



UMS Articles



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Devices Supported by IGEL Universal Management Suite (UMS)

Question

Which devices are supported by IGEL Universal Management Suite (UMS)?

Answer

- ⚠** To ensure that you can use all new features of IGEL OS:
- ▶ Update your UMS to the current version.
 - ▶ For all relevant OS 11 profiles, set **Based on** to the appropriate firmware version.
 - ▶ For OS 12 profiles, note the following: An OS 12 profile configures ALL versions of an app, unless a specific version is set under **Show Versions**.

The latest UMS version supports

- all IGEL devices that have not yet reached their end of maintenance
- devices converted with IGEL OS Creator (OSC)

Older UMS releases support

- IGEL devices that were released before the UMS release
- and that had not reached their end of maintenance at the time of the UMS release



IGEL UMS Communication Ports

The following table shows the default ports which are used by the components of the IGEL Universal Management Suite (UMS) and a UMS infrastructure. Some of these ports are configurable, e.g. web server port 8443, device communication port 30001 for IGEL OS 11 devices, etc. (see Settings - Change Server Settings in the IGEL UMS Administrator).

Port (Protocol)	Required by UMS (Feature)	Who is Listening? Applications/ Service Binding to Port	Who is Talking? Applications /Services Initiating Communicat ions	Description
443 (TCP)	IGEL App Portal https:// app.igel.com/	Cloud Service	UMS Server	The UMS Server imports apps from the IGEL App Portal.
443 (TCP)	IGEL Onboarding Service https:// obs.services.igel.co m¹	Cloud Service	UMS Server	The UMS Server validates the onboarding token.
443 (TCP)	IGEL Insight Service https:// insight.services.igel .com	Cloud Service	UMS Server	The UMS Server transfers analytical and usage data to IGEL.
443 (TCP)	Automatic License Deployment (ALD)	IGEL licensing server (at susi.igel.com)	UMS Server	The UMS Server requests licenses; see UMS Contacting the Licensing Server (see page 49).
443 (TCP)	Automatic License Deployment (ALD)	IGEL download server (HTTP server at fwus.igel.com)	UMS Server	The UMS Server requests the connection details required for connecting to the IGEL license server (at susi.igel.com). See UMS Contacting the Licensing Server (see page 49).

¹ <https://obs.services.igel.com/>



Port	Required by UMS (Protocol/Feature)	Who is Listening? Applications/ Service Binding to Port	Who is Talking? Applications /Services Initiating Communicat ions	Description
8443 (TCP)	Core	UMS Server (Windows: service IGELRMGUIS erver; Linux: daemon igelRMServ er)	UMS Console / UMS Web App	See UMS with Internal Database (see page 13) or UMS with External Database (see page 14).
8443 (TCP)	Unified Protocol	UMS Server (Windows: service IGELRMGUIS erver; Linux: daemon igelRMServ er)	IGEL OS 12 device	<p>The device opens a WebSocket for data exchange (all communication incl. registration via IGEL Onboarding Service or One-Time Password method, file transfer, firmware customization and license transfer, secure shadowing, secure terminal)</p> <p>For more information on Unified Protocol, see Overview of the IGEL UMS.</p>
8443 (TCP)	UMS as an Update Proxy	UMS Server (Windows: service IGELRMGUIS erver; Linux: daemon igelRMServ er)	IGEL OS 12 device	The device contacts the UMS Server to download app updates.
3000 2 (TCP)	Core (directly, without ICG)	UMS Server (Windows: service IGELRMGUIS erver; Linux: daemon igelRMServ er)	HA Load Balancer	If the UMS Server and the HA Load Balancer are running on the same host, the UMS Server will use port 30002 instead of 30001, and the HA Load Balancer will use port 30001 (relevant for IGEL OS 11 only).



Port (Protocol)	Required by UMS (Prot Feature)	Who is Listening? Applications/ Service Binding to Port	Who is Talking? Applications /Services Initiating Communicat ions	Description
30001 (TCP)	Unified Protocol (automatic registration or registration after scanning)	UMS Server (Windows: service IGELRMGUIS erver; Linux: daemon igelRMServ er)	IGEL OS 12 device	The device requests a registration token if the UMS Server was detected in the company network (see Registering Devices Automatically on the IGEL UMS and Importing Devices) or the device received a registration request after it was scanned (see Scanning the Network for Devices and Registering Devices on the IGEL UMS).
30001 (TCP)	Core (direct device communication, not used with communication via ICG)	UMS Server (Windows: service IGELRMGUIS erver; Linux: daemon igelRMServ er)	IGEL OS 11 device	See Devices Contacting UMS (see page 21).
8443 (TCP)	Core (file transfer)	UMS Server (Windows: service IGELRMGUIS erver; Linux: daemon igelRMServ er)	IGEL OS 11 device	The device requests a file from the UMS; see UMS and Devices: File Transfer (see page 41).
8443 (TCP)	Core (firmware customization)	UMS Server (Windows: service IGELRMGUIS erver; Linux: daemon igelRMServ er)	IGEL OS 11 device	The UMS provides files for customizing the look and feel of the device's GUI; see UMS and Devices: File Transfer (see page 41).



Port (Protocol)	Required by UMS (Protocol Feature)	Who is Listening? Applications/ Service Binding to Port	Who is Talking? Applications /Services Initiating Communicat ions	Description
88	Core (if Active Directory is used), Shared Workplace	MS Active Directory Service	UMS Server	The UMS Server sends a Kerberos request to MS Active Directory.
389	Core (if Active Directory is used), Shared Workplace	MS Active Directory Service	UMS Server	The UMS Server sends an LDAP request to MS Active Directory.
1527	Core (if Apache Derby is used)	Apache Derby database (Derby Network Server)	UMS Server	See UMS with External Database (see page 14).
636	Core (if LDAPS server is used)	LDAPS server (other than MS Active Directory)	UMS Server	The UMS Server sends an LDAP request over SSL.
1433	Core (if MS SQL Server is used)	Microsoft SQL Server database	UMS Server	See UMS with External Database (see page 14).
1521	Core (if Oracle is used)	Oracle database	UMS Server	See UMS with External Database (see page 14).
5432	Core (if PostgreSQL is used)	PostgreSQL database	UMS Server	See UMS with External Database (see page 14).
8443	Core (licenses)	UMS Server (Windows: service IGELRMGUIServer; Linux: daemon igelRMServer)	IGEL OS 11 device	The UMS provides license files for the devices; see UMS and Devices: File Transfer (see page 41).
Auto ("high port") (UDP)	Core (online check)	UMS Server (Windows: service IGELRMGUIServer; Linux: daemon igelRMServer)	IGEL OS 11 device	<p>The device responds to a message sent by the UMS to check if the device is online.</p> <p>The port number to be used is contained in the UDP packet sent by the UMS.</p>



Port (Protocol)	Required by UMS Feature	Who is Listening? Applications/ Service Binding to Port	Who is Talking? Applications /Services Initiating Communicat ions	Description
30005 (TCP/UDP)	Core (scanning for device)	Device (OS 12 & OS 11) (UMS agent)	Device (OS 12 & OS 11)	The device responds to a broadcast sent by the UMS during a scan. The port number to be used is contained in the UDP packet sent by the UMS. See UMS Server.
Auto ("high port") (UDP)	Core (scanning for device)	UMS Server (Windows: service IGELRMGUIServer; Linux: daemon igelRMServer)	Device (OS 12 & OS 11)	The device responds to a broadcast sent by the UMS during a scan. The port number to be used is contained in the UDP packet sent by the UMS.
3002 (TCP)	Core (secure terminal)	IGEL OS 11 device (UMS agent)	UMS Server	See UMS and Devices: Secure Terminal (see page 37).
5900 (TCP)	Core (shadowing)	IGEL OS 11 device (UMS agent)	UMS Console	The UMS Console initiates a VNC session for shadowing; see UMS and Devices: Shadowing (see page 25).
5900 (TCP) via UMS Web App	Core (shadowing)	IGEL OS 11 device (UMS agent)	UMS Server	The UMS Web App triggers the UMS Server to initiate a VNC session for shadowing. The VNC session is routed through the UMS Server; see UMS and Devices: Shadowing (see page 25).
9080 (TCP) no SSL	Core (unencrypted, no SSL)	UMS Server (Windows: service IGELRMGUIServer; Linux:	IGEL OS 11 device	The device requests a file from the UMS (regular file transfer or Universal Firmware Update).



Port (Protocol)	Required by UMS (Protocol Feature)	Who is Listening? Applications/ Service Binding to Port	Who is Talking? Applications /Services Initiating Communicat ions	Description
		daemon igelRMServer)		This port is only used if Allow SSL Connections only is deactivated in the UMS Administrator. If Allow SSL Connections only is activated, port 8443 is used for firmware updates and file transfer.
Auto ("high port")	Core (unencrypted, no SSL)	UMS Server (Windows: service IGELRMGUIServer; Linux: daemon igelRMServer)	UMS Console	The GUI is started via Java Webstart console. This port is only used if Allow SSL Connections only is deactivated in the UMS Administrator. If Allow SSL Connections only is activated, port 8443 is used for firmware updates and file transfer.
443 (TCP)	Core (Universal Firmware Update)	IGEL download server (HTTP server at fwus.igel.com)	UMS Server	See UMS Contacting the Download Server to Check for New Updates (see page 43).
8443 (TCP)	Core (Universal Firmware Update)	UMS Server (Windows: service IGELRMGUIServer; Linux: daemon igelRMServer)	IGEL OS 11 device	In the course of a Universal Firmware Update, the device requests a file from the UMS; see UMS and Devices: File Transfer (see page 41).
9 (UDP)	Core (Wake on LAN)	Device (OS 12 & OS 11)	UMS Server	The UMS Server sends magic packets to the devices.
8443 (TCP)	Core (with ICG)	ICG (IGEL Cloud Gateway)	UMS Server	See Devices and UMS Server Contacting Each Other via ICG (see page 18) or UMS Server.



Port (Protocol)	Required by UMS Feature	Who is Listening? Applications/ Service Binding to Port	Who is Talking? Applications /Services Initiating Communicat ions	Description
8443 (TCP)	Core (with ICG)	ICG (IGEL Cloud Gateway)	Device (OS 12 & OS 11)	See Devices and UMS Server Contacting Each Other via ICG (see page 18).
6155 (UDP)	High Availability (HA)	HA Load Balancer UMS Server	HA Load Balancer UMS Server	Both HA Load Balancer and UMS Server listen on port 6155 and use it for communication.
8443 (TCP)	High Availability (HA) and Distributed UMS	UMS Server (Windows: service IGELRMGUIServer; Linux: daemon igelRMServer)	UMS Server (Windows: service IGELRMGUIServer; Linux: daemon igelRMServer)	File synchronization between UMS Servers
6161 (TCP/UDP)	High Availability (HA)	HA Load Balancer UMS Server	HA Load Balancer UMS Server	Both HA Load Balancer and UMS Server listen on port 61616 and use it for communication.
8443 (TCP)	IMI	UMS Server (Windows: service IGELRMGUIServer; Linux: daemon igelRMServer)	3rd party component using IMI (IGEL Management Interface)	See IGEL Management Interface (IMI) (see page 16).

- [Internal Communication](#)(see page 12)
- [IGEL Management Interface \(IMI\)](#)(see page 16)
- [UMS and Devices: Settings and Control](#)(see page 17)
- [UMS and Devices: Shadowing](#)(see page 25)
- [UMS and Devices: Secure Shadowing](#)(see page 28)
- [UMS and Devices: Secure Terminal](#)(see page 37)
- [UMS and Devices: File Transfer](#)(see page 41)



- Universal Firmware Update(see page 42)
- Automatic License Deployment (ALD)(see page 48)



Internal Communication

- [UMS with Internal Database](#)(see page 13)
- [UMS with External Database](#)(see page 14)
- [Indexing for UMS Web App Search](#)(see page 15)

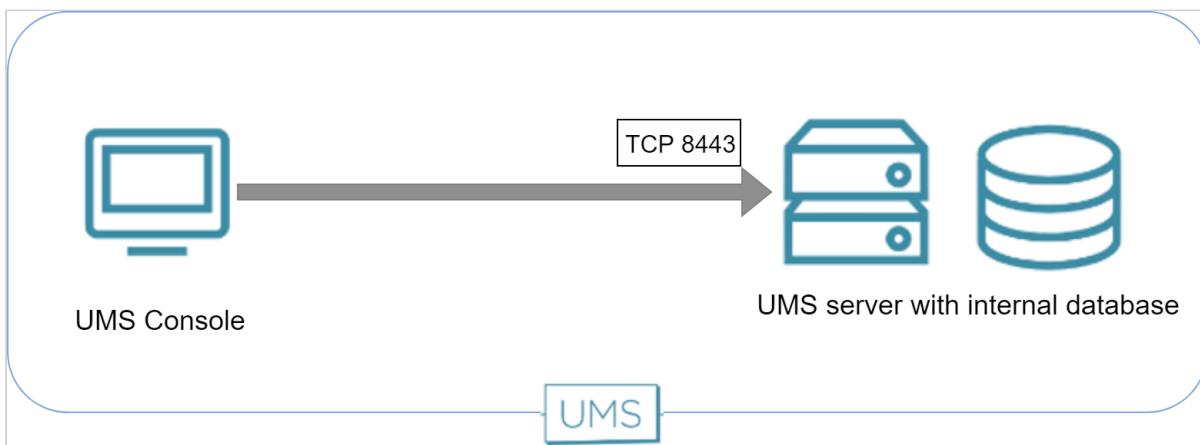


UMS with Internal Database

Communication between the UMS Console and the UMS server happens via HTTPS. By default, the UMS server listens for requests on TCP port 8443. The port can be changed in the UMS Administrator under **Settings > GUI server port**.

The port used by the UMS for internal TCP requests to the embedded database can be changed in the UMS Administrator under **Settings > Database Port (Embedded DB)**. The default port is 1528.

The following figure illustrates the communication between the UMS components:



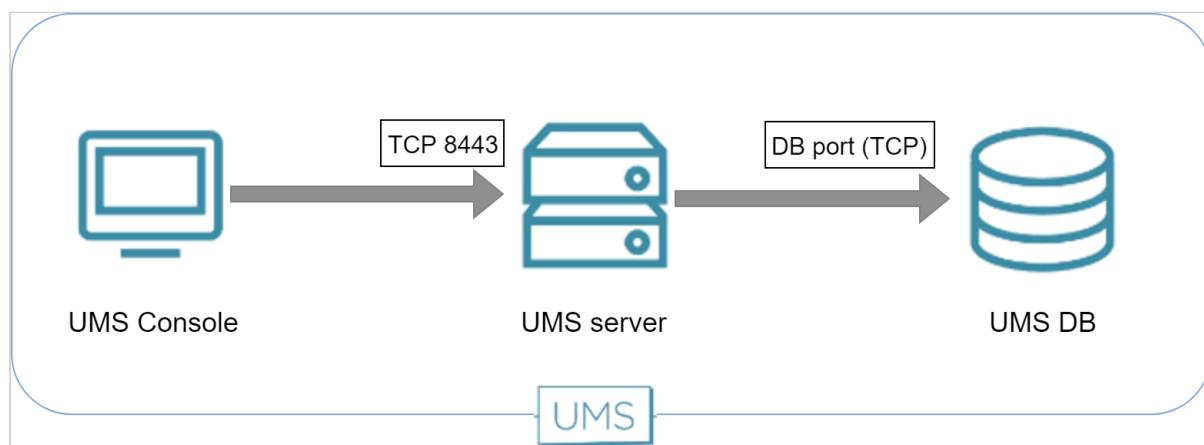
UMS with External Database

Communication between the UMS Console and the UMS server happens via HTTPS. By default, the UMS server listens to TCP requests on port 8443. The port can be changed in the UMS Administrator under **Settings > GUI server port**.

The ports used by the UMS for TCP requests to the database are defined as follows:

Database Type	Database Port (default)	Configuration
Apache Derby (Derby Network Server)	1527	(UMS Administrator) Datasource > Add... > [as DB-Type, select Derby] > Port
MS SQL Server	1433	(UMS Administrator) Datasource > Add... > [as DB-Type, select SQL Server] > Port
Oracle	1521	(UMS Administrator) Datasource > Add... > [as DB-Type, select Oracle] > Port
PostgreSQL	5432	(UMS Administrator) Datasource > Add... > [as DB-Type, select PostgreSQL] > Port

The following figure illustrates the communication between the UMS components:

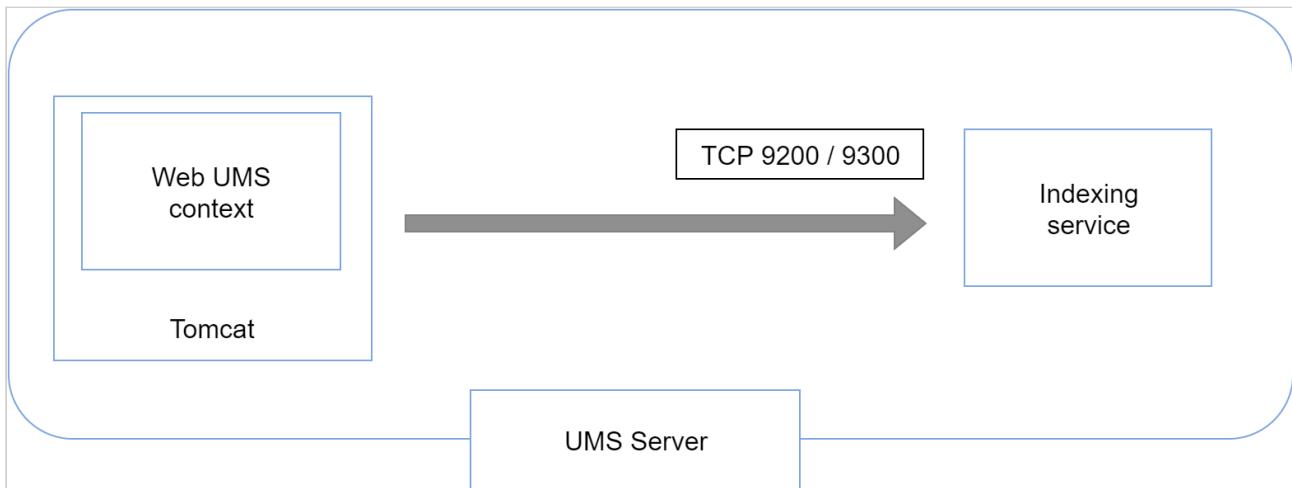




Indexing for UMS Web App Search

The indexing service that is used by the search function of the UMS Web App is listening on ports 9200 and 9300. The Web UMS context reads and writes data via these ports. The ports are open internally, but cannot be reached from outside the UMS Server.

The following figure illustrates the communication within the UMS Server:

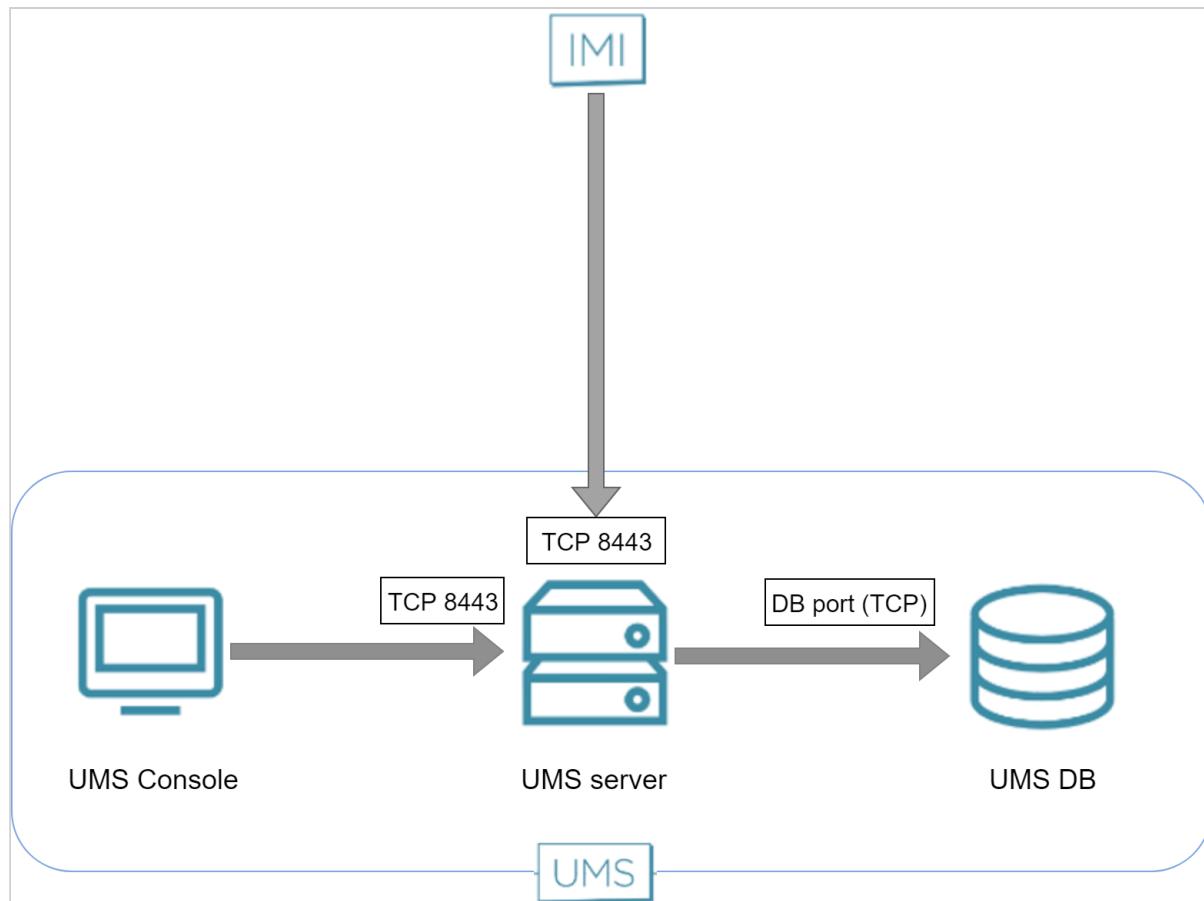




IGEL Management Interface (IMI)

The REST API provided by the IGEL Management Interface is served via HTTP on port 8443 (TCP).

The following figure illustrates the communication with the UMS server via IMI:





UMS and Devices: Settings and Control

- [Devices and UMS Server Contacting Each Other via ICG\(see page 18\)](#)
- [Devices Contacting UMS\(see page 21\)](#)
- [UMS Contacting Devices\(see page 23\)](#)



Devices and UMS Server Contacting Each Other via ICG

To communicate with the UMS, the devices initiate a TCP connection to the ICG.

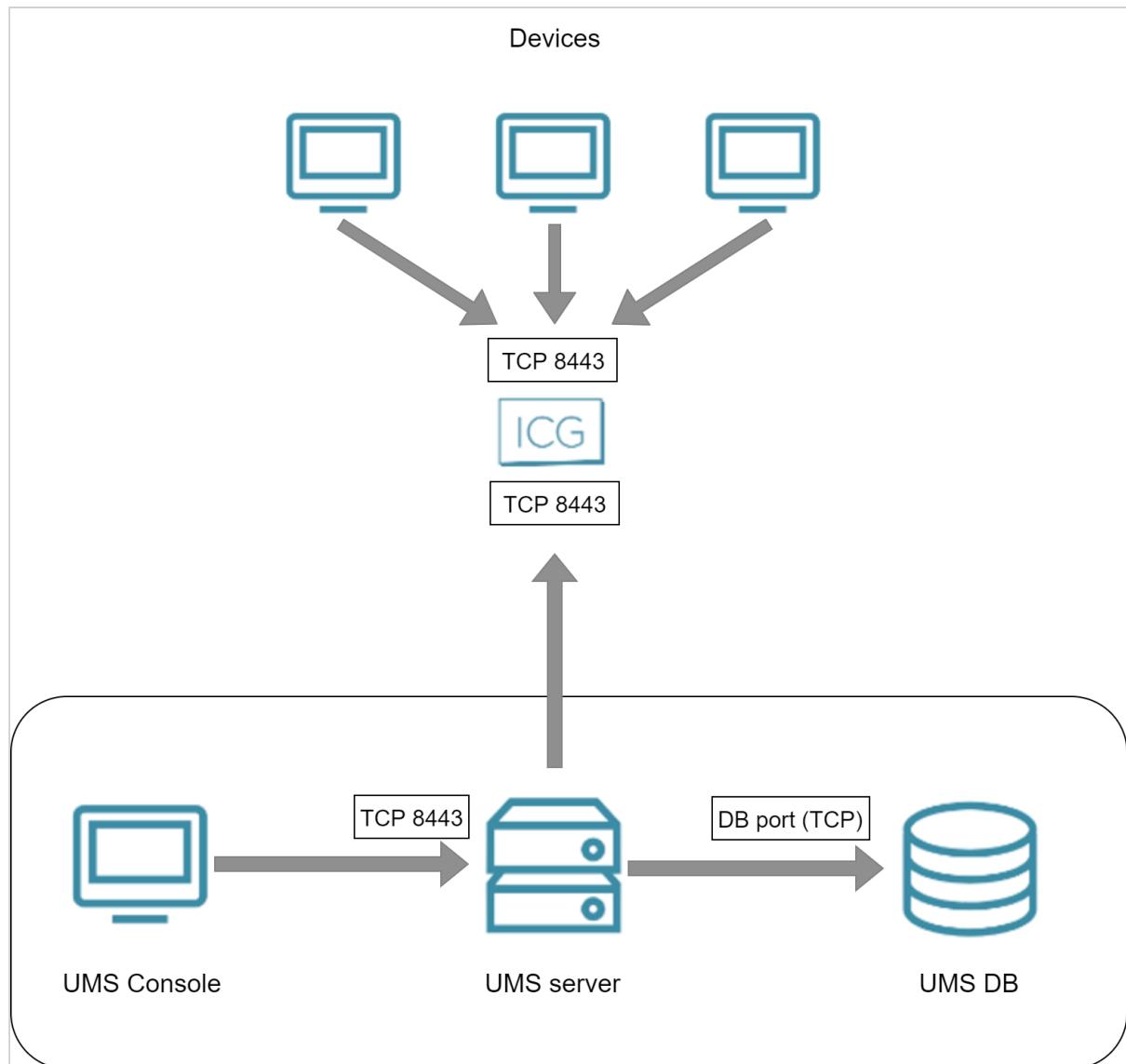
To communicate with the devices, the UMS initiates a TCP connection to the ICG.

The default port on which the ICG is listening is port 8443. It can be changed during the installation of the ICG. With ICG 2.02 or higher, a privileged port can be used, e.g. port 443. When the installation is completed, the port is fixed.

- ⚠ With ICG version 2.x or 12.01.x and UMS version 6.x or 12.01.x, it is not possible to inspect the TLS traffic between any of the components. The inspection would break TLS and interrupt communication between the products.
As of UMS version 12.02, you can inspect the TLS traffic, see [IGEL UMS Configuration for the External Load Balancer / Reverse Proxy: Example for NGINX with SSL Offloading](#)(see page 145).

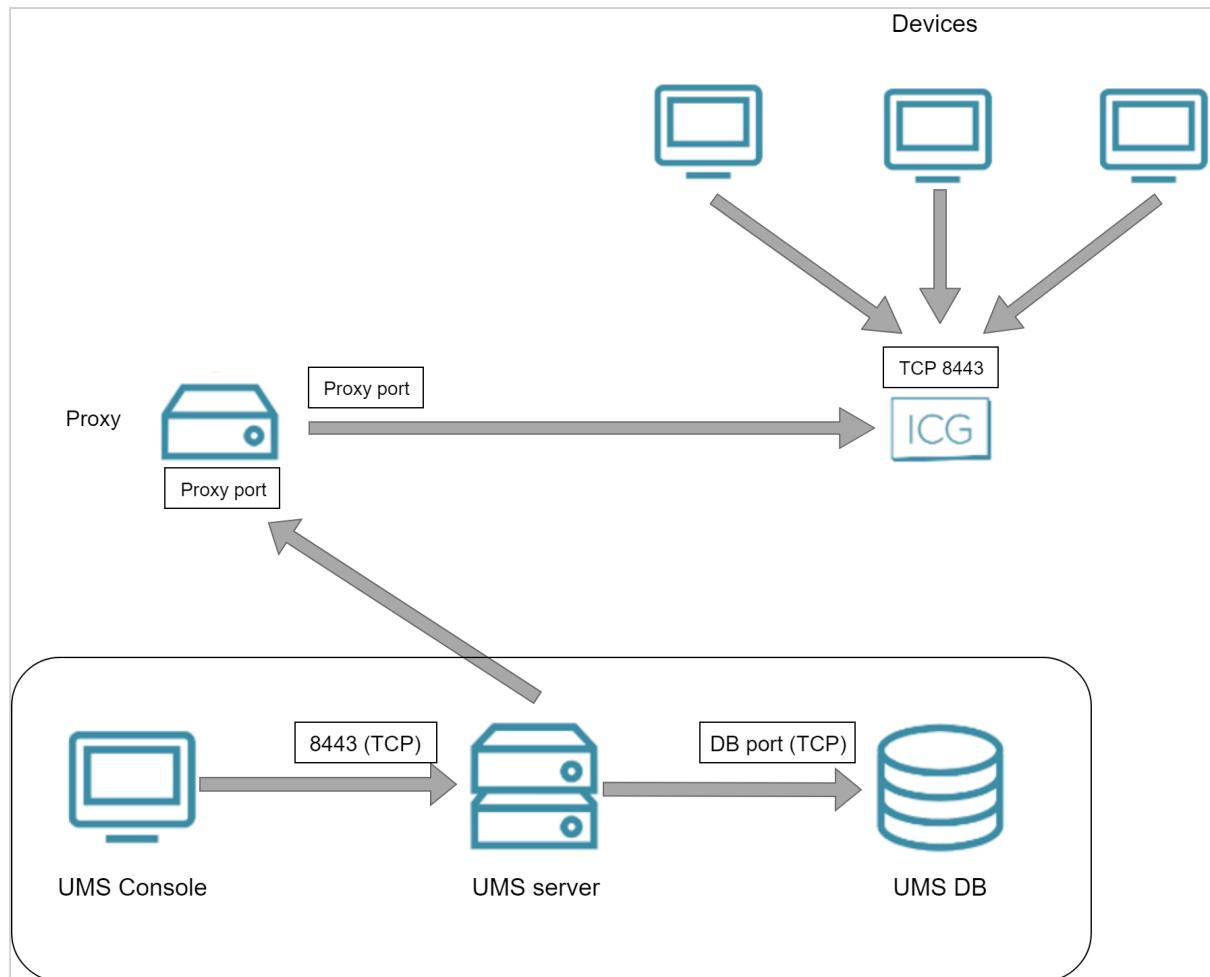
Direct Connection

The following figure illustrates the communication between the devices (thin clients) and the UMS via ICG:



Via Proxy

The following figure illustrates the communication between the devices (thin clients) and the UMS via ICG and a proxy:

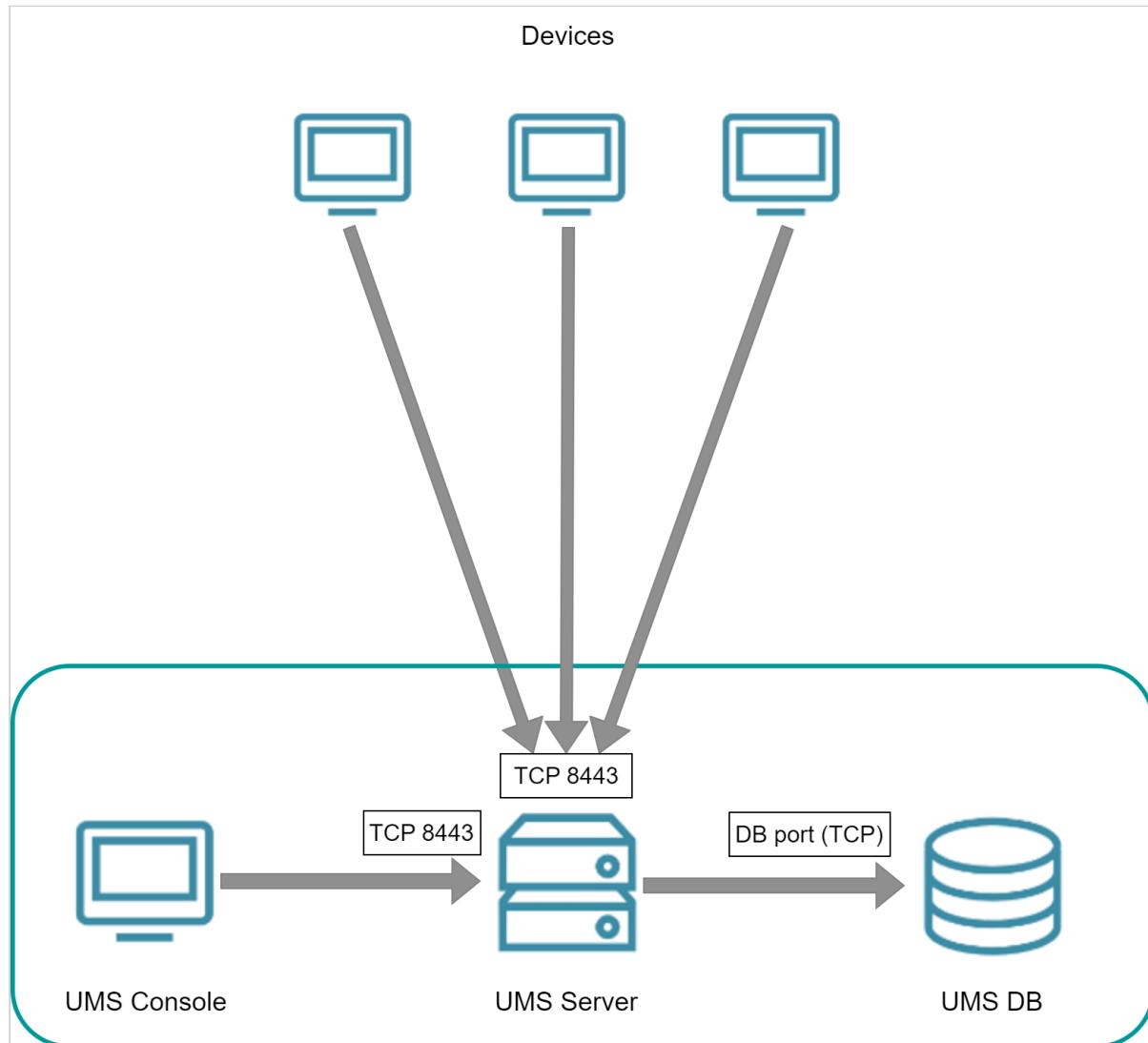


Devices Contacting UMS

The following figures illustrate the communication between the endpoint devices and the UMS.

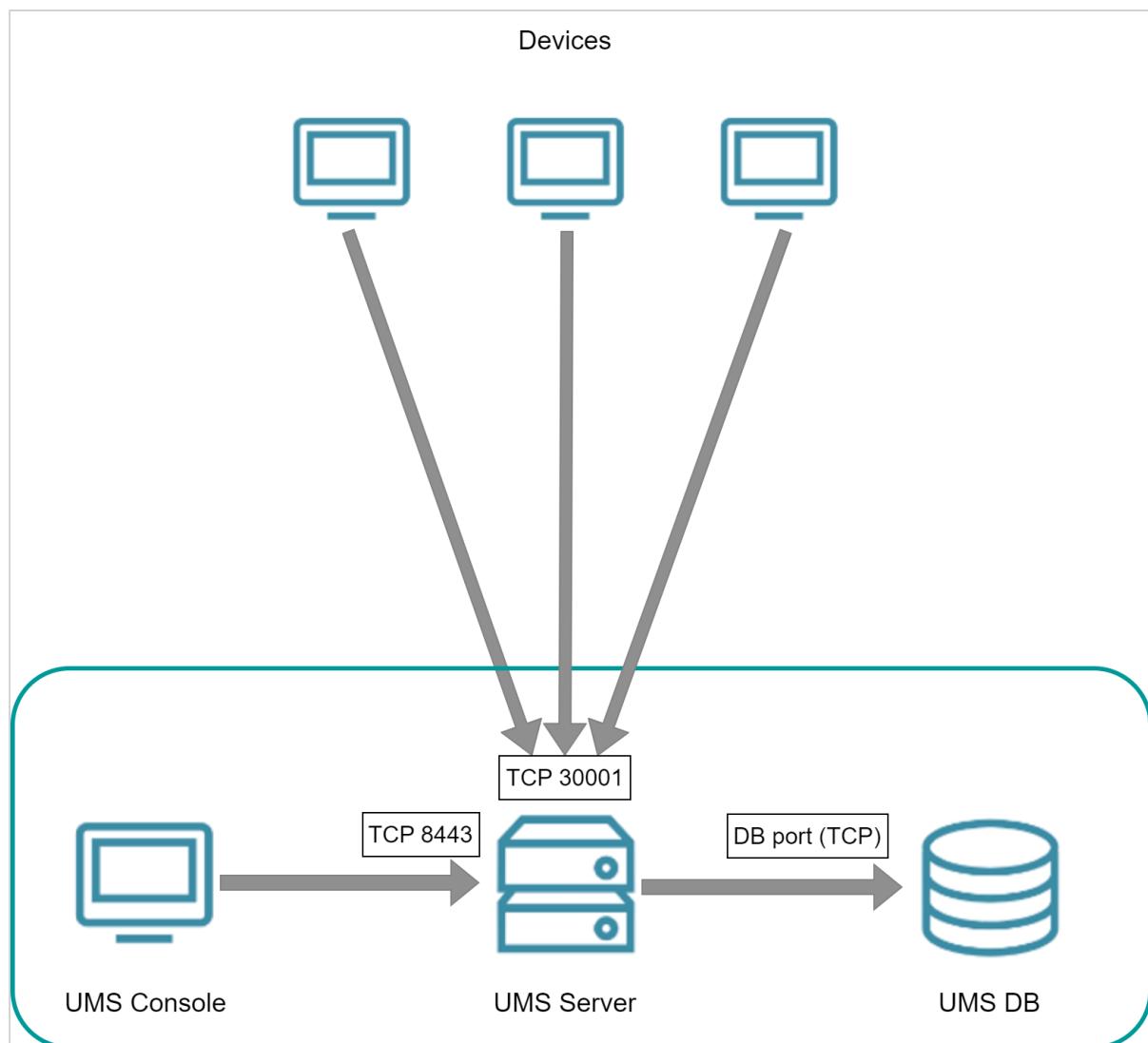
IGEL OS 12

To communicate with the UMS, the devices initiate a TCP connection to the UMS Server using port 8443.



IGEL OS 11 or Earlier

To communicate with the UMS, the devices initiate a TCP connection to the UMS Server using port 30001.





UMS Contacting Devices

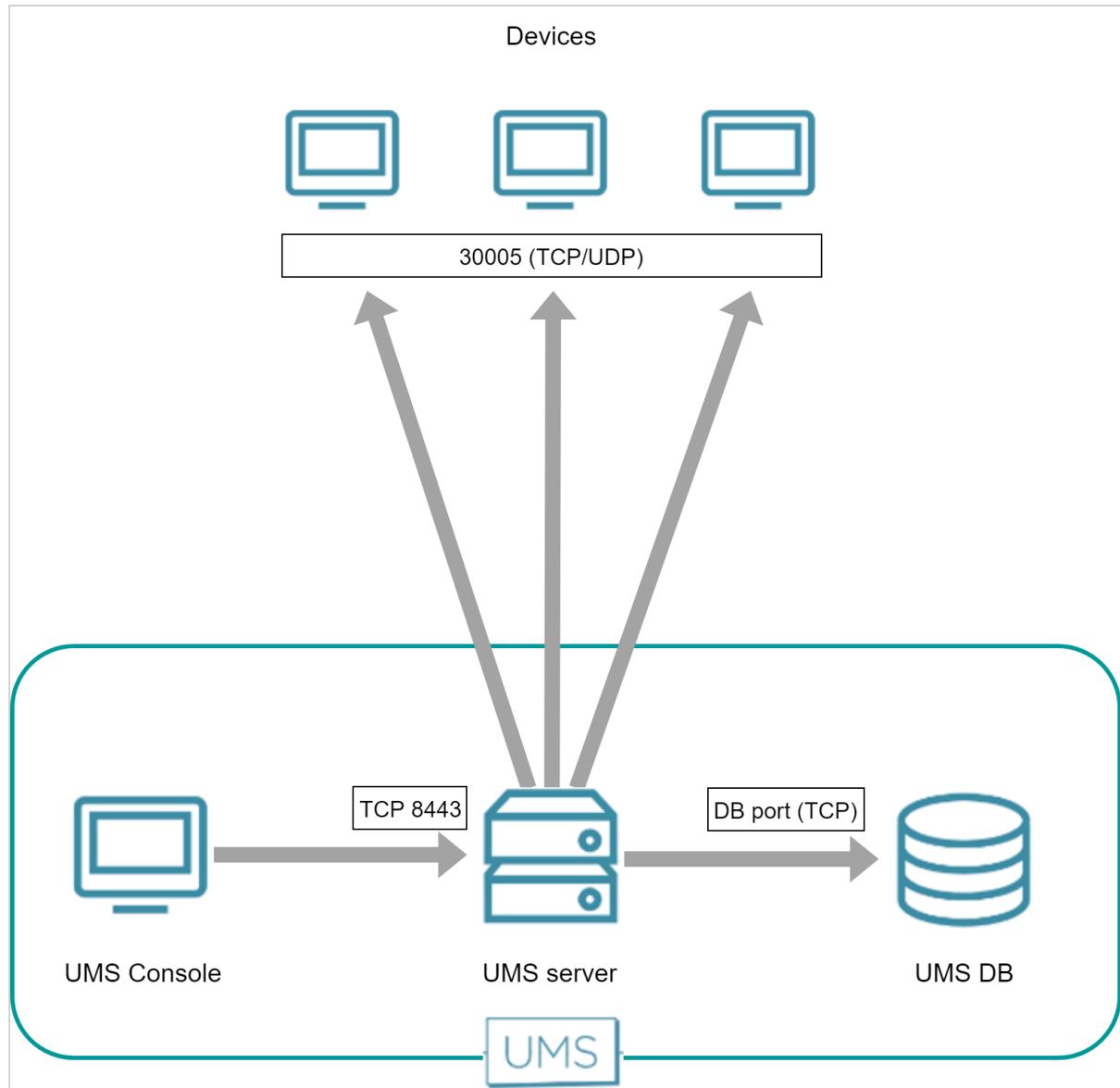
IGEL OS 12

For IGEL OS 12 devices, no additional channel is opened. An existing WebSocket (TCP 8443) is used.

IGEL OS 11 or Earlier

To communicate with IGEL OS 11 devices, the UMS initiates a TCP connection to the device's UMS agent using port 30005.

