



# **Unison v5.11.4**

## **Installation Guide**

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## Deployment Overview

Unison can be deployed on a single server that performs all database and device driver functions or multiple servers. Multiple server installations support database server clustering (replication), managing geographically different sites or to split device driver operation across multiple computers for load balancing.

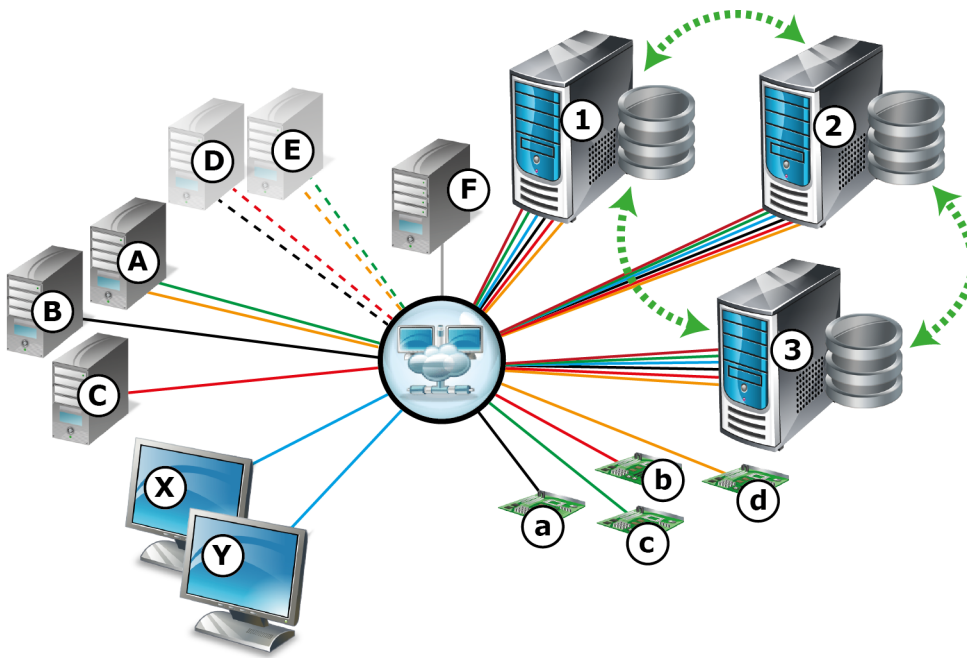
**Note:** It is important to read and fully understand all relevant sections of this guide in order to correctly install a Unison system. For upgrades from older versions, refer to the [appendices](#) for guidelines to changes in system operation between versions and the necessary steps to take in order to successfully upgrade. Similarly, if PACOM Controller hardware is in use, refer to the [appendices](#) for information. You can upgrade from older [Unison system](#) versions and PACOM Unison [Controller hardware](#).

### System core components

Component	Description
Unison Server	Used for connection and interfacing between Unison clients, device drivers and system databases.  All system functionality is centrally controlled via interaction between the Unison database server and databases. All server types include a system data service component that manages the transfer of graphical image data between Unison servers and clients for graphical images / site maps.
Cluster Server	Optional component  Used for database and system redundancy operations (also known as database clustering or replication). These are basically replicas of the Unison server that constantly maintain database content synchronization across all cluster servers.
Client Application	Used by system administrators and security operators for interacting with the system, security monitoring and alarm response.
Microsoft SQL Server	Hosts system databases, which store event, user, system and configuration data.
Device Drivers	Used for interfacing with proprietary and third party hardware / systems. Device drivers, which are self-contained Windows executables, can be run on different computers for load balancing and redundancy purposes. Each driver component uses a .dll file to access the Unison database server (and , therefore, the databases). All components are isolated, so are not affected by changes in other components.

## Example

The following example shows basic connectivity in a clustered database and redundant device driver system utilizing:



- An initially installed server (**1**) that hosts the system databases (for the sake of the example, this is referred to as the master).
- Two additional cluster servers (**2, 3**) that are also active system servers.

The master and cluster servers make up the "clustered server system". In the case of non-availability of server (**1**), clients and device servers switch to the next priority server in the cluster (**2**); if server (**2**) fails, switch to (**3**). Once server (**1**) is available again, it is synchronized with the other servers in the cluster and then takes over again as the master, with the clients and device drivers switching back to it.

- Two Unison client workstations (**X, Y**) that each can connect to any applicable server in the cluster (**1, 2, 3**).
- Three device servers (**A, B, C**) running device drivers that all connect to any applicable server in the cluster - (**A**) for (**c, d**); (**B**) for (**a**); (**C**) for (**b**).
- Two redundant device servers (**D, E**) that can be switched to running device drivers if the currently active device server becomes unavailable - if (**A**) fails, (**c, d**) switch to (**E**); if (**B**) fails, (**a**) switches to (**D**); if (**C**) fails, (**b**) switches to (**D**).
- A network time protocol (NTP) server (**F**) to maintain time synchronization amongst all servers.

## Prerequisites

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Take into consideration the following prerequisites before installing PACOM Unison:

### General

- For hardware and software requirements, refer to the release notes for the specific Unison version to be installed.
- The user performing the installation must have write access to all installation folders. It is recommended that this user has Windows administrator permissions.
- It is recommended that you change the default SQL password to a randomly generated, strong password during any Unison installation or upgrade.

### Servers / Communications

- Machines running SQL must have TCP/IP and Named Pipes communications enabled.
- The user performing the installation must be able to log on to the SQL Server where Unison databases are to be installed and also have "dbcreator" and "diskadmin" server roles enabled in order to properly install the database.

SQL Server 2012 requires manual activation of the sysadmin role for the NT Authority / System account security login properties in order for the Unison installer to create the system database. Refer to Microsoft SQL Server documentation for instructions.

- Machines running Unison services must have static IP addresses.
- Controllers must have static IP addresses.

They can use dynamic IP addressing, however, each time the address is changed, the controller must contact the system to update it with the new address - this requires extra bandwidth. Also, there is the possibility of the controller being unreachable until the system is updated with the current IP address.

- Hardware devices that support serial communications only (no TCP) require Moxa NPort / DIGI PortServer software or equivalent to manage serial-to-TCP data conversion in order to communicate with Unison. Moxa NPort supports traditional virtual COM ports or through TCP Server mode - selection of either is dependent on the device driver in question.

If you use virtual COM ports with 64-bit Windows, there is a risk that drivers are forced to 32-bit mode, therefore, TCP Server mode is recommended. When using TCP Server mode, communication parameters for the connected sub-system needs to be configured via the serial-to-TCP data conversion software.

- Networks using database server clustering (database replication) require a network time protocol (NTP) server to maintain time synchronization between database cluster servers. Time synchronization between servers and the NTP server should occur at least once per hour, which may require [configuration](http://support.microsoft.com/kb/816042) (<http://support.microsoft.com/kb/816042>).

**Tip:** The time difference between cluster servers must never exceed 2 seconds.

## Firewalls / Ports

- For each Unison server, [open](http://support.microsoft.com/kb/968872) a Windows firewall port for SQL Server database connections according to <http://support.microsoft.com/kb/968872>.
- For each server, open the port used for system data service (SDS) connections (default = 9684) and ensure that it is not blocked by any type of firewall (Windows, client-side, network, third-party firewalls, etc).
- For installations using PACOM Controller hardware, open the port used for Unison- controller connections (default = 3435) and ensure that it is not blocked by any type of firewall (Windows, client-side, network, third-party firewalls, etc).

## Windows environments

- For installations using Windows authentication to sign in to the Unison system, ensure that the latest operating system updates are installed or apply the [hotfix](http://support.microsoft.com/kb/2683913) <http://support.microsoft.com/kb/2683913> on all server and client machines.
- If the Windows environment has the user account control (UAC) feature enabled, UAC related confirmation dialog boxes may display during the Unison installation process.

**Tip:** Confirmations required through these dialog boxes must be completed within 2 minutes of appearing, otherwise the Unison installer process will be terminated by Windows without any information provided as to why the installer failed.

## Database backup and restore

The Unison system provides tools for performing automatic system backups at scheduled times and for restoring from backup for simpler system recovery in the event of system failure. Database archives, known as logs, can be scheduled for creation and the storage location specified.

It is recommended that the built-in back-up functions of the Unison system are used. Databases can be backed up and restored using SQL Server, however, this is not recommended, as the process can be complex (refer to the Microsoft SQL Server documentation), if needed.

It is strongly recommended that a backup solution is deployed.

## Virtual machines and remote desktop connections

- Virtual machines using VMWare ESXi 5.0 or later, VMWare Workstation 10 and Hyper-V (requires Windows Server 2008 or later) are supported.
- Remote desktop connections are supported.

## Anti-virus software

When using anti-virus software on Unison Servers, it must be configured correctly in order to not affect system stability or performance.

Problems that may arise as a result of incorrect configuration are:

- Locking of database files during virus scanning
- Communications problem during virus scanning of network ports
- Reduced performance.

## Compatibility with embedded web content

Download and install [Microsoft Edge Webview2 Runtime](#) on client and server computers before performing an Unison installation or upgrade. This is required if the WebViewControl graphic control is to be used.

## Windows and SQL Server Requirements

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Microsoft Windows and SQL Server must be installed before Unison can be installed. The following must also be installed before installing the SQL Server:

- Windows Installer
- Windows PowerShell
- Microsoft .NET Framework.

During installation the currently installed SQL Server version is validated. If the minimum requirement for the SQL Server version (as listed in the Unison Release Notes) is not met, the Unison installation will not proceed.

The information provided here is a guide only and may alter depending on Microsoft Windows and SQL versions in use - refer to Microsoft documentation for details.

### Consider the following ...

- If using the same machine for both the Unison database server and SQL Server, for best performance it is recommended that you configure the SQL Server to use approximately half the available system RAM.
- For installations using clustered database servers, SQL Server 2012 SP3 or later is required and must be installed and licensed on all cluster servers.

It is not recommended to use SQL Server Express for clustered database servers or any large system.

- Databases can be backed up and restored using SQL Server, however, it is not recommended as the process can be complex.

It is recommended to use the built-in database back-up functions of the Unison system and that a database management plan is deployed (refer to SQL administrators and Microsoft SQL Server documentation).

## SQL Server

The following Microsoft SQL Server settings are specifically required for the Unison system:

- Install SQL Server as a **default instance**.
- Set the:
  - SQL Server Windows service account name to **NT instance\system**, and
  - Startup type to **automatic**.
- Set the SQL Server browser Windows service startup type to **automatic**.
- Set the database engine authentication mode to Windows authentication.

