URL. For example, 3013487314.
2. Right-click the node_<xx.xx.x>.exe file and select **Properties**.

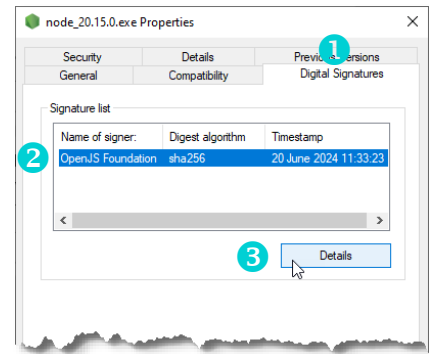
The node_<xx.xx.x>.exe Properties dialog appears (opposite).

Select **Digital Signatures** tab **1**.

- In the Signature list pane, select the **OpenJS Foundation** certificate **2** and click the **Details** button **3** (opposite).

The Digital Signature Details dialog appears (opposite).

- To export the node service certificate to your local drive, now follow steps 5-11 in the [Exporting the OpenFin digital certificate](#) section.



Expired certificates

When attempting to install Workspace, if your OpenFin runtime has an expired digital certificate, you may face issues. Security tools, such as Microsoft App Locker, can detect expired certificates and prevent the installation.

To ensure a smooth Workspace deployment, check valid OpenFin Runtime before install LSEG Workspace.

Entra authentication

Microsoft Entra is a comprehensive cloud-based identity and access management (IAM) solution that provides secure access to applications, resources, and devices across hybrid and multi-cloud environments.

To authenticate into Workspace, users will need to be registered on your Entra tenant.

Further information on this process will be provided in the Workspace - Entra Onboarding Guide, which is due for release in Q1 2025. However, for general guidance, similar Entra registration tasks are also covered in the [Meeting Prep Activation Guide](#).

Networking considerations

For further information about the domain requirements of Workspace, refer to the following links:

- [Domain access information](#) on the OpenFin developer documentation site.
- Sections of **Appendix E: Settings** of the [LSEG Workspace Installation and Configuration Guide](#):
 - Financial Community Network and Delivery Direct¹
 - Content filtering domains

Specifically for Workspace for OpenFin use, as a minimum, the following domains must be whitelisted:

Domain	Connection		Purpose
	Internet	Private	
*.openfin.co	●	●	Allows user machines to access resources hosted on OpenFin servers.
*.refinitiv.com *.refinitiv.net *.refinitiv.biz *.refinitiv.net	●	●	Allow user machines to access Workspace domains.

¹ Support for Delivery Direct will be implemented in Q1 2025.

Communication protocols and ports

Protocols/Port	Workspace Services	Required For
https (TCP443)	LSEG Workspace platform	<ul style="list-style-type: none"> - Administration Services - View Service - Search & Navigation Service - Time Series Service - Trading Service - Update Service - Thomson Reuters Remote Support (TRRS) - Newscasts (internet only) - FXall - Flextrade Spark - Real-Time Data
https (TCP443)	OpenFin servers	OpenFin services
Tcp15000	Real-Time Data	LSEG Real-Time: Advanced Distribution Servers
TCP/UDP53	DNS Server	Domain Name Resolution from Domain Name Server

APIs

Workspace APIs use the following connections:

API	Connection	Protocols/Ports
Desktop Data API	TBC	TBC
Side by Side API	http://localhost:9000\sxs\	9000

Downloading Workspace

You can download the Windows or macOS installer for LSEG Workspace from the following locations:

Operating System	Connection	
	Internet	Private
Windows	https://cdn.refinitiv.com/public/workspace-installer-packages/workspace-installer.exe	https://cdn.extranet.refinitiv.biz/public/workspace-installer-packages/workspace-installer.exe
		or https://cdn.refinitiv.net/public/workspace-installer-packages/workspace-installer.exe
macOS	https://cdn.refinitiv.com/public/workspace-installer-packages/workspace-installer.pkg	https://cdn.extranet.refinitiv.biz/public/workspace-installer-packages/workspace-installer.pkg
		or https://cdn.refinitiv.net/public/workspace-installer-packages/workspace-installer.pkg

Installing Workspace

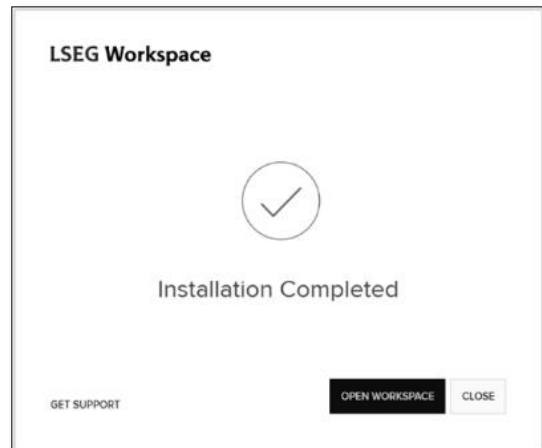
Workspace can be deployed on machines running Windows or macOS², and VDI. This section describes the installation process only. For configuration information, refer to the [Configuring Workspace](#) section.