The following figure illustrates the communication between the UMS and the devices:





UMS and Devices: Shadowing

IGEL OS 12

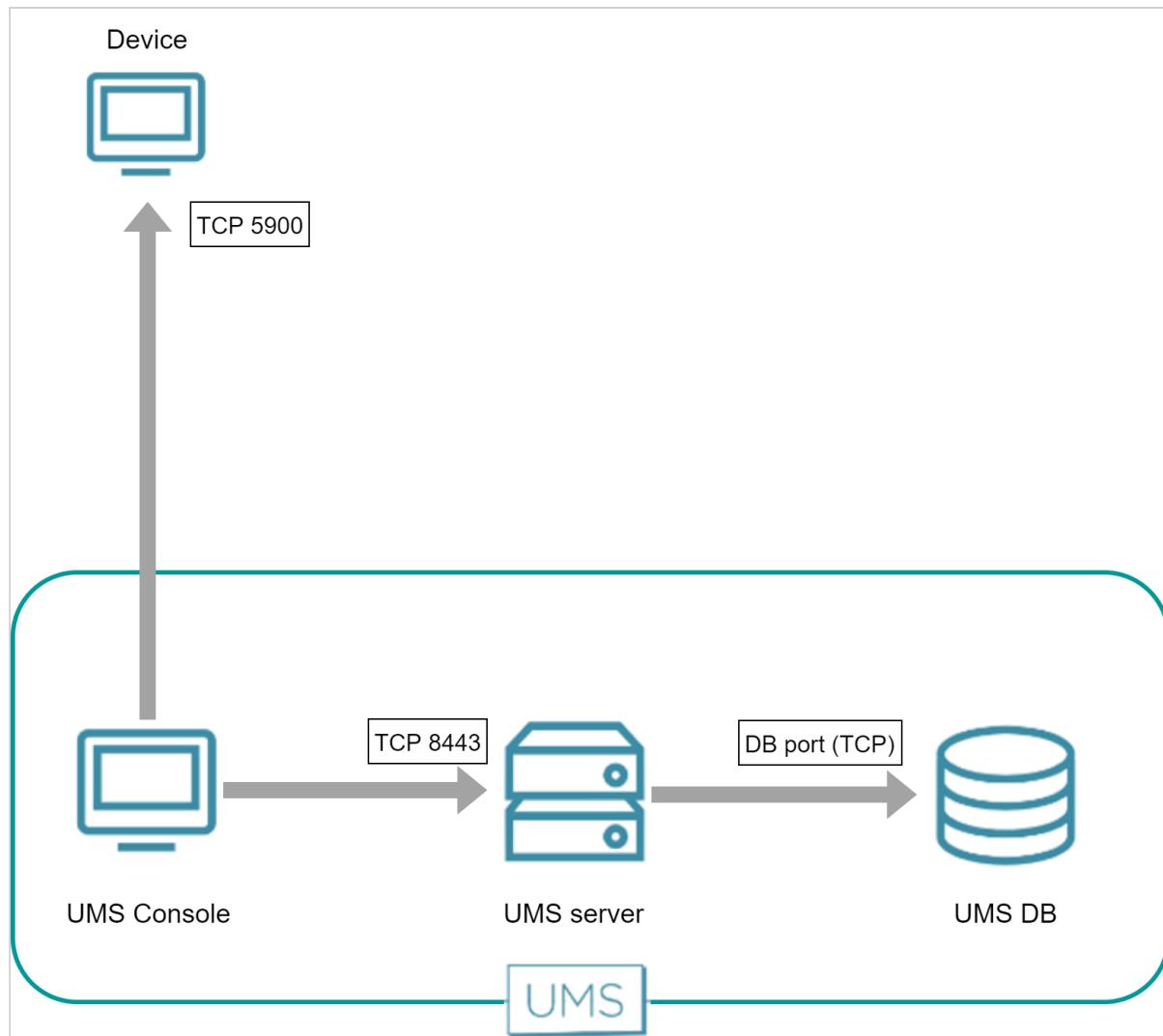
Shadowing of IGEL OS 12 devices is always secure, i.e. via the Unified Protocol. The communication is always encrypted. See [UMS and Devices: Secure Shadowing](#)(see page 28).

IGEL OS 11 or Earlier

UMS Console

The UMS Console initiates a VNC session with the device. The standard port is 5900 (TCP); the port can be changed per session.

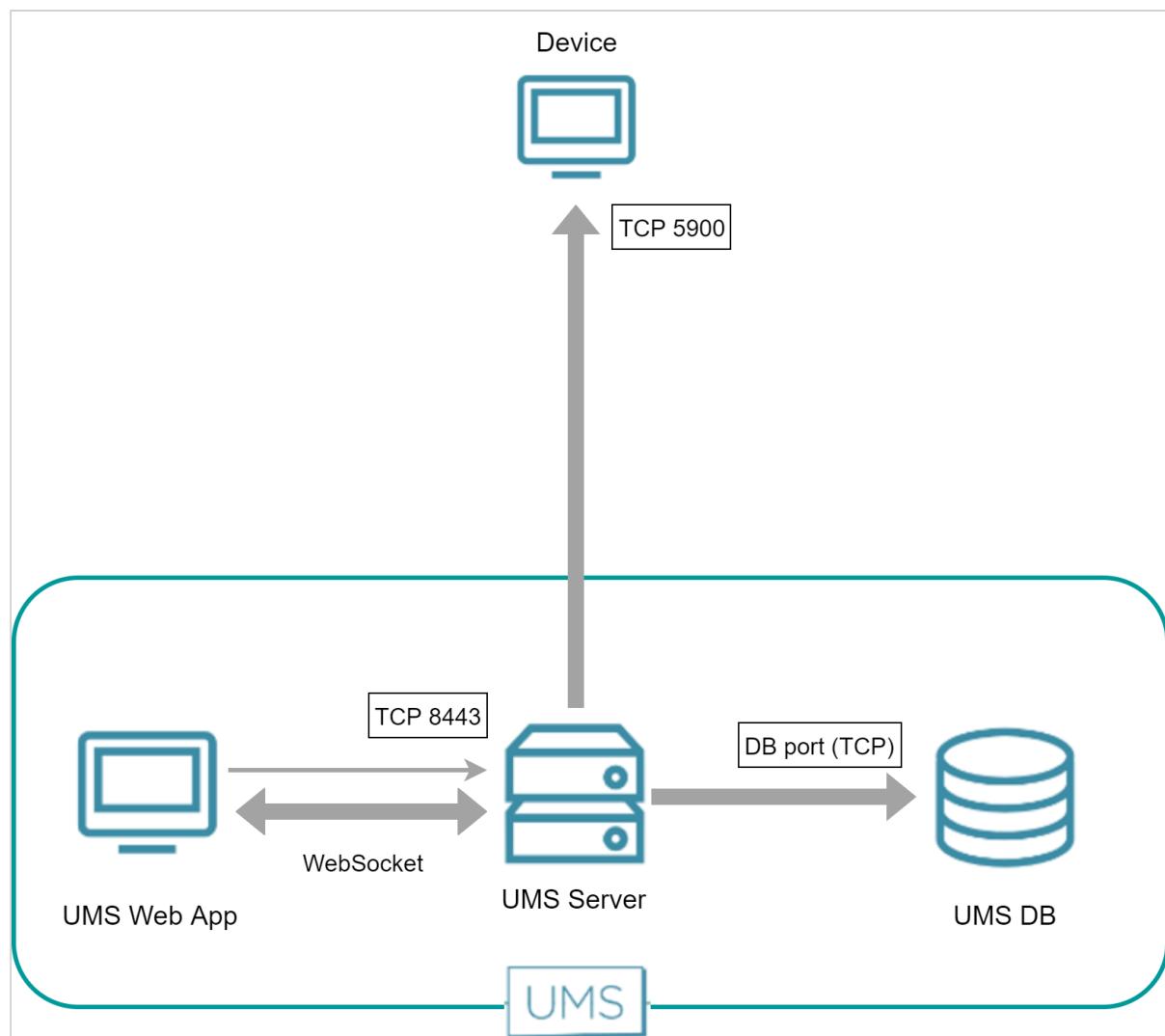
The following figure illustrates the communication between the UMS Console and a device:



UMS Web App

The UMS Web App requests the UMS Server to initiate a VNC session for shadowing. The VNC session is routed through the UMS Server; between the UMS Web App and the UMS Server, the data is transferred via WebSocket. The default port for the communication between the UMS Server and the devices is 5900 (TCP).

The following figure illustrates the communication between the UMS Web App, the UMS Server, and a device:





UMS and Devices: Secure Shadowing

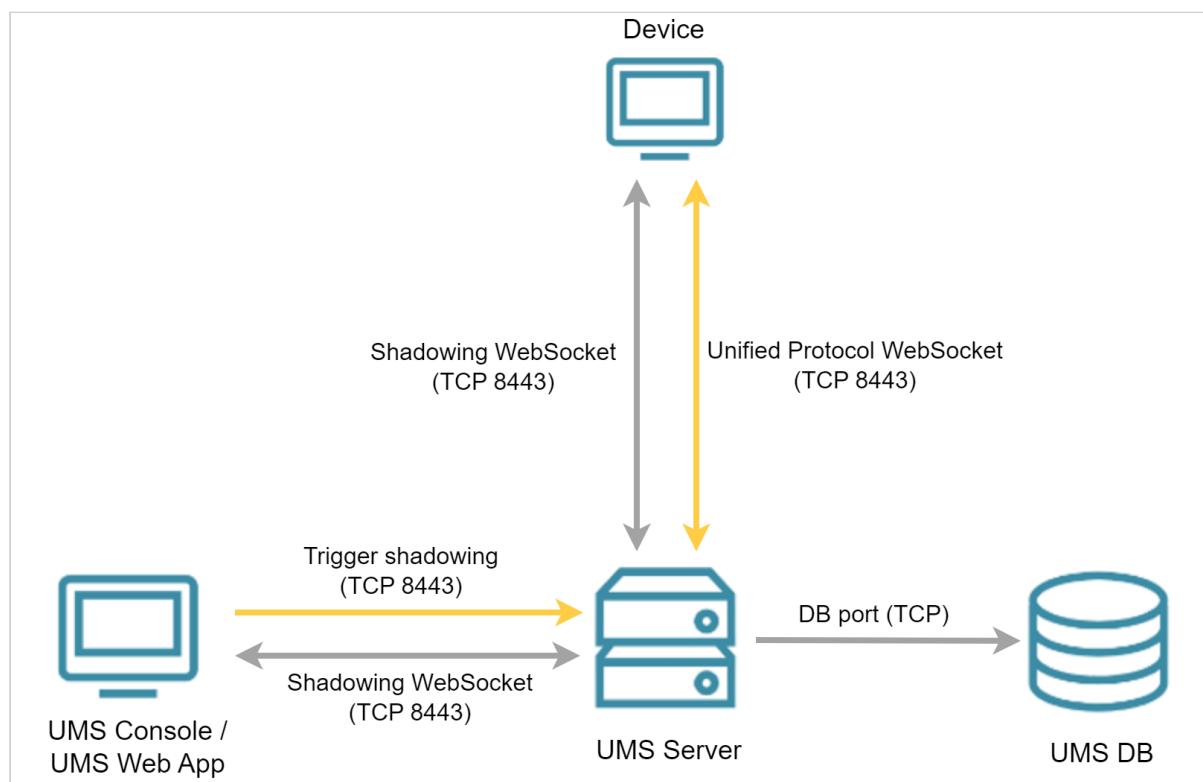
The following figures illustrate the communication between the UMS Console / UMS Web App, the VNC viewer, the UMS Server and the device.

IGEL OS 12

Shadowing of IGEL OS 12 devices is always secure, i.e. via the Unified Protocol. The communication is always encrypted.

Direct Connection - UMS Console (Internal / External VNC Viewer) and UMS Web App

The UMS Console / UMS Web App requests the UMS Server to initiate a VNC session for shadowing. The UMS Server requests the device to open the Shadowing WebSocket tunnel via the Unified Protocol WebSocket. Both the UMS Console / UMS Web App and the device open the WebSockets to the UMS Server, and now the VNC data can be sent through these WebSockets.

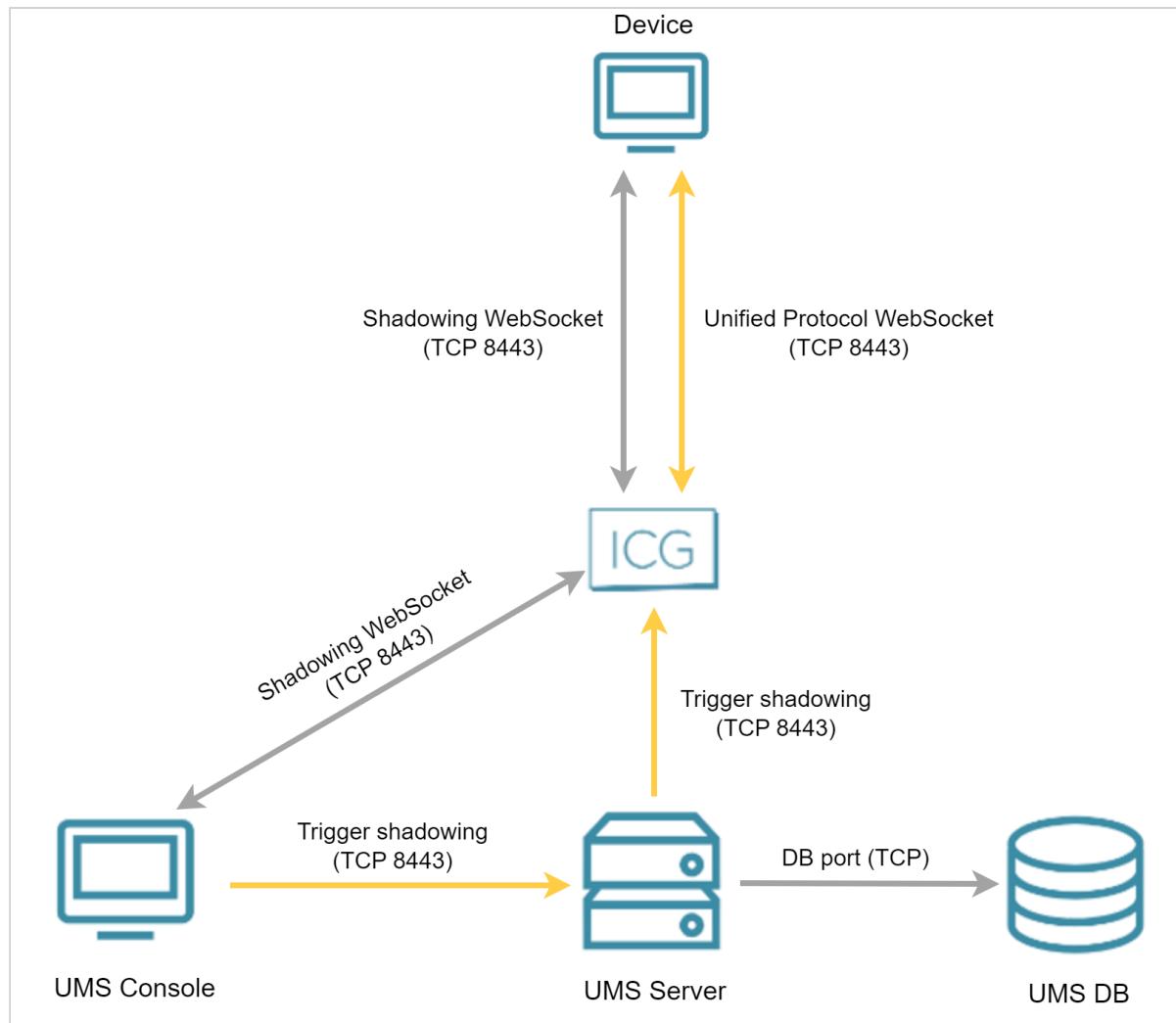


Over ICG - UMS Console (Internal / External VNC Viewer)

The UMS Console requests the UMS Server to initiate a VNC session for shadowing. The UMS Server requests the ICG and the ICG requests the device to open the Shadowing WebSocket tunnel via the Unified Protocol WebSocket.

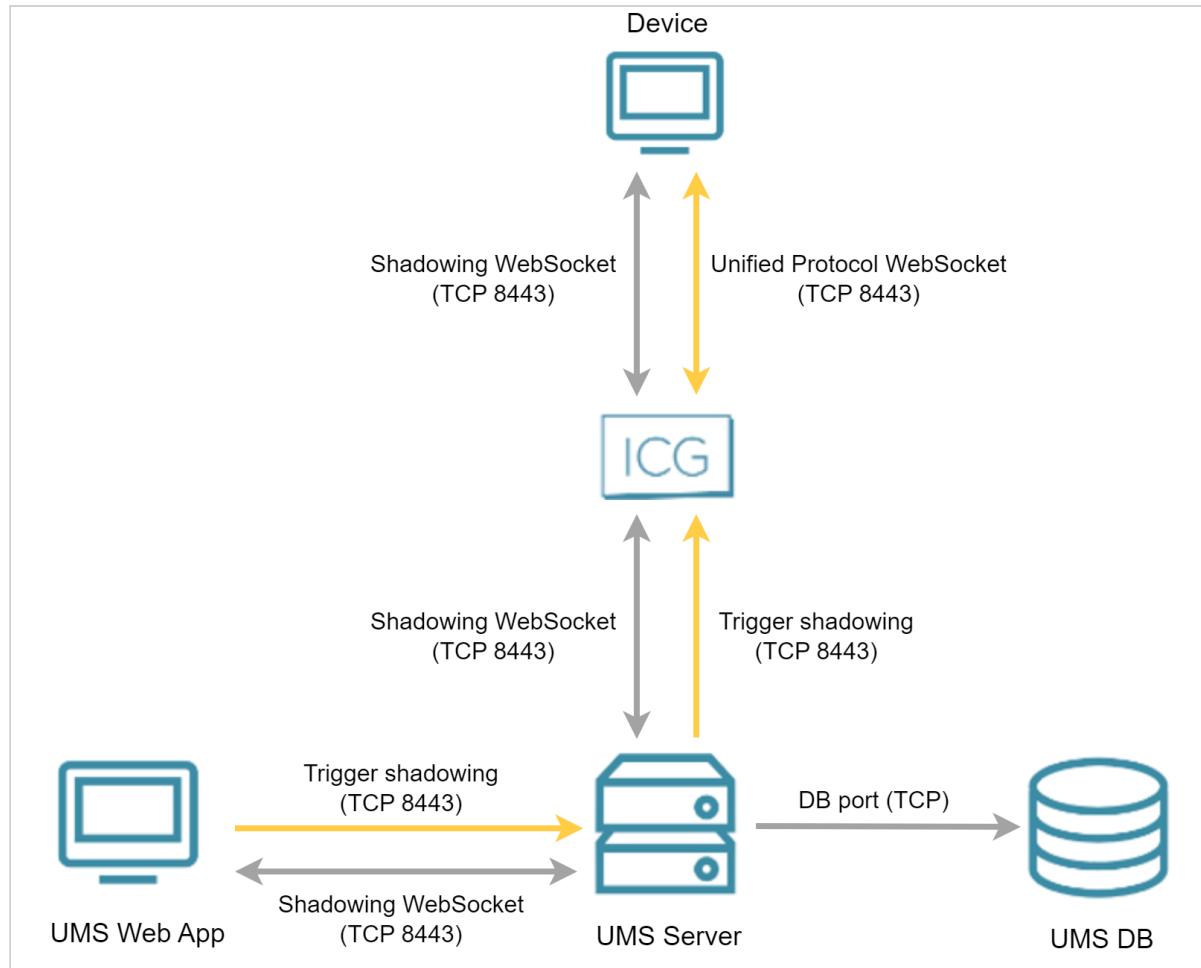


Both the UMS Console and the device open the WebSockets to the ICG, and now the VNC data can be sent through these WebSockets.



Over ICG - UMS Web App

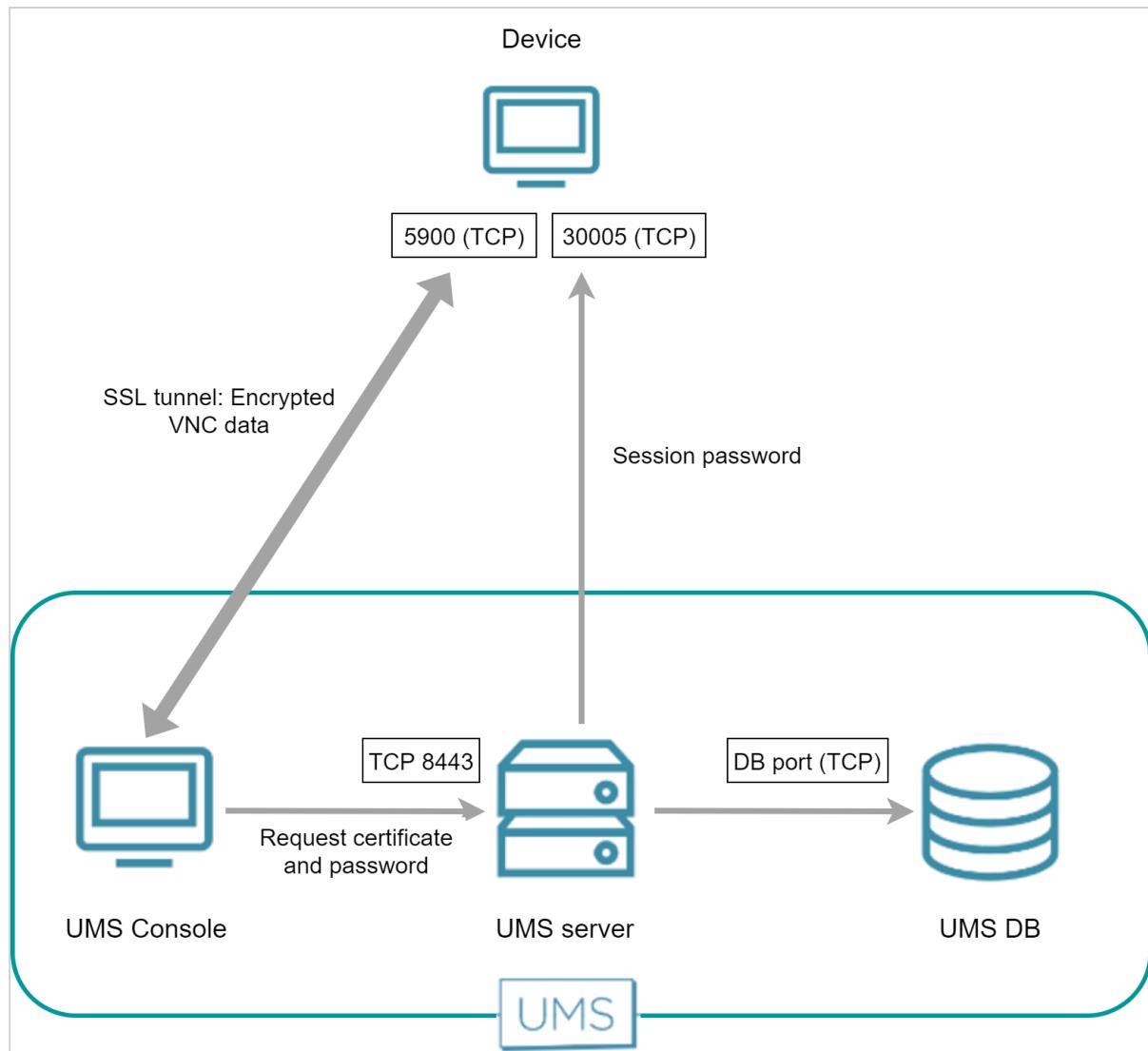
The UMS Web App requests the UMS Server to initiate a VNC session for shadowing. The UMS Server requests the ICG and the ICG requests the device to open the Shadowing WebSocket tunnel via the Unified Protocol WebSocket. The device opens the Shadowing WebSocket to the ICG. The UMS Web App opens the Shadowing WebSocket to the UMS Server, and the UMS Server opens the Shadowing WebSocket to the ICG. Now, the VNC data can be sent through these WebSockets.



IGEL OS 11 or Earlier

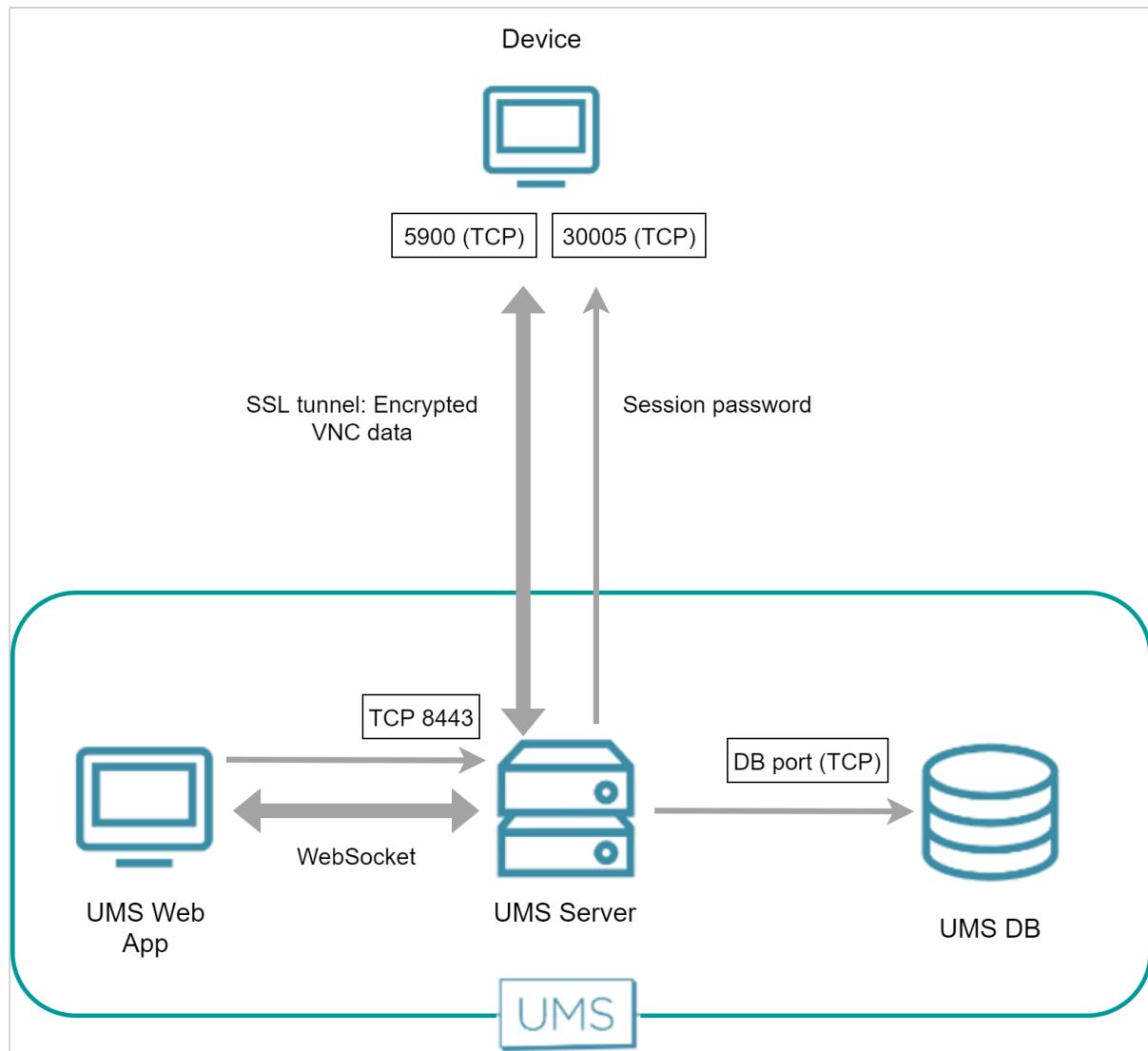
Direct Connection - Internal VNC Viewer

The UMS Console requests the device's certificate and the session password from the UMS Server. The UMS Console then establishes an SSL tunnel with the device using the session password. The device sends the certificate to the UMS Console; the UMS Console checks the certificate against the certificate it has received from the UMS Server. In return, the UMS Console sends the session password to the device. After that, the SSL tunnel between the UMS Console and device is established and can be used for exchanging VNC data.



Direct Connection - UMS Web App

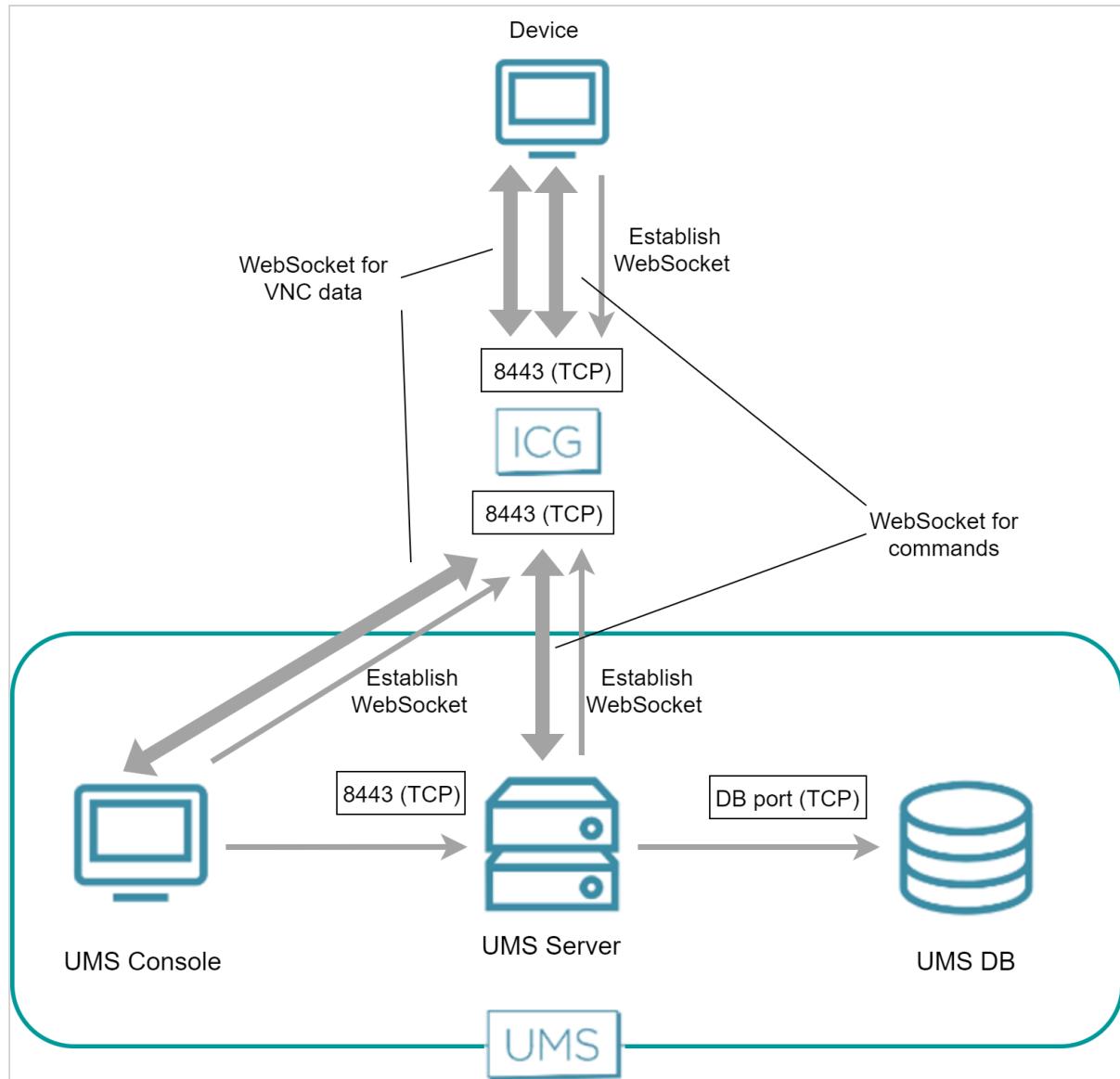
The UMS Web App requests the UMS Server to initiate a VNC session for shadowing. The UMS Server establishes an SSL tunnel with the device using a session password and the device's certificate. The UMS Web App and the UMS Server communicate via WebSocket, which also carries the VNC data.



Over ICG - Internal VNC Viewer

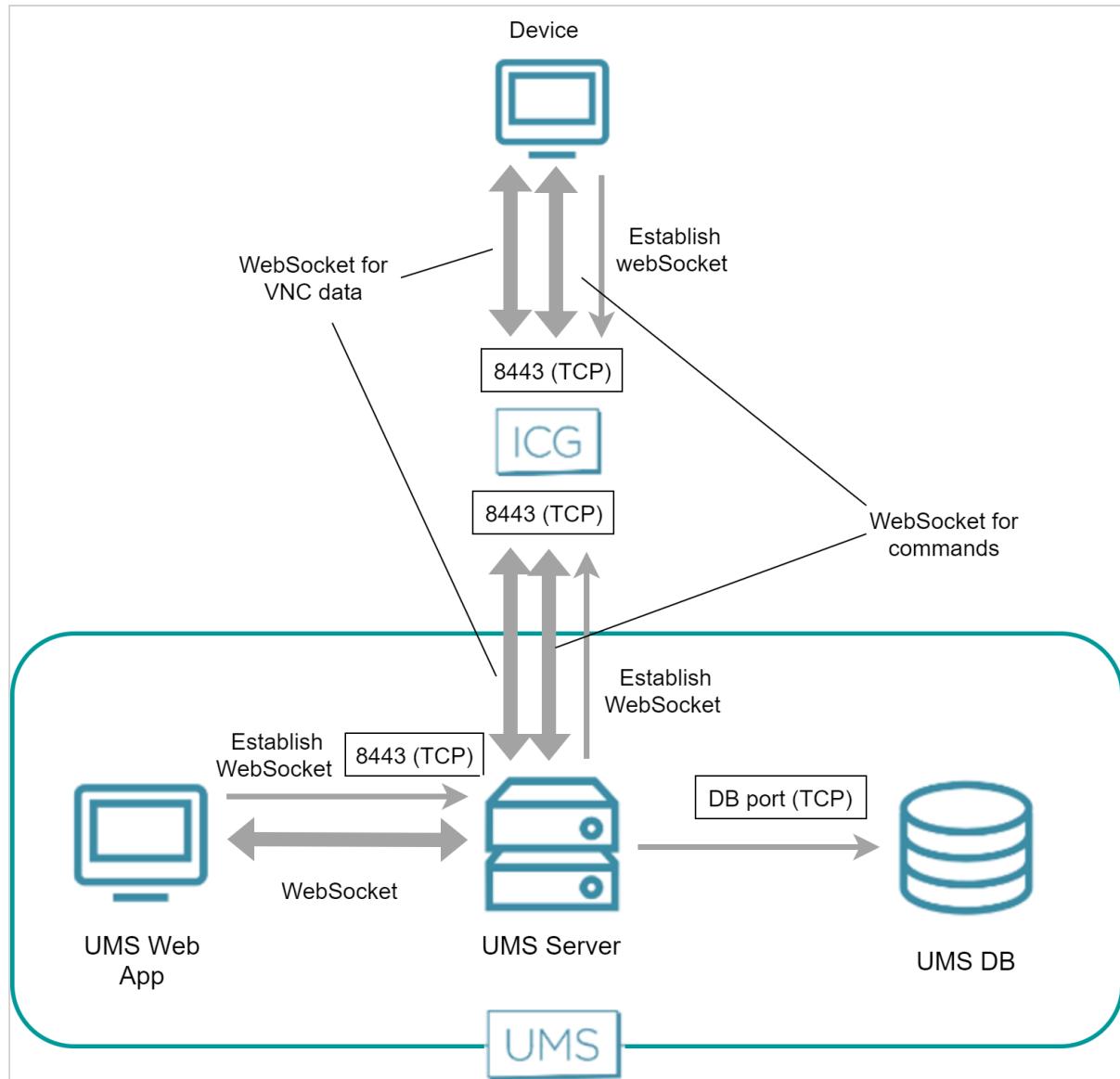
Both the UMS Server and the device have established a WebSocket connection to the ICG; this WebSocket is used for commands from the UMS and messages from the device.

The UMS Console and the device establish a dedicated WebSocket for secure shadowing with the ICG.



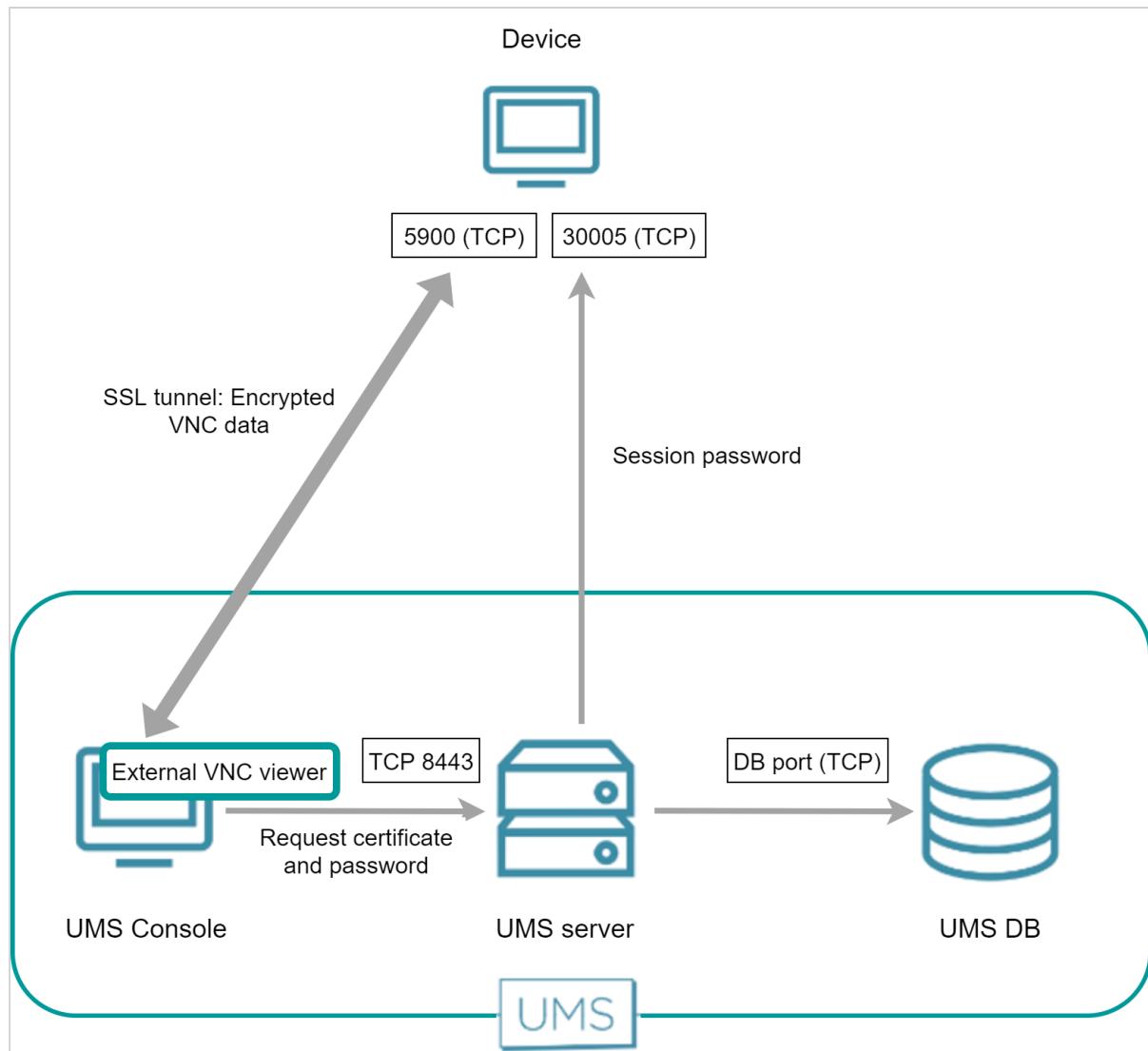
Over ICG - UMS Web App

The UMS Web App requests the UMS Server to initiate a VNC session for shadowing. The UMS Server creates an additional WebSocket connection for exchanging the VNC data. The UMS Web App and the UMS Server communicate via WebSocket, which also carries the VNC data.



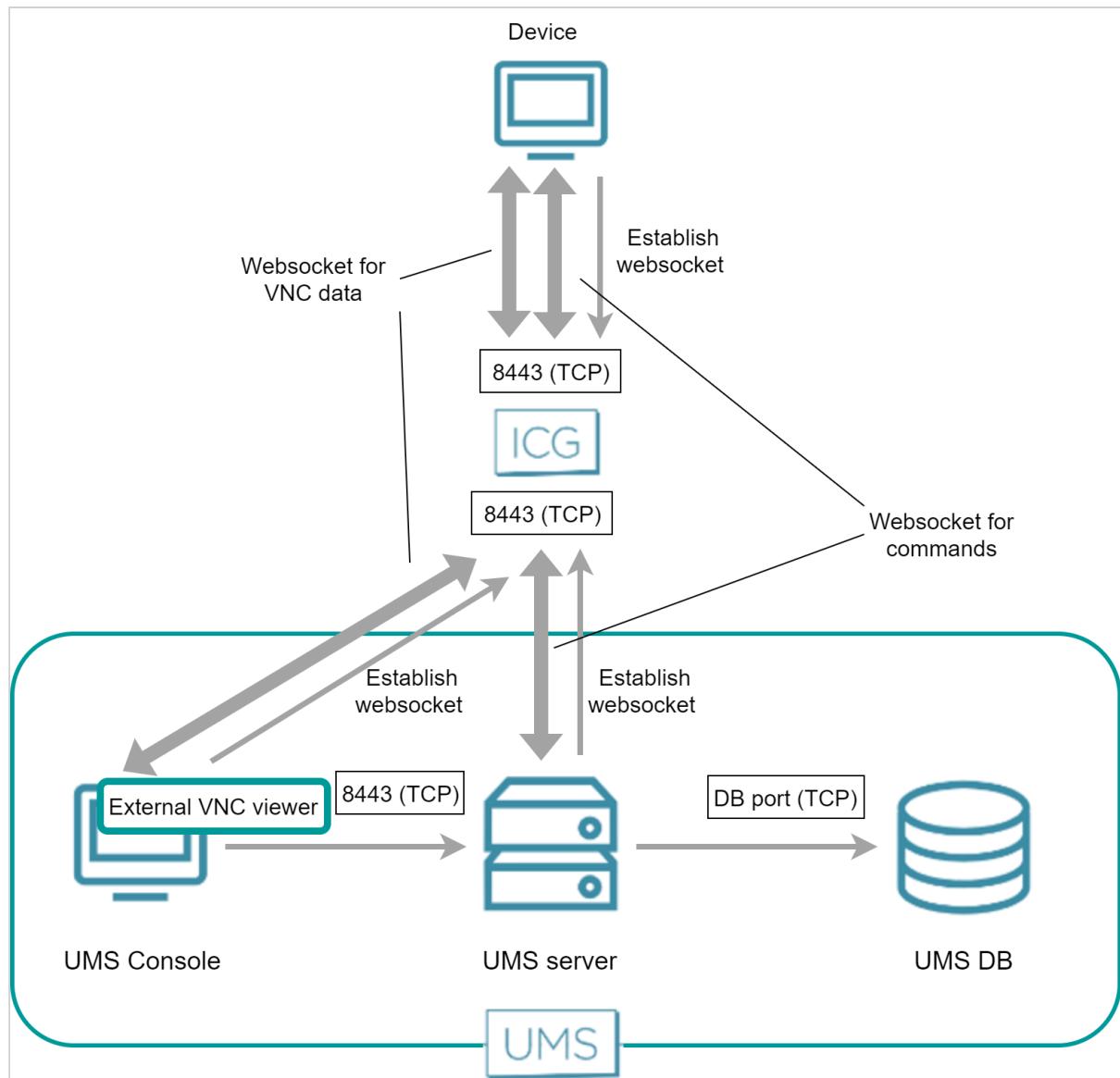
Direct Connection - External VNC Viewer

The external VNC viewer runs on the same machine as the UMS Console. The UMS Console starts the external viewer and then acts as a proxy between the device and the external VNC viewer.