Verify that the current Windows user is added to the server administrators list. If not, add the user.



**Note:** Mixed Mode [authentication](http://technet.microsoft.com/en-us/library/ms144284.aspx) is also supported (see <http://technet.microsoft.com/en-us/library/ms144284.aspx>).

If using database replication, the authentication mode must be set to **SQL Server authentication**.

- Verify that the SQL Server and SQL Server Browser Windows services are running.
- For the SQL Server network configuration, protocol settings, enable the **named pipes** and **TCP/IP** options.
- If encryption is required, enable the **force encryption** option in the SQL Server network configuration, protocol settings.
- SQL Server Locale Support: English-language version only.

## MSDTC

The following Microsoft Distributed Transaction Coordinator (MSDTC) settings are specifically required for the Unison system.

In all the SQL Servers (both master and slave):

- Right-click the SQL server instance.
- In **Server Properties > Connections**, enable **Require distributed transactions for server-to-server communication** in the **Remote server connections** settings.

In all the Unison Client/Server and SQL Server machines:

- Open **Control Panel > Administrative Tools > Component Services**.
- In **Local DTC** properties, enable the following options:
  - Allow Remote Client
  - Allow Remote Administration
  - Allow Inbound
  - Allow Outbound
  - No Authentication Required
  - Enable XA Transactions
  - Enable SNA Transactions.

## Windows firewall

The following Microsoft Windows firewall settings are specifically required for Unison servers:

**Note:** The configuration in other Windows versions is similar.

This procedure can also be achieved automatically using a script from [Microsoft](http://support.microsoft.com/kb/968872) (see <http://support.microsoft.com/kb/968872>).

- Create an **inbound rule** for the SQL Server windows service, and enable the **allow connection** option, then:
  - Enable all **profile options**.
  - Name it **SQL Server**.

- Create an **inbound rule** for the SQL Server Browser Windows service, then:
  - For **port** settings, select the **UDP** and **specific local ports** options.
  - Set the **port number** to **1434**.
  - Enable all **allow connection** options.
  - Enable all **profile options**.
  - Name it **SQL Server Browser**.
- For each server running the system data service, open the port used for communications with the service and ensure that it is not blocked by any type of firewall (client-side, network, third-party firewalls, etc. or any firewall that cannot be bypassed by the Unison installer application).

# Installation

The installation process uses a step-by-step wizard, with each screen providing various options. The same procedures apply to new installations as well as upgrades.

**Note:** If using the same machine for the both Unison database server and SQL Server, it is recommended that you configure SQL Server to use approximately half the available system RAM for best performance.  
If upgrading, it is important to read and understand [certain aspects](#) of the system before proceeding with the upgrade.  
If the system data service is to use encrypted communications, the user logged on to Windows at the time of installation must have administrator permissions.

## Before installing

The following must be installed before installing Unison:

- Microsoft .NET Framework on each Unison server and client computer
- [SQL Server](#) (see Windows and SQL Server Requirements).

## Installation steps

There are three main processes when installing Unison, that must be performed in the following order:

1. Configure Windows and SQL Server.
2. Install Unison [servers](#).
3. Install Unison [clients](#) (workstations).

## Installation types

There are various installation types that determine the functionality available.

The following options are available from the Setup Type installation screen:

Setup Type Option	Description
Client	<p>Installs a Unison client workstation that is used by operators for security related activities.</p> <p>Client machines require connectivity to a Unison server in order to function. This type of installation is used where multiple Unison client machines are used to connect to a central Unison server.</p>

Setup Type Option	Description
Server	<p>Installs system databases and components as a master server.</p> <p>A server of this type is mandatory, and allows client workstations / secondary device driver servers to interact with the system. When installing a server, a client workstation installation is also included in order to provide a user interface to the system.</p> <p>For standalone systems, where a single computer is used for all system activities (generally used for smaller systems for hosting system databases and device drivers, and also being the client workstation), a Unison server installation is all that is required.</p>
Device Server	<p>Installs as a device driver server and client application only, without a database.</p> <p>This type of server is for installing and running device drivers externally to the Unison server, for device driver redundancy operation and/or load balancing system resources.</p> <p>Device servers require connectivity to a Unison server in order to function. The system supports multiple device servers.</p>
Cluster Server	<p>Installs a server and databases for use in a clustered server system.</p> <p>This system incorporates deploying several servers in an active-active configuration. This means that all cluster servers are considered main servers, with system databases constantly synchronized between them. The result is a high-availability, load balancing system with inherent redundancy / failover capability.</p> <p><b>Note:</b> Microsoft SQL Server 2012 or later is required for database replication functions.</p> <p>For complete database redundancy, SQL clustering is recommended.</p>

## Installing Servers

The following instructions can be used if you are installing the PACOM Unison server for the first time or upgrading.

### Obtain the files

1. Download PACOM Unison v5.11.4 from PACOM's [FTP](ftp://ftp.pacom.com) site (<ftp://ftp.pacom.com>).
2. Click `Unison_Setup_x64.msi` to display the Installation Setup Wizard.

### How to install the server

1. On the Installation Setup Wizard, click **Next**.

Depending on your Windows version and security settings, the User Account Control screen may display. You can verify the software certificate by clicking **Show Information**. If you accept, click **Yes**. Other security warnings may be displayed by Windows depending on network settings, etc.

What language is used? The display language of the installer is determined by the machine Windows regional settings. If the required regional language is not available, English is used.

The End-User License Agreement screen displays.

2. Review the license agreement and if acceptable, tick the **I accept the terms in the License Agreement** checkbox.
3. Click **Next** to display the Destination Folder screen.
4. Choose the destination folder for the installation.
  - To accept the default installation folder, do not change anything.
  - To set a different installation folder, click **Change**. The Change Destination Folder screen displays, where you can browse to the required folder. Click **OK** to confirm the change and close the screen.
5. Click **Next** to display the Setup Type screen.
6. Select which type of server to install:

Setup Option	Description
Server	Installs a master server, databases and the client application.
Device Server	Installs a device driver server and client application only, without a database.
Cluster Server	<p>Installs a server and databases and client application as a member of a clustered database server system.</p> <p>When installing a clustered database system, the initial server must be installed using the <b>Server</b> option (to be a master server). Subsequent servers must be installed using the <b>Cluster Server</b> option. This is to ensure that server priority is correctly set and that there is no possible conflict in database identification in a clustered database server system.</p>

7. Click **Next** to display the Ready to Install Pacom Unison screen.
8. Click **Install**.
 

The Installing PACOM Unison screen displays showing progress of the installation.

The PACOM Unison Server Setup Wizard starts and the Welcome screen displays.
9. Verify that all open programs are closed.
10. Click **Next** to display the Database Connection screen.
11. Enter the database information:
  - a. In the **Local Server Connection** section, click the **Server** drop-down to display the available SQL Server instances.
 

Each instance is specified as [COMPUTER\_NAME]\[INSTANCE\_NAME]; for example, "UNISON-SRV\MSSQLSERVER".

Click the required option to select it. There are also [advanced settings](#) for you to use.

For **Advanced Settings**, see [Server and Client "Advanced" Settings](#).

**Note:** It is no longer possible to use localhost, "127.0.0.1", "." or ":::1" in the **Local Server Connection**. Use the server name or IP address.  
If restoring a database or upgrading on the same workstation with localhost already set as default, then everything will work as normal. Only when selecting the connection ellipsis on the Hardware-System-Unison Servers-Database Master Server and then clicking **OK** or **Test**, will the pop-up message *Cannot use 'localhost' in connection string* display.


- b. The **Database Status** section shows any applicable database information for the selected SQL Server instance.

For example, the version of any currently existing Unison database and the database version that will be installed.

When upgrading, an **Advanced** option is displayed that allows certain tasks to be carried out on existing databases, such as making back-ups, see [Server and Client "Advanced" Settings](#).

12. Click **Next** to display the Database Installation Path screen.  
13. Choose where Unison databases will be located.

If installing for the first time:

- To accept the default installation folder, do not change anything.
- To set different installation folder(s), select **Specify Folders Manually**, then click  next to each database type (Main and Log) to open a Select Folder dialog box, where you can browse to or create the required folder.

**Note:** Installing each database file on different physical hard drives may help improve system performance.

If upgrading to a recent version:

- Tick the **Backup Databases for Update** checkbox to create a copy of the databases before the update begins.

14. Click **Next** to display the Performing Database Upgrade screen with the progress of the installation.

After database installation or upgrade, the Set Global Database ID screen displays.

15. The settings are required if a clustered database system is being used; accept the default **Global Database ID** of **1**.

The initial master server must have a global database ID value of **1**.

Replication masters and standalone server must always use an ID of **1**.

Subsequent servers in a clustered database system must have differing ID numbers. The installer automatically applies the next available highest priority ID value as it is installed.

The system defaults operation to the server that has the database with the lowest global database ID value, that is, 1 is used before 2, etc.

16. Click **Next** to display the Configure Unison Client Password screen.

This sets the password that all Unison clients (workstations) must use in order to access the databases (via the Unison server).

- a. Tick the **Configure SQL Server for Unison Client Access** checkbox to set automatic access to the Unison client database.

If this option is not enabled, client access to the database will require manual configuration (refer to Microsoft SQL Server documentation), then enter a password.

- b. To use the default password, click **Reset Password**.

**Note:** If using a non-default password, it must be applied when installing the Unison client(s), otherwise they will not be able to access the databases.  
Store the password safely.

17. Click **Next** to display the System Data Service Configuration screen.

This screen is used to define the communications port that is used by the system data service and Unison client machines, and whether or not communications are encrypted. If encryption is required, a certificate can be specified or generated.


- To accept the default settings, do not change anything.

The default name is the computer name.

The default port is 9684, it is recommended to leave this unchanged.

- To set a different port number, enter it into the **Port** field or use the arrows to step through port numbers.
- For encrypted communications, select **HTTPS** for the **Protocol** field.

To create a new certificate, select **Generate Certificate** - the certificate is stored in the Unison database.

If a certificate already exists from a previous Unison installation, select **Import Certificate**, then click  to open a dialog box, where you can select the required certificate file. Once imported, the certificate is stored in the Unison database. The certificate is added to the Windows trusted root certificates for encrypted communications through the port. The certificate needs to exist on the server and all client machines that are able to connect to the server. If **Generate Certificate** is selected and there is an existing certificate, the existing certificate will be removed and a new certificate generated.

The System Data Service Configuration warning message displays. Click **OK**.

This screen only sets up the System Data Service for the main Unison installation, other System Data Services must be added [manually](#). See [here](#) for more information.