About the LSEG Workspace installer

The LSEG Workspace installer uses OpenFin technology to deliver a seamless installation process on user desktops. Additionally, it provides auto-update capabilities, in response to Workspace and OpenFin Runtime version changes, in a Workspace application manifest file.

When deploying Workspace, consider the following user requirements:

- Administrator rights are not required for installation.
- The installation file is signed by OpenFin.
- The installer copies the relevant Workspace application resources into the following folders:
 - OpenFin container - %localappdata%/OpenFin.
 - Microsoft Office standalone app - %localappdata%/Workspace Office
- Users require write access to the %localappdata% folder but not administrator rights.
- The installer creates the application shortcuts:
 - In Windows, on the desktop and in the Start menu.
 - On macOS, in the **Applications** folder.
- A download action is triggered when the required OpenFin Runtime Version is not present.



IT-managed desktop preparation

The following preparatory steps are required for IT-managed environments, where download, install, and update of any applications are prohibited on user desktops.

Before the Workspace release date, on user desktops, IT teams will need to do the following:

- Install OpenfinRVM
- Install the required OpenFin runtime version for LSEG Workspace

The download link for the new OpenFin runtime version that is required for Workspace is provided by OpenFin. However, it will also be communicated by Product Change Notification.

² For further information, refer to [macOS differences from OpenFin on Windows](#).

Installation process

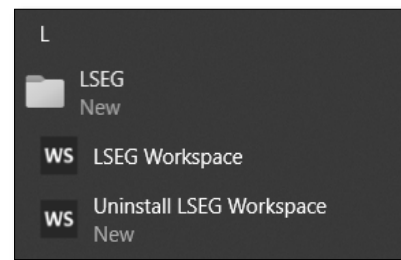
Workspace installation is a seamless process, utilising the capabilities of the OpenFin installer. During the installation, the following actions are performed:

1. Downloads OpenFin Runtime Version Management (OpenFin RVM)³ from cdn.openfin.co and installs it in `%localappdata%\OpenFin`.
2. Loads and reads the Workspace application manifest file from <https://cdn.refinitiv.com/public/workspace/manifest.json>
3. Based on the application manifest, downloads the required OpenFin Runtime Version(s) and Office add-in assets, if not present.
4. For the Office add-in, runs a system test to ensure the machine on which the installation is performed meets add-in [system requirements](#).
5. Installs shortcuts for LSEG Workspace and Workspace Office to the desktop and Start menu.
6. Follows with on-screen instruction allowing you to choose to exit the installer or launch Workspace⁴.

Shortcuts

By default, LSEG Workspace shortcuts that link the server-hosted manifest file will be created⁵ on Windows desktop and Start Menu, and the macOS **Applications** folder.

In Windows, the shortcuts have the following targets, where `%localappdata%` is the OpenFin RVM directory:



Shortcut	Target
LSEG Workspace	<code>%localappdata%\OpenFin\OpenFinRVM.exe --config=https://cdn.refinitiv.com/public/workspace/manifest.json</code>
Workspace Office file package	<code>%LOCALAPPDATA%\Workspace Office</code>
Uninstall LSEG Workspace ⁶	<code>%localappdata%\OpenFin\OpenFinRVM.exe --remove-app --config=https://cdn.refinitiv.com/public/workspace/manifest.json</code>
Uninstall Workspace Office	<code>%LOCALAPPDATA%\Workspace Office\uninstall.exe --excel</code>

After installation has completed, installer and setup files are removed, and Workspace configuration files are created in the following location:

Installation Mode	Openfin install path	Workspace configuration path
Default	<code>%LocalAppData%\Openfin</code> <code>%LocalAppData%\Workspace Office</code>	<code>OpenFin\apps\LSEG_Workspace_-_xxxx</code>
Custom	<code><Custom installation path>/Openfin</code> <code><Custom installation path>/Workspace Office</code>	<code>OpenFin\apps\LSEG_Workspace_-_xxxx</code>

For further information about:

- The OpenFin installer folder structure, refer to the [Folder structure](#) section of the OpenFin installer documentation.
- The Workspace Office folder structure, see [Appendix A: Add-in folder structure](#).

³ The Workspace installer also contains the OpenFin RVM, however, it can be downloaded directly from [OpenFin.co](https://openfin.co).

⁴ The standalone Workspace Office add-in is launched through its respective Office app (Excel, PowerPoint, ...) only.

⁵ Shortcut creation on desktop and Start menu is managed through `desktop-owner-settings`. For mor information, refer to the [Configuring Desktop Owner Settings for Workspace](#) section.

⁶ For instructions on uninstalling Workspace on macOS, refer to [From macOS](#) section of [Uninstalling Workspace](#).

Installing Workspace

The following sections describe the default installation processes, for both internet and private connections, using different installation methods.

Using the Workspace installer

1. [Download](#) and the appropriate `workspace-installer` package for your environment.
2. Run `workspace-installer`.
3. Follow the on-screen instructions to open Workspace.