Over ICG - External VNC Viewer

The external VNC viewer runs on the same machine as the UMS Console. The UMS Console starts the external viewer and then acts as a proxy between the ICG and the external VNC viewer.

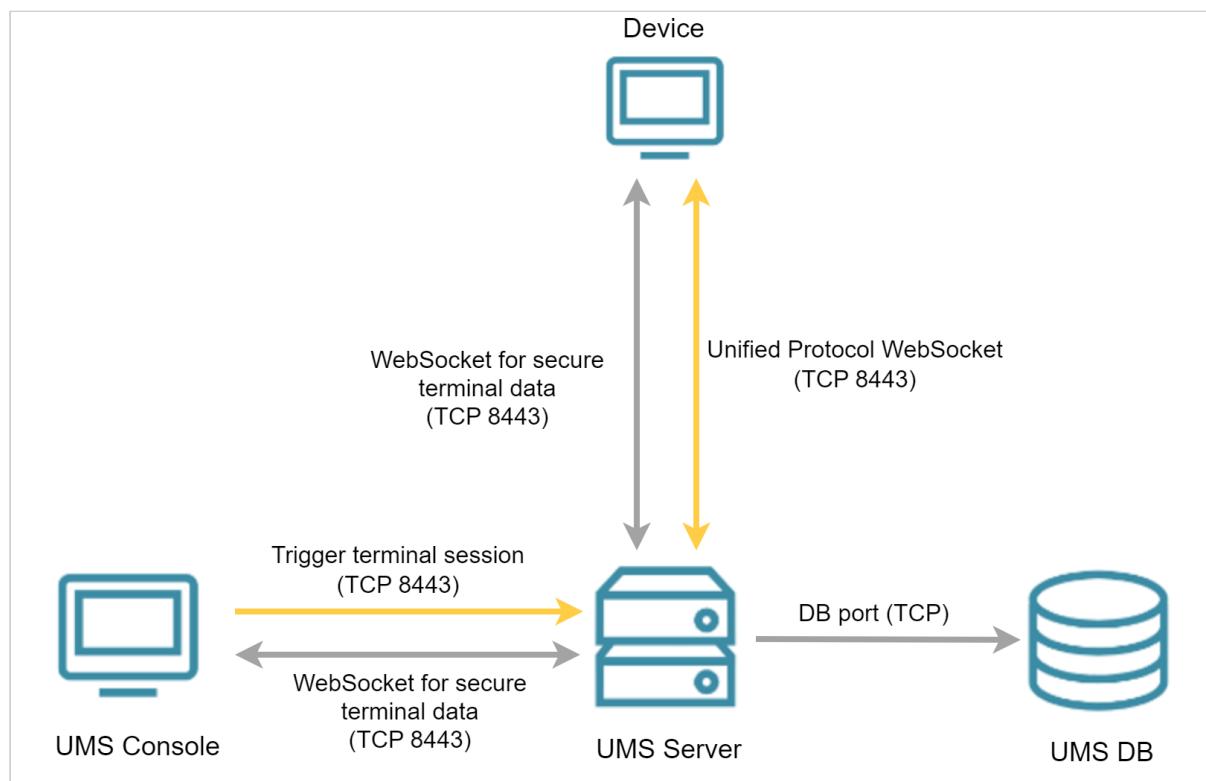


UMS and Devices: Secure Terminal

IGEL OS 12

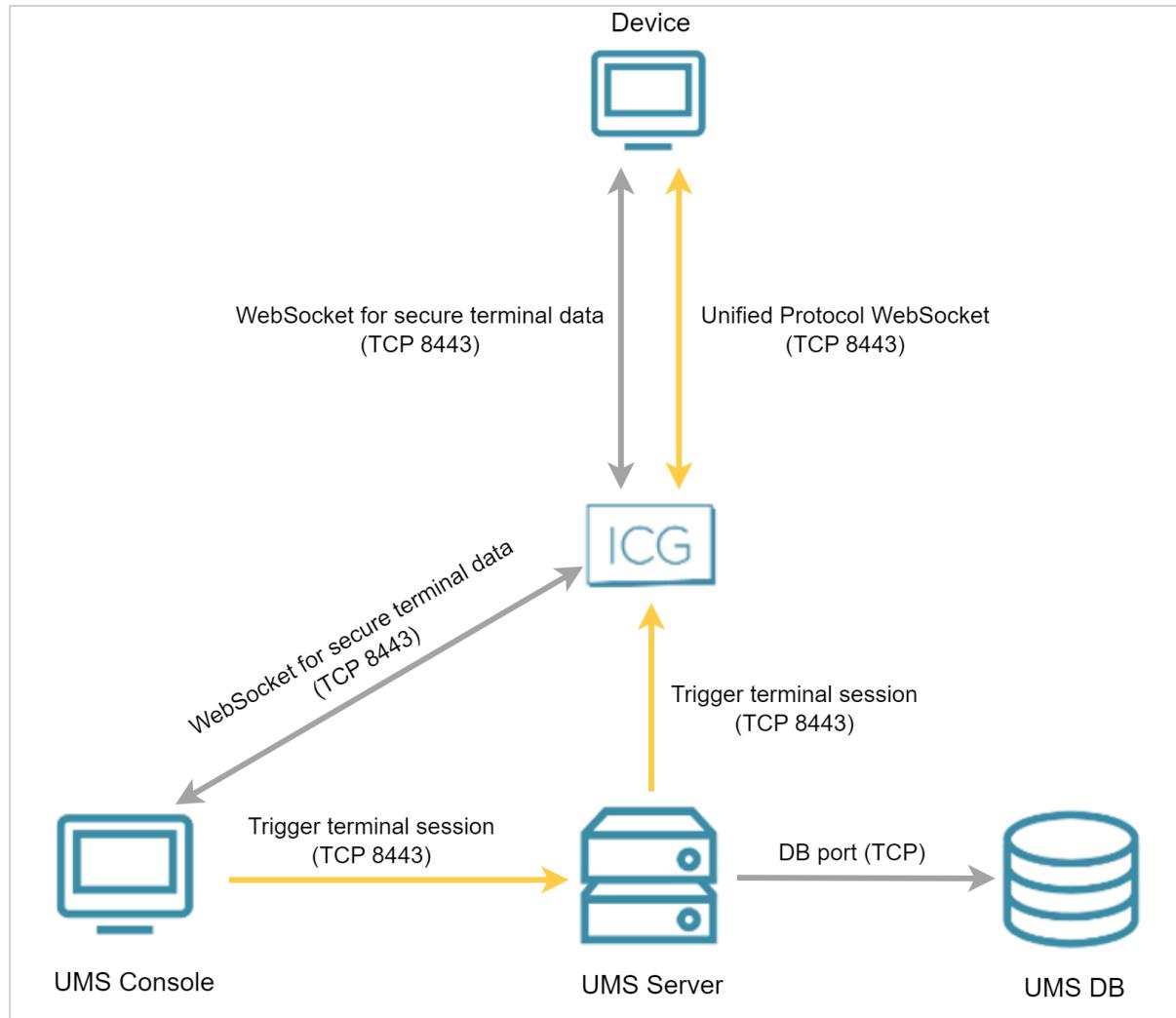
Direct Connection

The UMS Console requests the UMS Server to initiate a terminal session. The UMS Server requests the device to open the WebSocket tunnel for secure terminal data via the Unified Protocol WebSocket. Both the UMS Console and the device open the WebSockets to the UMS Server, and now the terminal data can be sent through these WebSockets.



Over ICG

The UMS Console requests the UMS Server to initiate a terminal session. The UMS Server requests the ICG and the ICG requests the device to open the WebSocket tunnel for secure terminal data via the Unified Protocol WebSocket. Both the UMS Console and the device open the WebSockets to the ICG, and now the terminal data can be sent through these WebSockets.

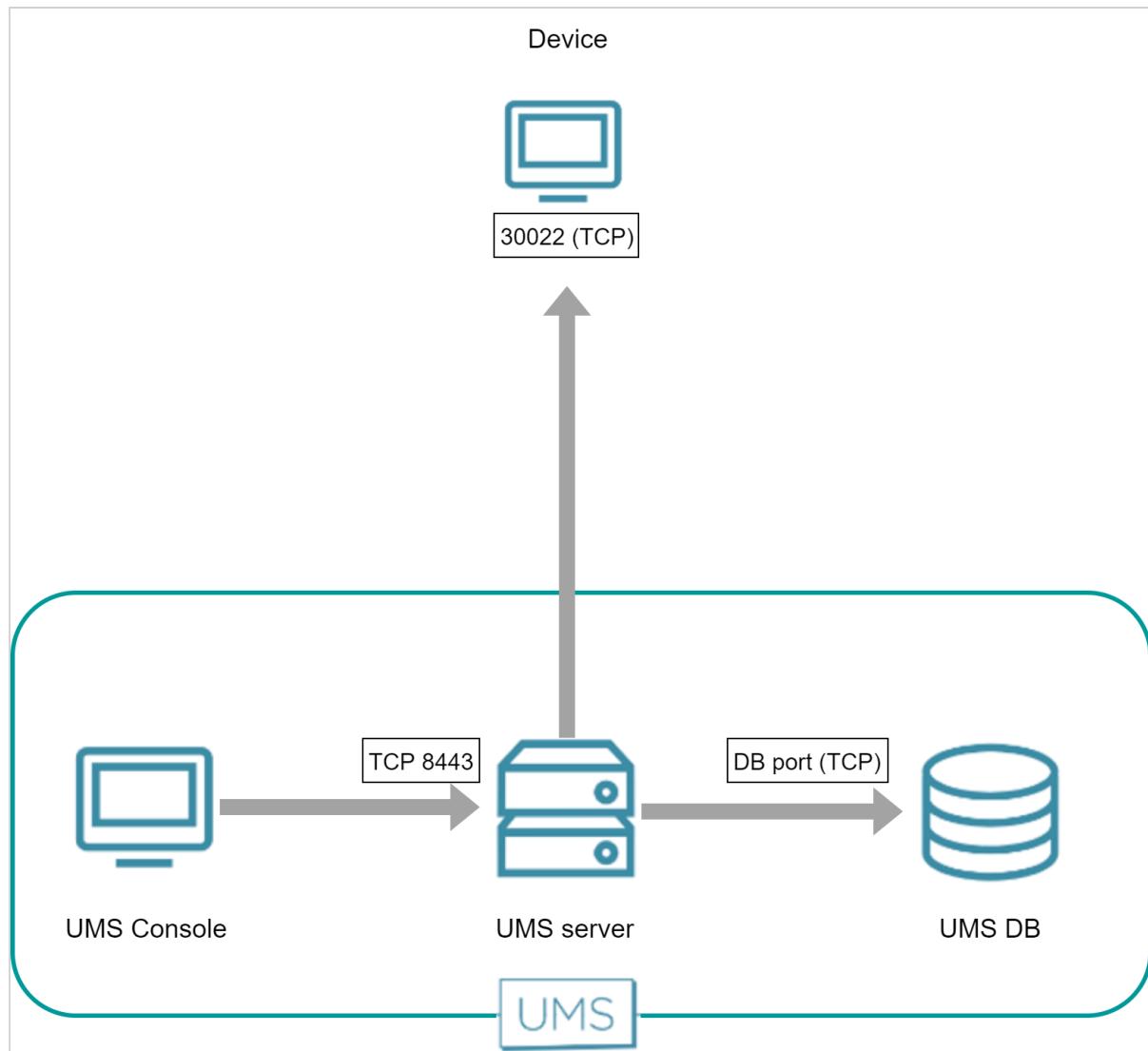


IGEL OS 11 or Earlier

Direct Connection

The UMS Console establishes a connection to the UMS Server. The UMS Server then establishes a TLS tunnel to the device.

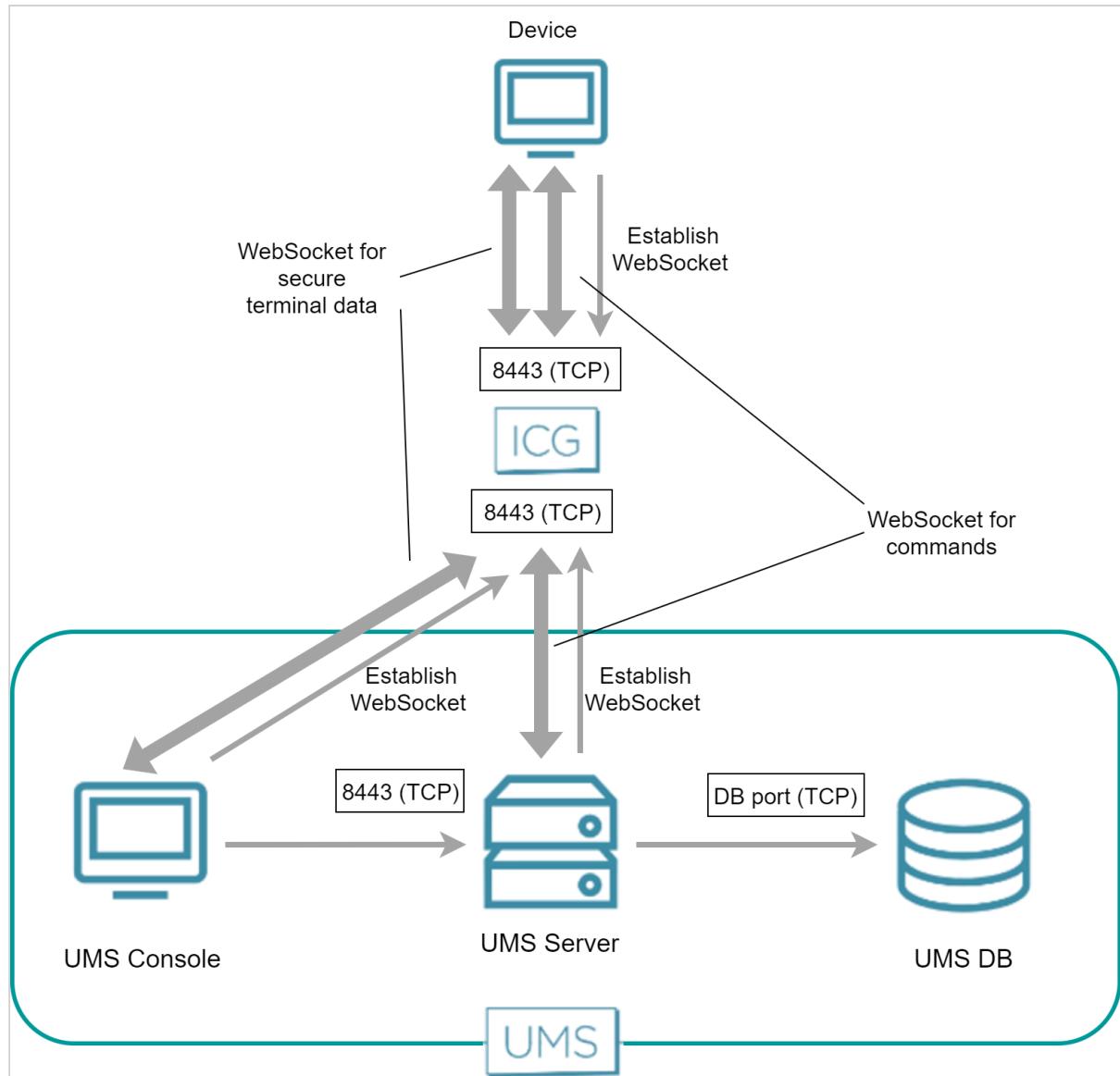
The following figure illustrates the communication between the UMS Console, the UMS Server and a device:



Over ICG

Both the UMS Server and the device have established a WebSocket connection to the ICG; this WebSocket is used for commands from the UMS and messages from the device.

The UMS Console and the device establish a dedicated WebSocket for the secure terminal with the ICG.





UMS and Devices: File Transfer

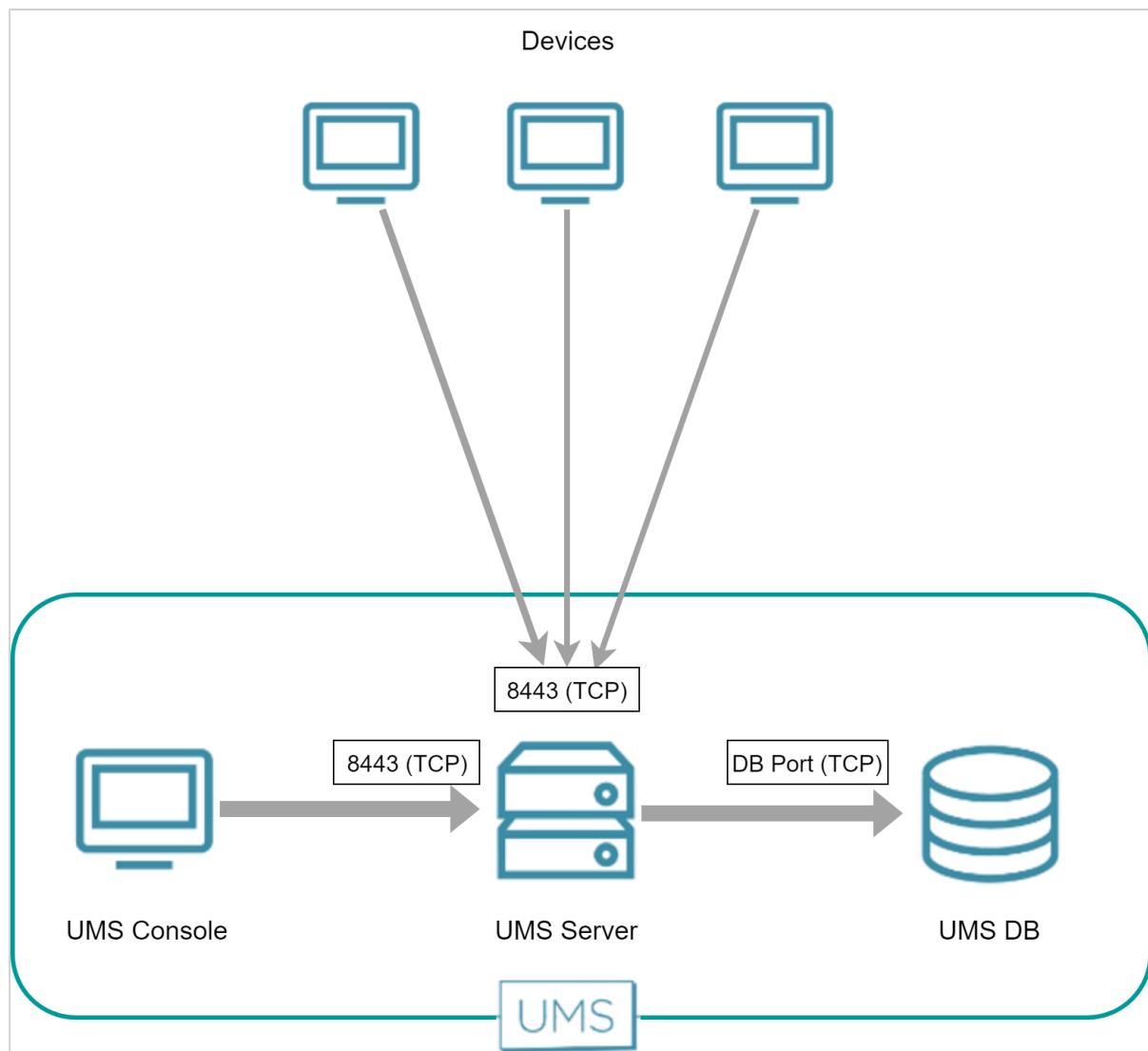
IGEL OS 12

For IGEL OS 12 devices, no additional channel is opened for the file transfer. An existing WebSocket (TCP 8443) is used.

IGEL OS 11 or Earlier

To fetch files from the UMS, e.g. a background image or log files, the devices send an HTTPS request to the UMS Server. The UMS Server is listening on port 8443.

The following figure illustrates the communication between the devices and the UMS:





Universal Firmware Update

The Universal Firmware Update feature enables the UMS to check for new firmware updates and download the desired firmware to a WebDAV directory or FTP server. The connection to the IGEL download server can be direct or through a proxy.

For more information about this feature, see Universal Firmware Update in the UMS manual.

- ⓘ The Universal Firmware Update feature is relevant for IGEL OS 11 devices and earlier, not for IGEL OS 12 devices.

- [UMS Contacting the Download Server to Check for New Updates](#)(see page 43)
- [UMS Downloading the Firmware](#)(see page 46)



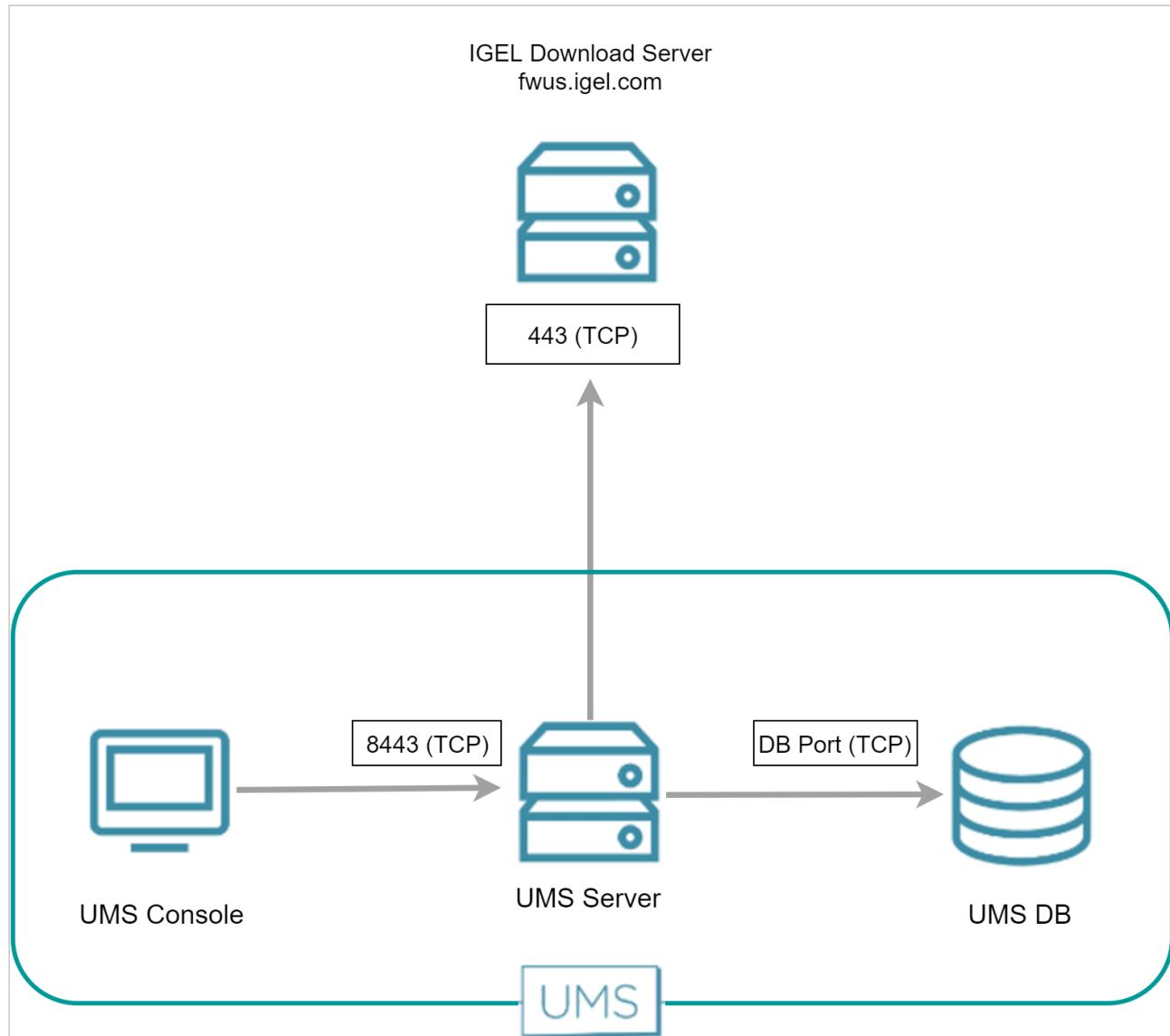
UMS Contacting the Download Server to Check for New Updates

- ⓘ The Universal Firmware Update feature is relevant for IGEL OS 11 devices and earlier, not for IGEL OS 12 devices.

The UMS initiates a TCP connection to port 443 at fwus.igel.com. The IGEL download server will send an answer containing a list of download links that enable the UMS to download the desired firmware.

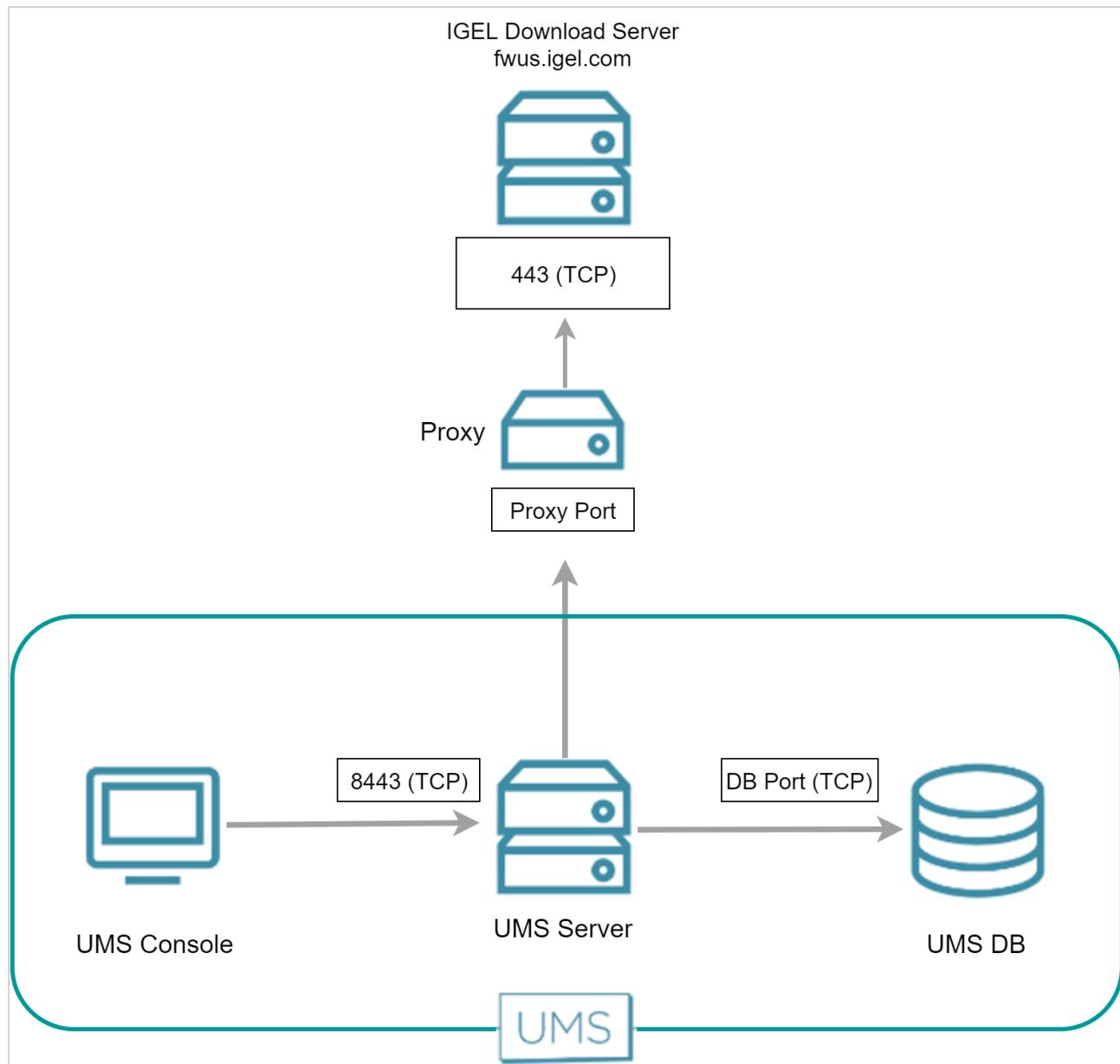
Direct Connection

The following figure illustrates the communication between the UMS server and the IGEL download servers:



Via Proxy

When a proxy is positioned between the UMS and the IGEL download servers, the port on which the proxy is listening must be specified under **UMS Administration > Global Configuration > Proxy Server**.





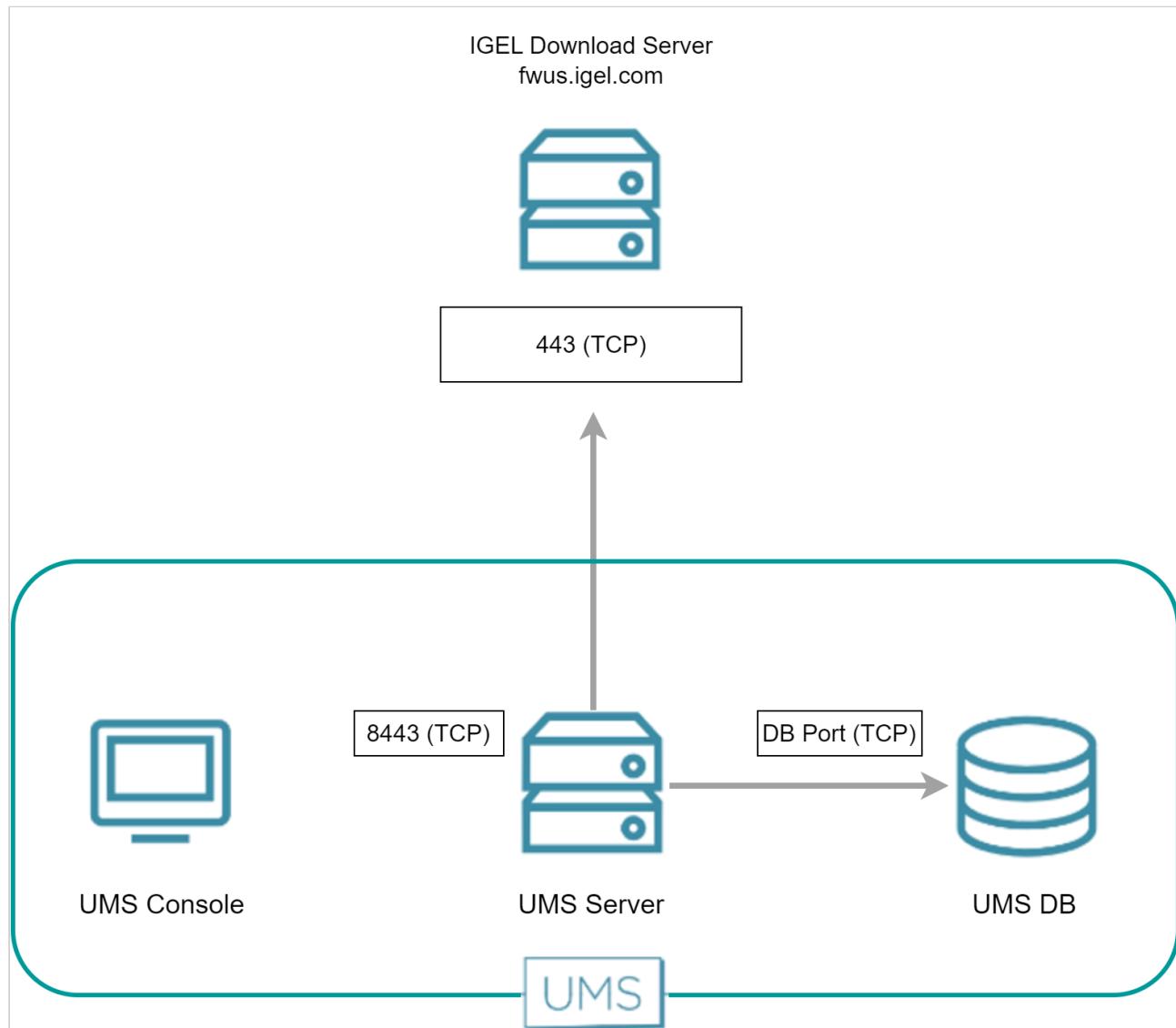
UMS Downloading the Firmware

- ⓘ The Universal Firmware Update feature is relevant for IGEL OS 11 devices and earlier, not for IGEL OS 12 devices.

The UMS downloads the desired firmware using the URLs it received from the download server. The UMS uses port 443 for fwus.igel.com.

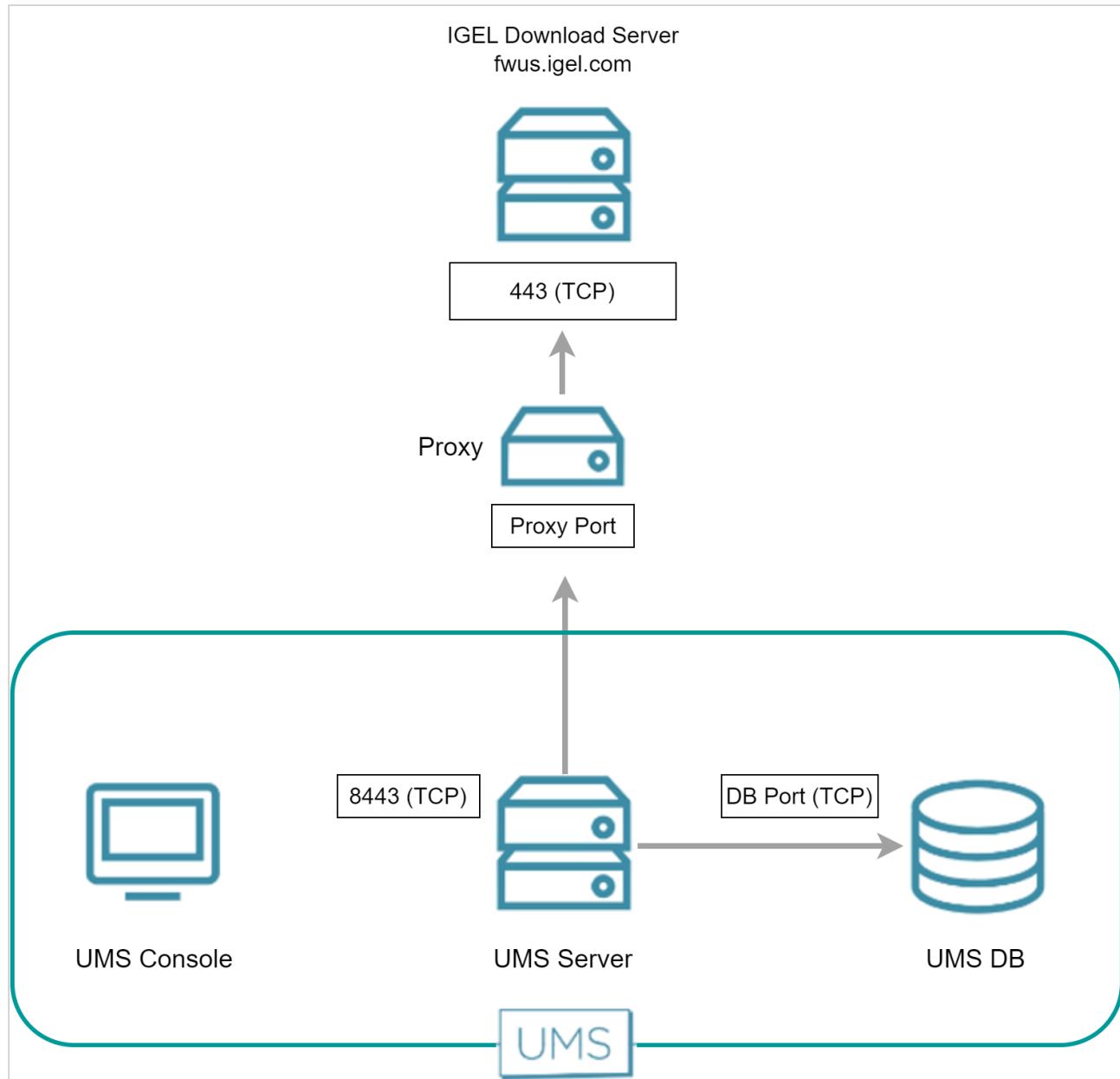
Direct Connection

The following figure illustrates the communication between the UMS Server and the IGEL download servers:



Via Proxy Server

When a proxy server is placed between the UMS Server and the IGEL download server, the port for the proxy server must be specified under **UMS Administration > Global Configuration > Proxy Server**.





Automatic License Deployment (ALD)

The Automatic License Deployment (ALD) feature is a method to deploy licenses to devices.

For more information about this feature, see [Setting up Automatic License Deployment \(ALD\)](#).

Automatic License deployment can be carried out via a direct connection or via a proxy.

The steps of the procedure are described in the following sections:

- [UMS Contacting the Licensing Server](#)(see page 49)
- [UMS Sending New Settings to the Devices](#)(see page 52)
- [Devices Contacting the UMS to Download License Files](#)(see page 53)



UMS Contacting the Licensing Server

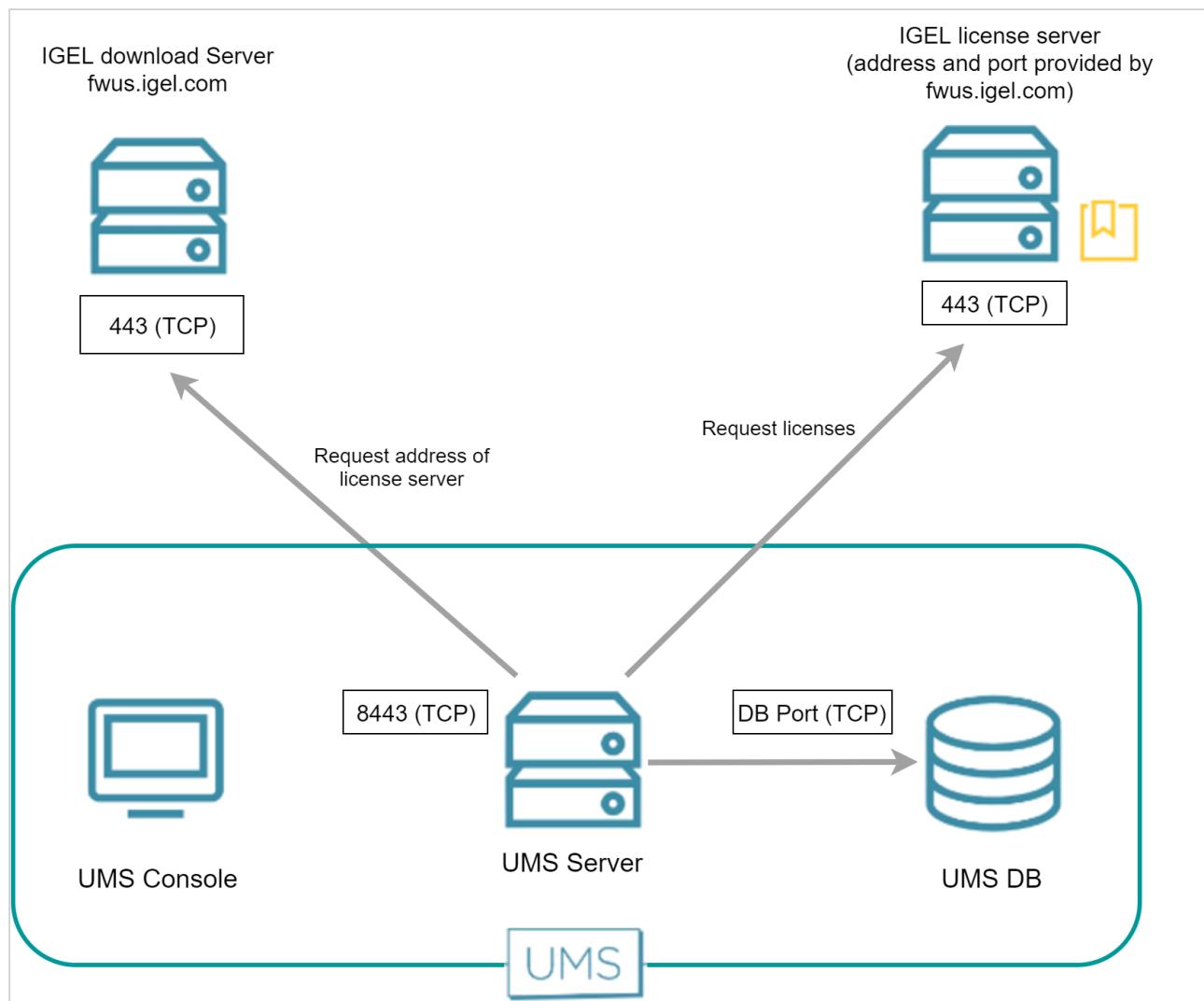
The UMS requests the connection details (URL and port) from the IGEL download server at fwus.igel.com and then contacts the IGEL licensing server. Currently, the connection details are as follows:

- URL: susi.igel.com
- Port: 443

i The connection details may be changed in the future.