18. Click **Next** to display the Register/Update Devices screen.


This screen lists all supported device drivers (that is, security system hardware such as control panels, door controllers, etc).

19. Tick the selection box next to each required device to install it.

- Newer versions of device drivers must be used when available. If you have other device drivers that are newer or additional to the displayed items, click **Add Driver** to open a Select Driver dialog box, where you can browse to and select the required driver(s).
- If you are unsure which devices will be used, install **all** drivers.
- When upgrading, if the path for a driver is highlighted red, it means that the installation path is different to that of the existing installation.

- If required, use the **Device Language** field to force the drivers to use a specific language independent of the language set for the operating system. That is, properties and displays in Unison for the device will be in the selected language. Note, however, that not all text or messages in the system may support this. It is not recommended to install device drivers in a different languages to what is generally used.
20. Click **Next**.
  21. When the installation completes, click **Finish** to close the Unison Server Setup Wizard and return to the Unison installer. Related system Windows services may start at this point.
  22. Click **Finish** in the Unison installer to exit.
  23. Reboot the computer, if required.
  24. After installation, start the PACOM Unison Server Process Windows service.

It starts automatically after reboot or requires manual start if no reboot.

When the service is running,  Unison Service Manager displays in the Windows system tray, at the bottom-right of the desktop.

The Unison Service Manager is a tool that allows you to [license](#) the system, configure the system data service, install device drivers and control associated Windows processes.

To open the Unison Service Manager, double-click .

- If the installation involves multiple device servers (for running specific device drivers) or integrates with other systems that require assigning the server to a particular system, click **Configuration** to open the Configuration dialog box, then set **Run System** to the applicable device server. Normally, there is only one node called "System" (see the "System Management" topic in the Unison help for information).
- For configuring the system data service on other Unison servers, start the Unison client on each server then follow the procedure described in the *System Management > System Data Service Configuration* topic in the Unison help.

**Caution:** Do NOT start any Unison client applications for normal system operation (that is, clients that are to be used by operators for normal security purposes) until the system is properly configured and the system data service is ready on each server.

To check system data service status, open the Unison Debug Monitor application. When an information message is displayed in the Unison Debug Monitor stating that the data service is ready for use, Unison client applications may be started and used as normal.



The installation procedure for device servers is similar to that for a Unison server.

### How to

1. Click the installer file, `Unison_Setup_x64.msi`, that you downloaded from PACOM's FTP site, to display the Installation Setup Wizard.
2. Click **Next** on the Welcome screen.

Depending on your Windows version and security settings, the User Account Control screen may display. You can verify the software certificate by clicking **Show Information**. If you accept, click **Yes**. Other security warnings may be displayed by Windows depending on network settings, etc.

What language is used? The display language of the installer is determined by the machine Windows regional settings. If the required regional language is not available, English is used.

The End-User License Agreement screen displays.

3. Review the license agreement and if acceptable, tick the **I accept the terms in the license agreement** checkbox.
4. Click **Next** to display the Destination Folder screen.
5. Choose the destination folder for installation.
  - To accept the default installation folder, do not change anything.
  - To set a different installation folder, click **Change**. The Change Destination Folder screen displays, where you can navigate to the required folder. Click **OK** to confirm the change and close the screen.
6. Click **Next** to display the Setup Type screen.
7. Select to install a **Device Server**.
8. Click **Next** to display the Unison Client Setup Wizard.
9. Click **Next** to display the Configure Unison Client Connections screen.

This sets the Unison server and password that the client uses in order to access the system databases.

10. Select the server from the **Server** list.

There is no need to enter a password unless it is something other than the default. To use the default password, click **Reset Password**.

11. Click **Next** to display the Importing Server Certificates screen.

At this point, the Unison database is contacted to determine if encrypted system data service communications is required. If it is, a search is made for a certificate in the database.

Optionally, if a certificate already exists from a previous Unison installation, click ... in the **Certificate Location** field to open a dialog box, then select the certificate file.

Once imported, the certificate is stored in the Unison database.

12. Click **Next**.

The Set Client Logins screen displays.

This screen is used for determining which Unison databases (if database cluster servers are being used) the client on the device server machine can connect to in the event of a database failover.

To add and set up servers:

- Click **Add** for a new entry to be added to the list. Click **...** for the entry to display connection [options](#) - see [Server and Client "Advanced" Settings](#).
  - Click **Move Up** / **Move Down** to adjust the order of the database servers that the client follows for connections in the event of a database failover. That is, connect to the first server in the list, if that is unavailable, connect to the second server and so on.
13. When the installation completes, click **Finish** to close the Unison Client Setup Wizard and return to the Unison installer.
  14. Click **Finish** in the Unison installer to exit.
  15. Reboot the computer, if required.

## Installing Cluster Servers

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The installation procedure for cluster (database replication network) servers is similar to that for a Unison server.

### How to

1. Click the installer file, `Unison_Setup_x64.msi`, that you downloaded from PACOM's FTP site, to display the Installation Setup Wizard.
2. Click **Next**.


Depending on your Windows version and security settings, the User Account Control screen may display. You can verify the software certificate by clicking **Show Information**. If you accept, click **Yes**. Other security warnings may be displayed by Windows depending on network settings, etc.

What language is used? The display language of the installer is determined by the machine Windows regional settings. If the required regional language is not available, English is used.

The End-User License Agreement screen displays.


3. Review the license agreement and if acceptable, tick the **I accept the terms in the license agreement** checkbox, then click .
4. Click **Next** to display the Destination Folder screen.
5. Choose the destination folder for installation.
  - To accept the default installation folder, do not change anything.
  - To set a different installation folder, click **Change**. The Change Destination Folder screen displays, where you can navigate to the required folder. Click **OK** to confirm the change and close the screen.
6. Click **Next** to display the Setup Type screen.
7. Select to install a **Cluster Server**.
8. Click **Next** to display the Unison Server Setup Wizard.
9. Click **Next** to display the Database Connection screen.

This sets the Unison server and password that the client uses in order to access the system databases.

10. Select the server using the **Server** list.
11. Click **Next** to display the Database Installation Path screen.
12. Choose where Unison databases will be located.
  - a. To accept the default installation folder, do not change anything.
  - b. To set different installation folder(s), select **Specify Folders Manually**, then click  next to each database type (main and log) to open a Select Folder dialog box, where you can navigate to or create the required folder.

**Note:** Installing each database file on different physical hard drives may help improve system performance.

If upgrading:

- To a later version, tick the **Backup Databases Before Update** checkbox to create a copy of the databases before the update begins.
  - From a non-clustered installation to a clustered database server system and an existing database is detected locally, the Cluster Server Upgrade Options screen displays. This screen provides options for how the database is installed with reference to the master database:
    - Select **Do Not Upgrade Database Now** to leave the database upgrade as a manual process to be done after the server is installed.
    - Select **Restore Recent Master Backup** to upgrade using an existing master database backup. Enter the path to the required database backup file in the **Backup File** field or click  to open a dialog box, then select the database backup file.
    - Select **Create New Empty Database** to delete the existing database and create an empty, upgraded database.
13. Click **Next** to display the Performing Database Upgrade screen with the progress of the installation.

After database installation or upgrade, the Set Global Database ID screen displays.
  14. Accept the default global database ID number or use the **New ID** field to set a different value.

The initial master server must have a global database ID value of **1**.

Subsequent servers in a clustered database system must have differing ID numbers. The installer automatically applies the next available highest priority ID value as it is installed.
  15. Click **Next** to display the Configure Unison Client Password screen.

This sets the password that all Unison clients (workstations) must use in order to access the databases (via the Unison server).
  16. Tick the **Configure SQL Server for Unison Client Access** checkbox to set automatic access to the Unison client database.

If this option is not enabled, client access to the database will require manual configuration (refer to Microsoft SQL Server documentation), then enter a password. To use the default password, click **Reset Password**.

**Note:** If using a non-default password, it must be applied when installing the Unison client(s), otherwise they will not be able to access the databases. Store the password somewhere safe.

17. Click **Next** to display the Register/Update Devices screen.

This screen lists all supported device drivers (that is, security system hardware such as control panels, door controllers, etc.).

18. Tick the selection box next to each required device to install it.
  - Newer versions of device drivers must be used when available. If you have other device drivers that are newer or additional to the displayed items, click **Add Driver** to open a Select Driver dialog box, where you can navigate to and select the required driver(s).
  - If you are unsure which devices will be used, install all drivers.
  - When upgrading, if the path for a driver is highlighted red, it means that the installation path is different to that of the existing installation.
  - If required, use the **Device Language** field to force the drivers to use a specific language independent of the language set for the operating system. That is, properties and displays in Unison for the device will be in the selected language. Note, however, that not all text or messages in the system may support this. It is not recommended to install device drivers in a different languages to what is generally used.
19. Click **Next**.
20. When the installation completes, click **Finish** to close the Unison Server Setup Wizard and return to the Unison installer.

Related system Windows services may start at this point.
21. Click **Finish** in the Unison installer to exit.
22. Reboot the computer, if required.

## Installing Clients (Workstations)

**Note:** For Unison clients to connect to system databases, the [Windows firewall](#) must be configured to allow correct connection permissions (see [Windows & SQL Server Requirements](#)).

### How to

1. Click the installer file, `Unison_Setup_x64.msi`, that you downloaded from PACOM's FTP site, to display the Installation Setup Wizard.
2. Click **Next** on the Welcome screen.

Depending on your Windows version and security settings, the User Account Control screen may display. You can verify the software certificate by clicking **Show Information**. If you accept, click **Yes**. Other security warnings may be displayed by Windows depending on network settings, etc.

What language is used? The display language of the installer is determined by the machine Windows regional settings. If the required regional language is not available, English is used.

The End-User License Agreement screen displays.

3. Review the license agreement and if acceptable, tick the **I accept the terms in the license agreement** checkbox.
4. Click **Next** to display the Destination Folder screen.

Choose the destination folder for installation.

- To accept the default installation folder, do not change anything.
- To set a different installation folder, click **Change**. The Change Current Destination Folder screen displays, where you can browse to the required folder. Click **OK** to confirm the change and close the screen.

5. Click **Next** to display the Setup Type screen.
6. Select to install a **Client**.
7. Click **Next** to display the Ready to Install the Program screen.
8. Click **Install**.

The Installing PACOM Unison screen displays showing progress of the installation.

The Unison Client Setup Wizard starts and the Welcome screen displays.

9. Verify that all open programs are closed.
10. Click **Next** to display the Configure Unison Client Connections screen.
11. In the **Client Connection Settings** section, click the **Server** list to display available SQL Server instances.