Using the FINS protocol

If you already have the OpenFin RVM installed on your computer, depending on your connection type and requirements, you can run one of the following FINS links in your browser:

Installation type	Connection	
	Internet	Private
Interactive	<code>fins://workspace.refinitiv.com/public/workspace/manifest.json</code>	<code>fins://workspace.extranet.refinitiv.biz/public/workspace/manifest-private.json</code>
Silent	<code>fins://workspace.refinitiv.com/public/workspace/manifest.json?\$\$forceTerminate=true</code>	<code>fins://workspace.extranet.refinitiv.biz/public/workspace/manifest-private.json?\$\$forceTerminate=true</code>

Custom installation

To install Workspace using customized settings⁷, do the following:

1. Prepare [desktop owner settings](#)⁸ with your preferred settings.
2. Enable desktop owner settings and define location of the desktop owner settings file in the Windows registry.
3. Perform either:
 - The [Workspace installer](#) steps, or
 - If you already have OpenFin RVM installed on your computer, [run the appropriate FINS link](#).

VDI installation

To install LSEG Workspace onto VDI under different scenarios, the following settings must be applied for `rvmInstallDirectory`, using either [registry](#) or [desktop owner settings](#).

Multi-tenant

Multi-tenant installation allows multiple users to log into the same server (VDI) or Desktop and use LSEG Workspace simultaneously. Workspace must be configured for installation into a public folder that is accessible by all users on the VDI.

To install Workspace into the local profile path of a user, do the following:

1. Using desktop owner settings, set `rvmInstallDirectory`

⁷ Administrative Rights are required for custom installation.

⁸ For further information, see the [Configuring Desktop Owner Settings for Workspace](#) section.

- In non-persistent environments, where %localappdata% is cleared automatically on user log out, set `rvmInstallDirectory` to `%APPDATA%\OpenFin`, or
 - For persistent environments, no action is needed. Workspace is installed in any directory.
2. Install Workspace, using either method, below:
 - Run `workspace-installer`
 - or
 - a. Install OpenFinRVM
 - b. Create a Windows shortcut, pointing to `OpenFinRVM.exe` (found under `%APPDATA%\OpenFin` or `%LOCALAPPDATA%\OpenFin`), using a similar structure to the example below:


```
%APPDATA%\OpenFin\OpenFinRVM.exe --
config="https://workspace.refinitiv.com/public/workspace/manif
est.json"
```

Single tenant

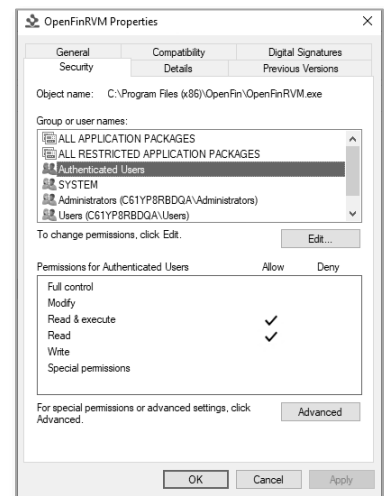
Single tenant installation allows one person, at any one time, to log into a VDI instance and using LSEG Workspace. Therefore, Workspace can be installed into any folder under Program Files or %appdata%.

An example of this process is described in the steps below:

1. Login as VDI server administrator
2. Set `rvmInstallDirectory` through desktop owner settings or by creating a registry key to setup `rvmInstallDirectory`.

It must be set to `%AppData%`, where all users on that VDI can perform files execution.

3. Configure registry keys and prepare master image of LSEG Workspace on a public folder. For example:
 - a. Open the Start menu and type **regedit**.
 - b. Click **Open** to run the Windows Registry Editor.
 - c. Go to `HKEY_LOCAL_MACHINE\SOFTWARE\OpenFin\RVM\Settings\Deployment`⁹.
 - d. Create a new string value, named `rvmInstallDirectory`, with the value `"C:\Program Files\OpenFin"`.



⁹ If the setting doesn't exist, create it using the context menu.

Uninstalling Workspace

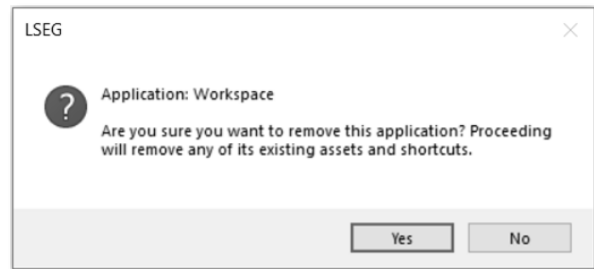
This section summarises the processes you can use to uninstall Workspace either locally, on an individual machine, or by using a manifest file. It also provides a summary of the method used to uninstall the standalone Office add-in.

From Microsoft Windows

Using shortcut menu

To uninstall Workspace using the Start menu shortcut:

1. In Windows, select **Start > LSEG > Uninstall LSEG Workspace**.
2. In the confirmation dialog, shown opposite, click **Yes** to proceed with the uninstallation.



LSEG Workspace shortcuts and assets are then removed from your computer.

Important: Before uninstalling LSEG Workspace, all OpenFin applications must be closed.