Direct Connection

The following figure illustrates the communication between the UMS Server and the IGEL licensing server:

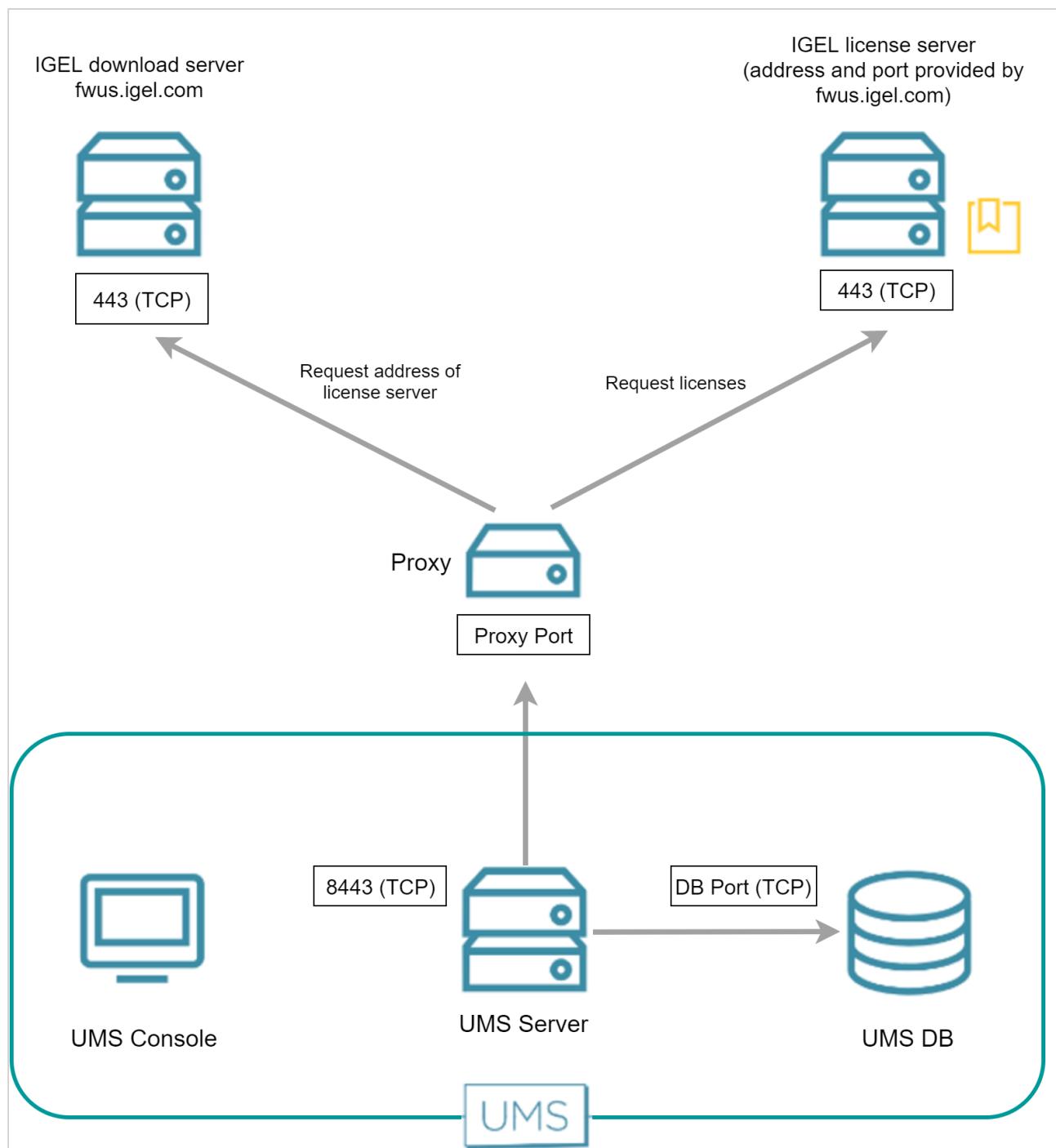




Via Proxy Server

When a proxy server is placed between the UMS and the IGEL licensing server, the port for the proxy server must be specified under **UMS Administration > Global Configuration > Proxy Server**.

- ⚠ If multiple proxies are configured, ensure to select the one that is defined for license deployment





UMS Sending New Settings to the Devices

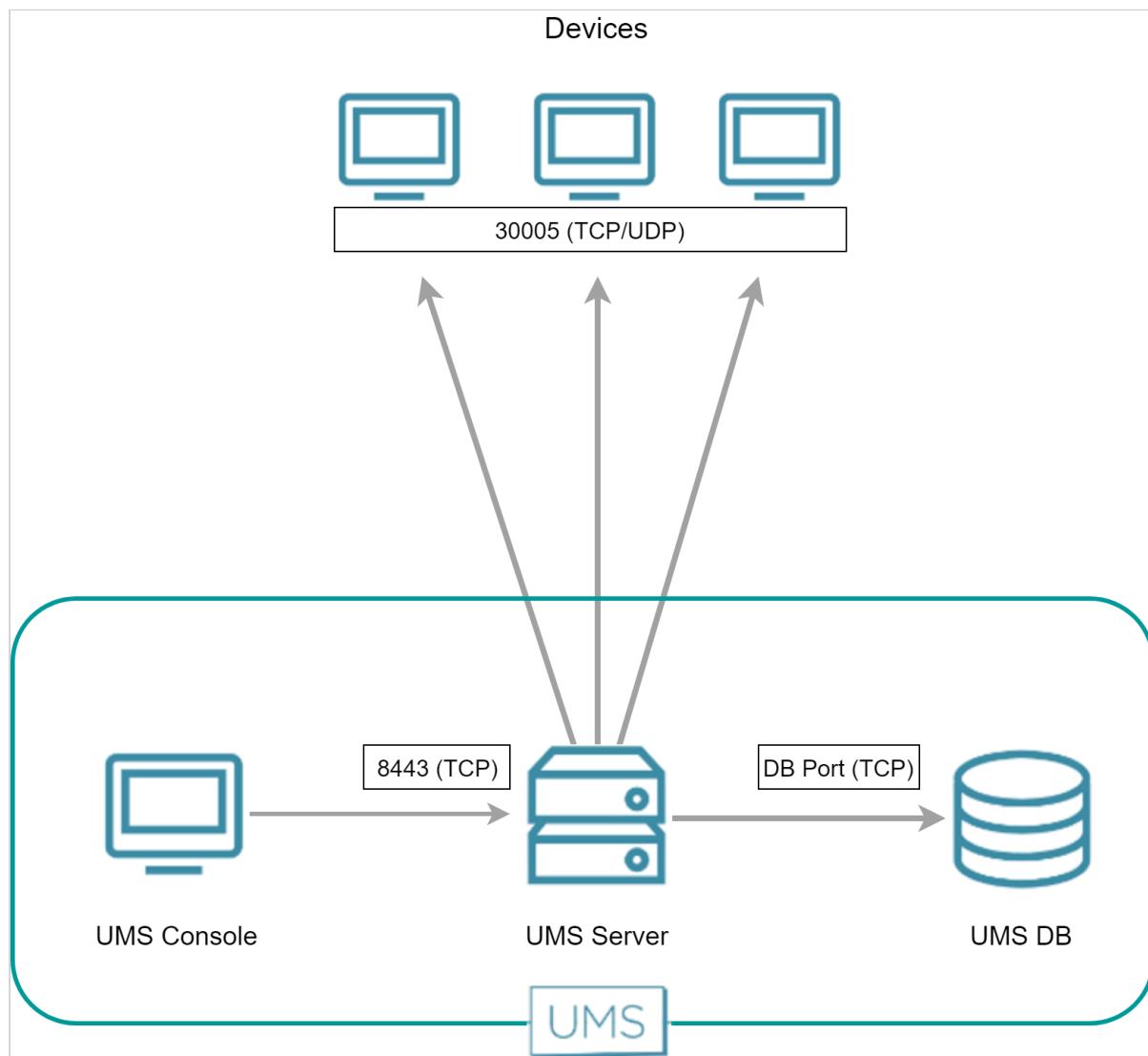
IGEL OS 12

For IGEL OS 12 devices, no additional channel is opened for the license transfer. An existing WebSocket (TCP 8443) is used.

IGEL OS 11 or Earlier

After obtaining the licenses from the license server, the UMS sends new settings to each device in question, including a download link for the license files. The device is listening on port 30005.

The following figure illustrates the communication between the UMS and the devices:





Devices Contacting the UMS to Download License Files

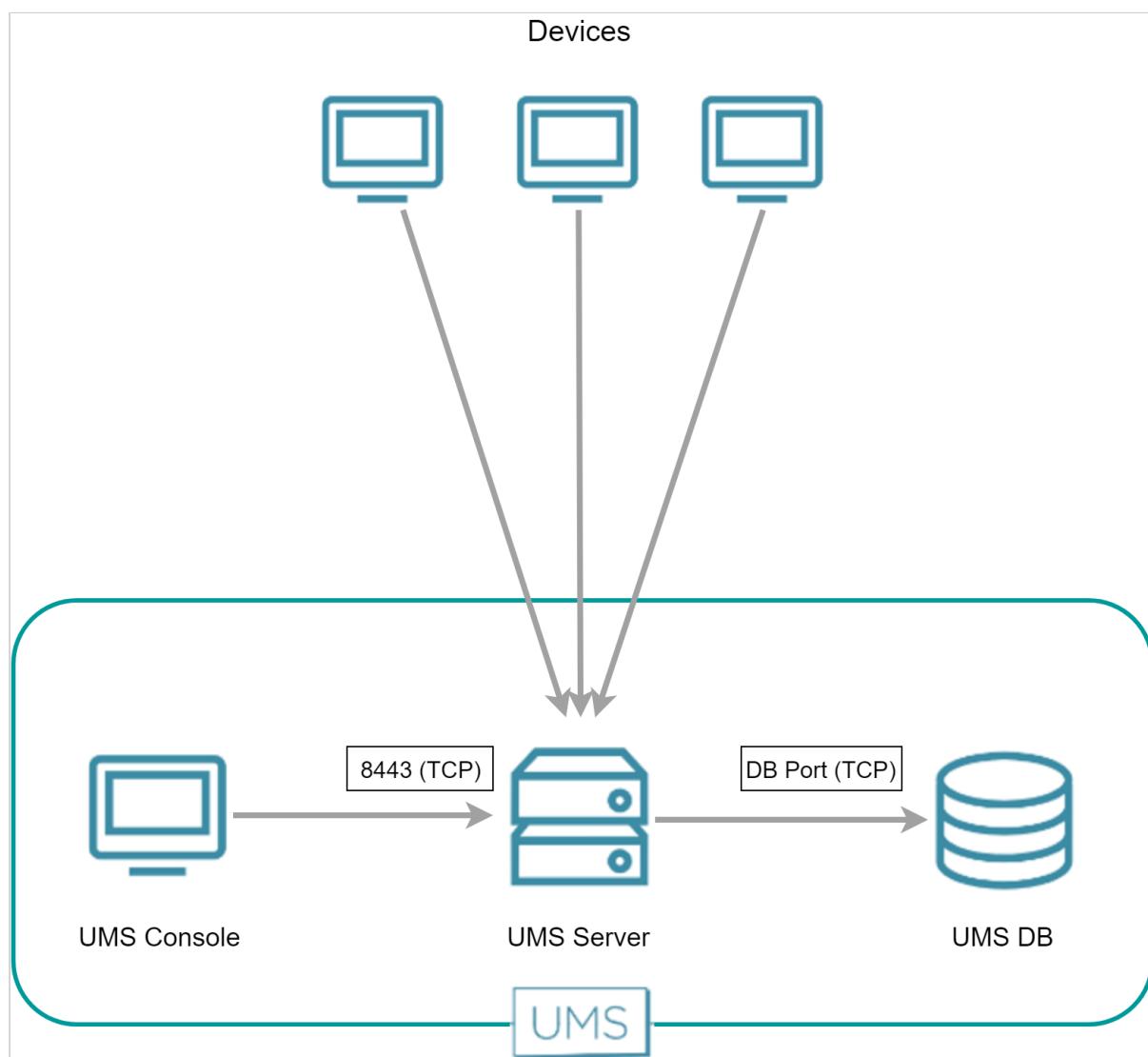
IGEL OS 12

For IGEL OS 12 devices, no additional channel is opened for the license transfer. An existing WebSocket (TCP 8443) is used.

IGEL OS 11 or Earlier

The devices have been informed by the UMS that license files are ready for download. Now, to fetch the license files from the UMS, the devices send an HTTPS request to the UMS Server. The UMS Server is listening on port 8443.

The following figure illustrates the communication between the devices and the UMS:





UMS Installation

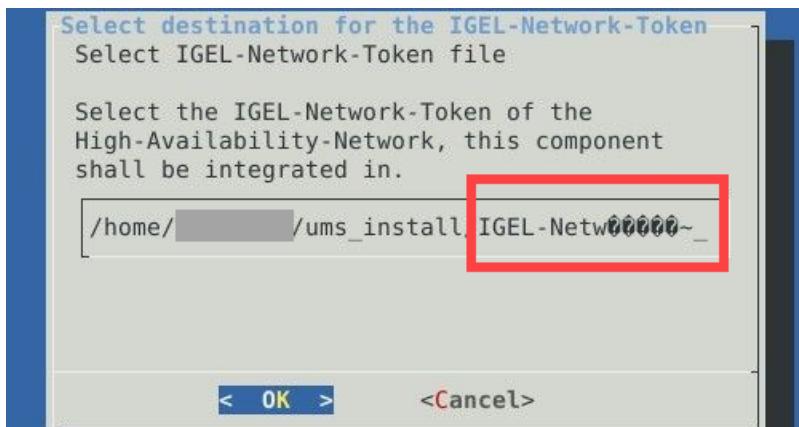
- Using Special Characters during the UMS Installation on Linux(see page 55)
- UMS Installation on 64-Bit Systems(see page 56)
- No Permissions after the UMS Update(see page 58)
- Invalid Web Certificate and Errors by Device Registration after the Installation of the IGEL UMS 12 on Linux(see page 61)



Using Special Characters during the UMS Installation on Linux

Question

Why do I see strange symbols in the UMS installer on Linux, e.g. when saving / loading the IGEL network token?



Answer

When you want to use language-specific characters, e.g. umlauts (ä, ö, etc.), for the UMS installation on Linux:

- the correct locale for the language must be set
- the system locale must also be correctly set

- ▶ Run the following command to list the available locales: `locale -a`
- ▶ If the necessary locale is not listed, you can generate and set it as the default locale for your system as follows (example for German):

```
sudo locale-gen de_DE.UTF-8
sudo update-locale LANG=de_DE.UTF-8
```



UMS Installation on 64-Bit Systems

i Since version 5.09.100, IGEL UMS is 64-bit based. This article serves now for information purposes only.

Question

What are the prerequisites for the installation of IGEL Universal Management Suite on 64-bit operating systems?

Answer

Since UMS 5.09

From UMS Version 5.09, the installation of 32-bit libraries is no longer required. The necessary dependencies are automatically installed if the corresponding option has been chosen during the UMS installation procedure. For information on UMS installation, see [Installing an IGEL UMS Server](#).

Since UMS 5.07.100

From UMS Version 5.07.100, the required 32-bit libraries can automatically be installed by the UMS installer if the corresponding option is chosen during the UMS installation procedure.

Before UMS 5.07.100

- Windows: Use the 32-bit compatibility mode (which is activated by default) before installing IGEL UMS (e.g. on Windows Server 2008 R2).
See also [MSDN: "Running 32-bit Applications"](#)²
- Linux (amd64/x86_64): Install the 32-bit compatibility packages before installing IGEL UMS.
Examples with Ubuntu follow below, apart from that see:
 - [Installing UMS on Red Hat Enterprise Linux \(RHEL\) 7.3](#)
 - [Installing UMS on Oracle Linux Server](#)

Example with Ubuntu 14.04 LTS 64-bit:

```
# add i386 support
sudo dpkg --add-architecture i386
sudo apt-get update
# install libraries
sudo apt-get install lib32z1 \ lib32ncurses5 \ lib32bz2-1.0 \ libxtst6:i386 \
libxinerama1:i386 \ libxi6:i386 \ libxext6:i386 \ libxrender1:i386
```

Example with Ubuntu 16.04 LTS 64-bit:

```
# add i386 support
```

² <https://msdn.microsoft.com/en-us/library/aa384249%28VS.85%29.aspx>



```
sudo dpkg --add-architecture i386
sudo apt-get update
# install libraries
sudo apt-get install lib32z1 \ lib32ncurses5 \ libbz2-1.0:i386 \ libxtst6:i386
\ libxinerama1:i386 \ libxi6:i386 \ libxext6:i386 \ libxrender1:i386
```



No Permissions after the UMS Update

Symptom

You have updated the UMS to version 6.05.100 or higher and have no permissions for an object/tree node in the UMS anymore. In the **Access Control** dialog, both checkboxes **Allow** and **Deny** are enabled but not editable:

Permission	Allow	Deny	Effective Rights
Browse	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	denied for user test (inherited from /ROOT/Profiles/)
Read	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	denied for user test (inherited from /ROOT/Profiles/)
Write	<input type="checkbox"/>	<input type="checkbox"/>	not set
Access Control	<input type="checkbox"/>	<input type="checkbox"/>	not set
Assign	<input type="checkbox"/>	<input type="checkbox"/>	not set

Environment

- UMS 6.05.100 or higher

Problem

Before UMS 6.05.100, permissions could be granted for a subnode even if they were denied for a node.

Permission	Allow	Deny	Effective Rights
Browse	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	allowed for user test
Read	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	allowed for user test
Write	<input type="checkbox"/>	<input type="checkbox"/>	not set
Access Control	<input type="checkbox"/>	<input type="checkbox"/>	not set
Assign	<input type="checkbox"/>	<input type="checkbox"/>	not set

With UMS version 6.05.100, the evaluation of UMS permissions has changed: If you set **Deny** on a node, you cannot set **Allow** permission on a subnode. The **Allow** checkbox is not editable.

Permission	Allow	Deny	Effective Rights
Browse	<input type="checkbox"/>	<input checked="" type="checkbox"/>	denied for user test (inherited from /ROOT/Profiles/)
Read	<input type="checkbox"/>	<input checked="" type="checkbox"/>	denied for user test (inherited from /ROOT/Profiles/)
Write	<input type="checkbox"/>	<input type="checkbox"/>	not set
Access Control	<input type="checkbox"/>	<input type="checkbox"/>	not set
Assign	<input type="checkbox"/>	<input type="checkbox"/>	not set



Solution

- Check the permissions in the **Access Control** dialog. If the **Allow** permissions should be given for a subnode, do not set any permissions for the node.

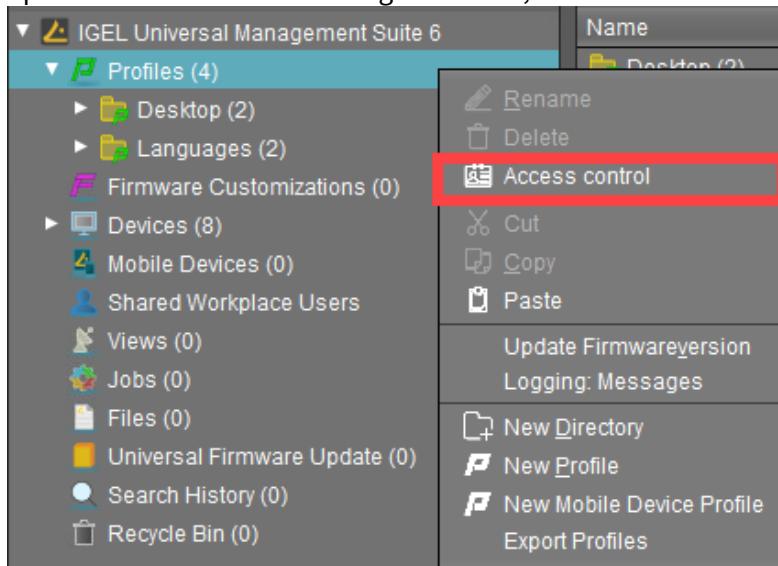
Permission	Allow	Deny	Effective Rights
Browse	<input type="checkbox"/>	<input type="checkbox"/>	not set
Read	<input type="checkbox"/>	<input type="checkbox"/>	not set
Write	<input type="checkbox"/>	<input type="checkbox"/>	not set
Access Control	<input type="checkbox"/>	<input type="checkbox"/>	not set
Assign	<input type="checkbox"/>	<input type="checkbox"/>	not set

If the permissions are not set, the behavior is like by **Deny**. Therefore, the user will not have access rights on the node but can browse up to the subnode.

Example:

The user should have access rights only to the profile folder "Languages" and its contents:

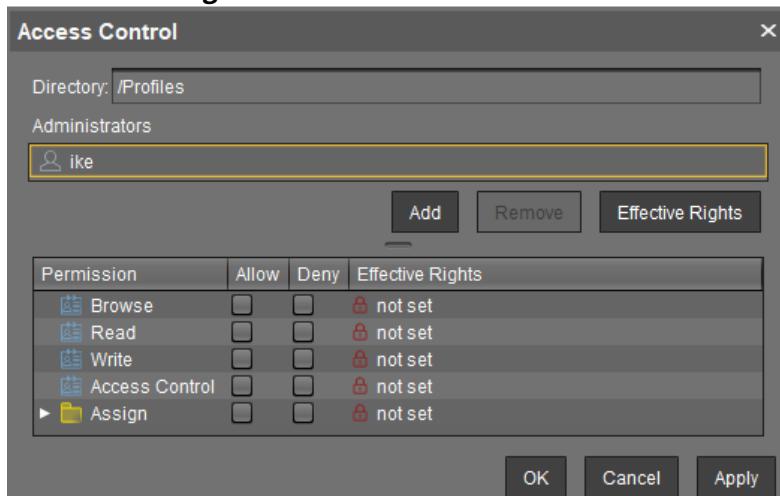
1. Open the **Access Control** dialog for a node, **Profiles** in this case.





2. Disable checkboxes **Allow** and **Deny**.

The **Effective Rights** read now "not set".



3. Open the **Access Control** dialog for a subnode, for which permissions should be granted. In our case, it is the folder "Languages".

4. Set the required permissions and save the settings.

Permission	Allow	Deny	Effective Rights
Browse	<input checked="" type="checkbox"/>	<input type="checkbox"/>	allowed for user ike
Read	<input checked="" type="checkbox"/>	<input type="checkbox"/>	allowed for user ike
Write	<input type="checkbox"/>	<input type="checkbox"/>	not set
Access Control	<input type="checkbox"/>	<input type="checkbox"/>	not set
Assign	<input checked="" type="checkbox"/>	<input type="checkbox"/>	allowed for user ike

The user can only browse up to the subnode "Languages", for which the access rights have been given.



Invalid Web Certificate and Errors by Device Registration after the Installation of the IGEL UMS 12 on Linux

You have just installed IGEL Universal Management Suite (UMS) 12 or updated your existing UMS installation to UMS 12 on Linux and face now various issues, e.g. with the scanning and registration of IGEL OS 12 devices.

Symptom

After the installation of UMS 12 on Linux, you have problems with automatic or manual device registration, logging in to the UMS Web App, etc.

On the device side, you get the following error (e.g. when running the command `journalctl -f` when trying to register the device):

```
ERROR: Failed to verify certificate... IP address mismatch
```

Environment

- IGEL UMS 12 on Linux

Problem

For new or update installations on a Linux host, the IP address determined by the JRE can be often wrong (e.g. default IP: 127.0.1.1). If the correct IP of the UMS Server was not specified in the UMS installer during the installation / update, this will lead to invalid UMS certificates.

Display name	Subject Alternative Names	Expiring date	Key Specification	Signature	Used	Private Key known	Status
3046398551	127.0.1.1;	Dec 15, 2041	RSA (4096 bits)	SHA512withRSA	✓	✓	✓
2018978320		Nov 16, 2023	RSA (4096 bits)	SHA512withRSA	✓	✓	✓

Solution

You have to generate a new certificate:

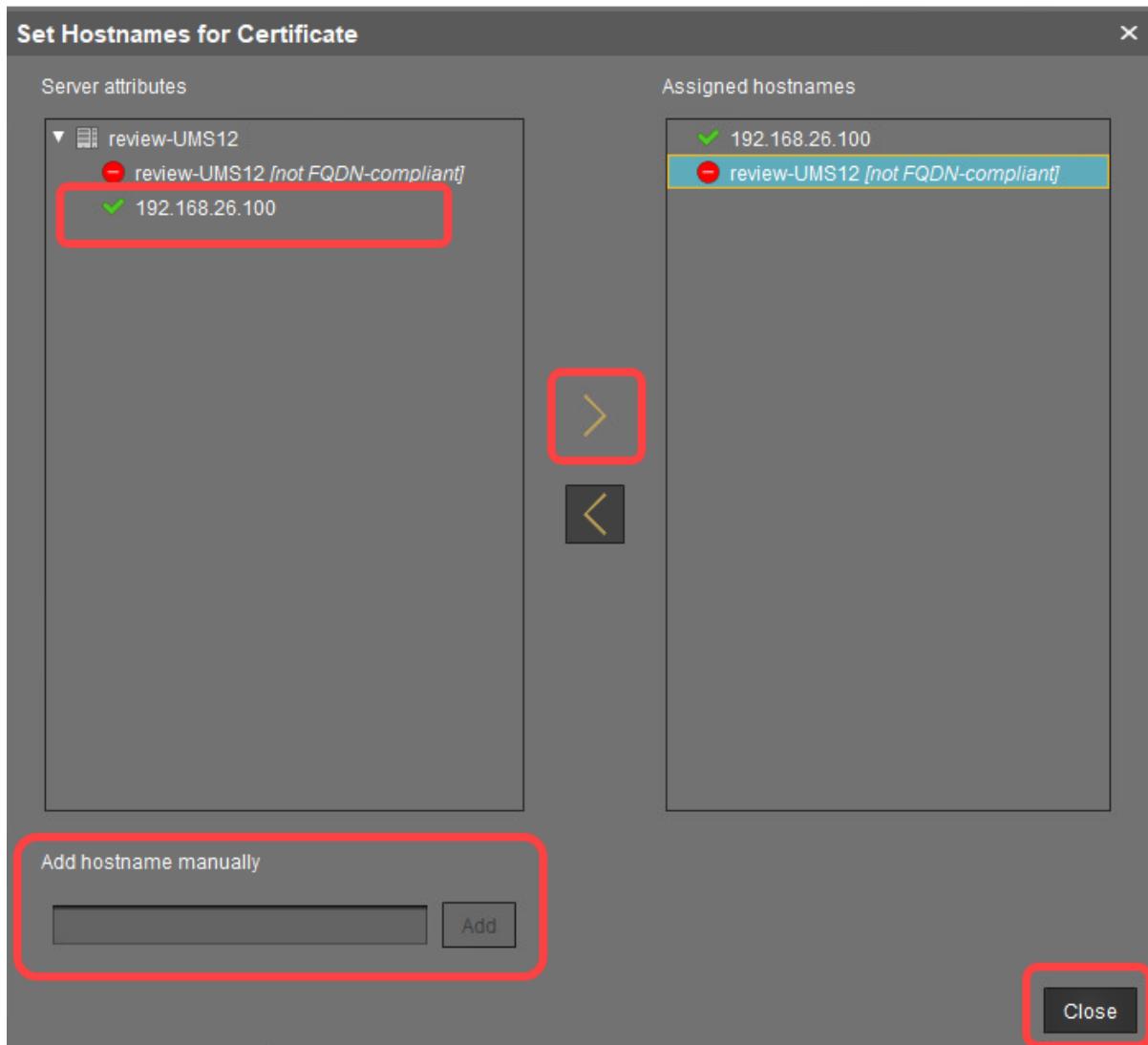
1. In the UMS Console, go to **UMS Administration > Global Configuration > Certificate Management > Web**.



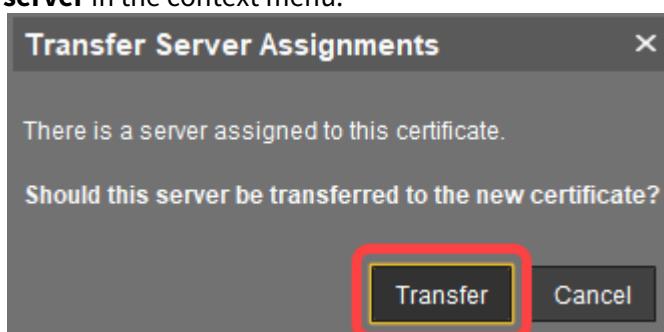
2. Select the existing certificate and click **Renew certificate**.

Display name	Subject Alternative Names	Expiring date	Key Specification	Signature	Used	Private Key known	Status
304630853	127.0.1.1;	Dec 15, 2043	RSA (4096 bits)	SHA12withRSA			
2018978320		Nov 16, 2023	RSA (4096 bits)	SHA512withRSA			

3. In the dialog **Create Signed Certificate**, fill in the empty fields (if there are any); all other settings can be left unchanged. Click **Manage hostnames**.
4. In the dialog **Set Hostnames for Certificate**, check if "localhost" and all IP addresses and FQDNs (Fully Qualified Domain Names) under which your server is reachable are displayed under **Assigned hostnames**. If not, add the missing IP addresses and FQDNs under **Add hostname manually**.
- Note: Under **Assigned hostnames**, there must be only FQDN-compliant names. Remove all not FQDN-compliant names, if there are any, using an arrow button.



5. Click **Ok**.
6. In the dialog **Transfer Server Assignments**, click **Transfer**.
Note: If you are not sure, you can click **Cancel** and assign the created certificate later via **Assign server** in the context menu.





A new certificate will be created and used for the server.

- ✓ It is also recommended to check the Linux OS file `/etc/hosts` and, if there are wrong entries there like 127.0.1.1, change them to the correct IP of your UMS Server and the correct server name.



Customization

- [User Authorization Rules\(see page 66\)](#)
- [Managing User Permissions via UMS\(see page 69\)](#)
- [Automating the Rollout Process in the IGEL UMS\(see page 70\)](#)
- [Using Structure Tags\(see page 73\)](#)
- [Deploying an IGEL made Custom Partition via UMS\(see page 74\)](#)



User Authorization Rules

Problem

In the IGEL UMS, you want to assign permissions or roles to administrators according to various responsibilities.

Reason

In the IGEL UMS, you can create user or administrator accounts, and you can assign rules to them, but it is not possible to assign roles.

You would like to group administrators according to their tasks in order to achieve a clearly structured management of user rights.

Within your company you already maintain employee accounts using an Active Directory or LDAP.

Solution

As best practice, we suggest connecting the UMS with the user accounts of the Active Directory. You maintain the user and group accounts in the Active Directory only. In the UMS, you assign rights to the imported groups.



Transferring Active Directory groups to the UMS and assigning permissions and roles to them:

- ▶ Click **UMS Administration > Global Configuration > Active Directory / LDAP** to integrate your Active Directory.

ⓘ You may import Administrative Users / UMS administrators from an Active Directory as well as from an LDAP.



- In the UMS console click **System > Administrator accounts > Import**, to import groups from the tree of your Active Directory.

- ⓘ The successful import of a group cannot be undone. You have to manually delete the wrongly created UMS group in the "Administrator account" management. The name of the imported Active Directory group is taken from the account.

- Assigning roles to groups in the IGEL UMS on the basis of authorization rules:
- Click **System > Administrator accounts > Groups > Edit** to directly assign general group rights.
 - Assign object-related access rights via object permissions, choosing **Access Control** in the context menu of any object.

This way, you can assign certain roles to administrators of the UMS according to their group memberships.

Please note:

- Permissions are inherited from a parent directory to a child directory or to a subordinated object.
- It is possible to change indirect rights, i.e. rights which are given by group assignment. However, directly assigned rights take precedence over indirectly assigned rights.
- An administrator can be a member of different groups and receives the corresponding rights. If they are contradictory, the deprivation of a right takes precedence over the permission. If a prohibition for an action or an object of a group is issued, it will override any number of rights from other groups.
- Click **Effective Rights** to get more details about the rules collection, for example if a permission was given directly or if it was assigned by a group or by an inheritance within a tree structure.



Managing User Permissions via UMS

Purpose

It is necessary to globally manage the permissions of the thin client users, e.g. for editing system information.

Solution

Use the **Access Control** function in the UMS.

Additional Information

There are different places where to open the **Access Control** dialog:

- In the main menu under **Edit > Access Control**
- In the symbol bar under
- In the context menu of a thin client or a thin client folder under **Access Control**

Defining end user permissions:

1. Click **Access Control** in the context menu of a thin client (folder).
The **Access Control** dialog opens.
2. Click **Add** to select a new user/group.
3. The corresponding **Effective Rights** will be listed in the lower part of the mask.
4. **Allow** or **Deny** the permissions of the selected group or user for the selected thin clients.
5. Confirm the settings with **OK**.
6. Click the **Refresh** button of the console to apply the changes in the UMS.

i If you have changed the rights of registered users they only take effect after a refresh.

For further details about authorization rules see our How-To [IGEL UMS: User Authorization Rules](#)(see page 66).

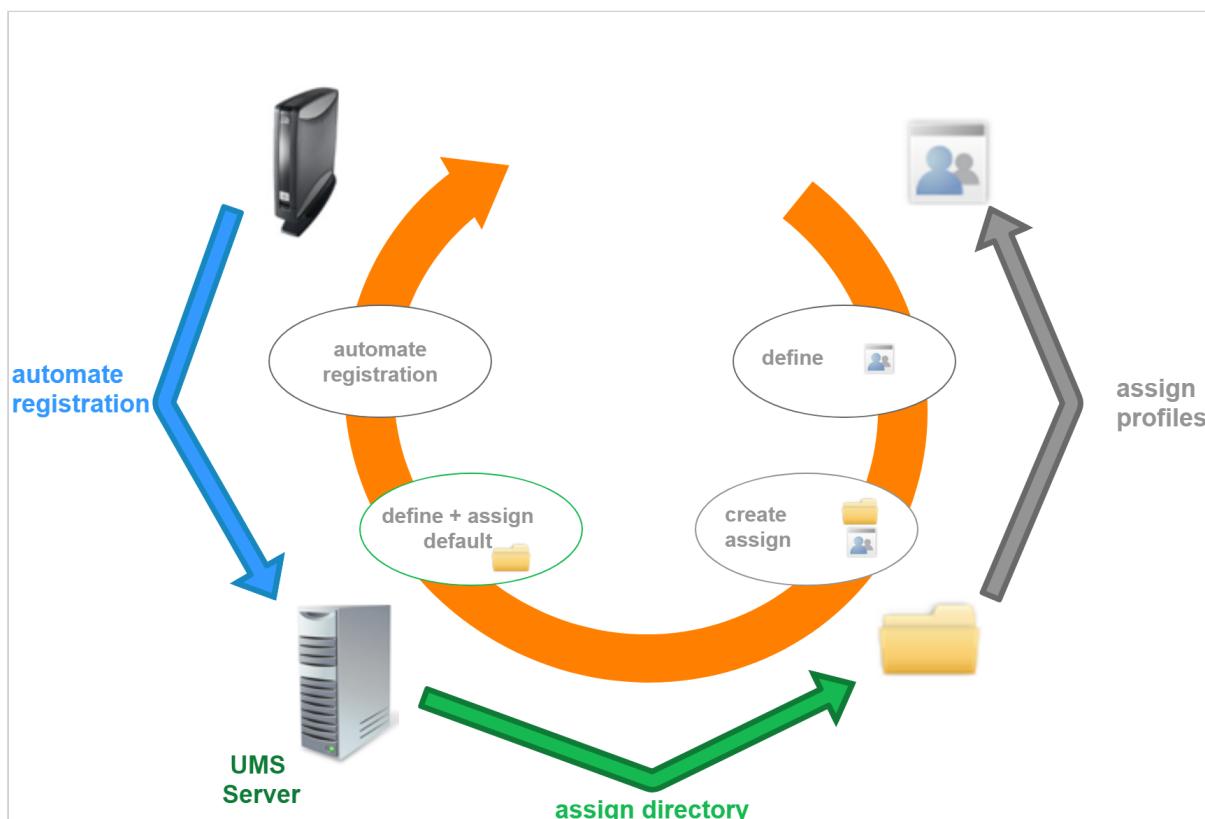
i Access rights to objects or actions within the *IGEL* UMS are attached to the administrator accounts and groups. The rights of the database user account cannot be restricted. They are created during installation or when setting up the data source. The account always has full access rights in the UMS.

Automating the Rollout Process in the IGEL UMS

You want to set up the IGEL Universal Management Suite (UMS) in such a way that new devices will be stored directly in the correct directory and the right configurations will automatically be assigned to them. With Zero Touch Deployment in the rollout, devices will be configured automatically according to the profiles, with almost zero management outlay.

The idea of Zero Touch Deployment means automatic device registration with automatic assignment of profiles by default directory rules.

In the end, the device will automatically be registered in the UMS, assigned to the right directory, and related to the valid profiles. To prepare this automated process, you have to go the other way around. First, define the profiles, then assign them to the directories, then create default directory rules and automate the registration.



Preparing Automatic Rollout

Configure your device globally, indirectly assigning profiles by a parent directory:

1. Create a new root directory, e.g. **IGEL OS**.
For how to create a device directory, see [Creating a Directory in the IGEL UMS](#).



2. Assign certain profiles to this root directory, e.g. **Security**.

For how to assign profiles, see How to Allocate IGEL UMS Profiles. See also Prioritization of Profiles in the IGEL UMS.

For detailed information on profiles, see Profiles in the IGEL UMS.

3. Move your devices or your directories containing devices to this root directory.

These devices will inherit the profiles assigned to the root directory.

Example: Devices that will be placed to the directory **Augsburg** during the registration will inherit the profile **Security** which is assigned to the root directory **IGEL OS**:

The screenshot shows the IGEL UMS interface. On the left, the navigation tree shows 'IGEL Universal Management Suite 6' with various sections like 'Profiles', 'Devices', etc. A red arrow points from the 'Augsburg (0)' folder in the main pane to the 'Indirectly assigned objects' panel on the right. This panel lists 'IGEL OS' under 'Directory' and 'Security' under 'Name'. Both items are highlighted with a red border.

Automating the Rollout

1. Click **UMS Administration > Global Configuration > Default directory rules** to create a new default directory rule.

For detailed information on default directory rules, see Default Directory Rules.

2. Choose the directory in which you want to store the devices according to the rule.

The screenshot shows the 'Create default directory rule' dialog. In the 'Select Directory' section, the 'Choose target directory' radio button is selected, and a red box highlights it. Below, a tree view shows 'Augsburg (0)' selected. Other options like 'Overrides existing directory membership', 'Apply rule when device boots', and 'Leave in Subdirectory' are shown but not selected. A red arrow points from the 'Choose target directory' button in the dialog to the 'Augsburg (0)' folder in the main pane of the UMS interface. The 'Default Directory Rules' section in the navigation tree is also highlighted with a red box.



The screenshot shows the 'Default Directory Rules' configuration in the IGEL UMS Administration. The left sidebar lists various management categories like 'UMS Network', 'Global Configuration', and 'Default Directory Rules'. The 'Default Directory Rules' item is selected and highlighted in blue. The main panel displays two rules under 'Default Directory Rules': 'Last known IP address is greater than' and 'Last known IP address is less than'. The path '/Devices/IGEL OS/Germany/Augsburg/' is shown at the bottom right.

- Configure your DNS or DHCP server and activate the automatic registration of devices as described under Registering Devices Automatically on the IGEL UMS.

i We recommend disabling automatic registration after the rollout, so that no unknown devices will be registered without your control and could obtain sensitive settings.

- Start your devices. They will be automatically registered on the UMS Server.

Thanks to the default directory rule, these devices will be stored in the right directory and will automatically receive the correct profiles.

Example:

The screenshot shows the device registration process. On the left, the 'Devices' tree view shows a device named 'TD-RD01' under 'IGEL OS > Germany > Augsburg'. A red arrow points from this node to the center panel. The center panel displays the device details for 'TD-RD01', including sections for 'System Information', 'Advanced System Information', 'Network Adapters', 'Licenses', 'Template Definition Check Results', 'Monitor Information', and 'Asset Inventory'. A red arrow points from the 'TD-RD01' icon in the center panel to the right panel. The right panel shows the 'Assigned objects' and 'Indirectly assigned objects' sections, both of which list 'IGEL OS' and 'Security' respectively.

Related Topics

If you want to use structure tags for automating the rollout: [Using Structure Tags](#)(see page 73)

If you have problems with the device registration: [Registration of a Device in the IGEL UMS Fails](#)(see page 180)



Using Structure Tags

Problem

When rolling out devices automatically it can be difficult to assign each to the desired folder in the Universal Management Suite (UMS).

Goal

Newly registered thin clients will automatically have the information where they are to be placed in the structure tree of the UMS.

The UMS will have flexible rules to place a newly registered device into a folder of the structure tree.

Solution

One solution is using a structure tag, a text string bound to the device, that is transmitted to UMS. It can be assigned to devices either via a DHCP option or in their local setup.

1. Define a Structure Tag in your Default Directory Rules under **UMS Administration > Global Configuration > Default Directory Rules**.
Learn more in the UMS manual: Default Directory Rules.
2. Assign a structure tag to a device manually or via DHCP:
Assigning a Structure Tag manually on the endpoint
 - a. In **Setup**, go to **System > Remote Management**.
 - b. Enter the structure tag value under **Structure tag**.
 - c. Click **OK**.

Assigning a Structure Tag via DHCP Server

Use the appropriate DHCP option, depending on the IGEL OS version of your endpoint devices:

- IGEL OS 11.03.500 or lower: Use DHCP option 226 to distribute the tag value to the devices. Set the DHCP option 226 as a string - not as a DWORD.
- IGEL OS 11.04.100 or higher: As an alternative, you can use the DHCP option 43 (encapsulated vendor-specific options) to send the DHCP option 226 (name: "umsstructuretag") to the right endpoint devices. An endpoint device with IGEL OS 11.04.100 or higher sends option 60 (vendor class identifier) with `igel-dhcp-1` as the value.

i An IGEL specific DHCP option that is sent in DHCP option 43 overrides a corresponding DHCP option that is sent in the global namespace. The DHCP options 1, 224, and 226 can be embedded in option 43.
You can prevent a DHCP option 226 that has been sent in the global namespace from being interpreted. To achieve this, you must add option 1 (name "exclusive", type Byte, value 1) to DHCP option 43.



Deploying an IGEL made Custom Partition via UMS

Goal

You want to deploy a custom partition that you received from IGEL to a number of thin clients via the Universal Management Suite (UMS).

Solution

- ⚠ The procedure described here is only intended for installing custom partition packages that have been built by IGEL.



1. Save the `*.zip` archive you received locally and extract it.
2. Copy the contents of the directory `target` into the `ums_filetransfer` directory on the UMS Server, e.g. `C:\Program Files (x86)\IGEL\RemoteManager\rmguiserver\webapps\ums_filetransfer`
3. Check the accessibility of the data by opening its address in a web browser, e.g. `http://[ums_server]:9080/ums_filetransfer/[name]/[name].inf`
This access is password-protected, and you need to enter your UMS credentials.
4. Import the file `profiles.zip` (located in the `igel\profiles` directory of the package) into the UMS via **System > Import > Import Profiles**.
The imported profile should now appear in the UMS Console under **Profiles**.
5. Edit the profile and adapt the settings in **System > Firmware Customization > Custom Partition > Download** to match the **URL**, **Username** and **Password** for your UMS.