Each instance is specified as [COMPUTER\_NAME] \ [INSTANCE\_NAME] ; for example, UNISON-SRV\MSSQLSERVER.

Click the required [option](#) to select it.

The version of the Unison databases found on the selected server are displayed for information purposes.

For **Advanced Settings**, see [Server and Client "Advanced" Settings](#).

## Clustered database servers

For installations that use clustered database servers, it is possible to configure clients to be able to log on to several clustered servers.

- a. Click **Configure Multiple Servers**.

The Set Up Client Logins screen displays.

- b. Click **Add** to insert additional servers into the list (the servers are known to the master server database, which is where the selections are sourced).
- c. To remove a server so that the client cannot log on to it, select it in the list then click **Remove**.
- d. To change the selection order of servers for operators during log on, select a server and click **Move Up** / **Move Down** as required.
- e. To access [advanced](#) settings for any server in the list, select it, then click **...**, see [Server and Client "Advanced" Settings](#).

If a non-default password has been used for the Unison server installation, enter it in the **Password** field. To use the default password, click **Reset Password**.

12. Click **Next**.

13. When the installation completes, click **Finish** to close the Unison Client Setup Wizard and return to the Unison installer.
14. Click **Finish** in the Unison installer to exit.
15. Reboot the computer, if required.

If the installation uses encrypted communications for the system data service, start each Unison client then follow the procedure described in the *System Management > Using Unison Service Manager* topic in the Unison help, *Configuring the System Data Service* section.

**Caution:** Do NOT start any Unison client applications for normal system operation (that is, clients that are to be used by operators for normal security purposes) until the system is properly configured and the system data service is ready on each server. To check system data service status, open the Unison Debug Monitor application.  
When an information message is displayed in the Unison Debug Monitor stating that the data service is ready for use, Unison client applications may be started and used as normal.

## Silent Installation

From version 5.4 onwards, the Unison installer is compatible with Microsoft Windows features that support silent upgrades (group policy management and shared network folders). Silent upgrades occur in the background on target computers, without displaying messages or requiring user interaction while installing. The process can be initiated by the user logging on to Windows or when the computer is next restarted. This feature can be extended to perform upgrades on multiple computers in multiple locations without having to be physically present at the computer by using MSI and MST files in a shared network folder. MST files are used for non-standard installation; for example, the language used for device drivers. Refer to [Microsoft documentation](http://msdn.microsoft.com/en-us/library/ms227324%28v=vs.80%29.aspx) for instructions (applies to Microsoft operating systems that support silent installation / upgrades only). For more information, see <http://msdn.microsoft.com/en-us/library/ms227324%28v=vs.80%29.aspx>.

The Unison system comes with several MST files, representing different languages:

- 1033.MST - English
- 1034.MST - Spanish
- 1035.MST - Finnish
- 1036.MST - French
- 1053.MST - Swedish.

It is possible to perform a silent installation of Unison Server and Clients.

### Prerequisites

- The user performing the silent installation must be a Windows administrator.
- Unison must be installed in the default location.

For example, `C:\Program Files\Pacom Systems\Unison`

### How to overview

1. Open a command prompt and change directory to the location of the `Unison_Setup_x64.msi` file.
2. In the command prompt, type the appropriate command string for the installation type.

Installation Type	Command String
Master Server	<code>msiexec /i Unison_Setup_x64.msi TRANSFORMS=:Master.mst /q /l*v log.txt</code>
Device Server	<code>msiexec /i Unison_Setup_x64.msi TRANSFORMS=:Secondary.mst /q /l*v log.txt</code>
Replication Server	<code>msiexec /i Unison_Setup_x64.msi TRANSFORMS=:Slave.mst /q /l*v log.txt</code>
Client	<code>msiexec /i Unison_Setup_x64.msi /q /l*v log.txt</code>

3. Go to the location of the `Unison_Setup_x64.msi` file and open the installation `log.txt` to check if installation is finished.

There should be a line containing the message *Product: Pacom Unison X.X.X -- Installation completed successfully.* near the end of the log (where X.X.X is the Unison version number).

4. Configure the installation (which may involve manual input).

## Silent Install of Unison Master Server

You can do a fresh install or update of the Unison master server.

### How to

1. Open a command prompt and change directory to the location of the `Unison_Setup_x64.msi` file.
2. In the command prompt, type:  
`msiexec /i Unison_Setup_x64.msi TRANSFORMS=:Master.mst /q /l*v log.txt`
3. Go to the location of the `Unison_Setup_x64.msi` file and open the installation `log.txt` to check if installation is finished.

There should be a line containing the message *Product: Pacom Unison X.X.X -- Installation completed successfully.* or *Product: Pacom Unison X.X.X -- Configuration completed successfully.* near the end of the log (where X.X.X is the Unison version number).

4. Configure the server.

From **Start > All Programs > Pacom Systems**, run **Unison Server Configuration**.

The PACOM Unison Server Setup Wizard displays.

5. Complete the configuration process as required (which may require manual input).

It is possible to do a silent installation of a new Unison:

### Client

1. Open a command prompt and change directory to the location of the `Unison_Setup_x64.msi` file.
2. Type the command:  

```
msiexec /i Unison_Setup_x64.msi /q /l*v log.txt
```
3. Go to the location of the `Unison_Setup_x64.msi` file and open the installation `log.txt` to check if installation is finished.

There should be a line containing the message *Product: Pacom Unison X.X.X -- Installation completed successfully.* near the end of the log (where X.X.X is the Unison version number).

4. Configure the client.

From **Start > All Programs > Pacom Systems**, run **Unison Client Configuration** and connect to the main server database.

The PACOM Unison Client Setup Wizard displays.

5. Complete the configuration process as required.

### Device server

1. Open a command prompt and change directory to the location of the `Unison_Setup_x64.msi` file.
2. Type the command:  

```
msiexec /i Unison_Setup_x64.msi TRANSFORMS=:Secondary.mst /q /l*v log.txt
```
3. Go to the location of the `Unison_Setup_x64.msi` file and open the installation `log.txt` to check if installation is finished.

There should be a line containing the message *Product: Pacom Unison X.X.X -- Installation completed successfully.* near the end of the log (where X.X.X is the Unison version number).

4. Configure the client.

From **Start > All Programs > Pacom Systems**, run **Unison Client Configuration** and connect to the main server database.

The PACOM Unison Client Setup Wizard displays.

5. Complete the configuration process as required.

### Unison cluster server

1. Open a command prompt and change directory to the location of the `Unison_Setup_x64.msi` file.
2. Type the command:  

```
msiexec /i Unison_Setup_x64.msi TRANSFORMS=:Slave.mst /q /l*v log.txt
```



3. Go to the location of the `Unison_Setup_x64.msi` file and open the installation `log.txt` to check if installation is finished.

There should be a line containing the message *Product: Pacom Unison X.X.X -- Installation completed successfully.* near the end of the log (where X.X.X is the Unison version number).

4. Configure the client.

From **Start > All Programs > Pacom Systems**, run **Unison Server Configuration** and set up the server and database for cluster servers.

5. Complete the configuration process as required.

## Silent Upgrades of Unison

---

It is possible to do a silent upgrade of the Unison:

### Client

1. Open a command prompt and change directory to the location of the `Unison_Setup_x64.msi` file.
2. Type the command:  

```
msiexec /i Unison_Setup_x64.msi /q /l*v log.txt
```
3. Go to the location of the `Unison_Setup_x64.msi` file and open the installation `log.txt` to check if installation is finished.  
  
There should be a line containing the message *Product: Pacom Unison X.X.X -- Configuration completed successfully.* near the end of the log (where X.X.X is the Unison version number).
4. See [Installing Clients \(Workstations\)](#) for more information.

### Device server

1. Open a command prompt and change directory to the location of the `Unison_Setup_x64.msi` file.
2. Type the command:  

```
msiexec /i Unison_Setup_x64.msi TRANSFORMS=:Secondary.mst /q /l*v log.txt
```
3. Go to the location of the `Unison_Setup_x64.msi` file and open the installation `log.txt` to check if installation is finished.  
  
There should be a line containing the message *Product: Pacom Unison X.X.X -- Configuration completed successfully.* near the end of the log (where X.X.X is the Unison version number).
4. See [Installing Device Servers](#) for more information.

### Cluster server

1. On the master server, backup the main server database.
2. Copy the Unison Installer folder (containing the `Unison_Setup_x64.msi` file) to the Cluster Server workstation.
3. Open a command prompt and change directory to the location of the `Unison_Setup_x64.msi` file.
4. Type the command:

```
msiexec /i Unison_Setup_x64.msi TRANSFORMS=:Slave.mst /q /l*v  
log.txt
```

5. Go to the location of the `Unison_Setup_x64.msi` file and open the installation `log.txt` to check if installation is finished.

There should be a line containing the message *Product: Pacom Unison X.X.X -- Configuration completed successfully.* near the end of the log (where X.X.X is the Unison version number).

6. Run the Unison Server Configuration.
7. Restore the main server backup of the database.
8. Click **Next** until the installation is finished.
9. See [Setting up Database Clustering/Replication](#) for more information.

## Advanced Settings

---

Advanced settings are available for:

### Server / Client

**Note:** Advanced settings should be modified for special reasons only, for example, to encrypt the database or split the main and log databases across different computers, etc.

Advanced settings are available from the Advanced Connection Options dialog box.

- For servers:

Click **Advanced Settings** in the Unison Server Setup Wizard, Database Connection screen, **Local Server Connection** region.

- For clients:

Click **Advanced Settings** in the Unison Client Setup Wizard, Set Client Logins screen.

The following settings can be configured:

Option	Sub-option	Description
Default Connection		Use the default connection to the database.
	Server	Specifies the computer and instance of SQL Server to connect to.
	User Name	Specifies an SQL username to connect to the database when not using Windows authentication. The username should be as defined in the SQL Server.
	Password	Specifies the password for nominated SQL user name ( <b>User Name</b> field). The password should be as defined in the SQL Server.
	Use Windows Authentication	Determines if Windows authentication is used to connect to SQL Server. If not enabled, the SQL Server user and password must be specified ( <b>User Name</b> and <b>Password</b> fields). <b>Note:</b> When deploying systems that will use system database redundancy features, SQL authentication must be used. That is, do NOT enable the <b>Use Windows Authentication</b> option.
Custom Connection		Determines if custom connection strings to connect to SQL Server are used.
	Main	Specify a custom connection string for the main (primary) database.
	Log	Specify a custom connection string for the log database.
Test Connection		Tests connection to database and displays test results.

## Database

When upgrading and Unison databases exist, additional database functions are available from the Advanced Options dialog box.