Using an OpenfinRVM command

To uninstall Workspace using a command line:

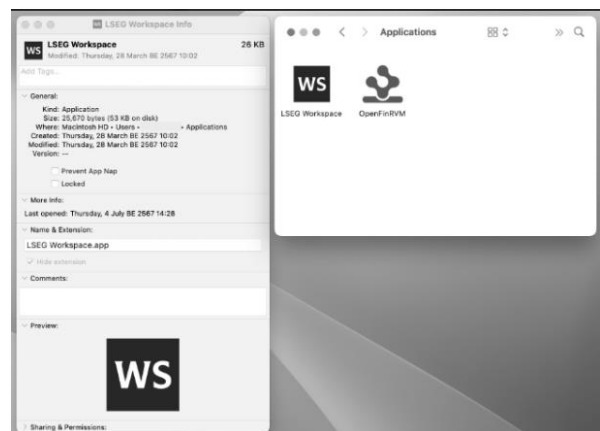
1. In Windows, select **Start**, type **cmd**, and click the **Command Prompt** menu item¹⁰.
2. To begin uninstalling LSEG Workspace, copy and run the following command:

```
%LocalAppdata%\OpenFin\OpenFinRVM.exe --remove-app --
config=https://workspace.refinitiv.com/public/workspace/manifest.json
```
3. In the confirmation dialog, shown above, click **Yes** to proceed with the uninstallation.
4. LSEG Workspace shortcuts and assets are then removed from your computer

From macOS

To uninstall Workspace from a PC running macOS:

1. Under **~/Applications**, open the **LSEG Workspace** folder.
2. Right-click the LSEG Workspace icon and select **Move to Trash**.



¹⁰ Alternatively, select **Start > Windows System > Command Prompt**.

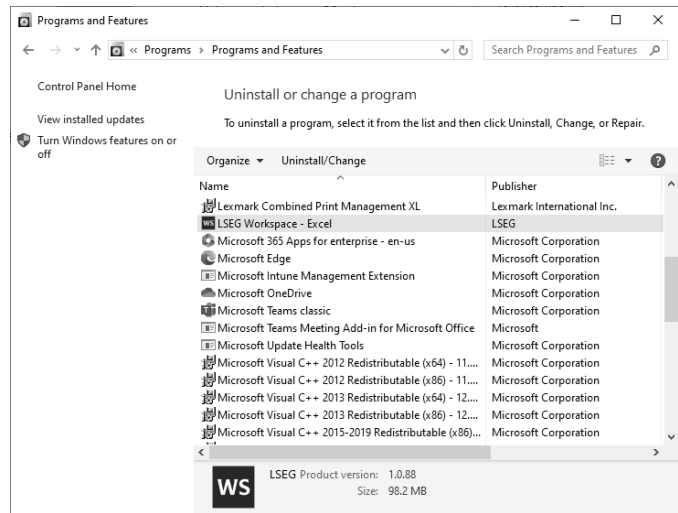
Uninstalling the Office add-in

To uninstall the Office add-in, do the following:

1. In Windows, select **Start > Windows System > Control Panel**.
2. Under **Programs**, select **Uninstall a program**.
3. The Programs and features panel, scroll through the list and select **LSEG Workspace – Excel**.
4. From the menu bar above the program list panel, select **Uninstall/Change**.
5. In the confirmation dialog, click **Yes** to proceed with the uninstallation.

The following actions are then performed by the uninstaller:

- a. Checks whether Microsoft Word, Excel or PowerPoint are running.
- b. Removes all add-in registry keys.
- c. Deletes all files in %LOCALAPPDATA%/Workspace Office.



Upgrading Workspace

Workspace takes advantage of a key strength of the OpenFin ecosystem, which ensures Workspace is always running on the latest version – the use of automatic updates. However, some organizations want to control which version of Workspace is running in their enterprise environment, as well as the timing of when versions are upgraded.

Workspace provides seamless Version Management services after a user successfully logs in. If the user does not have a specific Workspace version assigned by their IT administrator, they login to the latest version.

Configuring Workspace

After logging into Workspace, if a company configuration is not assigned, users obtain the default Workspace configuration from the LSEG Workspace service¹¹.

Default configuration

Default Configuration	Value
Connection Mode	Internet
Log Trace Level	Info
Default Streaming Source	IDN_RDF
Streaming Conflation Rate	1500 millisecond

Unlike the Desktop release of Workspace – currently, version 1.25 – the OpenFin release does not allow interaction with a local configuration file. The Workspace configuration is hosted server-side, on an LSEG platform. However, by using Admin Tools, Workspace can be configured by customer administrators or by LSEG. For further information, refer to the [Administration Tools Configuration Guide](#).

Customer administrators who are permissioned to access Workspace Admin Tools can modify the Workspace configuration for a single user or group of users within their company. To request access to Admin Tools, contact your LSEG Account Team.

Customising installation and OpenFin settings

Rather than defining custom settings directly in Windows registry, OpenFin provides [desktop owner settings](#)¹², which allow you to customise the OpenFin environment on an individual computer or device.

Desktop owner settings are defined in a JSON file, which is typically required to reside on your network. In the JSON file, in accordance with the requirements of your company, you can define multiple settings that are determined by the category of user and your company IT policies.

When OpenFinRVM launches, it does the following:

1. Reads the desktop owner settings registry key to find the location of the desktop owner setting file.
2. Parses the file and overrides any equivalent registry settings with the settings specified in the file.

Enabling desktop owner settings

Important: To enable desktop owner settings, Windows administrative rights are required.