Add X

<input checked="" type="checkbox"/>	Automatic Update
URL	<input type="text" value="http://172.30.91.227:9080/ums_filetr"/>
User name	<input type="text" value="USER"/>
Password	<input type="text" value="*****"/>
Initializing Action	<input type="text" value="/bin/sh /custom/init-putty.sh"/>
Finalizing Action	<input type="text"/>

Ok **Cancel**

6. Assign the profile to one or more devices.
7. Reboot these devices.



UMS Environment

- Migrating a UMS Database From Embedded DB to Microsoft SQL Server(see page 77)
- Restore and Recover Corrupted UMS Embedded DB(see page 85)
- Disaster Recovery: UMS with an External Database(see page 86)
- How to Connect to the ICG after the UMS Server Migration or New Installation with the Same Database(see page 89)
- UMS Does Not Connect to ICG: "TrustAnchor ...is not a CA certificate"(see page 92)
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- UMS Cannot Contact Download Server Any More(see page 134)
- Error During Firmware Upload in UMS: No Space on WebDAV(see page 135)
- How to Configure Java Heap Size for the UMS Server(see page 137)
- How to Configure Java Heap Size for the UMS Console(see page 140)
- How to Check the Current State of the IGEL UMS Server through Your Existing Monitoring Solution(see page 143)
- IGEL UMS Configuration for the External Load Balancer / Reverse Proxy: Example for NGINX with SSL Offloading(see page 145)
- Transferring or Registering the UMS ID(see page 163)
- Updating Host Assignment for Job Execution(see page 166)



Migrating a UMS Database From Embedded DB to Microsoft SQL Server

This document describes how to migrate the database of a *Universal Management Suite (UMS)* installation from *Embedded DB* to a *Microsoft SQL Server*.

This is an exemplary representation. If you want to integrate the other way round or integrate other databases, the same steps are always performed. You can always use this description as a guide.

IGEL Demos Channel



Sorry, the widget is not supported in this export.
But you can reach it using the following URL:

https://www.youtube.com/watch?v=_200UQppobw

- [Setting Up the SQL Database](#)(see page 78)
- [Copying Database Contents](#)(see page 80)



Setting Up the SQL Database

⚠ The UMS supports only those standard sortings of Microsoft SQL Server which are case insensitive ("CI"). Therefore, make sure that the parameter **Collation** in MS SQL Server is set appropriately.

► Execute the following SQL script on the Microsoft SQL Server to create database, login, user, and schema. Replace the placeholders such as `[databasename]` with settings of your choice.

`[sql-user]` can be an SQL account or a Microsoft Active Directory (AD) account; for more information on the latter, see Connecting the UMS to an SQL Server via Active Directory. The script uses the same string for login, user, and schema in order to simplify UMS setup.

i The **user name** for the external database may only be created with the following properties:

- it consists only of **lower case** letters or **upper case** letters.
- the **low-cut character** ("_") is the only special character, which is allowed.

Do not mix upper and lower case letters. Don't use points, spaces, minus, or @ sign!

```
CREATE DATABASE [databasename]
GO
USE [databasename]
GO
CREATE LOGIN [sql-user] WITH PASSWORD = '[password]',
DEFAULT_DATABASE=[databasename]
GO
CREATE USER [sql-user] WITH DEFAULT_SCHEMA = [sql-user]
GO
CREATE SCHEMA [sql-user] AUTHORIZATION [sql-user] GRANT CONTROL TO [sql-user]
GO
```



Microsoft SQL Server Management Studio

File Edit View Query Project Debug Tools Window Community Help

New Query | master | Execute | Properties

Object Explorer | Current connection parameters

localhost (SQL Server 10.50.16)

- Databases
- Security
- Server Objects
- Replication
- Management
- SQL Server Agent
 - Jobs
 - Job Activity Monitor
 - Alerts
 - Operators
 - Proxies
 - Error Logs

SQLQuery2.sql - lo...dministrator (53)* | localhost - Activity Monitor

```
CREATE DATABASE rmdb
GO
USE rmdb
GO
CREATE LOGIN igelums WITH PASSWORD = 'igelums',
    DEFAULT_DATABASE=rmdb
GO
CREATE USER igelums WITH DEFAULT_SCHEMA = igelums
GO
CREATE SCHEMA igelums AUTHORIZATION igelums GRANT CONTROL TO igelums
GO
```

Connected. (1/1) | localhost (10.50 RTM) | PM-MH-WIN7-UMS\Adminis... | master | 00:00:00 | 0 rows

Ln 10 Col 69 Ch 69 INS

Ready

The screenshot shows the Microsoft SQL Server Management Studio (SSMS) interface. The Object Explorer pane on the left shows the database structure for 'localhost (SQL Server 10.50.16)'. The central pane displays a query window titled 'SQLQuery2.sql' containing T-SQL code to create a database 'rmdb', a login 'igelums' with password 'igelums', and a user 'igelums' with schema 'igelums'. The Properties pane on the right shows connection parameters like 'Name' set to 'localhost' and 'State' set to 'Open'. The status bar at the bottom indicates a single row was affected.

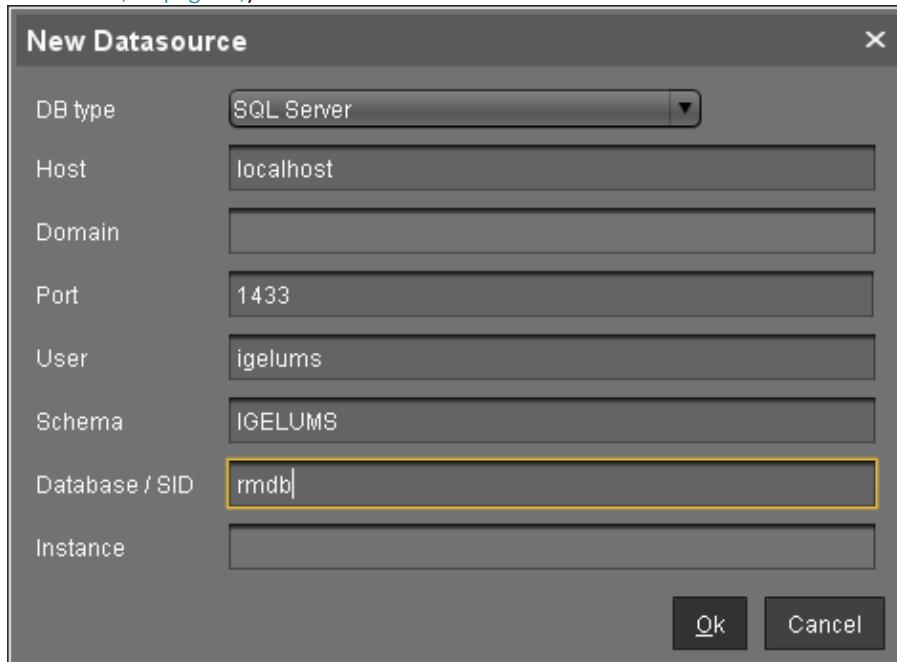


Copying Database Contents

1. Start IGEL Universal Management Suite Administrator.

ⓘ Default path to the UMS Administrator:
Linux: /opt/IGEL/RemoteManager/RMAdmin.sh
Windows: C:\Program Files\IGEL\RemoteManager\rmadmin\RMAdmin.exe
The IGEL UMS Administrator application can only be started on the UMS Server.

2. Go to **Datasource > Add...** to create a new SQL Server data source; use exactly the same database name and settings you have defined while setting up the SQL Database (see [Setting Up the SQL Database](#)(see page 78)).



The screenshot shows the 'New Datasource' dialog box. It has a dark gray background with white text and input fields. The fields are as follows:

DB type	SQL Server
Host	localhost
Domain	
Port	1433
User	igelums
Schema	IGELUMS
Database / SID	rmdb
Instance	

At the bottom right are two buttons: 'Ok' and 'Cancel'. The 'Database / SID' field is highlighted with a yellow border.

3. Select the **Embedded DB** entry and click **Copy**.



IGEL Universal Management Suite Administrator

File Help

Settings

UMS Licensing ID B...

Backups

Datasource

DB type: EmbeddedDB

Host: localhost

Domain:

Port: 1528

User: admin

Schema: ADMIN

Database / SID: rmdb

Instance:

UMS Admin User: admin

Change

Copy

Optimize Database

SQL Console

Datasource Configurations:

Database	Host	User	DB type
rmdb	localhost	admin	Embedded DB

Add..

Edit..

Delete

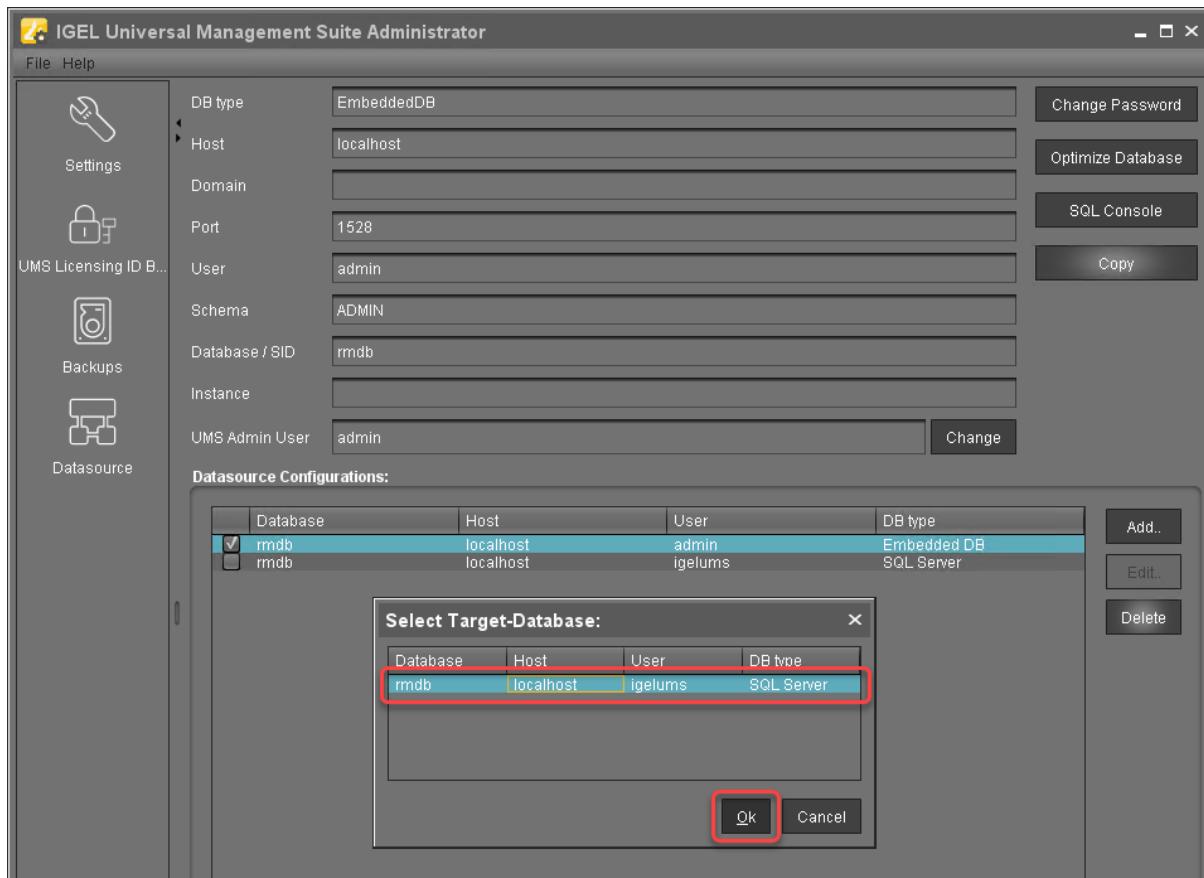
Test

Activate

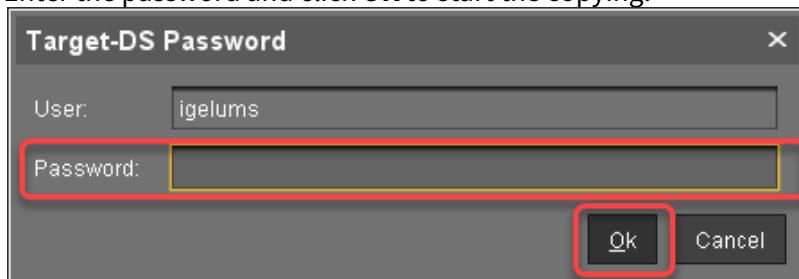
Deactivate

The screenshot shows the IGEL Universal Management Suite Administrator interface. On the left, there's a sidebar with icons for Settings, UMS Licensing ID B..., Backups, and Datasource. The main panel has fields for DB type (EmbeddedDB), Host (localhost), Port (1528), User (admin), Schema (ADMIN), Database / SID (rmdb), and Instance. Below this is a section titled 'Datasource Configurations' containing a table with one row: Database: rmdb, Host: localhost, User: admin, DB type: Embedded DB. A red box highlights the 'Copy' button and the table row. At the bottom are buttons for Test, Activate, and Deactivate.

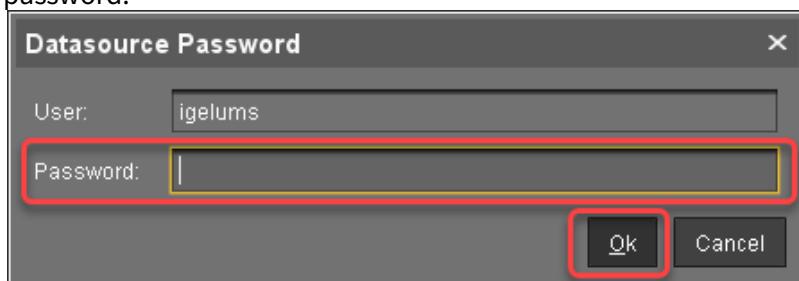
4. Select the newly created SQL Server entry as the target and click **OK**.



5. Enter the password and click **OK** to start the copying.



6. When the copying has completed, test the database connection by clicking **Test** and entering the password.





7. If the test was successful, select the **SQL Server** datasource and click **Activate**.

A screenshot of the IGEL Universal Management Suite Administrator window. On the left, there's a sidebar with icons for Settings, UMS Licensing ID B..., Backups, and Datasource. The main area shows configuration fields for a database connection: DB type (EmbeddedDB), Host (localhost), Port (1528), User (admin), Schema (ADMIN), Database / SID (rmdb), and Instance (empty). To the right are buttons for Change Password, Optimize Database, SQL Console, and Copy. Below these is a section titled "Datasource Configurations:" containing a table. The table has columns: Database, Host, User, and DB type. It lists two entries: "rmdb" (Host: localhost, User: admin, DB type: Embedded DB) and "igelums" (Host: localhost, User: igelums, DB type: SQL Server). The "igelums" row is highlighted with a red border. At the bottom right of the main window are buttons for Test, Activate (which is highlighted with a red box), and Deactivate.

8. Enter the password to confirm the activation.

A screenshot of a "Datasource Password" dialog box. It has a "User" field containing "igelums" and a "Password" field which is empty and highlighted with a red box. At the bottom are "Ok" and "Cancel" buttons, with "Ok" also highlighted with a red box.



- ⓘ Now the Microsoft SQL Server is set up as the datasource. From now on, back up the SQL Server in order to back up UMS data.
- ⓘ The same way you can go back to the embedded database, if you need.



Restore and Recover Corrupted UMS Embedded DB

Environment

- UMS 6 on Windows or Linux

If the embedded database of UMS* is corrupted, try the following measures to resolve the issue.

*The underlying technology of the embedded database is Apache Derby.

Restoring a Database Backup Made with the UMS Administrator

If a backup of the embedded database is available (see Creating a Backup of the IGEL UMS), just restore the backup, see Restoring a Backup.

Restoring a File-Based Backup

If an uncorrupted copy of the database files located under `C:\Program Files...\IGEL\RemoteManager\db\rmdb` (default installation path on Windows) and/or `/opt/IGEL/RemoteManager/db/rmdb/` (default installation path on Linux) is available, you can restore the file copy. In the remainder of this how-to, the aforementioned possible paths will be referred to as `RMDB_PATH`.

To restore the backup, perform the following steps:

1. Open the UMS Administrator, and go to **Datasource** in the menu on the left.

i Default path to the UMS Administrator:
Linux: `/opt/IGEL/RemoteManager/RMAdmin.sh`
Windows: `C:\Program Files\IGEL\RemoteManager\rmadmin\RMAdmin.exe`
The IGEL UMS Administrator application can only be started on the UMS Server.

2. In the **Datasource** area, delete the corrupted Derby DB.
3. Create a new embedded DB with exactly the same user name and password as you used for the deleted DB.
4. Deactivate the newly created DB.
5. Stop the UMS Server service. For details on how you can stop it, see IGEL UMS HA Services and Processes.
6. Erase all files contained in the folder at `RMDB_PATH`.
7. Copy your previously backed-up files to `RMDB_PATH`.
8. Activate the DB with the UMS Administrator under **Datasource**.
9. Wait 1 - 2 minutes, then log in to the UMS Console.

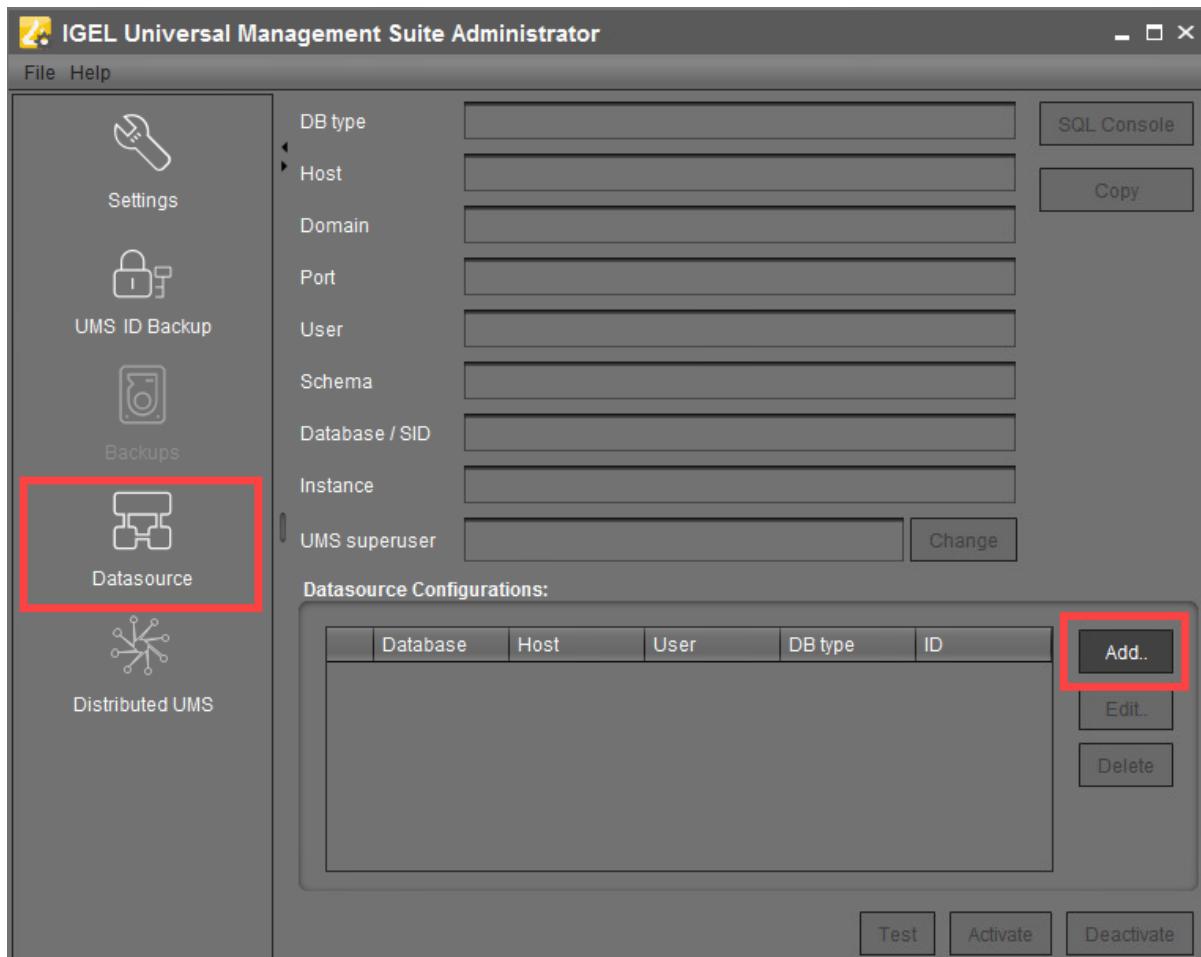


Disaster Recovery: UMS with an External Database

The following instructions require a proper backup of your environment, see the "External Database" section under Creating a Backup of the IGEL UMS.

Execution Order in Case of the Disaster Recovery

1. Install the UMS on the server, see [Installing an IGEL UMS Server](#). All the UMS components must be installed like before:
 - a. The same UMS version
 - b. The same network configuration of the host (the same IP addresses, ports)
 - c. For High Availability (HA) installations only: During the installation, use the backed-up IGEL network token. See the "Starting the Installation" section under [Adding Further Servers to the HA Network](#).
2. Stop the existing UMS Server(s). For the details on how you can do it, see [IGEL UMS HA Services and Processes](#).
3. Copy all the saved files and firmware updates from `[IGEL installation directory]/rmguiserver/webapps/ums_filetransfer` to the new UMS Server(s) – without the `WEB-INF` folder.
If you deploy the HA environment, see also [Which Files Are Automatically Synchronized between the IGEL UMS Servers?](#)(see page 170).
4. Restore the database backup using the procedures recommended by the DBMS manufacturer.
5. Add the database connection to your external database on each UMS Server: **UMS Administrator > Datasource > Add**.



6. Click **Activate** to enable the data source.
The UMS Server will start automatically after that.
7. In the **UMS Administrator > Backups > Restore**, restore the backup of server configurations on each UMS Server. If necessary, transfer host-specific server configurations to the new server(s).
8. In the **UMS Administrator > UMS ID Backup > Restore**, restore the backup of the UMS ID.
9. For HA and Distributed UMS installations only: Check host assignments for job execution and, if required, adjust them. See [Updating Host Assignment for Job Execution](#)(see page 166).

- i** After the procedure is complete, open the UMS Console and go to **UMS Administration > UMS Network > Server** to check if there is an entry for the previous UMS Server among the listed components. If so, select the entry and click **Delete** in the context menu.
In the case of the HA installations, the same must be done for the load balancers: **UMS Administration > UMS Network > Load Balancer**.



If you have a UMS installation with an embedded database, you may find it useful to read: [Restore and Recover Corrupted UMS Embedded DB](#)(see page 85).



How to Connect to the ICG after the UMS Server Migration or New Installation with the Same Database

After you have migrated your UMS Server, or newly installed it with the same database, or restored a database backup on this reinstalled server, the server cannot connect to an already existing IGEL Cloud Gateway (ICG). This happens because the ICG credentials are bound to the old process ID.

There are two possibilities to solve the problem:

- [Keeping the connection to the existing ICG](#)(see page 89): Applicable to UMS version 6.09.100 and higher. With this method, you follow the below instructions exactly in the order given and do NOT restart the UMS Server before performing these steps. Otherwise, you cannot connect to the existing ICG and have to reinstall it.
- [ICG reinstallation](#)(see page 91): Applicable to all UMS versions. With this method, you have to uninstall the ICG and then install it again.

i With both methods, there will be no negative impact on your endpoint devices – they will continue to work autonomously. Exception: login via Shared Workplace (SWP).

Keeping the Connection to the Existing ICG

Before UMS 6.09.100, it was always necessary to reinstall the existing ICGs after the migration of the UMS Server or reinstalling the UMS Server with the same database / backup restored. As of UMS 6.09.100, it is possible to keep the connection to the existing ICG. Proceed as follows:

1. On the old server / before the server reinstallation, open the UMS Console and go to **UMS Administration > UMS Network > Server**. Note the process ID of your UMS Server.

Attribute	Value
Process ID	b98a733e-765f-43f2-b9a0-bfbff4...
Cluster ID	UMS-CLUSTER-50125-159291...
Version	6.09.120

2. Install the UMS Server. For how to install the UMS, see [Installing an IGEL UMS Server](#).



3. In the UMS Administrator, restore the backup (see Restoring a Backup) or, in the case of the external database, connect the existing data source and activate it (see How to Set Up a Data Source in the IGEL UMS Administrator).

You will see the entries with the old and the new process ID in the UMS Console under **UMS Administration > UMS Network > Server** and **IGEL Cloud Gateway > [ICG name]**.

4. In the UMS Console, go to **UMS Administration > UMS Network > IGEL Cloud Gateway > [ICG name]**



and click the **Connect** button.

If there are several ICGs installed, perform this for each ICG.

Process Id	Process Display name	Connected to ICG	Last update time
b98a733e-765f-43f2-b...	td-ums-sv2019	Disconnected	24.01.2022 02:39
c4726f24-d4e4-4ed5-...	td-ums-sv2012	Disconnected	24.01.2022 02:39

5. Go to **UMS Administration > UMS Network > Server** and delete the server with the old process ID.

- ⓘ** After the above steps, you can restart the UMS Server at any time – you will keep the connection to the ICG. If you restart the UMS Server before performing the above steps, you will NOT be able to connect to your existing ICG and will have to reinstall it.



ICG Reinstallation

If you have migrated the UMS Server or reinstalled it with the same database / backup restored and cannot use the above-mentioned method for some reason, you will have to uninstall all the ICGs and install them again.

After you have confirmed that the new / reinstalled UMS Server is running properly, proceed as follows:

1. Log in to the ICG host and uninstall the ICG, see [Uninstalling ICG](#).
2. Reboot the ICG server.
3. In the UMS Console, go to **UMS Administration > UMS Network > IGEL Cloud Gateway** and click  to remove the ICG from the UMS Server.

In the case of the UMS Server migration, you have to remove the ICG from both the old and the new server if the old server is still running.

Display name	Process ID	Host	Port	Host (external)	Port (external)	Max number of devices	U...	proxy server
IGEL Cloud Gateway	48d15354-6c58-426c-b...		8443			2500		

4. Install the ICG, and in the case of the UMS Server migration, connect it only to the new UMS Server. See [Installing the IGEL Cloud Gateway](#).



- The same root certificate must be used for the installation.
- The ICG must not move to a new server and must be reachable as before.



Tip

Check preliminarily if ICG updates are available, see [IGEL Download Server](#)³. It is also recommended to check time and date on all UMS and ICG servers and ports, see [IGEL UMS Communication Ports](#)(see page 4).

After the ICG reinstallation, the previously bound endpoint devices can be managed via the new ICG and do not have to be re-registered.

³ <https://www.igel.com/software-downloads/enterprise-management-pack/>



UMS Does Not Connect to ICG: "TrustAnchor ...is not a CA certificate"

Symptom

The UMS fails to connect to the IGEL Cloud Gateway (ICG). The following message appears in the GUI or in the log file:

```
TrustAnchor ...is not a CA certificate
```

```
Caused by: sun.security.validator.ValidatorException: PKIX path validation failed: sun.security.validator.ValidatorException: TrustAnchor with subject "CN=UMS-CLUSTER--xxx, O=test, L=test, C=US" is not a CA certificate
at sun.security.validator.PKIXValidator.doValidate(PKIXValidator.java:380)
at sun.security.validator.PKIXValidator.engineValidate(PKIXValidator.java:273)
at sun.security.validator.Validator.validate(Validator.java:262)
at
sun.security.ssl.X509TrustManagerImpl.validate(X509TrustManagerImpl.java:327)
at
sun.security.ssl.X509TrustManagerImpl.checkTrusted(X509TrustManagerImpl.java:236)
)
at
sun.security.ssl.X509TrustManagerImpl.checkServerTrusted(X509TrustManagerImpl.java:113)
at
de.igel.apps.usg.connection.ssl.TrustedOnlyTrustManager.checkServerTrusted(TrustedOnlyTrustManager.java:74)
at
sun.security.ssl.AbstractTrustManagerWrapper.checkServerTrusted(SSLContextImpl.java:1099)
at
sun.security.ssl.ClientHandshaker.serverCertificate(ClientHandshaker.java:1622)
... 54 more
```

Environment

- UMS 6.04 or higher
- ICG with older root certificates created with UMS 5.07 or UMS 5.08

Problem

Older ICG root certificates (created with UMS 5.07 or UMS 5.08) do not have the right CA modifier, which was never a problem with previous Java versions. But the Java version used in UMS 6.4.x onwards blocks these certificates.

To check whether you have an old ICG root certificate:

1. Open the UMS Console, go to **UMS Administration > Global Configuration > Cloud Gateway** and select your ICG root certificate.



2. Click to read the certificate content.
If **Certificate Authority** is set to "false", you have an old ICG root certificate.

Solution

If you do not want to exchange the ICG root certificate (involves installing the ICG anew and re-registering all endpoint devices), you can add a start parameter that tells the UMS Server to ignore the CA flag in the certificate.

This start parameter will be overwritten on each UMS update installation, so you must set it again after the update.

Follow the instructions below, according to your operating system.

For Windows

1. Open the Windows **Services** dialog and stop the service **IGELRMGUIServer**.
2. Navigate to the directory <UMS installation directory>\RemoteManager\rmguiserver\bin (example: C:\Program Files (x86)\IGEL\RemoteManager\rmguiserver\bin)
3. Double-click on **editTomcatService**.
4. Confirm the warning dialog.
5. Select the **Java** tab.
6. Under **Java Options**, add the following entry as a new line:
`-Djdk.security.allowNonCaAnchor=true`
7. Click **Ok** to save the changes.
8. In the Windows **Services** dialog, start the service **IGELRMGUIServer**.

For Linux

1. Stop the service `igelRMserver`
2. Navigate to the directory /opt/IGEL/RemoteManager/rmguiserver/bin
3. Open the file `igelRMserver`
4. Find the two entries `-Xmx4096` and add a new line before each entry with the following content:
`-Djdk.security.allowNonCaAnchor=true`
5. Save the changes.
6. Start the service `igelRMserver`



Using Your Own Certificates for Communication over the Web Port (Default: 8443)

Overview

For all communication that is taking place over the Web Port (default: 8443, see also [IGEL UMS Communication Ports](#)(see page 4)), a specific self-signed certificate chain comes with the UMS on installation. Nevertheless, you can use a certificate chain of your own.

See also Web in the UMS Reference Manual.

This article describes how to deploy a certificate chain with a corporate CA certificate or a public certificate:

- [Deploying a Self-Signed Corporate Certificate Chain](#)(see page 94) (recommended)

We recommend using a self-signed corporate certificate chain. This approach makes you independent from public CAs, which are in danger of being compromised by attackers. Of course, a self-signed certificate must be made known to the browsers first, otherwise, the browsers will display warning messages.

- [Deploying a Certificate Chain with a Public Root CA](#)(see page 105)

Deploying a Self-Signed Corporate Certificate Chain

Prerequisites

- You have a self-signed root CA certificate that serves as a trusted “root” certificate company-wide.
- Your self-signed root CA certificate has been applied to all relevant trust stores within your company.
- You have an intermediate CA certificate that is signed by your root CA certificate and a corresponding private key.

Importing the Root Certificate

1. In the UMS Console, go to **UMS Administration > Global Configuration > Certificate Management > Web**.

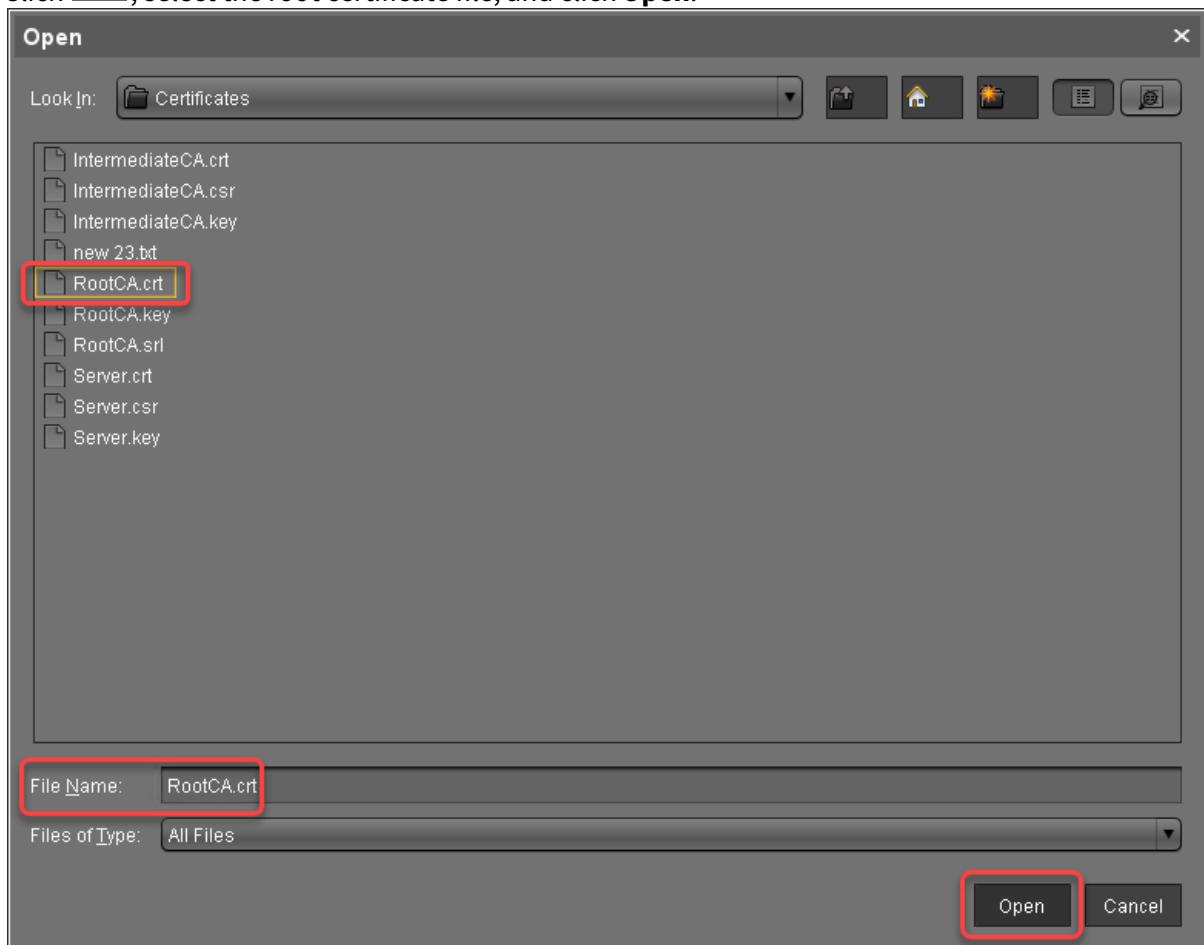


The screenshot shows the IGEL Universal Management Suite 6 interface. The left sidebar has 'Web' selected under 'UMS Administration'. The main pane displays 'Web Certificates' with two status indicators: 'Server status: OK' (green checkmark) and 'Certificate status: OK' (green checkmark). A note says 'Automatic renewal: ON'. Below this is a table of certificates:

Display name	Expiring date	Key Specification	Signature	Used	Private Key known	Status
6209499...	Oct 30, 2040	RSA (4096 bits)	SHA512withRSA	✓	✓	✓
4204...	Oct 30, 2021	RSA (4096 bits)	SHA512withRSA	✓	✓	✓

At the bottom, it says 'Please select a certificate to see its assigned server(s)'.

2. Click , select the root certificate file, and click **Open**.

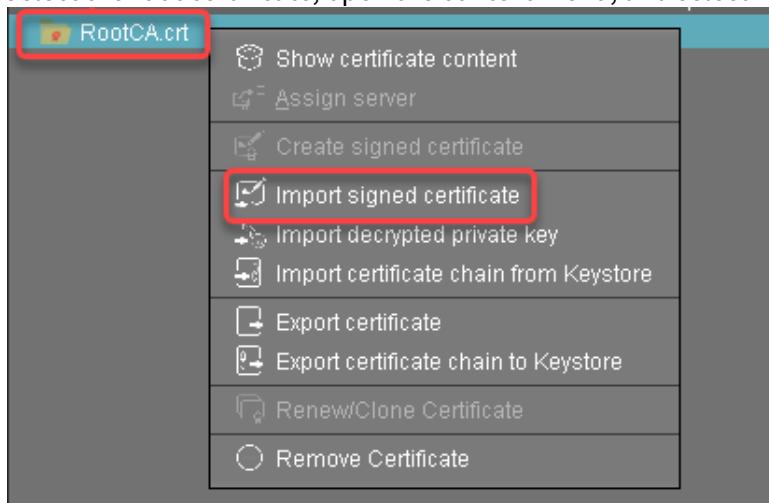


The root certificate is imported.



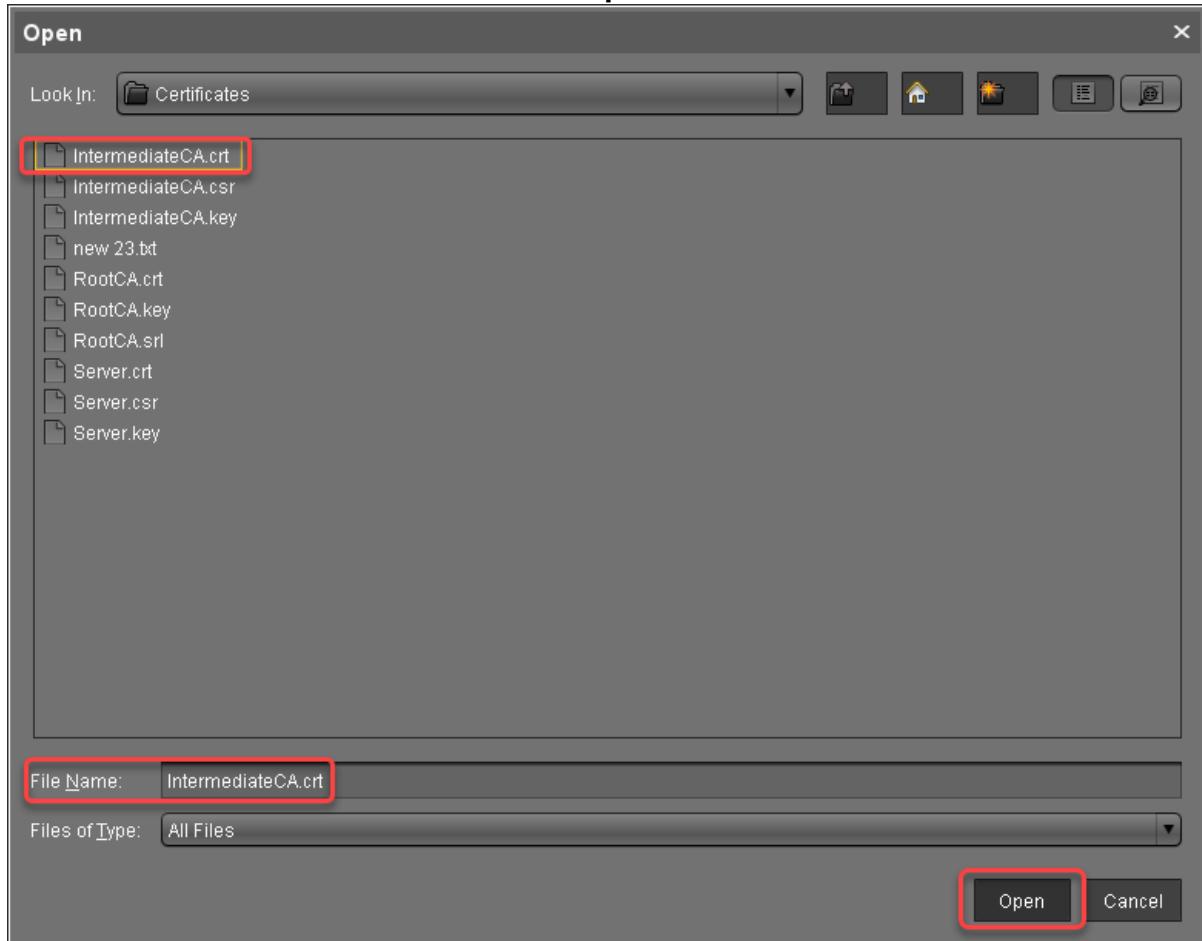
Importing the Intermediate Certificate

1. Select the root certificate, open the context menu, and select **Import signed certificate**.



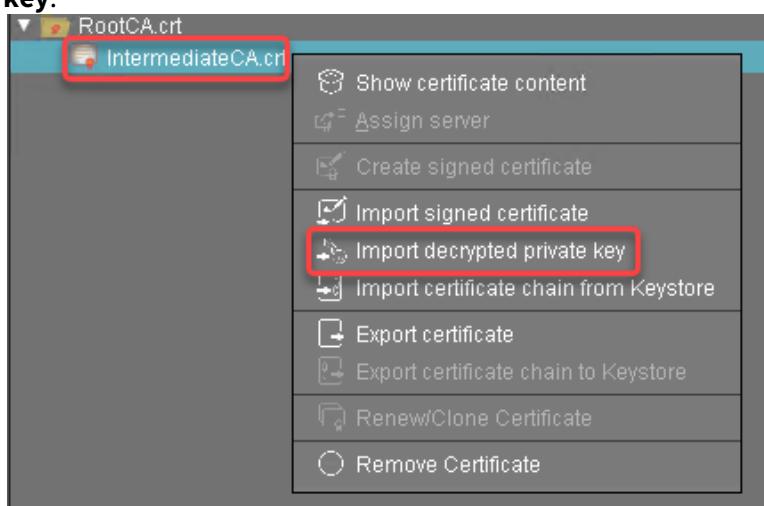


2. Select the intermediate certificate file and click **Open**.



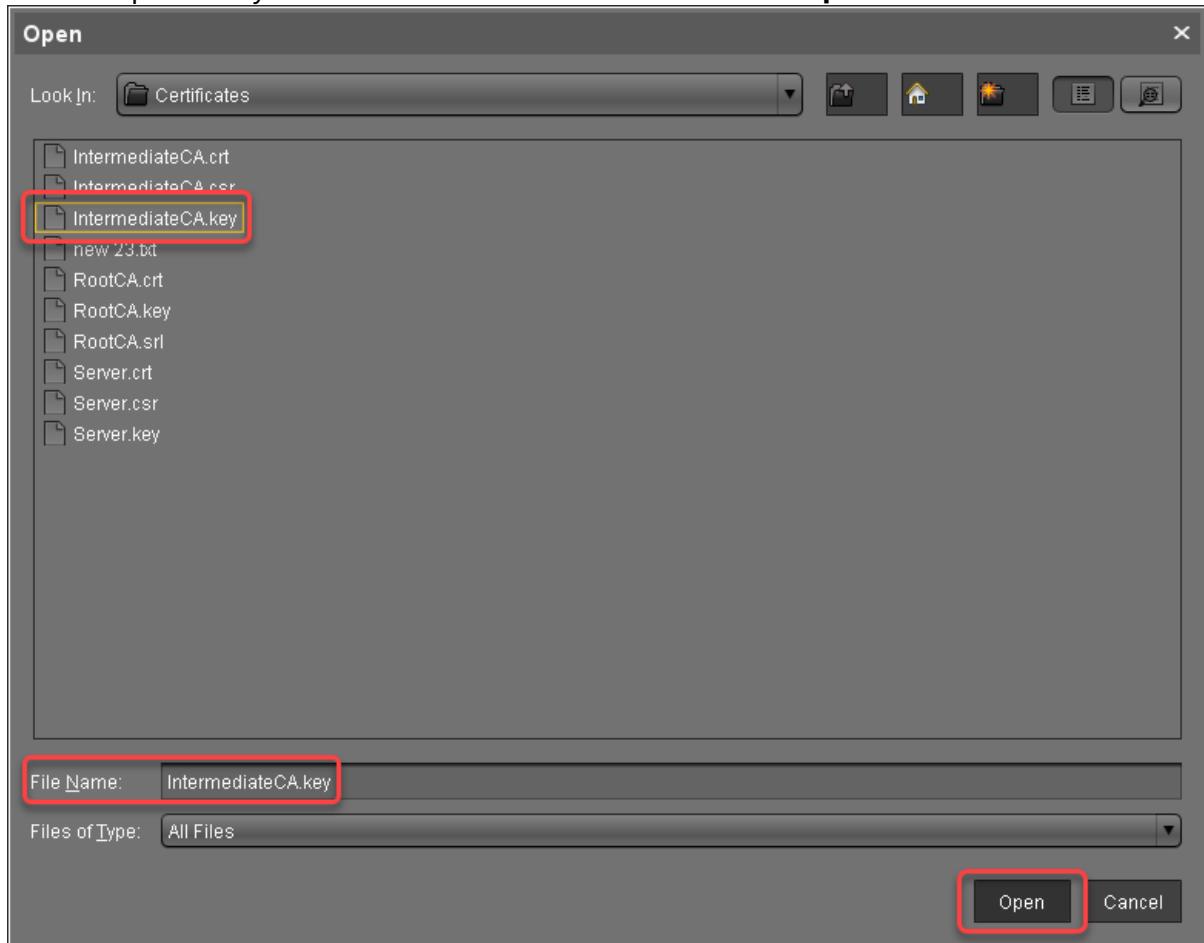
The intermediate certificate is imported.