Click **Advanced** in the installer Database Connection screen, **Database Status** section, to:

Option	Description
Back up	Create back-up copies of existing main and log databases.
Benchmark	Measure SQL database performance.
Drop Connections	Disconnect from existing main and log databases.
Restore	Import data from backed-up main and log databases.

## Installing Integrated Video

A separate install is required to use integrated digital video surveillance with PACOM Unison.

### Take note

- PACOM Integrated Video must be installed before any third party video plugins.
- You must have the appropriate video licenses.
- PACOM Integrated Video v1.0 is compatible with PACOM Unison v5.7 or later.  
This plugin has been developed and tested with the version stated. Do not use it with earlier Unison versions.
- PACOM Integrated Video and third party video plugins must be installed on each Unison client computer that will be using video surveillance.
- If you wish to install Integrated Video on a Windows Server, first check the software requirements and documentation of the third party camera / video manufacturer.

### How to

1. Exit all Windows programs.
2. Download PACOM Integrated Video v1.0.xx.0.exe (where xx is the current build number) from PACOM's [FTP site \(ftp://ftp.pacom.com\)](ftp://ftp.pacom.com).
3. Right-click PACOM Integrated Video v1.0.xx.0.exe and select **Run as administrator**.
4. On the Welcome screen, click **Next**.
5. Review the license agreement and if acceptable, select the **I accept the terms of the license agreement** option.
6. Click **Next**.
7. **Install** PACOM Integrated Video.
8. When installation is complete, click **Finish**.
9. Install and configure third party video plugins as needed.

### Configuration

The following settings can be changed in the <appSettings> section of the IntegratedVideo.exe.config file which (by default) is located in the C:\Program Files (x86)\Pacom Systems\Pacom Generic Video folder.

- Snapshot save location

```
<add key="SnapshotFilePath" value="C:\temp\Integrated.Video" />
```

- Host IP Address

This is the IP address of the PC the application is running on. The application uses this IP address along with the port provided in the input parameters to listen for commands.

```
<add key="hostIpAddress" value="127.0.0.1" />
```

**Note:** Other entries in <appSettings> section of the IntegratedVideo.exe.config file must not be changed.

## Installing or Upgrading Third Party Drivers

A device driver is the communications interface for events and commands between the Unison system and the actual hardware. Device drivers in the Unison system run as Windows executables.

It is possible to install a new third party driver that is compatible with your current Unison version or to update the third party driver to a later version, without having to install Unison.

1. Download the third party driver files from the PACOM FTP.

Download the files to a known location on your local drive.

2. Exit the Unison client.
3. Stop all Unison services.

Right-click the Unison Service Manager icon in your system tray, then select **Stop Service** from the context menu.

4. Access the Unison Service Manager.

Double-click the Unison Service Manager icon in your system tray.

or

Click **Start > All Programs > Pacom Unison > Unison Server Configuration**.

5. Click **Device Types** on the toolbar to display the Register Device screen.
6. Click **Register New Device** in the bottom left-hand corner.
7. On the Select Device to Register window, find and select the third party driver files you downloaded from the PACOM FTP, then click **Open**.

The new third party driver is listed as a Registered Device.

8. Click **Close** on the Register Device screen.
9. Close the Unison Service Manager.
10. Check that the installed version displays the old version of the third party driver and the new version is the same as the new version you just registered.

It is also possible to add new third party drivers when [installing](#) or upgrading to a new Unison version.

# Configuring the Map Feature

---

If you are proposing to use the Unison map component, extra installation and configuration steps are required.

See the Unison Release Notes or the System Requirements document for system requirements relating to the map feature.

## How to

1. Use the following SQL script to switch on the ESRI map feature

```
UPDATE [dbo].[GlobalSetting] SET [Value]= '1' WHERE [SettingID]=  
'365'
```

2. [Download](#) and install RabbitMQ.
3. Execute the following commands in sequence so as to use RabbitMQ:
  - a. Open the RabbitMQ command prompt.
  - b. To enable RabbitMQ web management enter:  
`rabbitmq-plugins enable rabbitmq_management`
  - c. To add a username and password, enter:  
`rabbitmqctl add_user admin admin`
  - d. To allow the user account permissions, enter:  
`rabbitmqctl set_user_tags admin administrator`  
then  
`rabbitmqctl set_permissions -p / admin "." "." ".*"`
4. Install [Microsoft Visual C++ 2015-2019 Redistributable](#) on all Unison clients, including the Unison server.
5. Prepare the map package and make sure that the `mmpk` file is accessible to all Unison clients.
6. Set the Unison Map location.
  - a. In Unison, go to **Explorer > Hardware > System > Map**.
  - b. Enter the **Map License > License Key**.
  - c. Find or enter the **Map Location > Map Package File**.
  - d. Find or enter the **Map Symbol Location**.
  - e. Click **Save**.
7. Set the Unison Event Bus hub.
  - a. Use the Unison administrator account.
  - b. Go to **Explorer > Hardware > System > Event Bus Hub**.
  - c. Enter the **Event Bus Hub Settings** for RabbitMQ.
  - d. Click **Save**.

8. Create a system notification device in Unison.
  - a. Use the Unison administrator account.
  - b. Go to **Explorer > System Configuration > Hardware > Create Device > System Notification**.
  - c. Enter the details.
  - d. Click **Save**.
9. Restart the Unison client(s).

### To use embedded WebView Controls

Download and install [Microsoft Edge Webview2 Runtime](#) on client and server computers before performing an Unison installation or upgrade.

### Troubleshooting

Use the Unison Debug Monitor to view any issues with UnisonMap.

To monitor RabbitMQ:



1. Restart the RabbitMQ Service.
2. Go to RabbitMQ's web management page <http://localhost:15672>
3. Click the **Channels** tab to view the states.

See the [RabbitMQ](#) documentation for details.

Unison is licensed on a per-module basis for alarm management, access control, video, intercom, elevator, fire alarm panel integration, etc. The total number of Unison clients is also licensed. Furthermore, most modules are also licensed for a limited number of applicable nodes. For example, an access control module includes the ability to manage 10 doors - if management for more than the currently available number of doors is required, packs are purchased to increase the number. Licensing is enforced using a license file provided by PACOM that attaches to unique server information for validation.

After a new installation, Unison will work unlicensed for 30 days. After the 30 day period, a valid license file must be loaded. The license file is based on a computer signature, which is unique to every computer. For example, something similar to G2D5N2Q97MJAdggRxZ0u8xN3LQc=. The Unison license file is generated via the [PACOM website \(www.pacom.com\)](http://www.pacom.com) and requires that you provide the computer signature in order to generate the license. The license file can be used only with the computer associated with the signature.

### How to access the computer signature

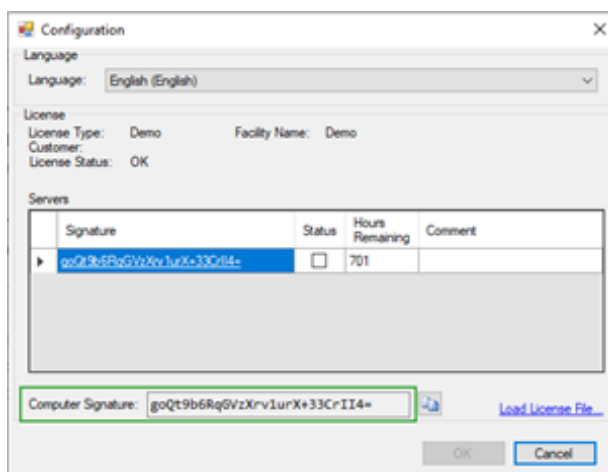
1. Double-click the Unison Service Manager  in your System Tray.
2. Click  **Configuration**.

The Configuration dialog box opens.

3. Copy the contents of the **Computer Signature** field and use it when requesting the license.

Copy the entire signature by using  **Copy to Clipboard** next to the **Computer Signature** field.

**Note:** For clustered database server installations, the computer signature for the master server and each cluster server must be provided, so that all servers are properly licensed. System database replication can be carried out only on licensed servers.



4. Once the license file has been created, download it to an accessible network location and then load it into Unison.



## Load the license file

1. Click **Load License File** in the Configuration dialog box.
2. Go to and select the license file.

Details of the facility and license are also displayed in the **License** section of the Configuration dialog box. Any servers that have been set up are displayed in the **Servers** table, along with their status and any grace period hours remaining (if applicable).

## Uninstalling

---

If needed, you can:

### Uninstall PACOM Unison

1. Go to the Windows **Control Panel > Programs > Programs and Features**.
2. Select **Pacom Unison**, then click **Uninstall** from the right-click menu or from the toolbar options.

### Repair PACOM Unison

1. Go to the Windows **Control Panel > Programs > Programs and Features**.
2. Select **Pacom Unison**, then click **Repair** from the right-click menu or from the toolbar options.

## Appendix

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There may be instances where you need to:

- upgrade from [older versions](#)
- set up the [system data service](#)
- set up database [clustering/replication](#)

or you have issues with [64-bit COM ports](#).

## Upgrading from Older Versions

---

Over the course of Unison's development, several aspects of the system have changed. In most cases, these changes do not affect how an upgrade is performed, however, for some versions there are some additional tasks that must be performed in order for the system to function as it was prior to the upgrade.

### Before upgrading

- All Unison clients should be closed before beginning the server upgrade process.  
This is to prevent client applications from attempting to interact with the Unison database whilst it is being changed (the database is effectively in maintenance mode).
- Terminate the PACOM Unison Server process Windows service on each server prior to starting the upgrade.

### System settings or components affected by upgrades

The following information lists the settings or system components that are affected during the Unison upgrade process.