You need to create the following registry key and specify the desktop owner file location. For guidance, refer to [Appendix B: Windows registry settings](#).

¹¹ For more information about configuring real-time data products, see Appendix F in the Workspace desktop edition of the [LSEG Workspace Installation and Configuration Guide](#).

¹² While OpenFin provides support for desktop owner settings on macOS, support is limited. For more information, refer to [macOS differences from OpenFin on Windows](#).

Subject	Value
Key	HKEY_CURRENT_USER\Software\OpenFin\RVM\Settings\DesktopOwnerSettings
Data type	String
Value example ¹³	https://example.com/company/files/end-user-desktop-owner-settings.json

Configuring desktop owner settings

An example of the desktop owner settings JSON file for custom installation is shown below:

```
{
  "desktopSettings": {
    "contactInfo": {
      "email": "support_contact@example.com"
    },
    "cleanUnusedRuntimes": true,
    "unusedRuntimeExpirationInMinutes": 43200,
    "enableDesktopShortcut": true,
    "enableStartMenuShortcut": true,
    "enableStartupShortcut": true,
    "disableShortcutCreation": false,
    "startMenuRootFolder": "CompanyName",

    "deployment": {
      "runtimeCache": "C:\\custom_path\\runtime\\cache",
      "runtimeDirectory": "C:\\custom_path\\runtime",
      "rvmInstallDirectory": "C:\\custom_path\\OpenFin"
    }
  },
  "applicationLogging": {
    "maxAppLogFileSizeMB": 10000,
    "maxAppLogFiles": 10
  }
}
```

Property	Description	Type	Example Value
contactInfo	Contact information of IT Support for this system.	Object	
contactInfo.email	Email address of the Support contact.	String	support_contact@example.com
cleanUnusedRuntimes	This is required when using runtimeControls settings; if omitted, the runtime version controls are not enforced. Determines whether the RVM cleans runtime and runtime cache folders that are no longer referenced by an installed application. By default, the cache folders are cleared.	Boolean	true (default)
unusedRuntimeExpirationInMinutes	Amount of time (in minutes) after which the RVM deletes the downloaded runtime and corresponding runtime cache folder(s).	integer	43,200 (that is, 30 days) (default)
enableDesktopShortcut	Globally determines whether applications have desktop shortcuts. By default, desktop shortcuts are created.	Boolean	true (default)
enableStartMenuShortcut	Globally determines whether applications have Start menu shortcuts. By default, Start menu shortcuts are created.	Boolean	true (default)
enableStartupShortcut	Globally determines whether OpenFin applications have startup shortcuts. By default, startup shortcuts are created.	Boolean	true (default)
disableShortcutCreation	Determines whether applications installed using RVM are prevented from creating their own shortcuts. By default, applications can create shortcuts.	Boolean	false (default)

¹³ The Value is an example indicating the location where your desktop owner settings file is stored on your network and is accessible to all users on your network.

Property	Description	Type	Example Value
startMenuRootFolder	The root folder for the Start menu shortcuts of applications. By default, this is a standard Start menu directory.	String	"Company Name"
uiDeployment	Several properties that control aspects of the operation of OpenFin that are relevant to deployment to end users.	Object	
runtimeCache	Location for runtimes to write cache data. Overrides application manifest settings.	String	C:\custom_path\runtime\cache
runtimeDirectory	Location for runtime binary files.	String	C:\custom_path\runtime
rvmInstallDirectory	Location for RVM binary files. The RVM is copied to this location.	String	C:\custom_path\Openfin
applicationLogging	Controls use of log files by the applications. For more information, see the General settings section of the OpenFin Desktop owner settings page.	object	
maxAppLogFileSizeMB	Maximum size in megabytes for an application-specific log file. By default, infinite.	Integer	10000
maxAppLogFiles	Maximum number of log files per application. By default, infinite.	Integer	10

Running a mass deployment

You can deploy LSEG Workspace using your own mass deployment tool. To do so, follow the steps summarised below:

1. [Optional] Prepare desktop owner settings.

Important: If you want customised installation and/or OpenFin settings, preparing desktop owner settings is a required step.

2. Create OpenFin environment.
 - a. Check the Workspace version and the OpenFin runtime version, defined in the [System Requirements](#).
 - b. Download the respective OpenFin runtime from [OpenFin Versions](#).
 - c. Ensure all machines in your company have OpenFin RVM installed, and your users can log in and run OpenfinRVM.exe.

Important: When you first perform this process, step 2c. is mandatory.

If your company has not used OpenFin nor installed an OpenFin application, OpenfinRVM.exe is installed as part of a Workspace deployment, as it is included in any version of the workspace-installer.exe package.

- d. Add OpenFin runtime packages to your deployment tool, such as Company Portal. You can also implement an internal CDN to host the OpenFin runtime. This needs to be done when there is a change in the OpenFin runtime version that is required for LSEG Workspace. LSEG and OpenFin will communicate the runtime version change through our official communication channels.

For more details about implementing an internal CDN, see [Hosting OpenFin runtime on an internal CDN](#).