3. Select the intermediate certificate, open the context menu, and select **Import decrypted private key**.





4. Select the private key file of the intermediate certificate and click **Open**.



The private key of the intermediate certificate is imported.

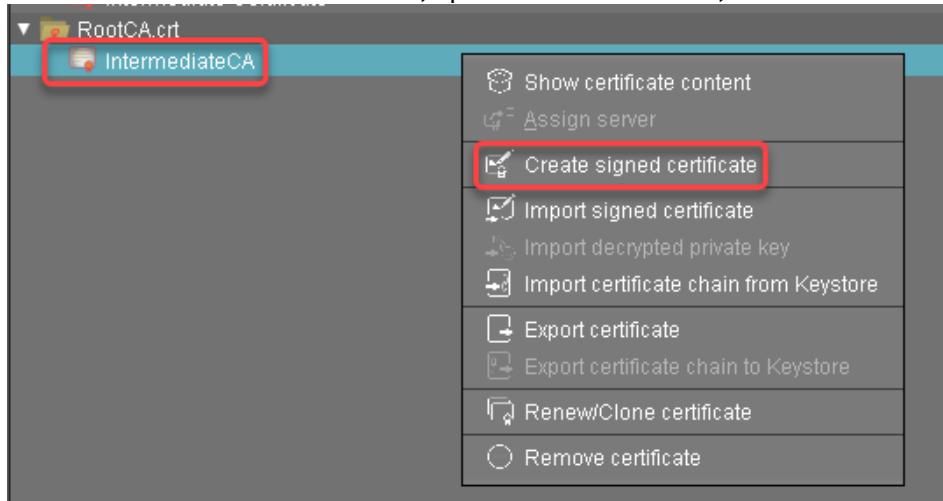
5. Continue with [Creating the End Certificates](#)(see page 98).

Creating the End Certificates

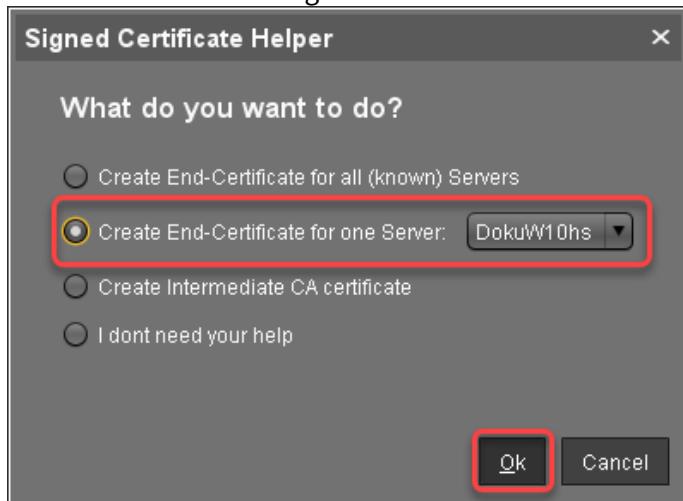
Repeat the following steps for each server in your UMS environment:



1. Select the intermediate certificate, open the context menu, and select **Create signed certificate**.



2. In the **Signed Certificate Helper**, select **Create end certificate for one server** and select the server which is to be assigned to the certificate.





3. In the dialog **Create Signed Certificate**, fill in the data as required.

Create signed certificate

Displayname	Server certificate
Your first and last name	Ike Igel
Your organization	My Company
Your locality (or random identifier)	Augsburg
Your two-letter country code	DE
Hostname and/or IP of certificate target server	Manage Hostnames
Key	RSA, 4096 bits Manage
Signature Algorithm	SHA256withRSA
Valid until	Oct 29, 2021
Certificate Type	<input type="radio"/> CA Certificate <input checked="" type="radio"/> End Entity
Ok Cancel	

4. Click **Manage hostnames**.

Create signed certificate

Displayname	Server certificate
Your first and last name	Ike Igel
Your organization	My Company
Your locality (or random identifier)	Augsburg
Your two-letter country code	DE
Hostname and/or IP of certificate target server	Manage Hostnames
Key	RSA, 4096 bits
Signature Algorithm	SHA256withRSA
Valid until	Oct 29, 2021
Certificate Type	<input type="radio"/> CA Certificate <input checked="" type="radio"/> End Entity
Ok Cancel	

5. In the dialog **Set Hostnames for Certificate**, check if "localhost" and all IP addresses and FQDNs (Fully Qualified Domain Names) under which your server is reachable are displayed under **Assigned hostnames**. If not, add the missing IP addresses and FQDNs under **Add hostname manually**.



Set Hostnames for Certificate

Server Attributes

- ▼ DokuW10hs
 - DokuW10hs *[not FQDN-compliant]*
 - ✓ 169.254.144.38

Assigned Hostnames

- ✓ 169.254.144.38
- ✓ localhost

>

<

Add Hostname manually

Add

Close

A screenshot of a software window titled "Set Hostnames for Certificate". On the left, under "Server Attributes", there is a dropdown menu showing "DokuW10hs" with two items: "DokuW10hs [not FQDN-compliant]" (marked with a red minus sign) and "169.254.144.38" (marked with a green checkmark). On the right, under "Assigned Hostnames", there is a list with two items: "169.254.144.38" and "localhost", both marked with green checkmarks. A red box highlights the "Assigned Hostnames" list. Below the "Server Attributes" section, there is a button labeled "Add Hostname manually" with a red box around it, and a "Add" button next to it. At the bottom right, there is a "Close" button with a red box around it.



6. Close the dialog **Create Signed Certificate** with **Ok**.

A screenshot of the 'Create signed certificate' dialog box. It contains the following fields:

- Displayname: Server certificate
- Your first and last name: Ike Igel
- Your organization: My Company (highlighted with a yellow box)
- Your locality (or random identifier): Augsburg
- Your two-letter country code: DE
- Hostname and/or IP of certificate target server: Manage Hostnames
- Key: RSA, 4096 bits
- Signature Algorithm: SHA256withRSA
- Valid until: Oct 29, 2021
- Certificate Type: End Entity (radio button selected)

The 'Ok' button at the bottom right is highlighted with a red box.

The signed server certificate is created.

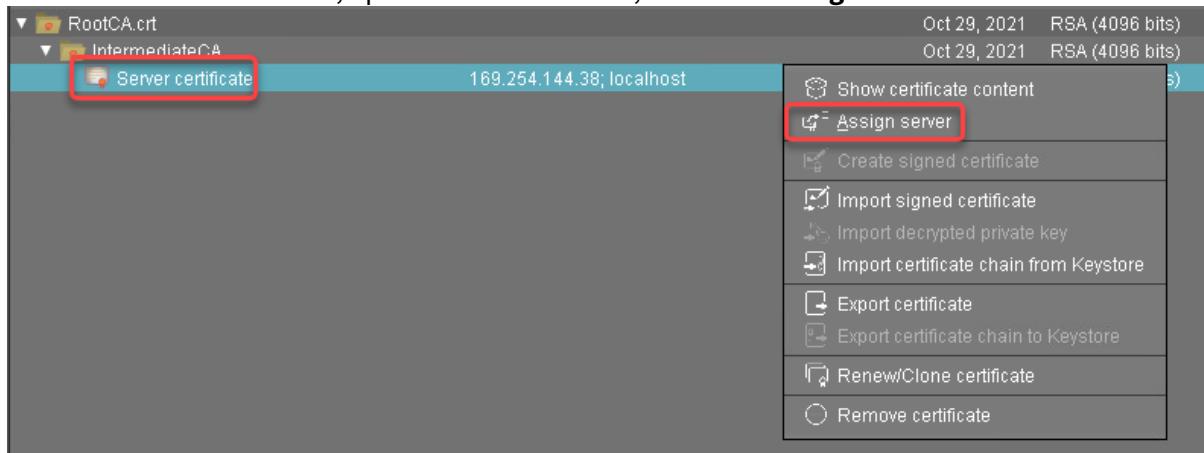
7. Continue with [Assigning the Certificate to All Servers](#)(see page 103).

Assigning All Servers to the Certificate

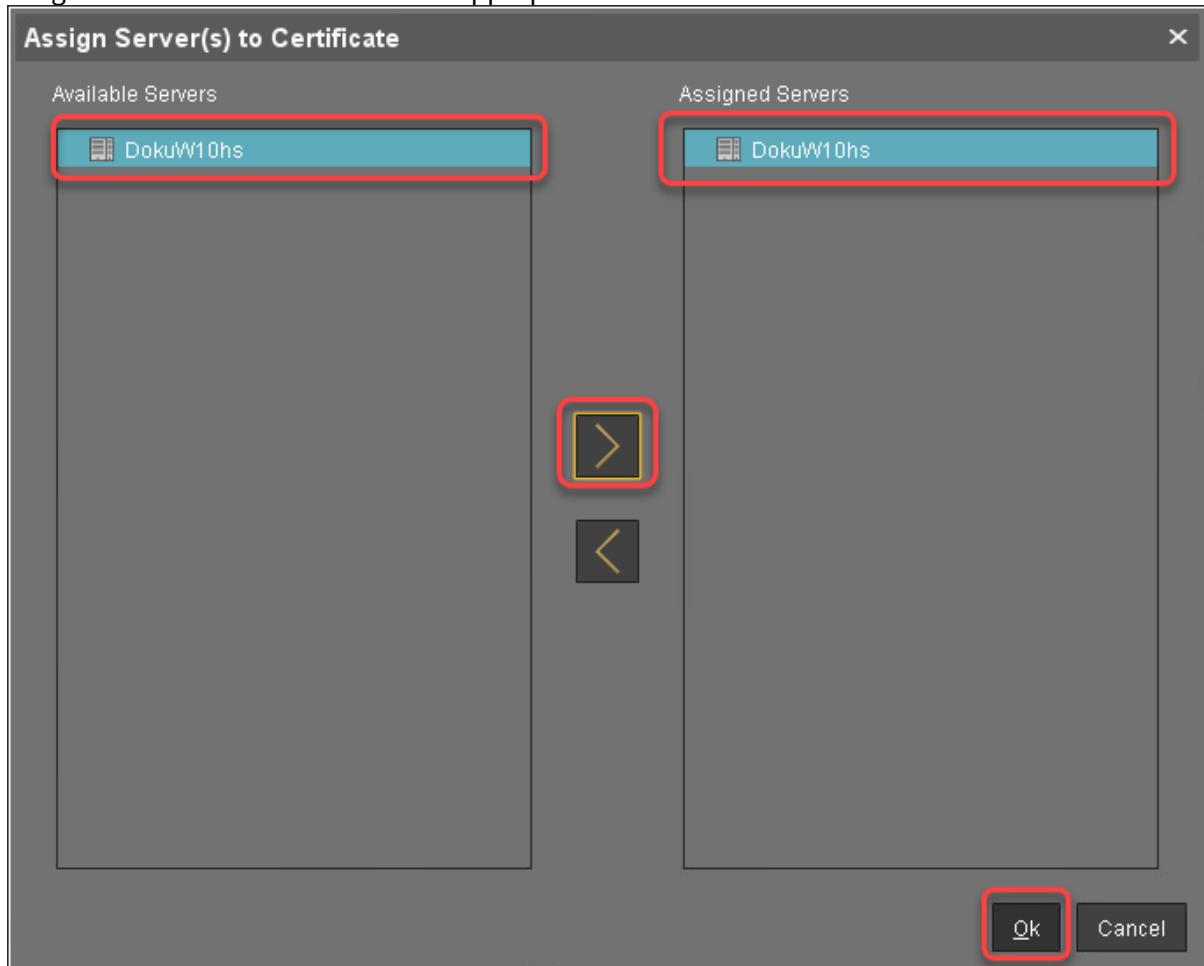
Repeat the following steps for each server in your UMS environment:



1. Select the server certificate, open the context menu, and select **Assign server**.



2. Assign the server to the certificate as appropriate.





3. If you are managing IGEL OS 12 devices, see [If You Exchange a Root Web Certificate for IGEL OS 12 Devices](#)(see page 115).
4. If you are using the UMS Web App: To avoid warning messages from browsers, you must make the new certificates known to the browsers. For instructions, see [UMS Web App: The Browser Displays a Security Warning \(Certificate Error\)](#)(see page 208).

Deploying a Certificate Chain with a Public Root CA

Prerequisites

- You have a public certificate that is able to serve as a CA.
- All UMS Servers follow the same naming scheme, e.g. "something.ums.mycompany.de" if the company name is "mycompany.de".

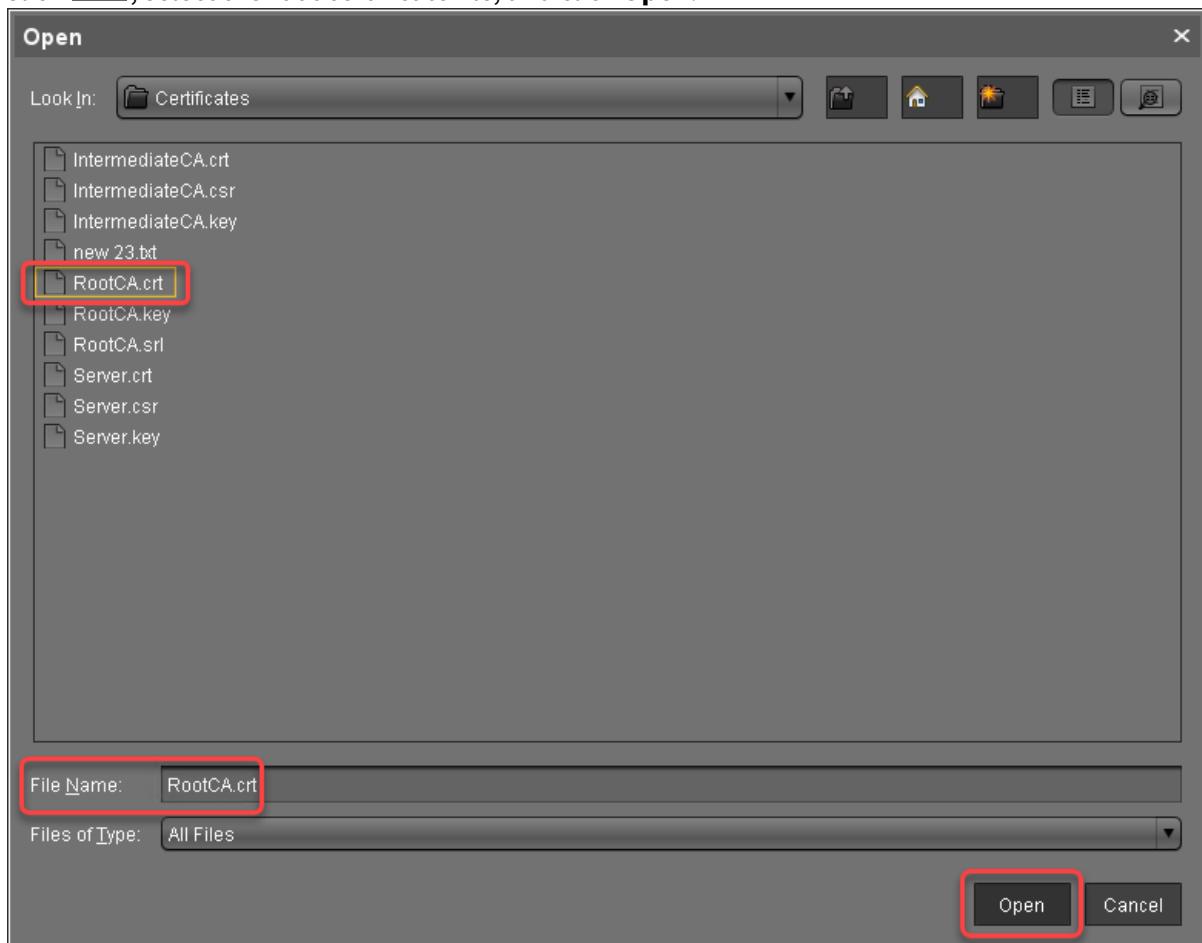
Importing the Root Certificate

1. In the UMS Console, go to **UMS Administration > Global Configuration > Certificate Management > Web**.

The screenshot shows the UMS Administration Suite 6 interface. The left sidebar has a tree view with 'Server -' at the top, followed by 'UMS Administration' which includes 'UMS Network', 'Global Configuration' (with 'Web' highlighted in a red box), 'Licenses', 'Certificates Management', and 'Device Communication'. Below this is another 'Web' node under 'Cloud Gateway'. The main panel has tabs for 'System', 'Edit', 'Devices', 'Misc', and 'Help'. The 'UMS Web App' tab is active. A search bar is at the top right. The central area is titled 'Web Certificates' with a note about the web certificate for port 8443. It shows two status indicators: 'Server status: OK' (green checkmark) and 'Certificate status: OK' (green checkmark). A radio button for 'Automatic renewal: ON' is checked. Below this is a table titled 'Certificates' with columns: Display name, Expiring date, Key Specification, Signature, Used, Private Key known, and Status. Two rows are listed: one for '6209499...' expiring Oct 30, 2040, and another for '4204...' expiring Oct 30, 2021. Both rows show green checkmarks in the 'Used' and 'Private Key known' columns. At the bottom, it says 'Assigned Server' and 'Please select a certificate to see its assigned server(s)'.



2. Click , select the root certificate file, and click **Open**.

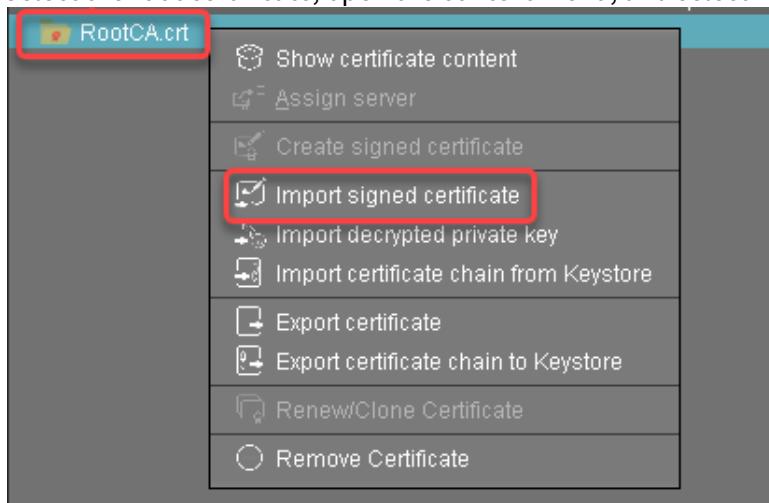


The root certificate is imported.



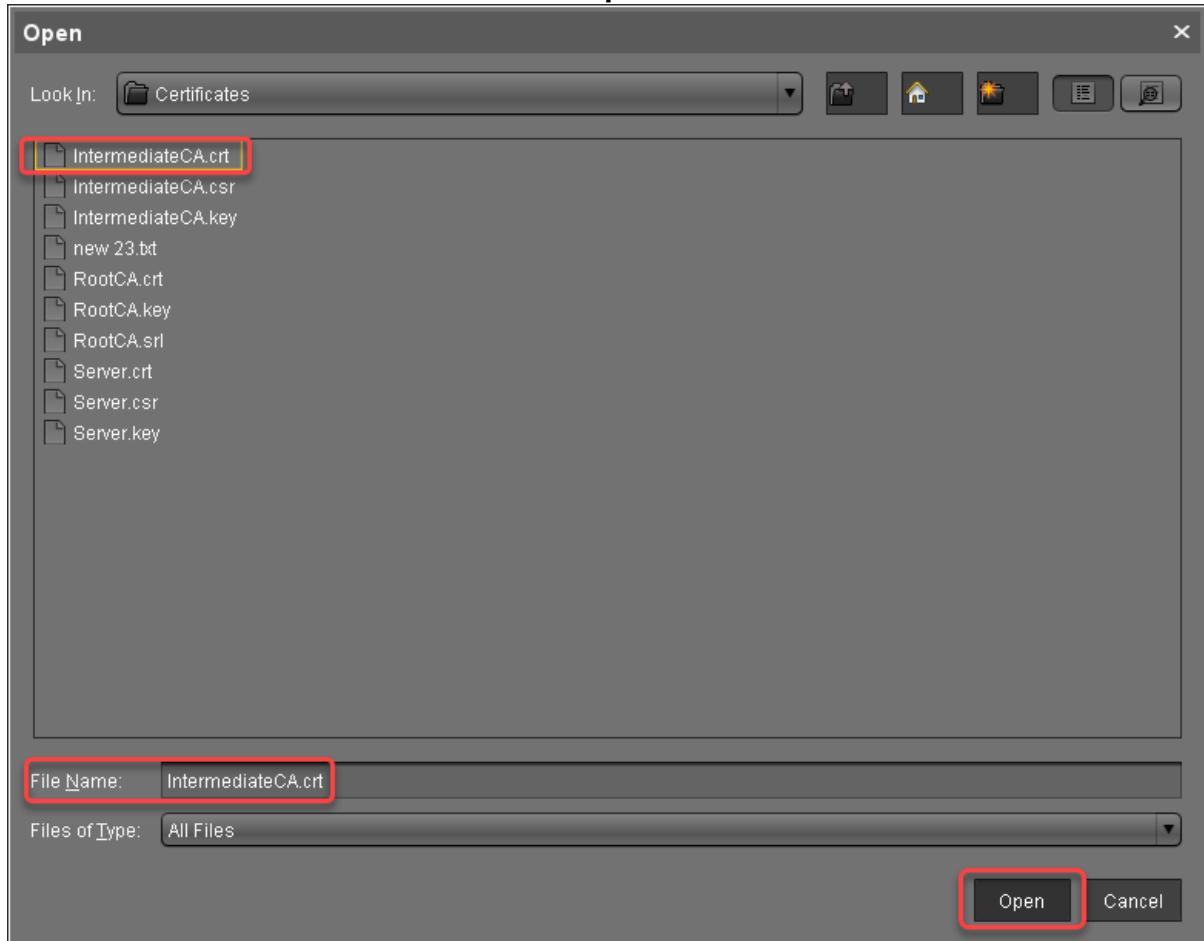
Importing the Intermediate Certificate

1. Select the root certificate, open the context menu, and select **Import signed certificate**.



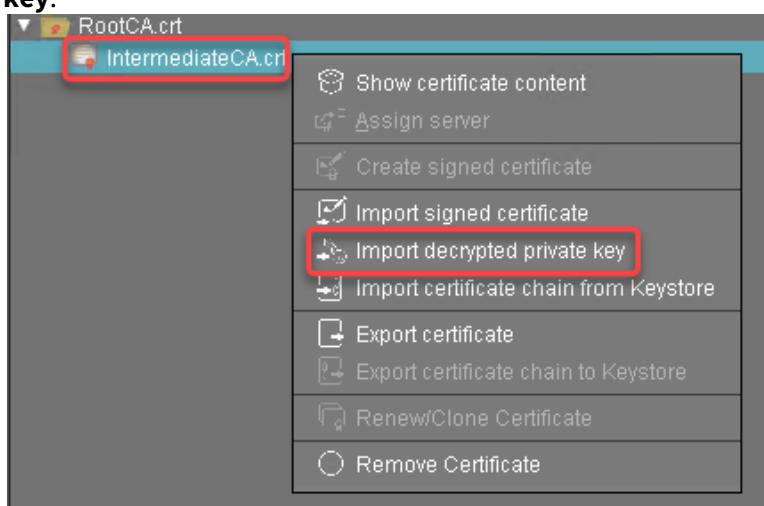


2. Select the intermediate certificate file and click **Open**.



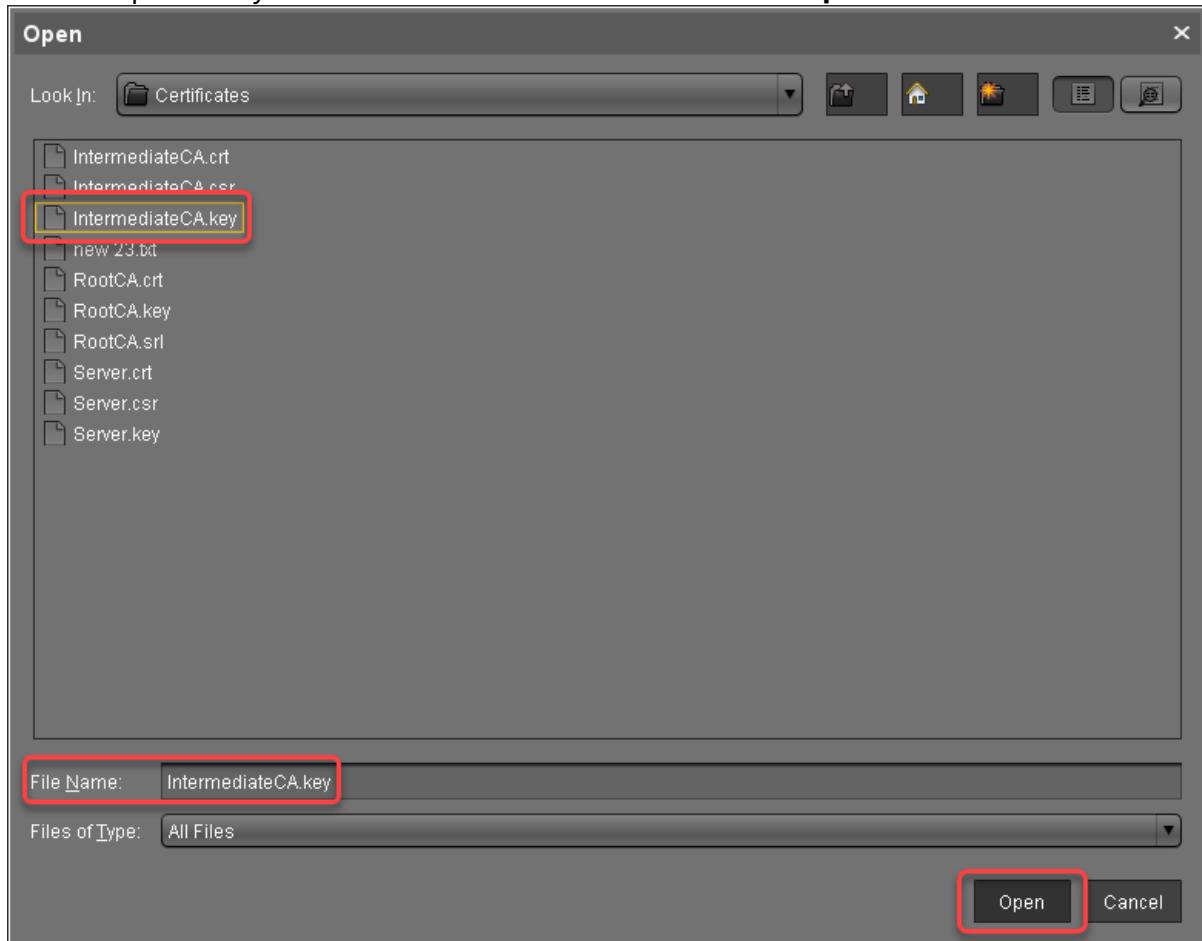
The intermediate certificate is imported.

3. Select the intermediate certificate, open the context menu, and select **Import decrypted private key**.





4. Select the private key file of the intermediate certificate and click **Open**.



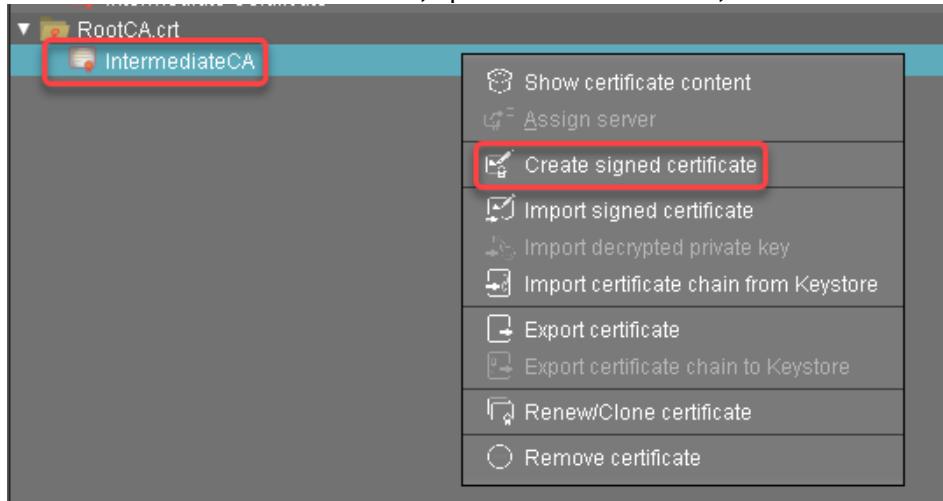
The private key of the intermediate certificate is imported.

Creating End Certificates

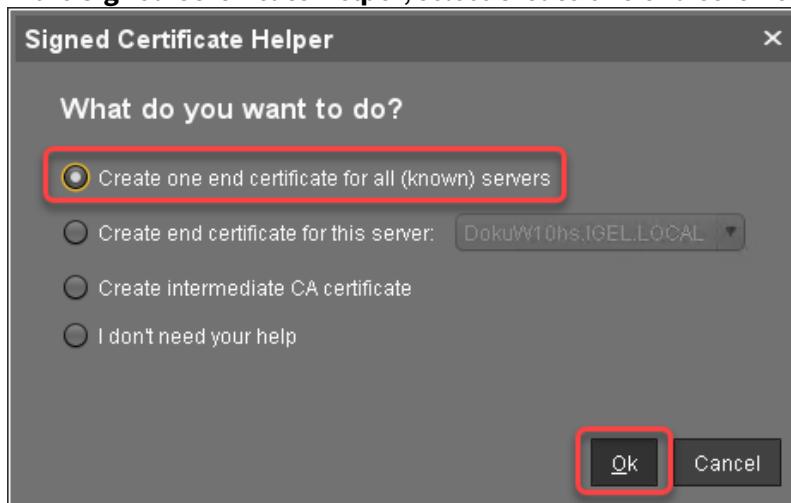
Repeat the following steps for each server in your UMS environment:



1. Select the intermediate certificate, open the context menu, and select **Create signed certificate**.



2. In the **Signed Certificate Helper**, select **Create one end certificate for all (known) servers**.





3. In the dialog **Create Signed Certificate**, fill in the data as required.

Create signed certificate

Displayname	Server certificate
Your first and last name	Ike Igel
Your organization	My Company
Your locality (or random identifier)	Augsburg
Your two-letter country code	DE
Hostname and/or IP of certificate target server	Manage Hostnames
Key	RSA, 4096 bits Manage
Signature Algorithm	SHA256withRSA
Valid until	Oct 29, 2021
Certificate Type	<input type="radio"/> CA Certificate <input checked="" type="radio"/> End Entity
Ok Cancel	



4. Click **Manage hostnames**.

The screenshot shows the 'Create signed certificate' dialog box. It contains fields for DisplayName (Server certificate), Your first and last name (Ike Igel), Your organization (My Company), Your locality (Augsburg), Your two-letter country code (DE), and a 'Hostname and/or IP of certificate target server' field which is highlighted with a red box. To the right of this field is a 'Manage Hostnames' button. Below these fields are sections for Key (RSA, 4096 bits), Signature Algorithm (SHA256withRSA), Valid until (Oct 29, 2021), and Certificate Type (radio buttons for CA Certificate and End Entity, with End Entity selected). At the bottom are 'Ok' and 'Cancel' buttons.

5. In the dialog **Set Hostnames for Certificate**, adjust the settings as follows:

- Check if "localhost" and all IP addresses and FQDNs (Fully Qualified Domain Names) under which your server is reachable are displayed under **Assigned hostnames**. If not, add the missing IP addresses and FQDNs under **Add hostname manually**.
- Remove all IP addresses and FQDNs you do not want to be part of the certificate.



Set Hostnames for Certificate

Server Attributes

- DokuW10hs
 - DokuW10hs (not FQDN-compliant)
 - ✓ 169.254.144.38

Assigned Hostnames

- ✓ 169.254.144.38
- ✓ localhost

> <

Add Hostname manually

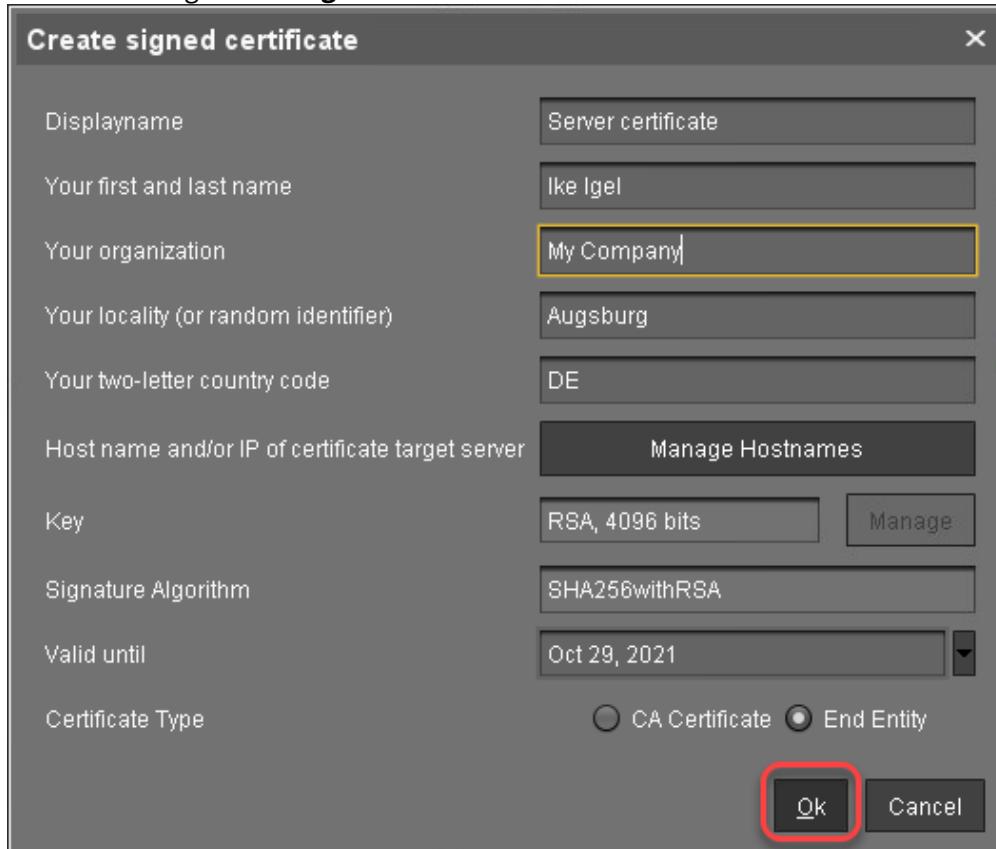
Add

Close

A screenshot of a software dialog titled "Set Hostnames for Certificate". On the left, under "Server Attributes", there is a list item for "DokuW10hs" which includes a note about being "not FQDN-compliant" and two hostnames: "169.254.144.38" (marked with a green checkmark) and "localhost" (also marked with a green checkmark). On the right, under "Assigned Hostnames", these same two hostnames are listed with green checkmarks. A red box highlights the "Assigned Hostnames" section. Below the server attributes, there is a section for "Add Hostname manually" with a text input field and an "Add" button. In the bottom right corner of the dialog, there is a "Close" button.



6. Close the dialog **Create Signed Certificate** with **Ok**.

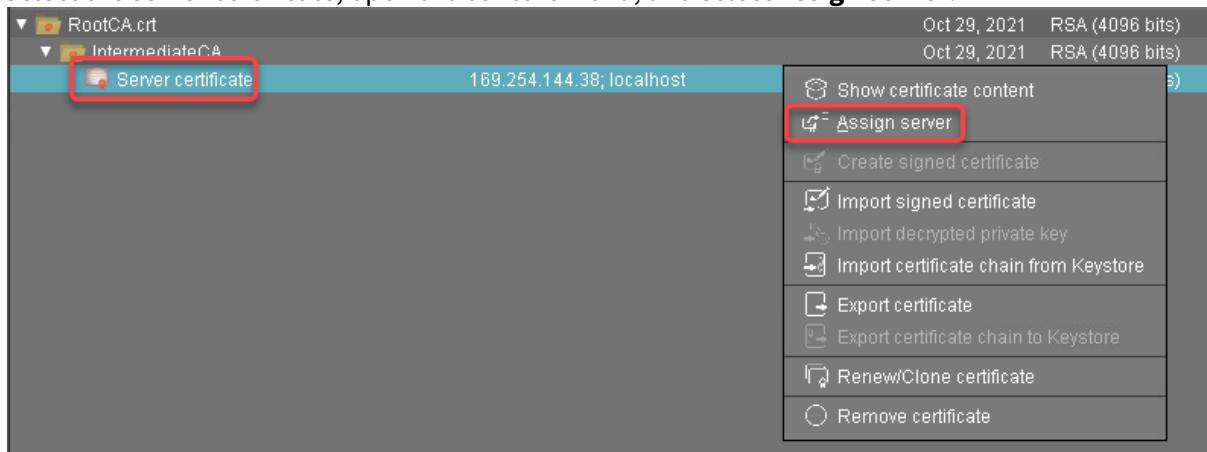


The signed server certificate is created.

7. Continue with [Assigning all Servers to the Certificate](#)(see page 114).

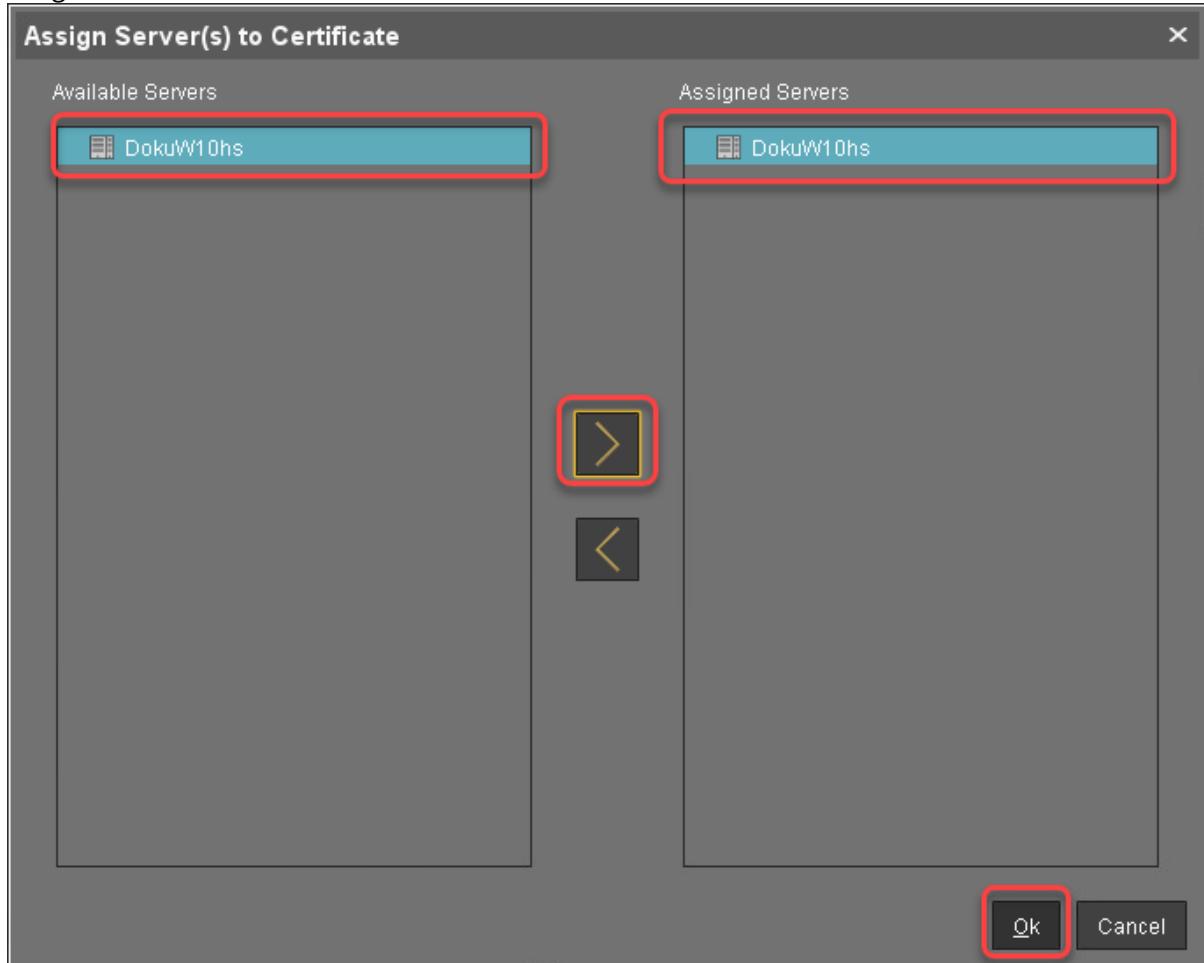
Assigning All Servers to the Certificate

1. Select the server certificate, open the context menu, and select **Assign server**.





2. Assign all servers to the certificate.



3. If you are managing IGEL OS 12 devices, see [If You Exchange a Root Web Certificate for IGEL OS 12 Devices](#)(see page 115).