Upgrade path	Affected setting/component	Change/Problem	Description/Solution
previous to 5.4.0 and onwards	System domain, calendar and day type	Node type name change	<p>Node type names changed from "system domain" to "calendar", and previous "calendar" to "day type" to better reflect functionality.</p> <p>Calendar now represents different geographical regions or other distinctions that require variations in dates for public holidays etc.</p> <p>Day type is what is defined in a calendar and is used to reference changes from "normal" access control operation, for example, door operation.</p>
	Device server	<p>Device property change</p> <p>Settings no longer used are erased during upgrade.</p>	<p>The system supports a device server concept to be able to provide redundancy and load balancing of Unison device drivers by allowing them to run on separate machines and for devices to switch between them as required.</p> <p>This design replaces and builds on the previous concept of system domains and calendars, which were used to define where device drivers were running and which one to use. Because of this, the previous system domain and calendar settings are no longer applicable, therefore, it will be necessary to specify the device server for every device in use, with the exception of the system device.</p> <p>The device server setting is in the <b>Properties &gt; Advanced Properties</b> section.</p>

Upgrade path	Affected setting/component	Change/Problem	Description/Solution
	Database	New system capability Node types added	<p>The system enables databases to be replicated / mirrored amongst a cluster of servers for the purposes of database redundancy.</p> <p>Nomination and configuration of database cluster services is provided through the normal installation process as described in <a href="#">"Setting Up Database Clustering/Replication" on page 51</a>. Additional configuration of applicable new node types on the Unison server is then required to make database clustering functional - see the Unison user help, <i>System Management &gt; Configuring the System &gt; Database and Device Driver Configuration and Management</i> topic.</p>
5.5.0 onwards	Operator log on	New system capability	The system supports Windows authentication / single sign-on. This allows operators to automatically log on to Unison using their Windows credentials.
5.6.0 onwards	Client machine	Node type added	Unison client machines can be added as nodes. This allows client application / machine events to be used when configuring system behavior. For example, creating an alarm if a client machine stops working unexpectedly. Client machine can also be blocked to prevent any operators from logging on, if required.
	Operator groups	New capabilities	Operator groups support defining which client machines can be used and role / skin to apply.

Upgrade path	Affected setting/component	Change/Problem	Description/Solution
5.7.0 onwards	Operating system	32-bit support ended	Unison no longer supports 32-bit operating systems. Ensure that the Windows operating system in use is 64-bit and is compatible with Unison. Refer to the release notes for compatible version information.
	Hardware	Machine specification changes	Ensure that computers being used for running Unison components meet the minimum requirements. Refer to the release notes for minimum computer specifications.
	PACOM Controller hardware	Machine specification changes and limitations	Ensure that computers being used for running PACOM Controller node drivers meet the minimum requirements, and do not exceed the number of device drivers running on a single server. Refer to the release notes for information.
	System Data Service	New system component	Introduced the system data service, which manages data transfer for graphics from server to client through an additional service. Set up the system data service as described in the Unison user help, <i>System Management &gt; Configuring the System &gt; System Data Service Configuration</i> topic. <b>Note:</b> If system data service communication is encrypted, each Unison client must have the encryption certificate imported into it. This requires a Windows administrator user. Later versions of Unison set up the system data service as part of the normal installation process.

Upgrade path	Affected setting/component	Change/Problem	Description/Solution
	Alarm list	Operator group permission added	Operator groups that require the ability to sort alarm lists will must have the sorting alarms permission enabled. Previously, it was a default feature of any operator group.
	Graphics	New system capability	<p>Graphics now use the <a href="#">System Data Service</a> for transfer from the server to the client.</p> <p>To further improve graphics performance it is now possible to pre-load selected graphics on client machines when operators log on. The graphics are selected on an operator group basis.</p> <p>Any graphics that are not pre-loaded will be downloaded to the client from the server when required.</p>

## Upgrade recommendations

Prior to upgrading:

- Ensure that a valid Unison license is available for the version to be installed.

If a non-valid license is used, Unison will apply the grace period. After the grace period expires, device drivers or other parts of the system will no longer function correctly.

Apply the [license](#) using the Unison Server Manager application after performing the upgrade. See [Licensing](#).

- If database clustering / replication is in use, note the global database ID value of each Unison database server in the cluster before performing the upgrade.

The database ID value can be checked in the **Properties** tab for each database cluster server node.

- For any third party devices, check the compatibility between the Unison device driver and the third party device. This information is available in the release notes for the Unison version.

Ensure that the third party device version in use is compatible with the Unison device driver. For example, the supported Bosch VMS device protocol version differs across several Unison versions. As a result, it may be necessary to install a patch or upgrade / downgrade the Bosch VMS version in order to retain compatibility.

- If any abnormal system behavior is noticed after upgrading, it is recommended that the debugging to file is activated, for the applicable device or node so that information is available to PACOM Support staff if investigation is required. Ensure that the location where the debug file is saved has adequate space, as these files can become very large.

## Upgrade procedure

1. Close all Unison clients.
2. Terminate the PACOM Unison Server process Windows service on all Unison servers.
3. Make sure to back-up the Unison databases as a precaution.
4. Terminate the Unison Service Manager (`PacomIs.ServerManager.exe`) application on all Unison servers if it is running.
5. Upgrade Unison in the normal manner.

Note the following:

- Upgrade all server machines before upgrading client machines.
- If database clustering / replication is in use, upgrade each server in the cluster in the order of its original global database ID value. That is, upgrade the server with database ID **1** first (the master server), then **2** and so on.
- If multiple Unison servers are in use as device driver servers, upgrade these after upgrading clustering / replication servers.
- Once all server and client machines are upgraded:
  - a. Start SQL Server on machines of the application was either terminated or the machines shut down.
  - b. Start the PACOM Unison Server process Windows service on the database master server first.
  - c. Start each clustering/replication server, if applicable.
  - d. Start each device driver server, if applicable.
  - e. Once all servers are operational, Unison client applications can be used a normal.

## Roll-back procedure

If it is necessary to roll-back Unison to the previous version:

1. Uninstall Unison.
2. Install the previously running version of Unison in the normal manner.
3. Load the previously backed up databases to Unison.

## Upgrading from older versions and using PACOM Controller hardware

As PACOM Controller hardware integration has been phased into Unison since version 5.x, many features supported by PACOM Controllers have been introduced. However, not all settings or concepts have been fully supported. In these cases, Unison GMS or the GMS Config software may have been used to configure controllers for features not supported by Unison at the time. As various Unison and controller firmware releases progress, many settings previously managed by the GMS software are now managed using Unison. Most affected settings are automatically converted and imported into Unison through the **initialize** command, using the existing controller configuration as the source. In cases where these settings are not automatically imported, they must be manually configured in Unison since the original settings configured using GMS are discarded during the initialization process.

**Caution:** PACOM strongly recommends against using GMS to manage settings after the controller is running using Unison. Once the following procedure is complete and the Unison-Controller are synchronized, it is highly recommended to perform all controller configuration from the Unison system.



## Controller settings affected by upgrades

The following table describes the settings that either require manual configuration in Unison or are discarded during the Unison upgrade process.

Upgrade Path	Affected Setting	Problem/Change	Solution
5.3.x to 5.4.x	Anti-passback for multiple doors	Settings made using GMS are permanently erased from controller memory.	If anti-passback for multiple doors is required, do NOT upgrade as it is not possible to re-apply the previous settings.
5.4.x to 5.9.0	Controller macros / expressions	Settings made using GMS are permanently erased from controller memory.	<p>It is recommended to make records of any event, card reader or BMS macros / expression configurations in use before migrating to Unison and re-defining them after the migration.</p> <p>In terms of the tools to use to re-define macros/expressions, Unison v5.8 or later should be used. GMS may be used if the Unison version is pre-5.8, however, this is not recommended.</p>
	Reader schedule	The schedule which has egress mode configured in 5.4 is still downloaded to RTU as egress mode but it shows locked mode in Unison.	A user needs to open the reader schedule through the user interface and re-save the schedule again to force an update.

Upgrade Path	Affected Setting	Problem/Change	Solution
5.4.1 to 5.5.1	Area schedules	Timezones created using GMS are erased from controller memory.	Recreate the necessary area schedules in Unison, apply them to the required areas and download the configuration to the controllers.
	Egress schedules	Timezones created using GMS are erased from controller memory.	Recreate the necessary egress schedules in Unison, apply them to the required doors and download the configuration to controllers.
	Door schedules	Card+PIN+OP, Card+OP, GIN+OP and Egress+OP modes are no longer used.	Time intervals in existing door schedules that used any of the now unsupported modes are set to "blocked". These intervals will require changing to an applicable door mode that is supported.
	Card reader settings	Card reader settings that are visible and can be configured using GMS that are NOT visible in Unison are erased from controller memory.	Any card reader settings not in Unison are currently not supported. Once a controller is configured to communicate with Unison, it is not possible to configure card readers on that controller using GMS.
5.7.x to 5.9.0	Elevator schedules	Timezones created using GMS are erased from controller memory.	Recreate the necessary elevator schedules in Unison, apply them to the required elevators and download the configuration to controllers.
Pre 5.8.0 to 5.9.0	GMS output linkages (partial)	Simple output linkage configuration is automatically migrated. More complex ones will be wiped out and will need to be manually configured.	Some GMS output linkages need to be manually re-programmed in Unison.
Pre 5.8.0 to 5.9.0	Reader Macros	These macros remain on upgrade and can be programmed through GMS but currently cannot be programmed through Unison.	All GMS reader configurations cannot be programmed through Unison and need to be programmed through GMS.
Pre 5.8.0 to 5.9.0	BMS Macros / Settings	The macros and the settings are wiped out on upgrade and are not supported in this version of Unison.	It is recommended not to use this version of Unison for any site requiring the BMS feature.

<b>Upgrade Path</b>	<b>Affected Setting</b>	<b>Problem/Change</b>	<b>Solution</b>
Pre 5.8.0 to 5.9.0	Timezone macro conditions	These setting are not used on upgrade and need to be manually reconfigured with Unison basic schedule conditions instead.	Manual configuration is required.
Pre 5.8.0 to 5.9.0	Alarm Event Macros	Simple alarm event macros configuration is automatically migrated. More complex ones will be wiped out and will need to be manually configured.	Partial automatic support only. Manual configuration required in complex configurations.
Pre 5.8.0 to 5.9.0	Vaults and Vault Controllers		Not supported in Unison.
Pre 5.8.0 to 5.9.0	People counters		Not supported in Unison.
Pre 5.8.0 to 5.9.0	Ports and Protocols (Partial)	Commonly used protocols are supported. Unsupported protocols to be listed.	Partially supported in Unison.
Pre 5.8.0 to 5.9.0	Alarm User Types (Partial)	For a list of Supported Alarm User Types, refer to the list in the Unison software configuration screens.	Partially supported in Unison.
Pre 5.8.0 to 5.9.0	Message Filters (Partial)	For the list of Supported Message Filters, refer to the list in the Unison software configuration screens.	Partially supported in Unison.
Pre 5.8.0 to 5.9.0	1062 CRI operations	These settings are wiped out and are not supported and cannot be manually configured in Unison.	Not supported in Unison.
Pre 5.8.0 to 5.9.0	Other non-supported GMS configurations	Any settings not explicitly appearing on the supported list are wiped out and cannot be manually configured in Unison.  Refer to the help for the list of supported items.	Not supported in Unison.

## Upgrade recommendations

Depending on controller configuration prior to upgrade and the functions set using GMS that are discarded from controller memory, then:

- Use GMS to view the settings for each schedule (area, egress, etc) that is used. Note the settings and the areas and doors they are applied to.
- For each controller, use GMS to save the Controller configuration as a template if, and only if the controller has settings, macros, etc that have been set using GMS.