3. Create the Workspace package. The installation script may include the following commands:
 - a. [Optional¹⁴] Create registry keys to enable desktop owner settings.
 - b. To install LSEG Workspace silently, create the Workspace package using an appropriate command from those listed below and create shortcuts on the desktop and Start menu:

For hosted Internet users	<pre>fins://workspace.refinitiv.com/public/workspace/manifest.json?\$\$forceTerminate=true or RVMLocation/OpenFinRVM.exe -- config="https://workspace.refinitiv.com/public/workspace/manifest.json?\$\$forceTerminate=true"</pre>
For customer managed private network users	<pre>fins://workspace.extranet.refinitiv.biz/public/workspace/manifest-private.json?\$\$forceTerminate=true or RVMLocation/OpenFinRVM.exe -- config="https://workspace.extranet.refinitiv.biz/public/workspace/manifest-private.json?\$\$forceTerminate=true"</pre>

¹⁴ This step is required if you want to configure an internal CDN for the OpenFin runtime. For more information, see [Customising installation and OpenFin settings](#).

Notes:

- `RVMLocation` is the location of your `OpenfinRVM.exe` file, such as `%localappdata%/Openfin`.
- On your deployment tool, make sure you set `OpenFin` as a dependency for the `Workspace` package, so it will be installed before the `LSEG Workspace` package.

Appendix A: Add-in folder structure

The Workspace add-in files for Microsoft Office products have the following folder structure:

```
└─ %LOCALAPPDATA%
  └─ Workspace Office/
    └─ config/
    └─ Office_x64/
    └─ Office_x32/
    └─ resources/
    └─ soa-installinfo.json
    └─ uninstall.exe
    └─ WORKSPACEOFFICE.ico
    └─ Workspace Office Installer/
      └─ {{Installer Version}}/
        └─ workspace-office-core-installer-log.log
└─ %APPDATA%/Microsoft/Windows/Start Menu/Programs/LSEG
  └─ LSEG Workspace - Excel.lnk
```

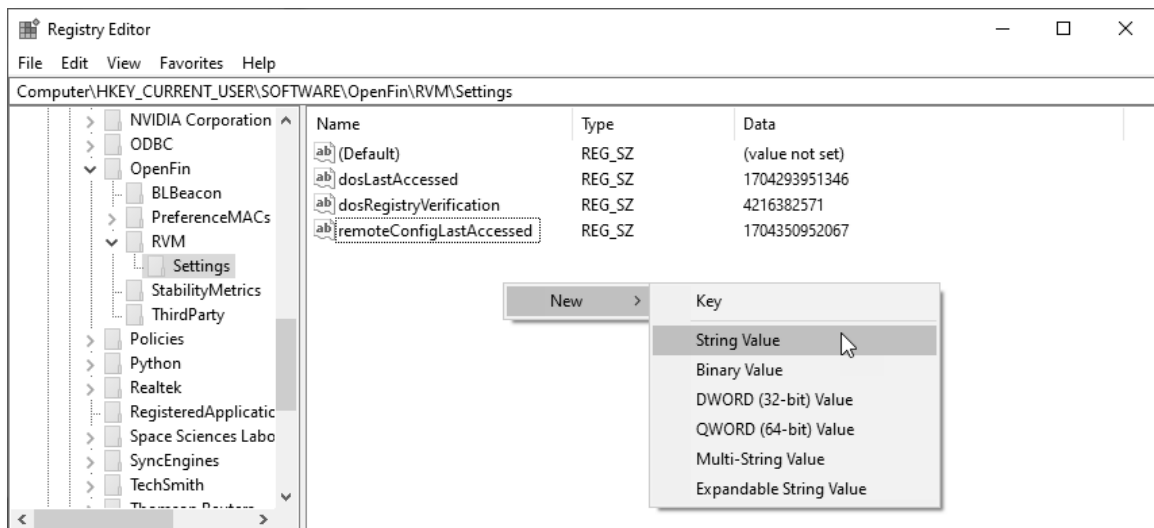
Appendix B: Windows registry settings

This appendix contains instructions for defining registry entries for desktop owner settings.

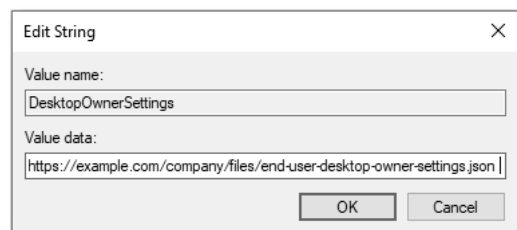
Defining desktop owner settings

To define the registry entry for OpenFin desktop owner settings, do the following:

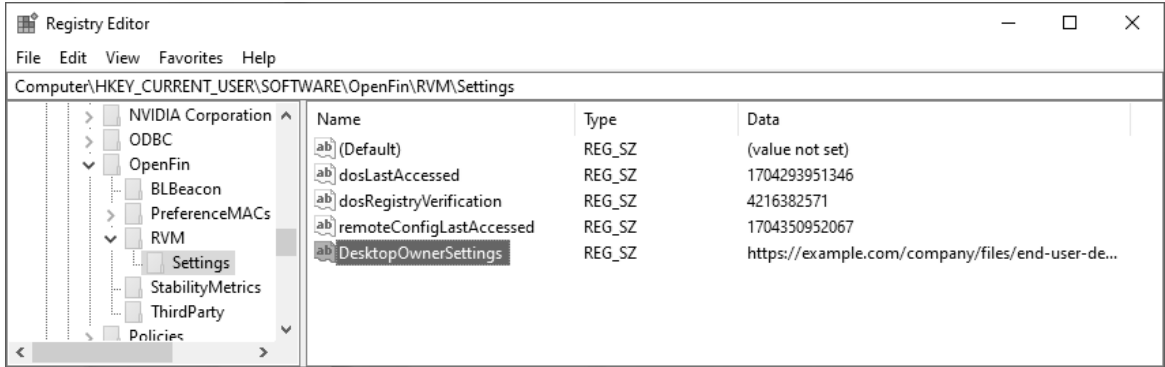
1. To open the Windows Registry Editor:
 - a. Select **Start**
 - b. Type **reg**, and
 - c. Select the **Registry Editor** menu item.
2. Open the path **Computer > HKEY_CURRENT_USER > SOFTWARE > OpenFin > RVM\Settings**
3. Right-click on a blank part of the values panel and select **New > String Value**.



4. Create a string value with the name **DesktopOwnerSettings**.
5. Right-click the new string value and choose **Modify** from the context menu.
6. In the **Value data** field, define the desktop owner file location.



The argument and value are displayed as the **DesktopOwnerSettings** key:



Appendix C: Collecting logs for Support requests

If LSEG Support requests copies of your log files, these can be retrieved from the locations outlined below.

Windows

Log	Location
rvm.log	C:/Users/[username]/AppData/Local/OpenFin/rvm/logs
debug.log	C:/Users/[username]/AppData/Local/OpenFin/cache/[runtime]
application logs	C:/Users/[username]/AppData/Local/OpenFin/apps/LSEG Workspace/app.log and logs in archive folder

macOS

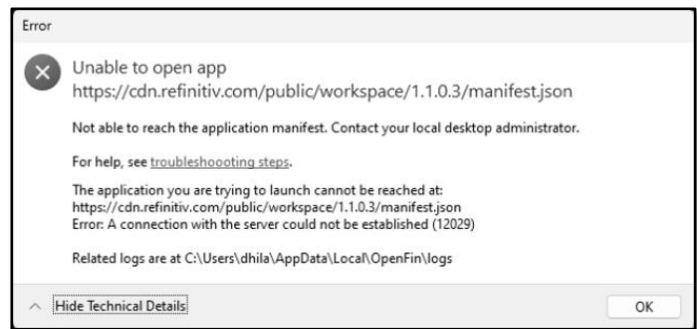
Log	Location
rvm.log	/Users/[username]/Library/Application Support/OpenFin/rvm/logs
debug.log	/Users/[username]/Library/Application Support/OpenFin/cache/[runtime]
application logs	/Users/[username]/Library/Application Support/OpenFin/apps/LSEG Workspace/app.log and logs in archive folder

Appendix D: Troubleshooting

This appendix provides guidance on known or potential issues with the supported versions of Workspace for OpenFin.

Error: Unable to open app

The following error could appear immediately following an application launch, or during the application installation process. The error indicates the RVM is unable to reach the application configuration URL.



Potential cause

- The application configuration URL is invalid.
- The server hosting the application configuration is unavailable.
- The network path to the application configuration file is not open. That is, it could be blocked by network devices or local device management applications. For more details, refer to the [Networking considerations](#) section.

Troubleshooting steps

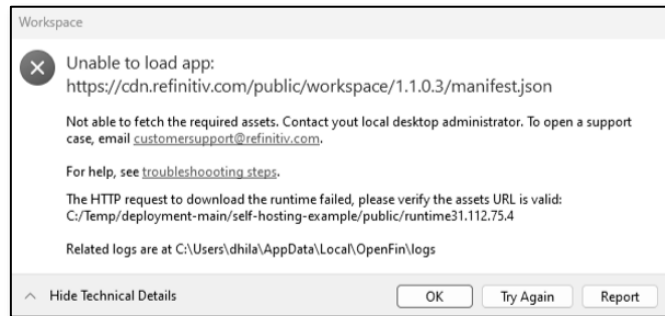
1. The application configuration file should load in a standard web browser. Copy the URL from the error into any browser to check connectivity and the format of the file. For an example of the format, see [Appendix B: Workspace application manifest file](#).
2. If the configuration fails to load, contact the Support team of the application developer to confirm the following:
 - a. The Configuration URL is correct
 - b. The server is online
 - c. Access is granted to the local system
3. Check the RVM.log file located in %LocalAppData%\openfin\logs for errors that have been returned by the network stack. You should be able to find the request for the configuration:

```
[1234:12345]Get request for url: Application Configuration URL
```

- a. Search for any errors in the log that follow this line, where the numbers in the square brackets match those in the Get Request line.
- b. Search for the error on the [OpenFin Support Knowledge Base](#).

Error: Unable to load app

The following error could appear immediately following an application launch, during the application installation process. The error indicates the RVM is unable to reach the application configuration URL.



Potential causes

- The Application Configuration URL is invalid.
- The Server hosting the application configuration is unavailable.
- The network path to the application configuration is not open.
- Asset download times out, due to slow connectivity.