If You Exchange a Root Web Certificate for IGEL OS 12 Devices

(i) New root web certificates are deployed to IGEL OS 12 devices on reboot.

For IGEL OS 12 devices, you can view which devices will no longer trust the UMS and will be unmanageable when you assign a new root certificate:

1. Select the certificate you want to be used under **UMS Console > UMS Administration > Global Configuration > Certificate Management > Web**.



Display name	Subject Alternative Names	Expiring date	Key Specification	Signature	Used	Private Key known	Status
4225471616		Jan 20, 2043	RSA (4096 bits)	SHA512withRSA	✓	✓	✓
3309108743	192.168.26.100; review-UMS12	Jan 20, 2024	RSA (4096 bits)	SHA512withRSA	✓	✓	✓
Certificate	192.168.26.100; localhost	Mar 15, 2024	RSA (4096 bits)	SHA512withRSA	✓	✓	✓

2. Click or select **Assign server** in the context menu.
3. In the dialog **Assign Server(s) to Certificate**, assign the required server(s) and click **Next**.

4. For IGEL OS 12 devices, you will see the **Affected Devices** dialog. Review it:
 If the **OS 12 devices without the new necessary certificates** number = 0 and there is no warning dialog, you can complete the assignment. The devices will safely switch to the new certificate.
 If the **OS 12 devices without the new necessary certificates** number > 0, click **Show devices** to create a view that collects the affected devices:



Affected Devices (only OS 12)

All affected OS 12 devices (3)

- OS 12 Devices without the new necessary certificates (3)
- OS 12 Devices that are ready to switch (0)

! Warning

Affected OS 12 devices without the necessary certificates may no longer be manageable!

New View

Create view and show affected devices

Yes **No**

A red arrow points from the warning message to the "Yes" button in the "New View" dialog.

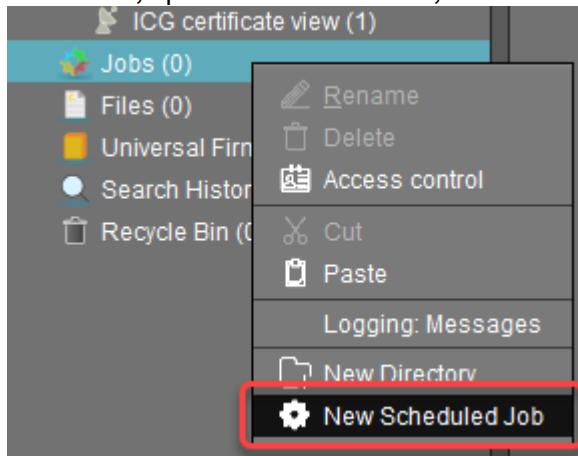
The view is created, and the UMS Console switches to the newly created view.

Name	TCs not supporting Web certificate view			
Description	Devices which are registered and don't have all given certificates			
Rule	Has not Web certificate with SHA256 Fingerprint 6981... AND Firmware version is greater than 12.0			
Query	webCertFingerprint != 6981E C19 and version > '12.0'			
Result list was last updated at 3:44 PM	Refresh			
Settings				
Matching devices (3 devices)				
Name	Last known IP address	MAC address	Product	Version
ITC0056569356CB	192.168.20.217	0056569356CB	IGEL OS	12.01.100-1rc4+1
ITC005656938022	192.168.30.101	005656938022	IGEL OS Base System	12.01.100-1rc10+1
ITC001E0C50B3CA2	192.168.10.251	8844C299B848	IGEL OS	12.01.100-1rc5+1

Now, it is necessary to restart the affected devices. On reboot, the devices will receive all certificates from the UMS; afterward, they are ready to switch to the new certificate. To restart all affected devices at a defined time, it makes sense to create a scheduled job.



5. Go to **Jobs**, open the context menu, and select **New Scheduled Job**.



6. In the **New Scheduled Job** window, change the settings as follows and click **Next**:

- **Name:** A name for the job
- **Command:** Select "Reboot"
- **Execution time:** Select the time at which the restart should take place.

A screenshot of the 'New Scheduled Job' configuration dialog. The 'Details' tab is selected. The settings shown are:

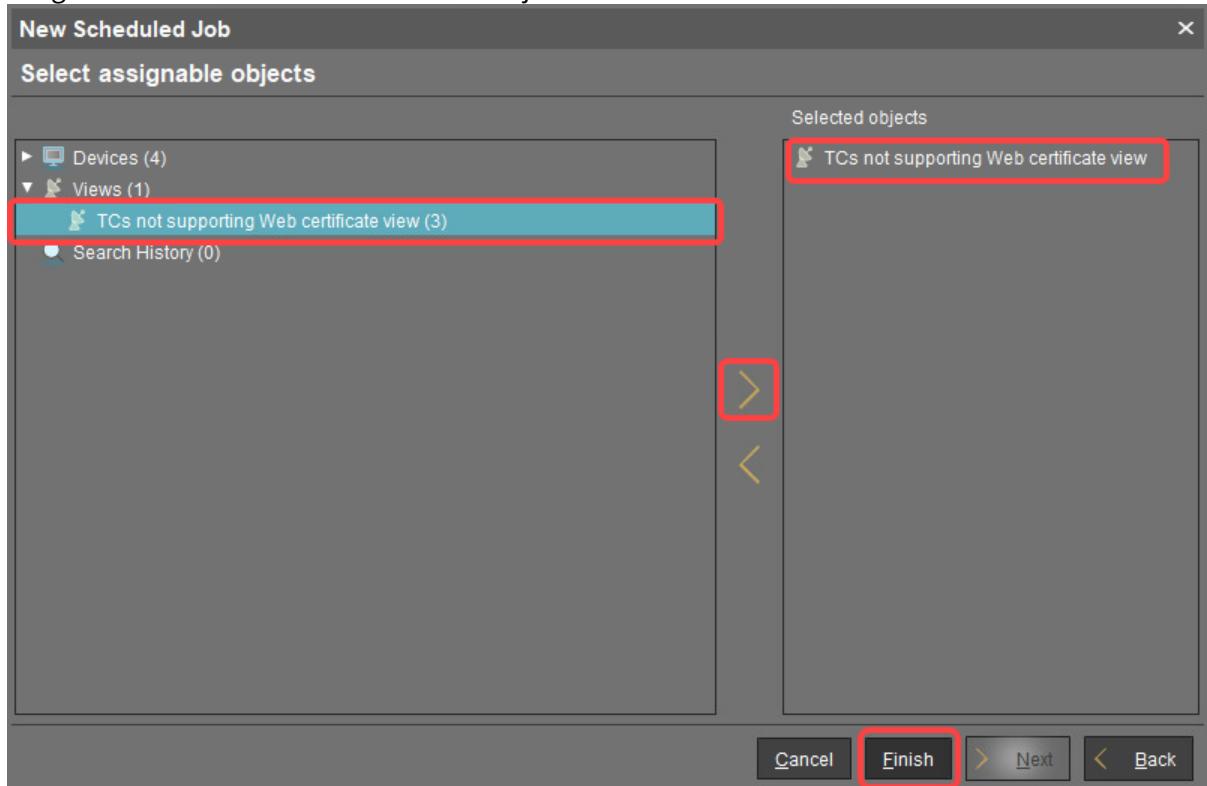
- Name: Reboot devices to get new root certificate
- Command: Reboot
- Execution time: 18:30
- Start date: 2024-03-15
- Enabled: checked

The entire 'Details' section is highlighted with a red box. At the bottom right of the dialog are buttons for Cancel, Finish, Next, and Back.

7. In the next step, leave the settings as they are and click **Next**.



8. Assign the view created beforehand to the job and click **Finish**.



9. After the reboot, complete the assignment: Under **UMS Administration > Global Configuration > Certificate Management > Web**, select the required certificate and click or **Assign server** in the context menu. If the output in the **Affected Devices** dialog is like this, click **Finish**. The devices will safely switch



to the new certificate.

Affected Devices (only OS 12)

All affected OS 12 devices (2)
OS 12 Devices without the new necessary certificates (0) Show devices
OS 12 Devices that are ready to switch (2) Show devices

✓ OK

All affected OS 12 devices are ready for the keystore update

Cancel Finish Next Back



Wake on LAN

- Deploying a Wake on LAN Proxy for Distributed Environments(see page 122)
- Distributing Wake on LAN Packets(see page 129)
- Use a WoL Proxy for Waking up Devices(see page 130)



Deploying a Wake on LAN Proxy for Distributed Environments

Problem

The UMS is residing outside the network which contains your devices, so it cannot wake up your devices by Wake on LAN.

Goal

You want the UMS to wake up your devices from outside their network.

Solution

If you are using UMS version 5.02.100 or higher and devices running Linux version 5.09.100 or higher, you can make a device act as a proxy which sends the Wake on LAN packets on behalf of the UMS.



Defining Devices as Wake on LAN Proxy

You can define one or more devices as a Wake on LAN proxy.

To define a device as a Wake on LAN proxy:

1. Logon to the UMS console.
2. Go to **UMS Administration**.
3. Select **Wake on LAN**.

A screenshot of the IGEL Universal Management Suite 6 (UMS) software interface. The window title is "IGEL Universal Management Suite 6". The left sidebar shows a tree view of "UMS Administration" with several collapsed categories like "UMS Network" and expanded categories like "Wake on LAN". The "Wake on LAN" category is highlighted with a blue selection bar. The main pane is titled "Wake On LAN Configuration" and contains the following sections:

- "Send the "magic packet" to ...":
 - Broadcast address
 - Last known IP address of the device
 - Automatic Wake On LAN Proxy Detection
 - All defined subnets
- "Subnet": A table with columns "Subnet" and "CIDR". One row is present with the value "0" in both columns.
- "Network address of last known IP address": An unchecked checkbox.
- "Network Mask": A table with columns "Network Mask" and "Comment". One row is present with an empty "Network Mask" field and a "Comment" field containing "Comment".
- "Dedicated Wake On LAN Proxies": An unchecked checkbox.
- "Name": A table with columns "Name", "MAC", and "Last Known IP Address". One row is present with an empty "Name" field, a "MAC" field, and an empty "Last Known IP Address" field.

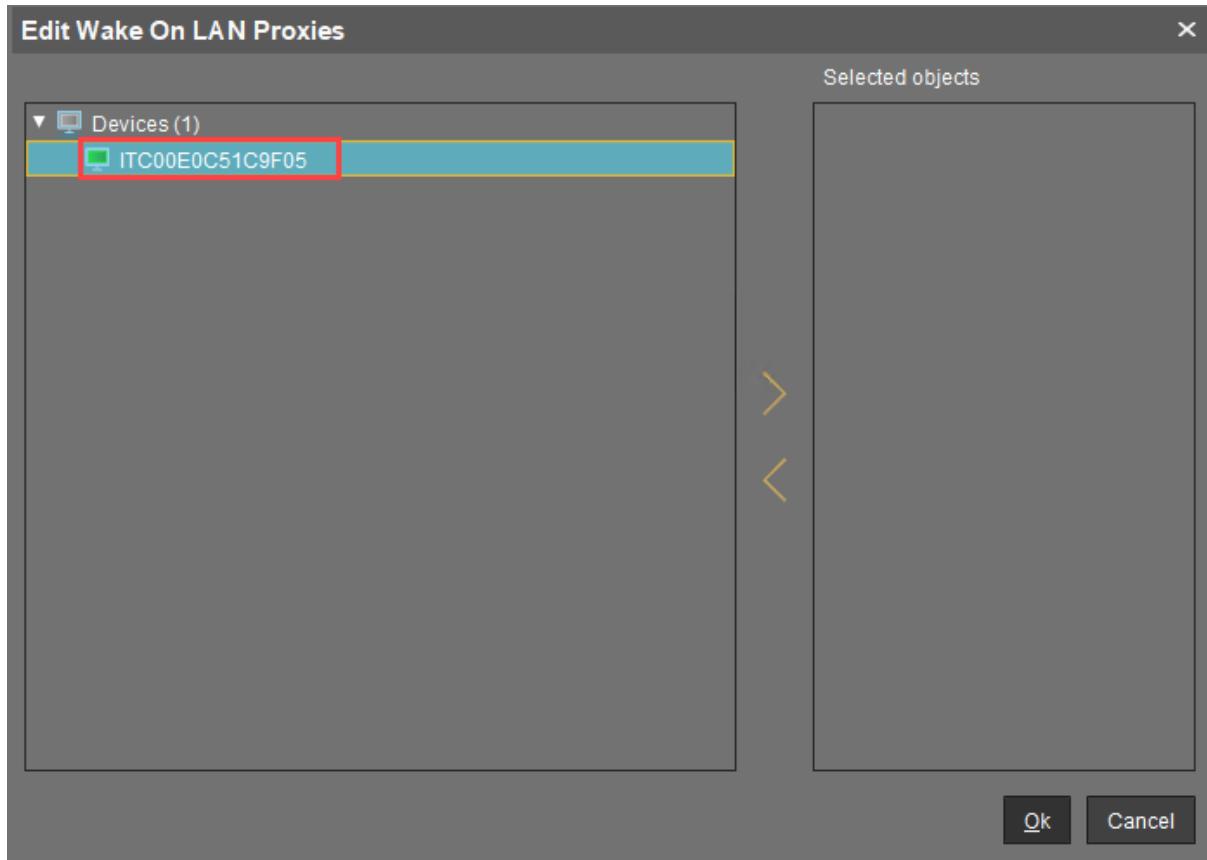
The status bar at the bottom left says "Connected to 172.30.91.30 as admin".

4. Activate **Dedicated Wake on LAN Proxies**.

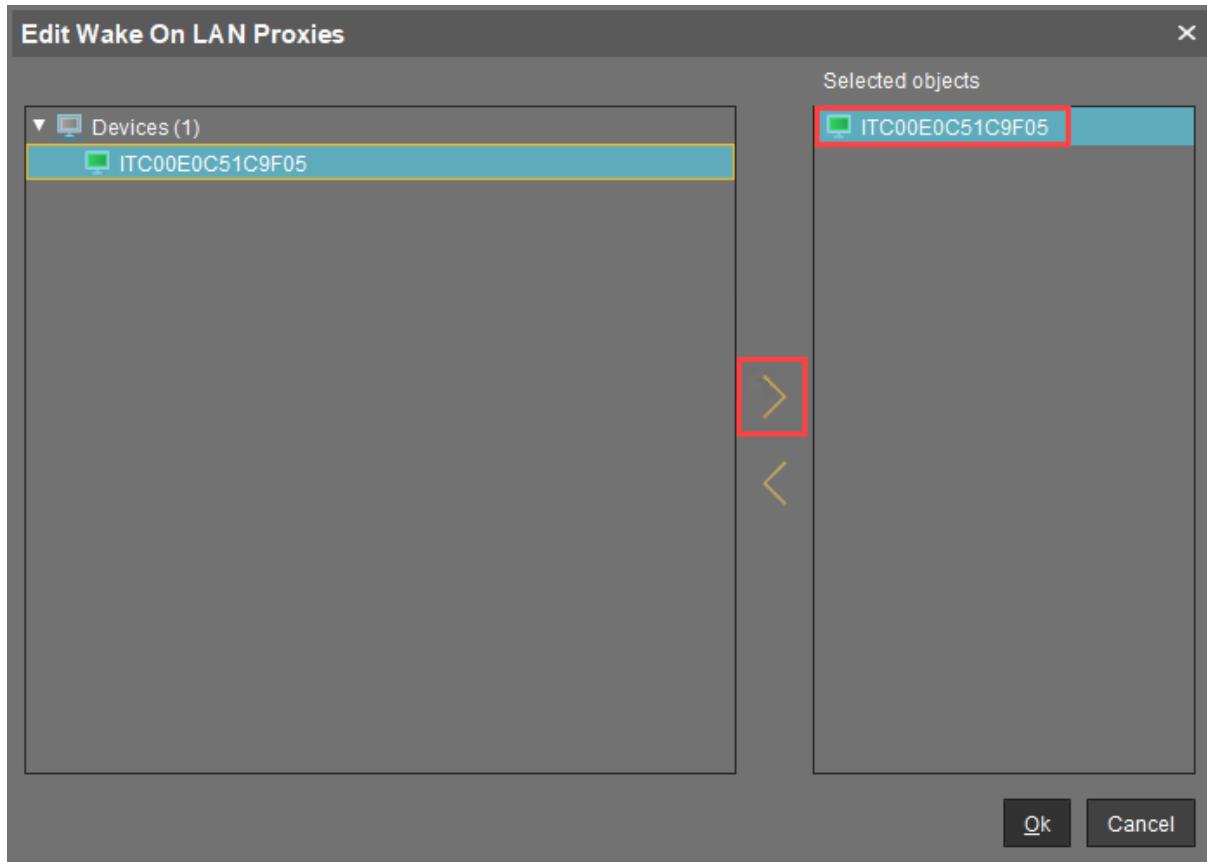
A screenshot of the IGEL Universal Management Suite 6 software interface. The window title is "IGEL Universal Management Suite 6". The left sidebar shows a tree view of the UMS Administration menu, with "Wake on LAN" selected. The main pane displays the "Wake On LAN Configuration" dialog. It includes sections for sending a "magic packet" to various targets (Broadcast address, Last known IP address, Automatic Wake On LAN Proxy Detection, All defined subnets), a table for defining subnets (Subnet, CIDR, Comment), and a section for Network address of last known IP address. At the bottom, there is a checkbox for "Dedicated Wake On LAN Proxies" which is checked, and a table for managing proxies (Name, MAC, Last Known IP Address).

Connected to 172.30.91.30 as admin

5. Click .
- The dialog **Edit Wake ON LAN Proxies** opens.
6. Select the device you want to use as a Wake on LAN proxy.



7. Click .
The selected device is listed under **Selected objects**.



8. Click **Ok**.

The selected device is configured as a Wake on LAN proxy. In the device's registry, the **parameter system.remotemanager.wol_proxy.enabled** is set to true.

i A device that is configured as a Wake on LAN proxy cannot be set to standby or shut down. This lock is in effect as soon as the device has received its settings from the UMS.



Removing a Wake on LAN proxy

You can remove the Wake on LAN proxy function from a device.

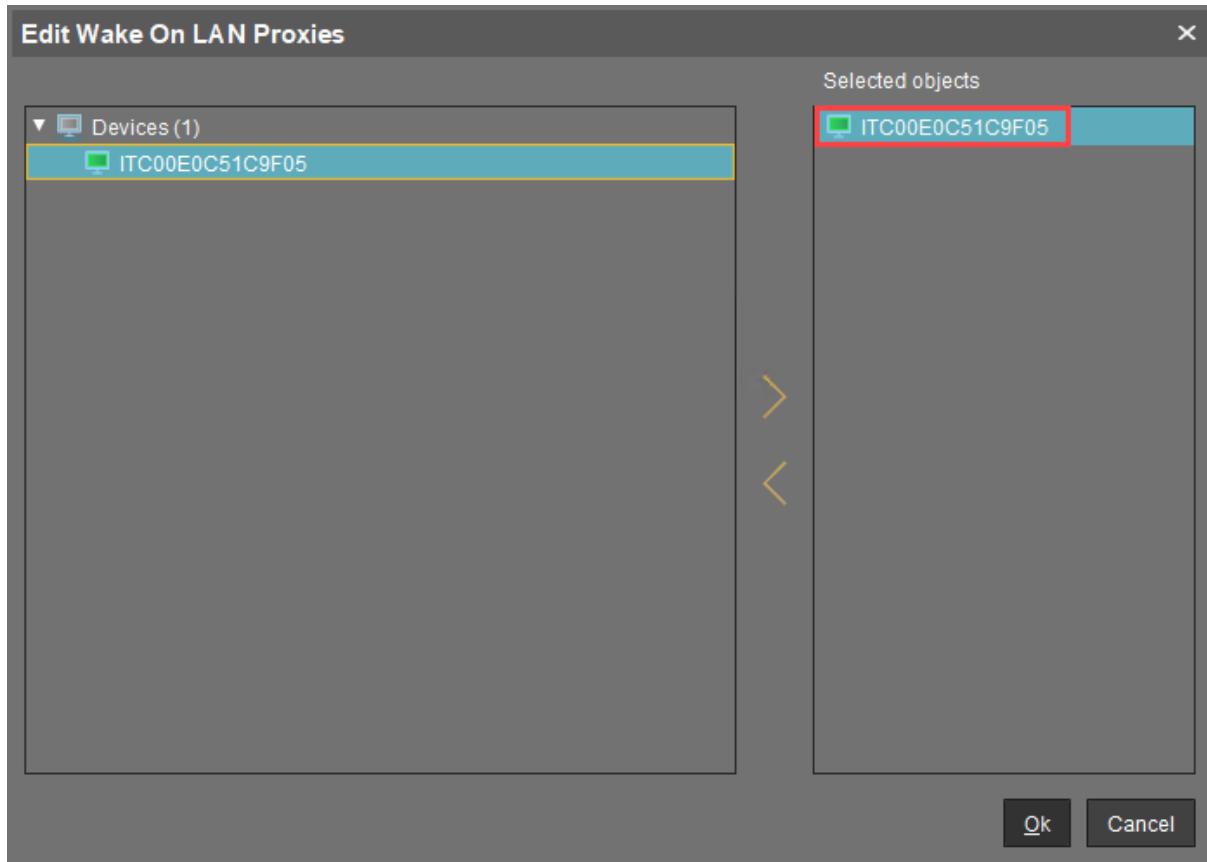
To define one or more devices as Wake on LAN Proxy:

1. Log in to the UMS Console.
2. Go to **UMS Administration**.
3. Select **Wake on LAN**.

A screenshot of the IGEL Universal Management Suite 6 (UMS) interface. The window title is "IGEL Universal Management Suite 6". The left sidebar shows a tree view of "Server - UMS Administration" with several collapsed categories like "UMS Network", "Global Configuration", and "Mobile Devices". The "Wake on LAN" category is expanded, and its name is highlighted with a red box. The main panel is titled "Wake On LAN Configuration" and contains the following sections:

- "Send the "magic packet" to ...":
 - Broadcast address
 - Last known IP address of the device
 - Automatic Wake On LAN Proxy Detection
 - All defined subnets
- "Subnet": A table with one row showing "CIDR 0".
- "Network Mask": A table with one row.
- "Dedicated Wake On LAN Proxies": A table with one row showing "Name", "MAC", and "Last Known IP Address".

4. Click .
- The dialog **Edit Wake ON LAN Proxies** opens.
5. Select the device you do not want to use as Wake on LAN proxy.



6. Click .
7. Click **Ok**.

The selected device is no longer configured as a Wake on LAN proxy. As soon as the device has received its settings from the UMS, it can be set to standby and shut down as normal. In the device's registry, the parameter **system > remotemanager > wol_proxy > enabled** is set to "false".



Distributing Wake on LAN Packets

IGEL UMS sends the magic packets as UDP datagrams to port 9. In order to work for different subnets, this has to be supported by the routers involved.

Wake on LAN settings can be configured in **UMS Console** under **UMS Administration > Global Configuration > Wake on LAN**.

UMS supports sending Wake on LAN magic packets to

- the broadcast address
- the last known IP address of the device
- all defined subnets
- the network address of the last known device IP address (define one or more network masks to be applied)
- a dedicated Wake on LAN proxy to wake up thin clients in another network; see [Use a WoL Proxy for Waking up Devices](#)(see page 130)



Use a WoL Proxy for Waking up Devices

You have the possibility to wake up devices even if they live in a different network that does not allow broadcast packets from the WAN. The trick is to set up one or more devices as Wake-on-LAN proxy. A device acting as a Wake-on-LAN proxy will never fall asleep itself, as its job is to listen to a special wake-up call from the UMS. This wake-up call tells the Wake-on-LAN proxy to send magic packets to all devices or a selection of devices in its network. To support this functionality, the Wake-on-LAN proxy device must have IGEL Linux version 5.09.100 or higher.

You can define a dedicated Wake-on-LAN proxy, or, alternatively, set the UMS to determine a Wake-on-LAN proxy automatically. However, the latter option cannot guarantee that a Wake-on-LAN proxy can be defined, as this depends on an appropriate device being online in the relevant subnet.

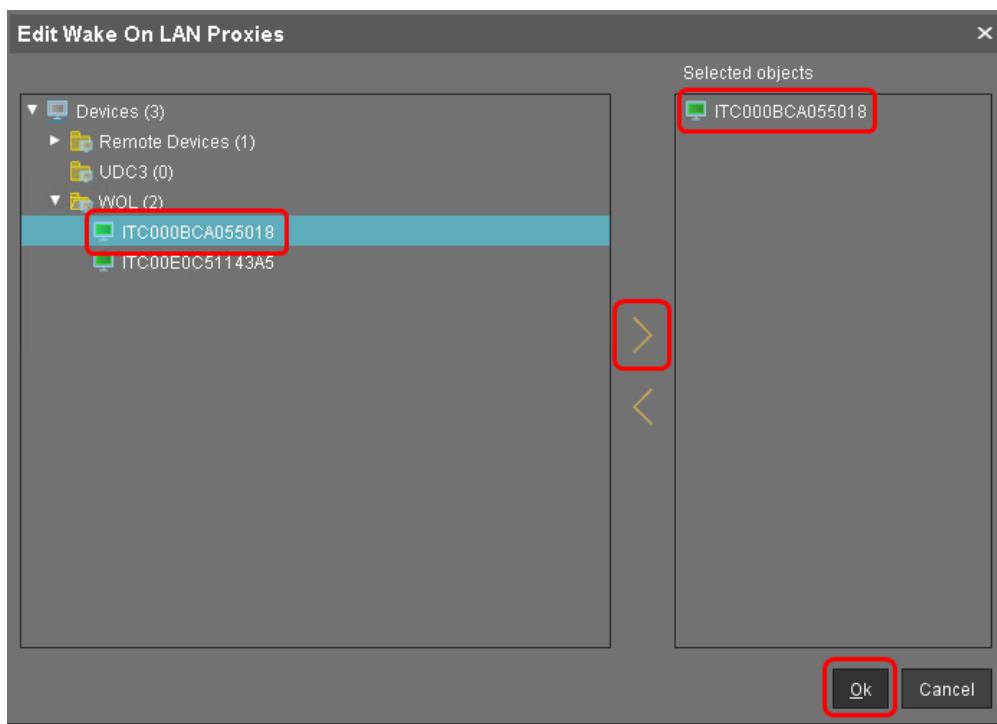
For detailed information, see the Wake-on-LAN chapter in the manual.

To define a dedicated Wake-on-LAN proxy:

1. Go to **UMS Administration > Global Configuration > Wake On LAN**.
2. Under **Send the "magic packet to ..."**, choose the address(es) to which the Wake-on-LAN proxies should send their wake-up calls.
3. Activate **Dedicated Wake On LAN Proxies**.

A screenshot of a software interface titled "Global Configuration" with a sub-section "Wake On LAN". At the top left, there is a checkbox labeled "Dedicated Wake On LAN Proxies" which is checked and highlighted with a red rectangle. Below this, there is a table with three columns: "Name", "MAC", and "Last Known IP Address". In the top right corner of the table header, there is a small edit icon. The table is currently empty.

4. In the area below **Dedicated Wake On LAN Proxies**, click on .
5. Highlight the desired device in the left-hand column.
6. Click on to select the device.
7. Click on **OK**.



The device will now function as a Wake-on-LAN proxy.

- i A device that is configured as a Wake-on-LAN proxy can no longer be put on standby or shut down. This restriction applies as soon as the device receives the settings from the UMS.

- i As an alternative or parallel one can also use the **Automatic WoL Proxy Detection**. However, you cannot be sure that this proxy is always running, while the **Dedicated WoL Proxy** is always running.



Using an HTTP Proxy for Firmware Updates in UMS

Symptom

You want UMS to download firmware updates from the Internet.

Problem

Internet access is only available via an HTTP proxy in your environment.

Solution

Configure an HTTP proxy for firmware downloads in UMS:

1. In UMS Console, go to **UMS Administration > Global Configuration > Universal Firmware Update**
2. Click **Edit Proxy Configuration**

A screenshot of the 'Universal Firmware Update' configuration dialog. At the top, there are three buttons: 'Edit...', 'Edit proxy configuration' (which has a red box around it), and 'Test Server Connection'. Below these are sections for 'Universal update settings' and 'The FTP server settings where the files are downloaded to (optionally)'. The 'Universal update settings' section includes fields for 'Proxy Server' and 'Connection test'. The 'FTP server settings' section includes fields for 'Host' (<ftpServername>), 'Port' (21), 'User name' (<ftpUser>), 'Password' (redacted), 'Directory' (<ftpServerpath>), and 'Connection test'.

The **Edit Proxy Configuration** dialog opens.

3. Check **Use proxy for HTTP connection to firmware update server**.
4. Enter the **Proxy-Host** name or IP address.
5. Enter the proxy host **Port**.



6. Enter the proxy **User**.
7. Enter the proxy **Password**.
8. Click **Save**.
The dialog closes.
9. To test the connection via the proxy, click **Test Server Connection**.

A green bar signifies success, if the bar is red, review your proxy configuration and test again.

Universal Firmware Update

[Edit...](#) [Edit Proxy Configuration](#) [Test Server Connection](#)

Universal update settings

The IGEL Universal Firmware files are downloaded from '<http://myigel.biz>'

Connection Test Result Connection successfully tested !



UMS Cannot Contact Download Server Any More

Symptom

After the UMS has been updated to version 6.03.130 or higher, it can not reach the download server anymore.

Environment

- UMS 6.03.130 or higher

Problem

From UMS 6.03.130 onwards, the UMS contacts <https://fwus.igel.com> (port 443) instead of <http://fwu.igel.com> (port 80). This may be blocked by a firewall.

Solution

- ▶ Allow <https://fwus.igel.com> (port 443) in your firewall.



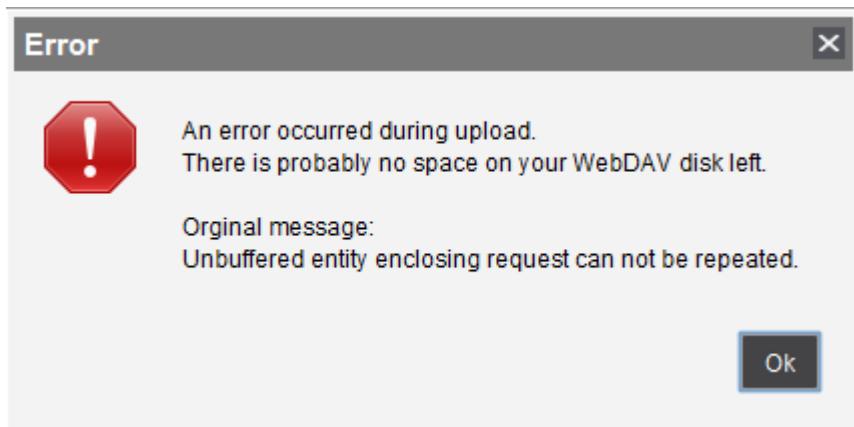
Error During Firmware Upload in UMS: No Space on WebDAV

⚠ Solution Based on Experience from the Field

This article provides a solution that has not been approved by the IGEL Research and Development department. Therefore, official support cannot be provided by IGEL. Where applicable, test the solution before deploying it to a productive environment.

Issue

When importing a firmware into the UMS, the following error message appears:



An error occurred during upload.
There is probably no space on your WebDAV disk left.

Original message:
Unbuffered entity enclosing request can not be repeated.

Cause

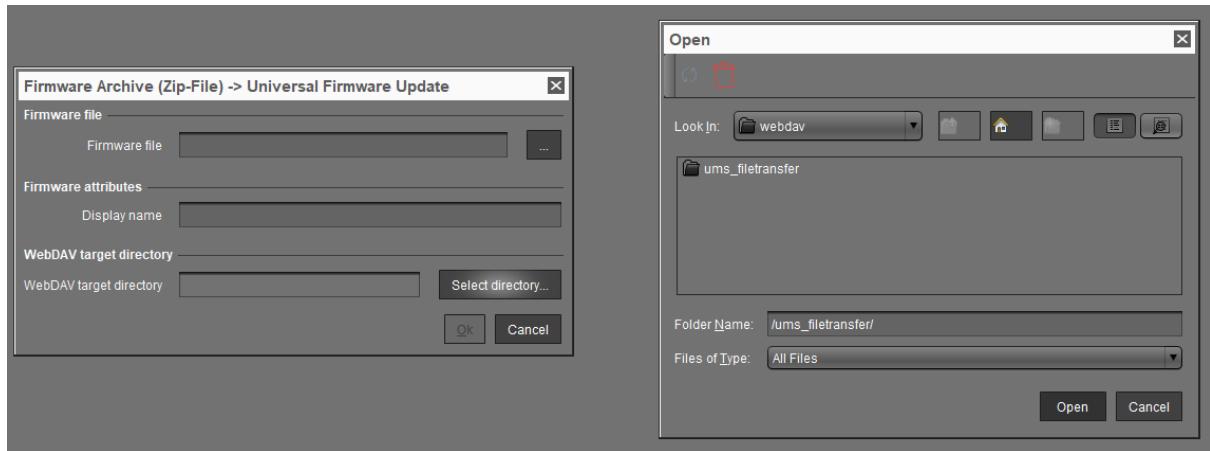
This error is caused when a file is being imported into a WebDAV folder which has no available space remaining.

Solution

1. Check that the host system of the UMS Server has available storage.



2. Ensure that the **ums_filetransfer** folder is selected during the firmware import process:





How to Configure Java Heap Size for the UMS Server

You experience performance issues with IGEL Universal Management Suite (UMS). Manifold reasons can underlie performance degradation, and there are various solutions like optimizing the UMS according to recommendations under Performance Optimizations, expanding the server's physical RAM, switching from the embedded database to the external database, updating the UMS components, etc. The following article covers only the increase of UMS Server memory (Java heap size).

Symptom

You face performance problems and encounter memory issues in the UMS Server log files (`catalina.log`; see [Where Can I Find the IGEL UMS Log Files? \(see page 253\)](#)), e.g. `java.lang.OutOfMemoryError`.

Problem

The default Java heap size may be insufficient for the UMS Server. This usually happens if you have

- numerous jobs
- numerous administrative tasks
- a lot of concurrent device requests (e.g. hundreds of devices booting up in a narrow time frame)
- a large number of devices in the database (>10.000)
- the UMS Web App installed
- the combination of the above factors

The more jobs, administrative tasks, etc. are created, the more heap is "eaten up", so there may be no memory left for additional tasks. In such situations, it can make sense to increase the Java heap size for the UMS Server.

Solution: Change Java Heap Size for the UMS Server

Windows

For the UMS Server installed on Windows, you can modify the Java heap size as follows:

1. Stop the `IGEL_RMGUIServer` service. For details on how you can stop it, see [IGEL UMS HA Services and Processes](#).
2. Navigate to `C:\Program Files\IGEL\RemoteManager\rmguiserver\bin`.
3. Launch `editTomcatService.bat`.
4. Select the **Java** tab and adapt the **Maximum memory pool** value according to your needs.
(Default: 4096 MB)



Local Disk (C) > Program Files > IGEL > RemoteManager > rmguiserver > bin

Name	Date modified	Type	Size
bootstrap.jar	21/12/2021 17:54	JAR File	
catalina	21/12/2021 17:54	Windows Batch File	
catalina.sh	21/12/2021 17:54	SH File	
catalina-tasks	21/12/2021 17:54	XML Document	
ciphers	21/12/2021 17:54	Windows Batch File	
ciphers.sh	21/12/2021 17:54	SH File	
commons-daemon.jar	21/12/2021 17:54	JAR File	
configtest	21/12/2021 17:54	Windows Batch File	
configtest.sh	21/12/2021 17:54	SH File	
daemon.sh	21/12/2021 17:54	SH File	
digest	21/12/2021 17:54	Windows Batch File	
digest.sh	21/12/2021 17:54	SH File	
editTomcatService	21/12/2021 17:54	Windows Batch File	
igelRMserver	21/12/2021 17:54	File	
log4j2	21/12/2021 17:54	XML Document	
log4j-api-2.17.0.jar	21/12/2021 17:54	JAR File	
log4j-core-2.17.0.jar	21/12/2021 17:54	JAR File	
log4j-jul-2.17.0.jar	21/12/2021 17:54	JAR File	
mssql-jdbc_auth-8.4.1.x64.dll	26/03/2021 16:23	Application extens...	
mssql-jdbc_auth-9.2.0.x64.dll	18/06/2021 18:43	Application extens...	
msvcr100.dll	26/03/2021 16:23	Application extens...	
service	21/12/2021 17:54	Windows Batch File	
SetACL	26/03/2021 16:23	Application	
setclasspath	21/12/2021 17:54	Windows Batch File	

IGEL RMGUIServer Properties

General Log On Logging **Java** Startup Shutdown

Use default

Java Virtual Machine:
C:\Program Files\IGEL\RemoteManager_jvm/bin/server/jvm.dll ...

Java Classpath:
C:\Program Files\IGEL\RemoteManager\rmguiserver\bin;C:\Program Files

Java Options:
-Dderby.system.home=C:\Program Files\IGEL\RemoteManager\db
-Dumsversion.file=C:\Program Files\IGEL\RemoteManager\umsversio
-Dcatalina.home=C:\Program Files\IGEL\RemoteManager\rmguiserve
-Djava.io.tmpdir=C:\Program Files\IGEL\RemoteManager\rmguiserve
-Djava.net.preferIPv4Stack=true

Java 9 Options:

Initial memory pool: [] MB

Maximum memory pool: **4096** MB

Thread stack size: [] KB

OK Cancel Apply

⚠ The Java heap size must always be defined INDIVIDUALLY depending on the configuration of the server and your UMS environment, but it must be less than the amount of available physical RAM. General recommendations can be found in the Oracle article [Tuning Java Virtual Machines \(JVMs\)](#)⁴; see also the `-Xmx` option there.

Note also the following:

- All heap size changes are at your own risk! Change the heap size only if you know exactly what you are doing. In the case of improper configuration, the UMS Server will be unable to run.
- Reducing the memory may affect the function of the UMS and is NOT recommended.
- During the UMS update, the heap size value is set to the default. Therefore, you have to adapt it again.

5. Click **Ok**.

6. Restart the **IGEL RMGUIServer** service.

⁴ https://docs.oracle.com/cd/E15523_01/web.1111/e13814/jvm_tuning.htm#PERFM150



Linux

For the UMS Server installed on Linux, you can modify the Java heap size as follows:

1. Stop the UMS Server process. For details on how you can stop it, see [IGEL UMS HA Services and Processes](#).
2. Edit `/opt/IGEL/RemoteManager/rmguiserver/conf/ums-server.env`
3. Find the option `CATALINA_OPTS=-Xmx4096m` and change the `-Xmx` value according to your needs. (Default: 4096 MB)

⚠ The Java heap size must always be defined INDIVIDUALLY depending on the configuration of the server and your UMS environment, but it must be less than the amount of available physical RAM. General recommendations can be found in the Oracle article [Tuning Java Virtual Machines \(JVMs\)](#)⁵; see also the `-Xmx` option there.

Note also the following:

- All heap size changes are at your own risk! Change the heap size only if you know exactly what you are doing. In the case of improper configuration, the UMS Server will be unable to run.
- Reducing the memory may affect the function of the UMS and is NOT recommended.
- During the UMS update, the heap size value is set to the default. Therefore, you have to adapt it again.

4. Restart the UMS Server process.

Related Topics

[How to Configure Java Heap Size for the UMS Console](#)(see page 140)

[How to Configure Java Heap Size for the ICG](#)

⁵ https://docs.oracle.com/cd/E15523_01/web.1111/e13814/jvm_tuning.htm#PERFM150



How to Configure Java Heap Size for the UMS Console

You use IGEL Universal Management Suite (UMS) and experience performance issues with the UMS Console. Manifold reasons can underlie performance degradation, and there are various solutions like optimizing the UMS according to recommendations under Performance Optimizations, updating the UMS components, etc. The following article covers only the increase of UMS Console memory (Java heap size).

Symptom

You face performance problems and encounter memory issues in the UMS Console log files (`igel-ums-console.log`; see [Where Can I Find the IGEL UMS Log Files? \(see page 253\)](#)), e.g. `java.lang.OutOfMemoryError`.

Problem

The default Java heap size may be insufficient for the UMS Console. This usually happens if you have

- a large number of devices registered (>10.000)
- a lot of devices in one folder (a flat directory structure under **Devices** in the UMS Console; >1.000 per folder)

Solution: Change Java Heap Size for the UMS Console

For the UMS Console, you can modify the Java heap size as follows:

1. Close the UMS Console.
2. Open the following file:
Default path on Windows: `C:\Program Files\IGEL\RemoteManager\rmclient\RMClient.config`
Default path on Linux: `/opt/IGEL/RemoteManager/rmclient/RemoteManager.config`
3. Find the line `vmparam -Xmx3072m` and change the `-Xmx` value according to your needs.
(Default: 3072 MB)



Local Disk (C:) > Program Files > IGEL > RemoteManager > rmclient

Name	Date modified	Type	Size
documentation	27/04/2021 11:25	File folder	
lib	11/01/2022 16:34	File folder	
licenses	11/01/2022 16:34	File folder	
WEB-INF	11/01/2022 16:34	File folder	
cacerts	11/01/2022 16:38	File	168 KB
log4j	21/12/2021 17:54	PROPERTIES File	1 KB
logging	21/12/2021 17:54	PROPERTIES File	1 KB
msvcr100.dll	26/03/2021 16:23	Application extens...	810 KB
Qt5Core.dll	26/03/2021 16:23	Application extens...	5.690 KB
RMClient	11/01/2022 16:36	CONFIG File	1 KB
RMClient			
RMClient.exe.manifest			
tc_import			
tc-import-log4j			
ws_splash			

RMClient - Notepad

```

File Edit Format View Help
javapath ../_jvm/bin/server/jvm.dll
vmparam -Djava.util.logging.config.file=logging.properties
vmparam -Dlog4j.configuration-file=log4j.properties
vmparam -Xmx3072m
vmparam -Djava.library.path=lib
vmparam -Dumsversion.file=../umsversion.properties
vmparam -Drmhome.dir=..
addjars lib/..
mainclass de.igel.rm.rmconsole.RMClient

vmparam -Dde.igel.rm.home=C:\Program Files\IGEL\RemoteManager

```

⚠ The Java heap size is defined INDIVIDUALLY depending on the configuration of the server and your UMS environment, but must be less than the amount of available physical RAM. General recommendations can be found in the Oracle article [Tuning Java Virtual Machines \(JVMs\)](#)⁶; see also the `-Xmx` option there.

Note also the following:

- All heap size changes are at your own risk! Change the heap size only if you know exactly what you are doing. In the case of improper configuration, the UMS Console will be unable to run.
- Reducing the memory may affect the function of the UMS and is NOT recommended.
- During the UMS update, the heap size value is set to the default. Therefore, you have to adapt it again.