This step is a safety precaution so that a configuration record is available, if required.

**Note:** The access card database is not retained as part of the template.

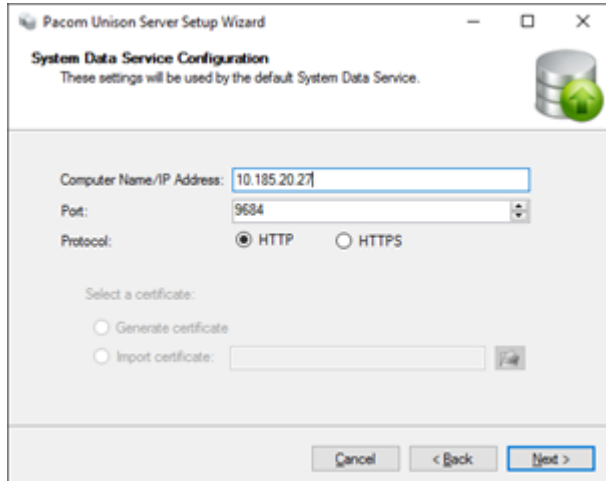
## System Data Service

Installing the System Data Service (SDS) also covers the main Unison Server installation steps and the manual steps required for Device Servers and Replication Servers.

### Main Unison server

SDS installation for the main server, occurs as a part of the main Unison installation. The following steps outline what is required to install SDS on the main system, only the section related to SDS is shown.


The System Data Service Configuration screen is used to define the communications port that is used by the system data service and Unison client machines, and whether or not communications are encrypted. If encryption is required, a certificate can be specified or generated.

The screenshot shows a Windows-style dialog box titled "Pacom Unison Server Setup Wizard" with a subtitle "System Data Service Configuration". Below the subtitle, it says "These settings will be used by the default System Data Service." There is a green database icon in the top right. The main area contains several fields: "Computer Name/IP Address:" with the value "10.185.20.27" entered; "Port:" with a dropdown menu showing "9684"; "Protocol:" with two radio buttons, "HTTP" (selected) and "HTTPS"; and a "Select a certificate:" section with two options: "Generate certificate" (selected) and "Import certificate:" with an empty text box and a "File" button. At the bottom are three buttons: "Cancel", "< Back", and "Next >".

1. To accept the default settings, do not change anything.  
The default name is the computer name.  
The default port is 9684, it is recommended to leave this unchanged.
2. To set a different port number, enter it into the **Port** field or use the arrows to step through port numbers.
3. For encrypted communications, select **HTTPS** for the **Protocol**.
4. Select a certificate:

- a. To create a new certificate, select **Generate Certificate** - the certificate is stored in the Unison database.

If the **Generate Certificate** option is selected and there is an existing certificate, the existing certificate will be removed and a new certificate generated.

- b. If a certificate already exists from a previous Unison installation, select **Import Certificate**, then click  to open a dialog box, to select the required certificate file.

Once imported, the certificate is stored in the Unison database. The certificate is added to the Windows trusted root certificates for encrypted communications through the port. The certificate needs to exist on the server and all client machines that are able to connect to the server.

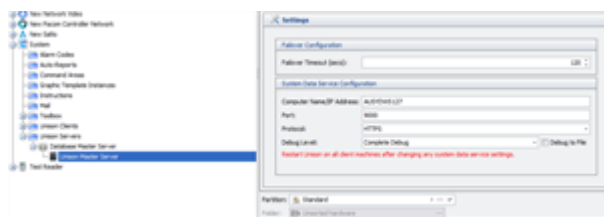
The System Data Service Configuration warning message displays.

**Note:** If using encrypted communications, the certificate must be imported to each Unison client machine.

5. Click **OK**.
6. Continue to [install](#) Unison.

A System Data Service device driver is added.

7. Once installation is complete, SDS settings are found in Server Settings located under **Unison Explorer > System Configuration > Hardware > System > Unison Servers...**



## Port bindings

For the System Data Service, a port is registered to the operating system with a port number and a server address. If Unison has been uninstalled, the port binding may not be removed. If Unison is then reinstalled with the same port but a different server address (IP / machine name), then SDS may not work. The port must be available (that is, not bound to any previous SDS or other application). The binding should be manually removed using the `netsh` command before reinstalling Unison. Failure to do so may cause SDS to not work correctly if Unison is subsequently reinstalled. Use the following `netsh` commands to properly clean up port bindings after an uninstall.

Action	Command
View all bindings	<code>netsh http show urlacl</code>
View all stored certificates	<code>netsh http show sslcert</code>
Delete Specific Binding	<code>netsh http delete urlacl=https://&lt;addr&gt;:&lt;port&gt;/</code>
Delete SSL certificate	<code>netsh http delete sslcert ipport=&lt;addr&gt;:&lt;port&gt;</code>

## Other Unison Servers (device server, replication server)

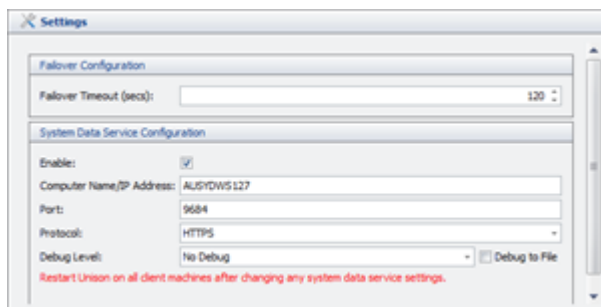
All other System Data Services must be manually added, after the main Unison Server is installed.

### Rules for configuring the SDS

- You need at least one SDS per database that clients connect to in order for graphics to work.  
A client connecting to a database without SDS running will not be able to use the graphic feature.
- SDS does not currently support load-balancing, therefore any additional SDS per database will act as a failover only.
- Automatic failover only works with SDS that connect to the same database, switching SDS to a Replicated Server or database requires the client to re-login (which is the default behavior in Unison).
- You can only have one SDS configuration per Device Server.

### How to install SDS on non-main servers

1. Install device server or replication server according to the normal installation procedure.
2. Once installed, log onto the Unison client.
3. Go to **Hardware** in the System Configuration and add a new [Device Server](#).  
Refer to Device Server and Replication Server installation topics.
4. Under each Device Server, complete the SDS configuration settings and ensure the **Enable** checkbox is ticked.



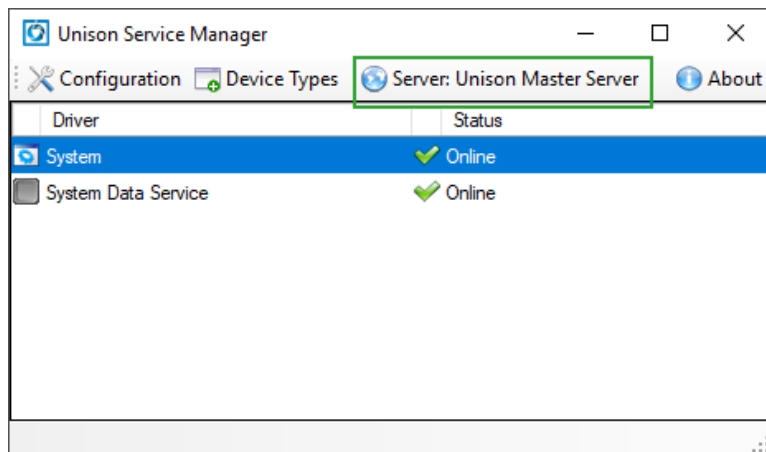
**Note:** You need to have a least one SDS per database that the client is connected to, in order for the graphics to work.

**Caution:** You can only have one SDS per Device Server.  
If you have multiple Device Servers per database, you can configure multiple SDS per replicated database.  
Currently, SDS does not support load-balancing, multiple SDS per database is only use for failover. Clients can automatically failover to another enabled SDS that is connected to the same database. Switching to another SDS that connects to different database requires client re-login, as per the default behavior of Unison.

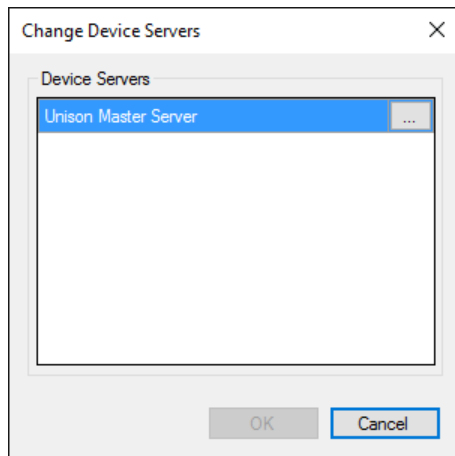
5. Reserve the port.

Once SDS is configured, there will be an undefined event for this node. This is caused by the SDS Communication Error because the port has not been reserved yet.

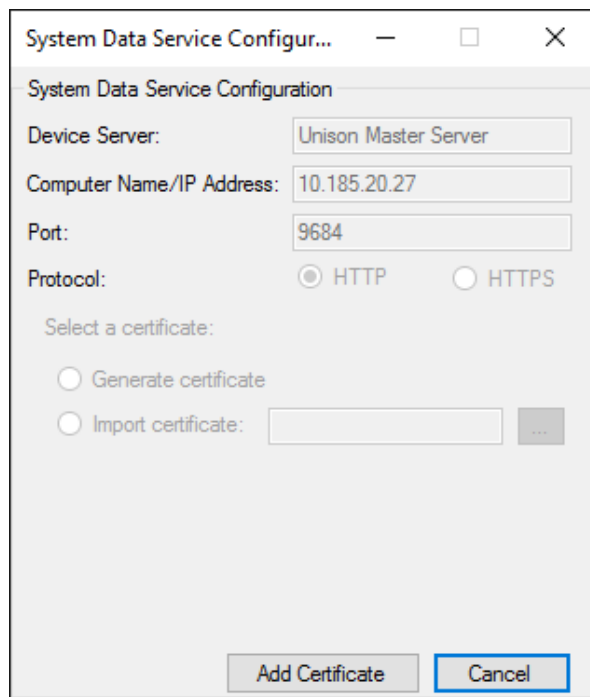
To reserve the port, open Unison Service Manager as an administrator, then click **Device Server**.



- Click ... for the Device Server that the Unison System Data Service is running on.