Troubleshooting steps

1. The application configuration file should load in a standard web browser.
Copy the URL from the error into any browser to check connectivity and the format of the file.
2. If the configuration fails to load, contact the Support team of the application developer to confirm the following:
 - a. The Configuration URL is correct.
 - b. The server is online.
 - c. Access is granted is the local system.
3. Check the RVM.log file located in %LocalAppData%\openfin\logs for errors that have been returned by the network stack. You should be able to find the request for the configuration:

```
[1234:12345]Get request for url: Application Configuration URL
```

- a. Search for any errors in the log that follow this line, where the numbers in the square brackets match those in the Get Request line.
- b. Search for the error on the [OpenFin Support Knowledge Base](#).

Error: We failed to download the app asset file from ...

Some applications running on OpenFin require additional assets to provide functionality. If the asset is hosted on a remote server and is declared in the application manifest, upon application launch, the OpenFin Runtime Version Manager will attempt to download the asset.

If an asset is defined as mandatory and the Runtime Version Manager is unable to download it to the local machine, the application may then fail to start.

Potential cause

- The Asset URL is invalid.
- The server hosting the asset is unavailable.
- The network path to the server hosting the runtime is not open.

Troubleshooting steps

1. Check the specified URL for the asset(s), if the required runtime is valid.
 - a. Copy the full asset URL from the error and paste it into a Web browser, which should initiate a file download.
 - b. If the file download works in a browser, compare the browser network configuration with the local system default settings.
2. If the download fails in the step above:
 - a. Check with the local network team that the network path to the URL is open.
 - b. Check with the application provider that the URL is correct, and the server is operational.
3. Check the network.log file, located in %LocalAppData%\openfin\logs for errors that have been returned by the network stack. You should be able to find the following request for the runtime:

```
[1234:12345] We failed to download the app asset file from ...
```

In the lines preceding this error, you may find network-specific information, such as TCP or HTTP codes that can be used to determine the reason for the file to fail to download.

RVM failed on initialization

This RVM status code 113 error occurs when the desktop denies the zip extraction in AppData Local Temp through a Windows Group Policy. It only occurs when using the Web installer and on less than 0.5% of desktops.

Resolving the issue

To resolve this issue, add the following flag to your web installer link:

- `&old=true`

For example:

```
https://install.openfin.co/download/?os=win&config=https%3A%2F%2Fcdn.refinitiv.com%2Fpublic%2Fworkspace%2F1.1.0.3%2Fmanifest.json&fileName=Workspa
ce&old=true
```

Appendix E: Important OpenFin resources

Desktop owner settings

You can customise OpenFin global settings to follow your company IT policies and requirements. Workspace provides a method for [customising desktop owner settings](#) for custom and VDI installation.

For further information, refer to the [desktop owner settings](#) section in OpenFin documentation.

Hosting OpenFin runtime on an internal CDN

For IT managed environments, where the downloading of binaries and executables from external sites through the Internet is prohibited, it is recommended that you host the OpenFin runtime on your own network. This can be done by setting up an internal Content Delivery Network (CDN).

For step-by-step instructions on how to implement an internal CDN, refer to the [Internal Hosting](#) example. If you have any questions or issues following the steps provided, [contact us](#) so we can coordinate with OpenFin to support you.

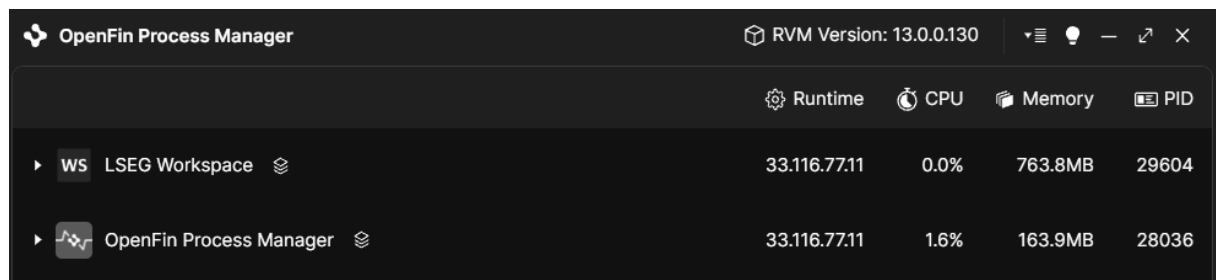
OpenFin deployment health check

OpenFin provides a [deployment health check page](#), which validates the accessibility of OpenFin resources.

For further information about the OpenFin health check, refer to the [OpenFin Service Deployment Health Check](#) site.

OpenFin Process Manager

OpenFin provides a system monitor tool for OpenFin processes. It shows a list of running processes and their respective system use. Much like the Windows Task Manager, it can also force the shutdown of processes.



OpenFin Process Manager		RVM Version: 13.0.0.130			
		Runtime	CPU	Memory	PID
WS	LSEG Workspace	33.116.77.11	0.0%	763.8MB	29604
	OpenFin Process Manager	33.116.77.11	1.6%	163.9MB	28036

It is recommended that users install OpenFin Process Manager to collect the related Workspace information that may be required for troubleshooting.

For more information, refer to the [Process Manager](#) section of OpenFin documentation.