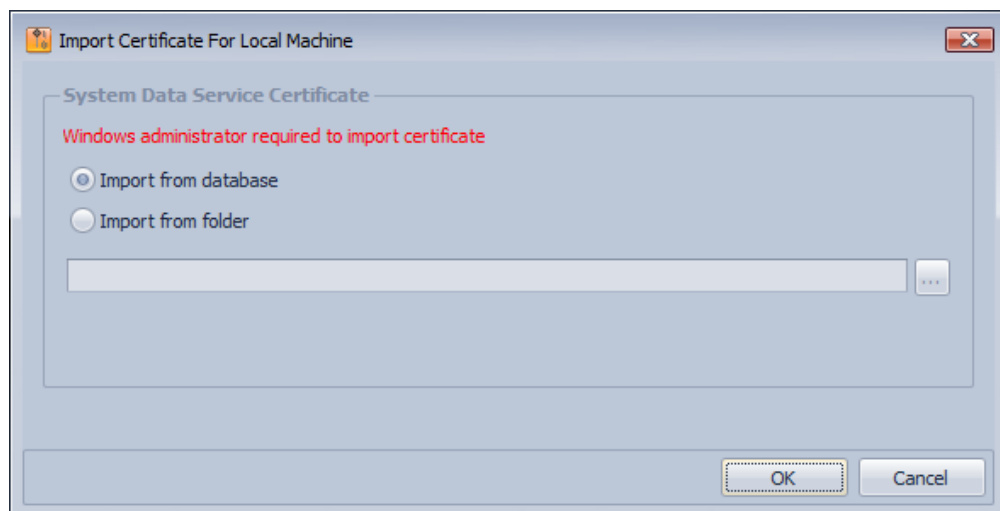


- Configure SDS as required.



8. If HTTPS is being configured then import the certificate on each computer where the Unison client is installed to allow authenticated communication.
  - a. Run the Unison Client as administrator.
  - b. Go to **Unison Explorer > System Configuration > Hardware**, right click **System** then select **Commands > Import Certificate for Local Machines....**

The Import Certificate for Local Machine dialog displays.

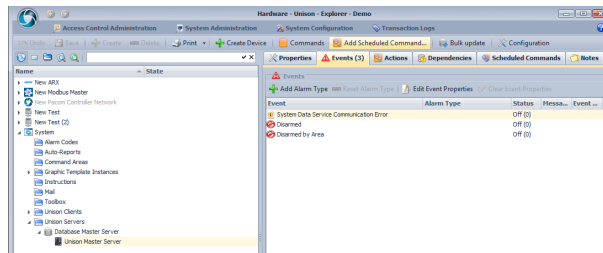


- c. If the certificate was generated by Unison, then the certificate will be stored in the database, in this case, select **Import from database**. Click **OK**.
- d. If the certificate is externally created, then select **Import from folder**, click ... to select the certificate to import. Fill in the textbox of the folder that contains the .cer file which is generated from the Unison Service Manager server (this file is contained in the Certificate Path selected at the Webs Server Configuration stage). Click **OK**.
- e. If the import is successful, then a *Handled* text will be shown at the bottom right-hand corner of the Unison client.



9. Verify that the Device Server node is included in the System in the Hardware tree structure.
- When the *Undefined* text disappears, the SDS is ready to use.

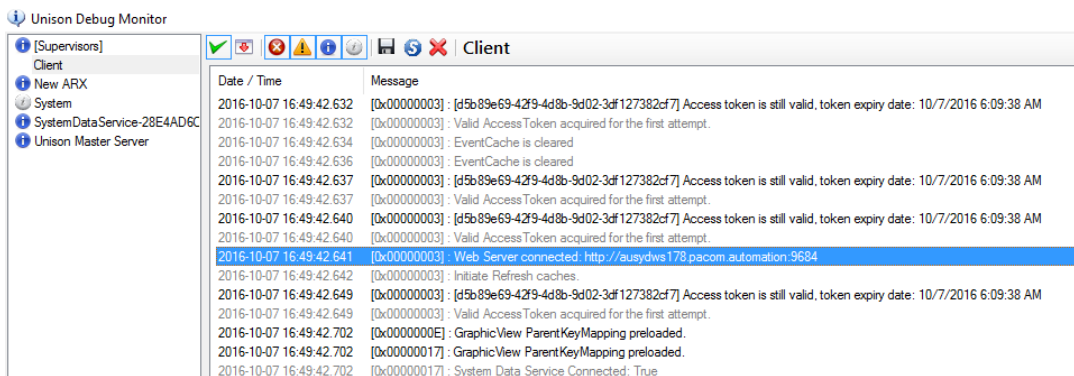
Alternatively, go to the **Events** tab and check that the SDS Communication Error event is off.



## How to check which SDS the client is currently connected to

Unlike other devices, SDS is started on each of the available Unison Servers. This is to minimize the graphic downtime if failover happens. The cache pre-loading may take sometime if the service is started by demand.

To determine which SDS the client is currently connecting to, check the debug monitor. Each time the Unison client starts, it prints a message stating which Web Server it is connected to.



## Replication and Redundancy

Unison 5.4 and later, in conjunction with Microsoft SQL Server 2012, provides tools for performing automatic unison server and database failover / redundancy operations (without requiring proprietary Microsoft server failover clustering). That is, in the event of server failure or server communications failure, the system will redirect messages from the previously used server to the next available database cluster server. Several servers can be set up for database clustering / replication, with the database in each one being constantly updated with the latest changes, events and other transactions.

This system incorporates deploying several servers in an active-active configuration, which means all are essentially main servers, with system databases constantly synchronized between all servers. The result is a high-availability, load balancing system with inherent redundancy / failover functions. Servers that are used in a database replication / cluster system are known as cluster servers. The system also supports failback, which means if the initial database server (that failed) becomes available again, the system switches back to using it. When multiple database servers are used, the system databases are continuously replicated amongst all servers.

When using clustered database servers, if a failover occurs on the server that a client machine is currently connected to, a notification of server connection loss occurs on the client and the operator is automatically logged off. The client will connect to the next available database (the system data service associated with that database will also be used) and the operator must log on again. If a higher priority server becomes available again after a failover, client machines are not switched back to it automatically - operators must log off from the currently used server and log on to the required server manually.

### Take note of ...

- Each database replication server must be installed as a cluster server.
- Each cluster server requires a licensed version of Microsoft SQL Server 2012 installed.

It is not recommended to use SQL Server Express for clustered database servers or any large system.

- A specific SQL Server account is required for database replication functions.

It is recommended to use the same SQL account for each database replication server SQL Server instance. Database replication does not support Windows authentication.

- Each cluster server must synchronize time at least once per hour with a network time protocol (NTP) server.

**Tip:** The time difference between cluster servers should never exceed 2 seconds.

- Each cluster server must have a unique global database ID assigned to it, which is the mechanism used for selecting the server to failover to.

The master server must have an ID of **1**.

- Network bandwidth between cluster servers should be a minimum of 100Mbit/sec (based on a typical system of 200 card readers and 1000 alarm inputs).

For larger or busier systems, higher bandwidth availability will improve system performance.

## Microsoft SQL Server clustering and mirroring

**Note:** If Microsoft SQL Server database clustering is available, it is recommended to use that for redundancy / failover operations.  
The redundancy architecture also provides failover / failback operation for device drivers.

- For increased availability, Unison databases can be hosted in a proprietary SQL Server database cluster.

Clustering spreads the databases across a number of servers in the cluster and maintains synchronization between them. If a server in the cluster fails, another one of the cluster servers is automatically switched to. Clustering has been tested with *Microsoft Windows Server Failover Clustering*.

When clustering, the Unison system should communicate with sub-systems using TCP/IP only in order for failover from one cluster node to another to occur. This means that all sub-systems that normally communicate using RS232 COM ports must be connected via Moxa NPort software in order to connect to cluster nodes using IP.

- Database mirroring has been used successfully, however, is not currently fully tested.

PACOM reserves the right to provide support for systems using database mirroring.

Basically mirroring automatically maintains a replica of databases in another SQL Server database. If the primary database becomes unavailable, the mirrored one can be switched to, however, this requires manual intervention and resetting system components to point to the mirrored SQL Server database.

## Setting Up Database Clustering/Replication

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You can set up or upgrade an older Unison system to use database server clustering/replication.

**Note:** Network bandwidth between database cluster servers should be a minimum of 100Mbit/sec (based on a typical system of 200 card readers and 1000 alarm points). For larger or busier systems, higher bandwidth availability will improve system performance.

### How to

1. For upgrades:
  - a. Make a backup of the Unison main and log databases from the current system being used.
  - b. Uninstall the current Unison system.
2. Install the new version of Unison as a server on the master server.  
Ensure that:
  - A licensed version of Microsoft SQL Server is installed.
  - SQL Server authentication is being used for database access. Database replication does not support Windows authentication.
  - A specific SQL Server account is set up for database replication functions. It is recommended to use the same SQL account for accessing the SQL Server on each cluster server.
  - The global database ID value is **1**.  
The global database ID value is the mechanism used for selecting the server to failover to.
3. Install the new version of Unison as a [cluster server](#) on all required cluster servers.  
Ensure that:
  - A licensed version of Microsoft SQL Server is installed.
  - Each cluster server has a unique global database ID value (other than **1**).
4. For upgrades, restore the previously backed up main and log databases to the master server.
5. Set up an NTP server on the network and make all Unison server and client machines use it for time synchronization at least once per hour.  
The time difference between database cluster servers should never exceed 2 seconds.
6. Start Unison on the master server, then:
  - a. Create and configure the necessary database clustering / replication device nodes - database server, Unison server, replication device and replication target, as required.

- b. Configure the device server(s) for all devices that were available in the Unison database before the upgrade (this is not done automatically) and set up failover / failback as required for each.

**Note:** Do NOT configure failback for replication nodes.  
DO configure failback for the system device node.

## 64-Bit Windows COM Ports

A problem with some device drivers has been identified when using 64-bit COM port RS232 communications that may cause the connected device to consistently crash and reboot. The following drivers are known to be affected, however, this may also apply to any device driver that use standard COM port RS232 communications:

- C2 (PacomIs.C2Device.exe)
- UC120 (PacomIs.UC120Device.exe)

### How to

To bypass this problem, it is recommended to force the drivers to run in 32-bit mode:

1. Open a command prompt and navigate to the folder where the Unison drivers are installed.  
The default is `C:\Program Files\Pacom Systems\Unison\bin`
2. Enter "`Corflags DriverName /32BIT+`", where *DriverName* is the applicable device driver file.  
For example, "`Corflags PacomIs.C2Device.exe /32BIT+`".

**Note:** If you use an RS232-to-TCP converter (for example., Moxa NPort or DIGI PortServer) in TCP Server Mode for COM port communication, the drivers do not need run in 32-bit mode.