4. Save the changes.

⁶ https://docs.oracle.com/cd/E15523_01/web.1111/e13814/jvm_tuning.htm#PERFM150



5. Restart the UMS Console.

Related Topics

[How to Configure Java Heap Size for the UMS Server](#)(see page 137)

[How to Configure Java Heap Size for the ICG](#)



How to Check the Current State of the IGEL UMS Server through Your Existing Monitoring Solution

IGEL Universal Management Suite (UMS) includes a monitoring endpoint solution, which you can integrate into your existing monitoring infrastructure (e.g. Nagios, SolarWinds, Paessler, Logic Monitor, Sensu, etc.). With the monitoring endpoint, you can check the process/service states for the IGEL UMS Server and, thus, react accordingly if any problems are detected.

IGEL Environment

- IGEL UMS 6.09.100 or higher

How to Request the Current Status of the UMS Server

► Use the following requests to check the status of the UMS Server. If you use a browser for this purpose and the UMS deploys a self-signed certificate, the browser may display a security/certificate warning. Accept the risk and continue, or make the certificate known to the browser.

`https://[server]:[web_server_port]/ums/check-status`

OR

`http://[server]:[jws_server_port]/ums/check-status`

The following responses are possible:

1. If the (check status) service is up and running, HTTP status code 200 is returned. The response body contains a JSON document with information on the UMS Server status:
`{"status": "init|ok|warn|err"}`

For the details, see [Monitoring the UMS Server: Possible Statuses](#)(see page 144) below.

Example:

A screenshot of a web browser window. The address bar shows "https://:8443/ums/check-status". Below the address bar, there is a red warning icon followed by the text "Not secure". The main content area of the browser displays a JSON object: {"status": "ok"}.

2. If the check status service is not reachable, HTTP status code 404 is returned.
3. Other common HTTP status codes indicating standard HTTP errors might occur.



- i** Note that the status of the server updates every minute. For performance reasons, the status is NOT recalculated on each monitoring request, i.e., if a monitoring request is received, but a one-minute interval is not over, the previously saved server status will be shown.

Monitoring the UMS Server: Possible Statuses

The response statuses returned during the monitoring of the UMS Server indicate the following situations:

ok	The server is up and running.
warn	<ul style="list-style-type: none"> • The server is in HA update mode; see Updating the Installation of an HA Network. • The server is not connected to one or more configured IGEL Cloud Gateways; see Connecting the UMS to the ICG. • Certificates used for communication with endpoint devices, i.e., certificates of the <code>tc.keystore</code> file, are not in sync with the database. This might happen, for example, if you make changes to certificates and the automatic synchronization stops functioning due to some network issues or if the IGEL network token differs between the components, e.g., when a wrong network token was chosen during the server installation.
err	<ul style="list-style-type: none"> • There is no database connection – no database is configured, or the database connection has failed. For where to configure the database, see How to Set Up a Data Source in the IGEL UMS Administrator. • The device communication port is not ready. For where to configure the device communication port, see Settings - Change Server Settings in the IGEL UMS Administrator; for details on UMS ports, see IGEL UMS Communication Ports(see page 4).
init	<p>Server initialization has not been completed yet.</p> <p>Note: If the initialization process is not finished within 120 seconds, the status automatically changes to err.</p>

Related Topics

[How to Monitor the IGEL Cloud Gateway](#)

[Monitoring Device Health and Searching for Lost Devices](#)(see page 191)

[UMS HA Health Check - Analyse Your IGEL UMS High Availability and Distributed UMS Systems](#)



IGEL UMS Configuration for the External Load Balancer / Reverse Proxy: Example for NGINX with SSL Offloading

This article describes the configuration of the IGEL Universal Management Suite (UMS) and NGINX for SSL offloading. You can use this document when you want the SSL to be terminated not at the UMS Server, but at the load balancer / reverse proxy. The article is based on the example of NGINX. For more information on NGINX, see <https://www.nginx.com/resources/glossary/nginx/>.

- ⓘ A reverse proxy / external load balancer can be used if you manage IGEL OS 12 devices only. See [IGEL Cloud Gateway vs. Reverse Proxy for the Communication between UMS 12 and IGEL OS Devices](#).

The tasks to be done involve:

- Configuring the Cluster Address and checking UMS web certificates
- Exporting the UMS web certificate chain
- Extracting the private key and certificate chain
- Exporting the client certificate chain (`https_trust.keystore`)
- Installing NGINX (example based on Ubuntu)
- Configuring NGINX
- Configuring the UMS
- Configuring the IGEL Cloud Gateway (ICG) if used

Requirements

- IGEL UMS version 12.02.100 or higher
- If the ICG is used: ICG version 12.02.100 or higher
- In the case of the Distributed UMS or High Availability installations, the time on all servers must be synchronized.

- ⓘ For extracting keys and certificate chains, you will require a suitable tool like "Keystore Explorer". Please use the latest version of such tools.
Please also make sure that you use Java 17.

Limitations

- The scan and register command can only be used when an endpoint device can open a direct connection to the UMS. Thus, when an external load balancer / reverse proxy is configured, the scan and register feature might not be usable.



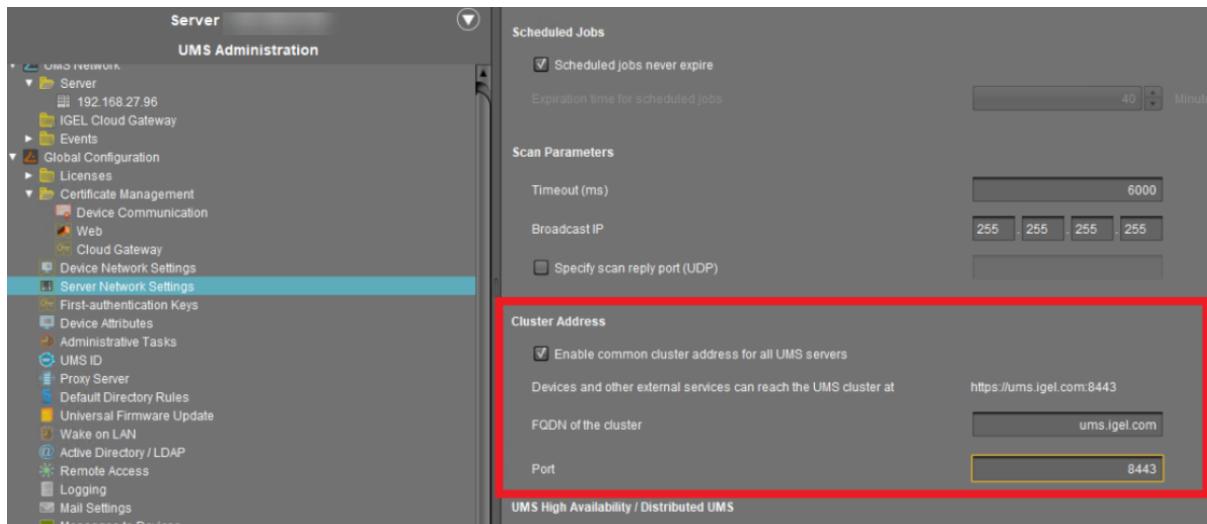
Configuring the Cluster Address and Checking UMS Web Certificates

If you are using an external load balancer / reverse proxy, you have to update the FQDN of the UMS cluster as an external address. This FQDN of the UMS cluster must be included into your web certificate, and the corresponding certificate must be assigned to all UMS servers:

1. In the UMS Console, set the Cluster Address under **UMS Administration > Global Configuration > Server Network Settings > Cluster Address** and configure a web certificate for all servers. For detailed information, see Server Network Settings in the IGEL UMS.

For information on hostnames, Cluster Address, FQDNs, see also Troubleshooting: Error 38 during the Onboarding of an IGEL OS 12 Device. For general information on web certificates, see Web.

- i** Use subject alternative names (SAN) if the IP addresses or hostnames that are used for the UMS and your load balancer / reverse proxy are different.



2. In the UMS Console, go to **UMS Administration > Global Configuration > Certificate Management > Web** and check again that you use a valid certificate for the UMS and your load balancer / reverse proxy. If not, create a valid web certificate.



Screenshot of the UMS Certificate Management interface showing a certificate details window.

Left Panel (Certificate Management):

- Device Communication
- Web** (selected)
- Cloud Gateway
- Device Network Settings
- Server Network Settings
- First-authentication Keys
- Device Attributes
- Administrative Tasks
- UMS ID
- Proxy Server
- Default Directory Rules
- Universal Firmware Update
- Wake on LAN
- Active Directory / LDAP
- Remote Access
- Logging
- Mail Settings
- Messages to Devices
- Misc Settings
- UMS Features

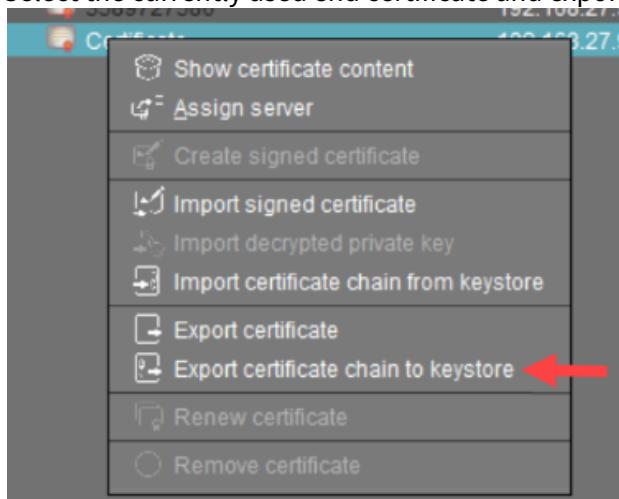
Right Panel (Certificate Details):

Display name	Subject Alternative Names
Certificate	
Version: 3	CN=IGEL,O=IGEL,L=399197744,C=US
Subject: C=DE,L=Bremen,O=IGEL Technology GmbH,CN=ID-49701-16848562	
Issuer:	
Signature Algorithm: SHA512withRSA	
Key: RSA, 4096 bits	
Serial number: 1450222266	
Fingerprint (SHA1): e55 [REDACTED] a9	
Fingerprint (SHA256): 8b 9 a2 0e 52 70 21 01	
Valid from: Thu May 25 17:47:42 CEST 2023	
Valid to: Sat May 25 17:47:42 CEST 2024	
Subject alternative names: 192.168.27.96; 192.168.27.30; ums.igel.com; localhost	
Certificate Authority: false	
Signature:	[REDACTED]
00000	..5'...
00000	I<U.z
00000	:Ld*..
00000	J..u.-
00000	R.H5u.r
00000	3..IJ.
00000	@.bU.
00000	.T.....

Buttons: Ok

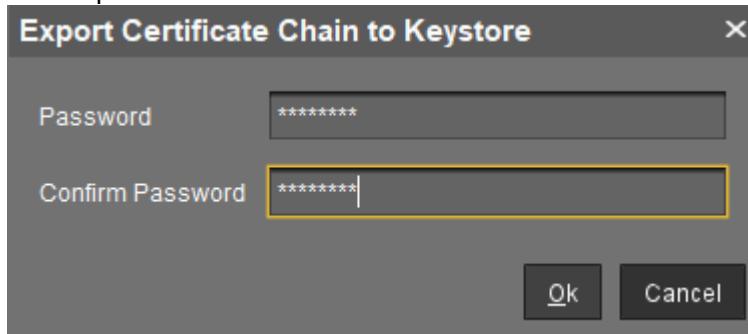
Exporting the UMS Web Certificate Chain

- Select the currently used end certificate and export the certificate chain.

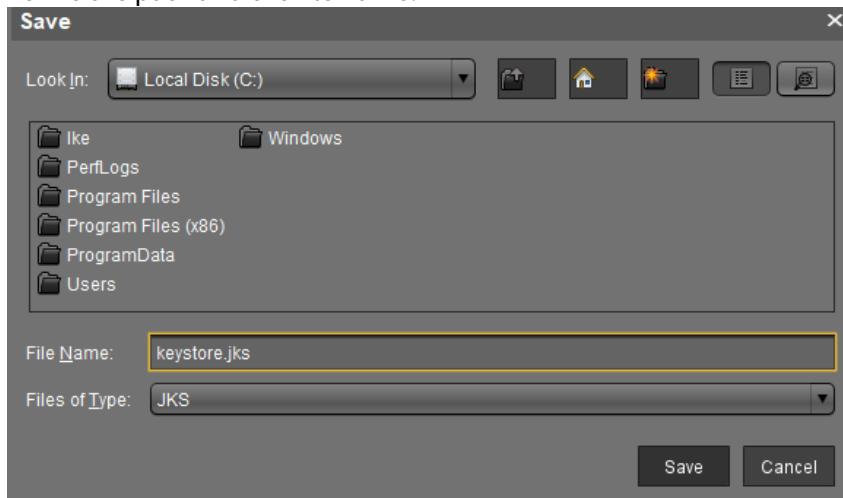




2. Set the password.



3. Define the path and the file name.



Extracting the Private Key and Certificate Chain

The exported keystore file contains several keys and certificates, at least the root and the currently used keys and certificates. The currently used key and certificate chain must be extracted from this file. You can use any suitable tool for this, e.g. "Keystore Explorer":

1. Open the exported file and enter the password you used in the UMS for the export.
Several entries are shown:



The screenshot shows the KeyStore Explorer application window. The title bar reads "keystore.jks - KeyStore Explorer 5.4.3". The menu bar includes File, Edit, View, Tools, Examine, and Help. The toolbar contains icons for New, Open, Save, Import, Export, Find, Copy, Paste, and Delete. The main pane displays a table of keystore entries:

	Entry Name	Algorithm	Key Size	Certificate Expiry	Last Modified
PKCS12	-	RSA	4096	5/25/2024 5:47:42 PM CEST	5/31/2023 1:32:46 PM CEST
PKCS12	1450222266_cert	RSA	4096	5/25/2024 5:47:42 PM CEST	5/31/2023 1:32:46 PM CEST
PKCS12	1450222266_key	RSA	4096	5/25/2024 5:47:42 PM CEST	5/31/2023 1:32:46 PM CEST
PKCS12	-	RSA	4096	5/23/2043 5:37:53 PM CEST	5/31/2023 1:32:46 PM CEST
PKCS12	1978573192_cert	RSA	4096	5/23/2043 5:37:53 PM CEST	5/31/2023 1:32:46 PM CEST
PKCS12	1978573192_key	RSA	4096	5/23/2043 5:37:53 PM CEST	5/31/2023 1:32:46 PM CEST

At the bottom, a status bar indicates "KeyStore Type: JKS, Size: 4 entries, Path: 'C:\Users\admin\Documents\keystore.jks'".

2. Find the currently used key.

For this, you can simply compare the ID of the currently used certificate displayed in the UMS and the ID in the certificate details in Keystore Explorer.

The screenshot shows the 'Certificate Management' section of the IGEL UMS configuration interface. The left sidebar has 'Web' selected. The main panel displays certificate details, including the subject alternative names listed as '192.168.27.96; 192.168.27.30; ums.igel.com; localhost'. A red arrow points to the 'Subject Alternative Names' section. The 'Ok' button is located at the bottom right.



keystore.jks - KeyStore Explorer 5.4.3

File Edit View Tools Examine Help

keystore.jks *

T	P	E	Entry Name	Algorithm	Key Size	Certificate Expiry	Last Modified
Red	-	Green	1450222266_cert	RSA	4096	5/25/2024 5:47:42 PM CEST	5/31/2023 1:32:46 PM CEST
Yellow	Lock	Green	1450222266_key	RSA	4096	5/25/2024 5:47:42 PM CEST	5/31/2023 1:32:46 PM CEST
Red	-	Green	1978573192_cert	RSA	4096	5/23/2043 5:37:53 PM CEST	5/31/2023 1:32:46 PM CEST
Yellow	Lock	Green	1978573192_key	RSA	4096	5/23/2043 5:37:53 PM CEST	5/31/2023 1:32:46 PM CEST

Certificate Details for Entry '1450222266_key'

Certificate Hierarchy:

- Red ID-49701-1684856268384-0-0 ←
- Red IGEL

Version: 3

Subject: C=DE,L=Bremen,O=IGEL Technology GmbH,CN=ID-49701-1684856268384-0-0

Issuer: C=DE,L=Bremen,O=IGEL Technology GmbH,CN=ID-49701-1684856268384-0-0

Serial Number: 0x75EEA188

Valid From: 5/23/2023 5:37:53 PM CEST

Valid Until: 5/23/2043 5:37:53 PM CEST

Public Key: RSA 4096 bits

Signature Algorithm: SHA512WITHRSA

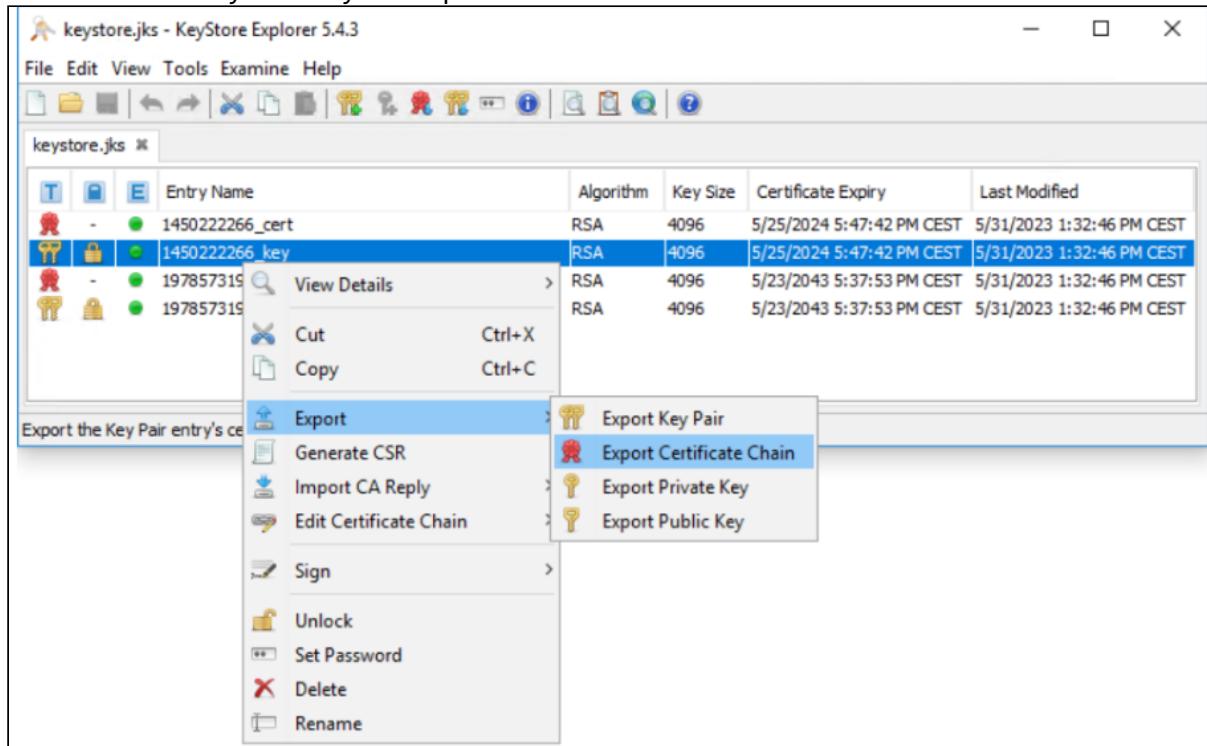
Fingerprint: SHA-1 A1:79:D2:25:0F:44:2E

Export Extensions PEM ASN.1 OK

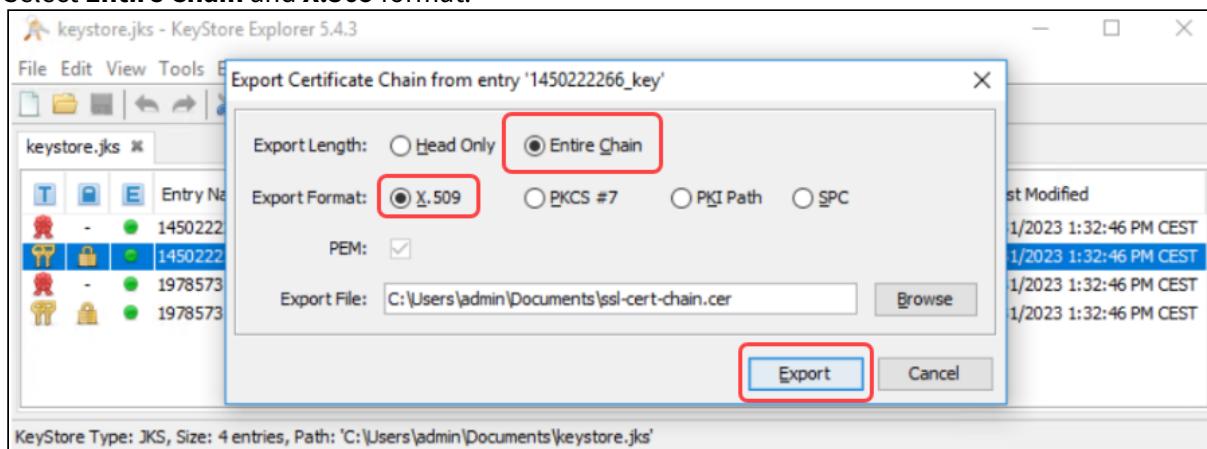


Exporting the Certificate Chain

- Select the currently used key and export the certificate chain.



- Select **Entire Chain** and **X.509** format.

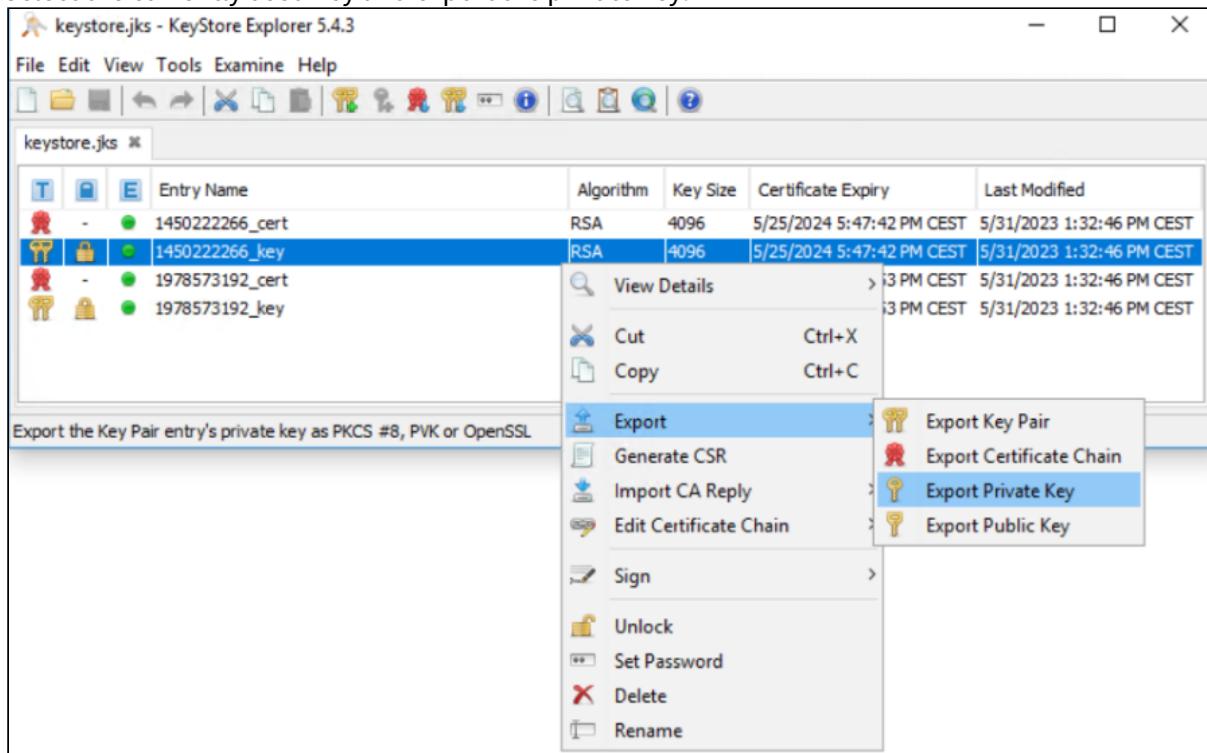


- Click **Export**.



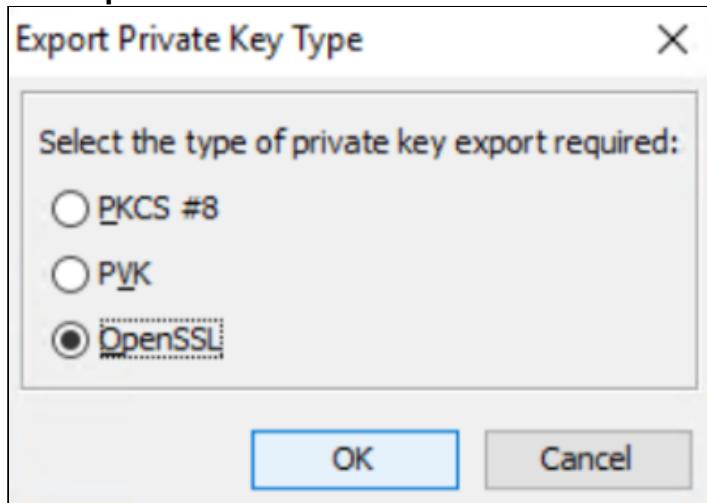
Exporting the Private Key

1. Select the currently used key and export the private key.



2. Enter the password you used in the UMS for the export.

3. Select **OpenSSL**.





4. If required, select **Encrypt** and enter the corresponding data. In this example, we will use a not encrypted key file.

Export Private Key as OpenSSL from KeyStore Entry '1450222266_key'

Encrypt:

Encryption Algorithm: PBE with DES CBC

Encryption Password:

Confirm Password:

PEM:

Export File: C:\Users\admin\Documents\cert-key.key

5. Click **Export**.

Exporting the Client Certificate Chain (https_trust.keystore)

The EST CA certificate is required for the client certificate check. This file is stored under `[UMS installation directory]/IGEL/RemoteManager/rmguiserver/https_trust.keystore`.

1. Open the keystore, e.g. with the Keystore Explorer.
2. Use the password `igelhttpskey`.



3. Export the certificate with the alias **estca**.

Entry Name	Algorithm	Key Size	Certificate Expiry	Last Modified
estca	RSA	4096	3/31/2042, 4:20:13 PM CEST	-
icg	RSA	4096	7/10/2043, 10:42:14 AM CEST	-
web-1291836156	RSA	4096	7/7/2024, 4:03:42 PM CEST	-
web-579048789	RSA	4096	10/2/2040, 12:23:24 PM CEST	-

Export Certificate from entry 'estca'

Export Format: X.509 PKCS #7 PKI Path SPC

PEM:

Export File: C:\Users\ct\estca.cer

Installing NGINX (Example Based on Ubuntu)

- ▶ Install NGINX on your system:

```
sudo apt update
sudo apt install nginx
```

- ▶ If a firewall is used, check the configuration:

1. Check the firewall configuration:



```
sudo ufw app list
```

The output of the command should look like this:

```
Output
Available applications:
  Nginx Full
  Nginx HTTP
  Nginx HTTPS
  OpenSSH
```

2. Enable 'Nginx Full':

```
sudo ufw allow 'Nginx Full'
```

3. Check the firewall configuration with

```
sudo ufw status
```

4. For the UMS support, it might be necessary to open further ports. For more information on UMS ports, see [IGEL UMS Communication Ports](#)(see page 4).

5. Get the current state of NGINX:

```
sudo systemctl status nginx
```

6. Check the current configuration of NGINX:

```
sudo nginx -t
```

Configuring NGINX

The configuration of the server is done in configuration files. In an Ubuntu installation, the main configuration file is `/etc/nginx/nginx.conf`.

In this example, a separate configuration file `umSSLOffloading.conf` is used. This file has to be included in the `nginx.conf` file:

```
http {

##
# Basic Settings
##
```



```

sendfile on;
...
##
# Virtual Host Configs
##

include /etc/nginx/conf.d/*.conf;
include /etc/nginx/sites-enabled/*;
include /etc/nginx/umsSSLOffloading.conf; # used for configuration
}
  
```

The extracted keys and certificates can be copied to a directory under `/etc/nginx` : for example, `/etc/nginx/ssl` – create the directory if it does not exist.

NGINX Configuration File for SSL Offloading

- ▶ Create a new config file `umsSSLOffloading.conf`.

This file must contain

- **upstream server** configuration
- **server** configuration
- **location** configuration

This is an example configuration to use with UMS 12 and IGEL OS 12:

- The **upstream umsserver** block defines the UMS Server in the backend.

```

upstream umsserver {
    server 192.168.27.96:8443 max_fails=3 fail_timeout=10s;
}
  
```

- The **server** block contains the configuration for the NGINX listener and the location. The UMS web certificate and the client certificate validation should be added here.
Server common configuration:

```

server {
    listen      8443 ssl; # 'ssl' parameter tells NGINX to decrypt the traffic
    ssl_certificate          ssl/ssl-cert-chain.cer; # The Certificate File
    (Web)
    ssl_certificate_key      ssl/cert-key.key; # The Private Key File (Web)
    ssl_verify_client        optional; ## Client Certificate check must be
    optional
    ssl_client_certificate   ssl/estca.cer; #certificate for Client
    Certificate Check

    access_log               /var/log/nginx/ssl-access.log;
  
```



```
error_log /var/log/nginx/ssl-error.log;
```

- At least two **location** definitions are required:

- Location definition for all connections via WebSocket. The WebSocket connection requires the forwarding of the client certificate within the header. A second header information to add is the upgrade header which is required for WebSockets.

```
# Configuration for connections via WebSocket, the upgrade header
information must be written by NGINX
location ~ /device-connector/device/(ws-connect|portforwarding) {
    proxy_pass https://umsserver;
    proxy_set_header X-SSL-CERT $ssl_client_escaped_cert; # client
certificate in current connection
    proxy_set_header Upgrade $http_upgrade; # Set upgrade header
    proxy_set_header Connection $connection_upgrade;
    proxy_ssl_trusted_certificate ssl/ssl-cert-chain.cer; #trusted
Cert Chain for UMS connection

    # TLSv1.3 configuration is recommended but not necessary
    proxy_ssl_protocols TLSv1.3;
}
```

- Location definition for all other connections.

```
# Configuration for all other connections
location / {
    proxy_pass https://umsserver;
    proxy_ssl_trusted_certificate ssl/ssl-cert-chain.cer;
    proxy_ssl_protocols TLSv1.3;
}
```

The whole configuration file:

```
#map upgrade header
map %https_upgrade $connection_upgrade {
default upgrade;
'' close;
}

upstream umsserver {
    server 192.168.27.96:8443 max_fails=3 fail_timeout=10s;
}

server {
    listen      8443 ssl; # 'ssl' parameter tells NGINX to decrypt the traffic
    ssl_certificate      ssl/ssl-cert-chain.cer; # The Certificate File (Web)
    ssl_certificate_key  ssl/cert-key.key; # The Private Key File (Web)
```



```

ssl_verify_client optional; ## Client Certificate check must be
optional
ssl_client_certificate ssl/estca.cer; #certificate for Client Certificate
Check

access_log /var/log/nginx/ssl-access.log;
error_log /var/log/nginx/ssl-error.log;

# Configuration for connections via WebSocket, the upgrade header information must be
written by NGINX
location ~ /device-connector/device/(ws-connect|portforwarding) {
  proxy_pass https://umsserver;
  proxy_set_header X-SSL-CERT $ssl_client_escaped_cert;
  proxy_set_header Upgrade $http_upgrade;
  proxy_set_header Connection $connection_upgrade;
  proxy_ssl_trusted_certificate ssl/ssl-cert-chain.cer;
  # TLSv1.3 configuration is recommended but not necessary
  proxy_ssl_protocols TLSv1.3;
}

# Configuration for all other connections
location / {
  proxy_pass https://umsserver;
  proxy_ssl_trusted_certificate ssl/ssl-cert-chain.cer;
  proxy_set_header Upgrade $http_upgrade;
  proxy_set_header Connection $connection_upgrade;
  proxy_ssl_protocols TLSv1.3;
  # proxy_ssl_session_reuse on;
}
}
  
```

Configuring the UMS

Activate Forwarding Client Certificate Processing at the UMS

The processing of forwarded client certificates must be activated on the UMS side:

1. Open the configuration file [UMS installation directory]/IGEL/RemoteManager/rmguiserver/conf/appconfig/application.yml.
You will see:

```

igel:
  client-cert-forwarding:
    enabled: false
    client-cert-forwarded-header: X-SSL-CERT
  
```



2. Activate `client-cert-forwarding` by setting "enabled" to "true":

```
client-cert-forwarding:  
  enabled: true
```

3. If required, the forwarding header can be configured. The `X-SSL-CERT` header value can be changed but be aware to change the corresponding value in the NGINX configuration, see above [Location definition for all connections via WebSocket\(see page 157\)](#).
4. Save the configuration changes and restart the UMS Server service. For details on how you can restart the service, see [IGEL UMS HA Services and Processes](#).

Configuring the IGEL Cloud Gateway (ICG) If Used

If you use an external load balancer / reverse proxy and the IGEL Cloud Gateway, it is necessary to configure the load balancer / reverse proxy in front of the ICG.

The differences in the configuration are:

- ICG certificate export (instead of the export of the UMS web certificate)
- Activate forwarding client certificate processing at the ICG (not the UMS)

⚠ Note that the IP or hostname of your load balancer / reverse proxy must be added when generating the ICG certificate. Use a semicolon to separate the values. For more information on ICG installation and certificates, see [Installation and Setup](#).

ICG Certificate Export

1. In the UMS Console, go to **UMS Administration > Global Configuration > Certificate Management > Cloud Gateway** and export the ICG certificate chain to IGEL Cloud Gateway keystore format:

Display name	Subject
Root certificate	C=US, L=1754484573, O=IGEL, CN=ID--49688-16855 CN=IGEL_O=IGEL_L=1625862822_C-US
Certificate	

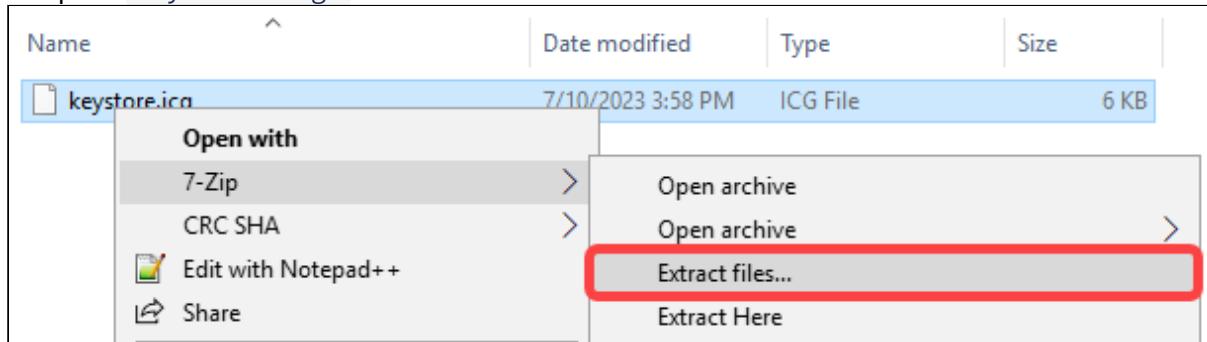
The context menu options are:

- Create signed certificate
- Import signed certificate
- Import decrypted private key
- Remove certificate
- Export certificate chain to IGEL Cloud Gateway keystore format** (highlighted)
- Export certificate chain to IGEL Cloud Gateway keystore format
- Show certificate content

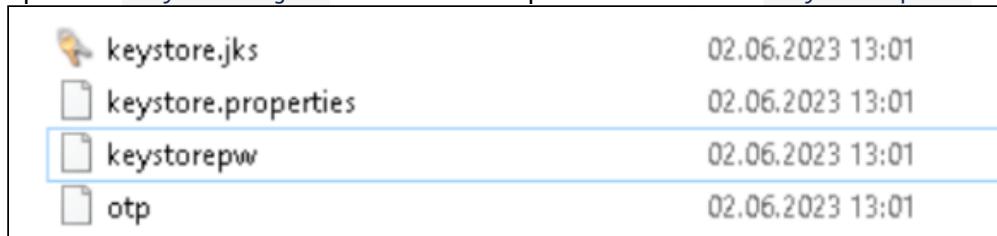


The `keystore.icg` file will be saved.

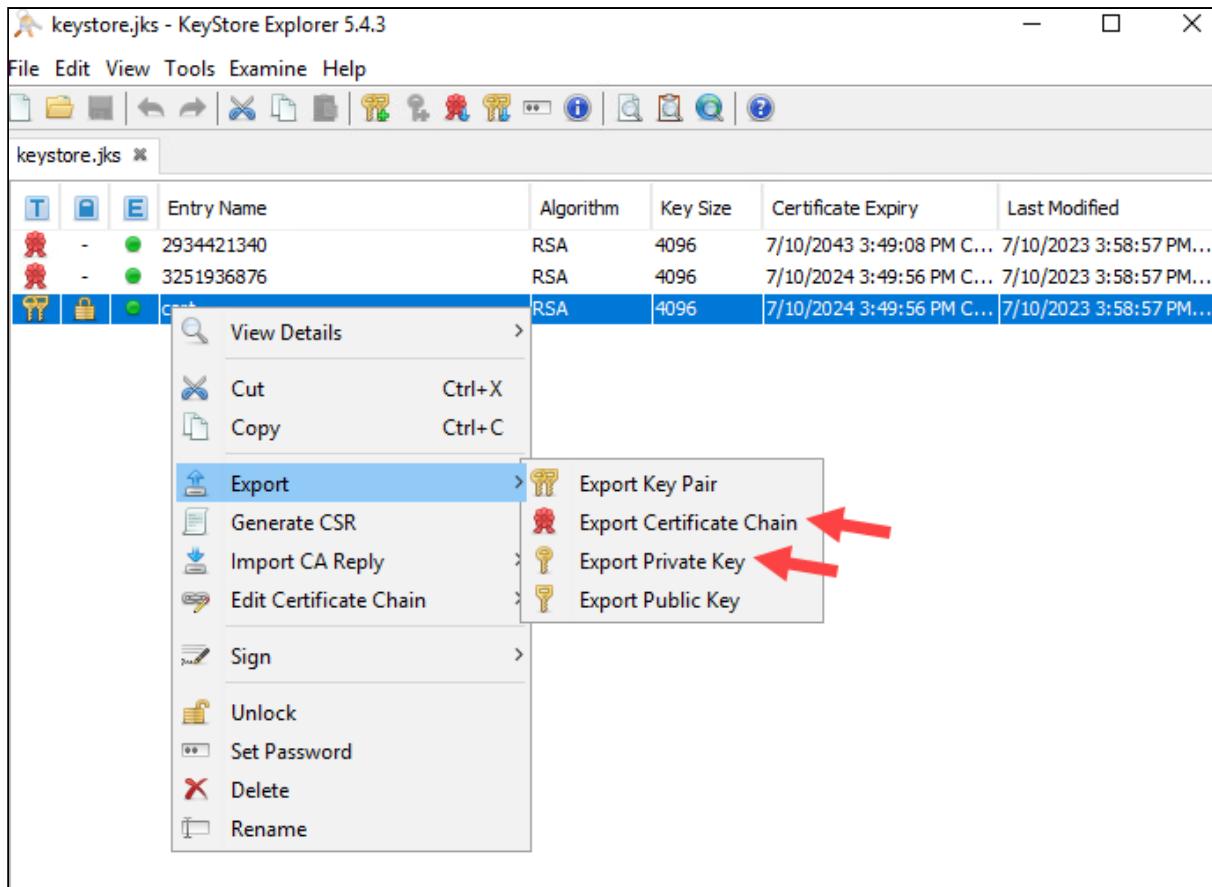
2. Unzip the `keystore.icg` file.



3. Open the `keystore.jks` file and use the password from the `keystorepwd` file.



4. Select the configured key entry and export the certificate chain (**Entire Chain, X.509** format) and the private key (**OpenSSL**).



5. Proceed further as described above starting with [Exporting the Client Certificate Chain \(`https_trust.keystore`\)](#) (see page 153).

Activate Forwarding Client Certificate Processing at the ICG

The processing of forwarded client certificates must be activated on the ICG side, not the UMS side:

1. Open the configuration file `[UMS installation directory]/IGEL/icg/usg/conf/application-prod.yml`.

You will see:

```
igel:
  client-cert-forwarding:
    enabled: false
    client-cert-forwarded-header: X-SSL-CERT
```

2. Activate `client-cert-forwarding` by setting "enabled" to "true":



```
client-cert-forwarding:  
  enabled: true
```

3. If required, the forwarding header can be configured. The `X-SSL-CERT` header value can be changed but be aware to change the corresponding value in the NGINX configuration, see above [Location definition for all connections via WebSocket](#)(see page 157).
4. Save the configuration changes and restart the ICG server.



Transferring or Registering the UMS ID

There are two different ways to handle the UMS ID if you migrate the UMS Server:

- [Transferring the UMS ID](#)(see page 163) (recommended): With this method, you make a backup of the old UMS ID and take it with you. The UMS ID, which is automatically created during the installation of the new UMS Server, is overwritten.
Advantage: You do not have to reassign the license packages in the ILP and to re-register your UMS.
Disadvantage: To authenticate your UMS to the IGEL Cloud Services, you also have to re-register your UMS in the IGEL Customer Portal using the new UMS ID.
- [Registering the New UMS ID](#)(see page 164): With this method, you register the UMS ID of the new server in the IGEL License Portal.
Advantage: You do not need to know the UMS ID of the old server.
Disadvantage: To authenticate your UMS to the IGEL Cloud Services, you also have to re-register your UMS in the IGEL Customer Portal using the new UMS ID.

Transferring the UMS ID

Old Server: Create a Backup of the UMS ID

1. Open the UMS Administrator on your old server.

i Default path to the UMS Administrator:
Linux: /opt/IGEL/RemoteManager/RMAdmin.sh
Windows: C:\Program Files\IGEL\RemoteManager\rmadmin\RMAdmin.exe
The IGEL UMS Administrator application can only be started on the UMS Server.

2. Go to **UMS ID Backup** and create a backup as described under UMS ID Backup in the IGEL Administrator.
3. In your file explorer, go to the folder where you saved the UMS ID backup.
4. Copy the backup (e.g. `UMS_ID_backup_before_migration.ksbak`) to a directory of your new UMS Server environment.

New Server: Restore the UMS ID to the New Server

1. Open the **UMS Administrator** on the new server.
2. Go to **UMS ID Backup** and restore the backup as described under UMS ID Backup in the IGEL Administrator.

The UMS ID is now stored in the new UMS environment.



Registering the New UMS ID

In the IGEL License Portal (ILP)

1. Log in to the IGEL License Portal (ILP) at <https://activation.igel.com>⁷. If you have not registered yet, you must register first.
Your dashboard is shown.
2. Select **UMS ID**.
The page **UMS ID** is shown.
3. Click **Register UMS ID**.
The dialog **Register UMS ID** opens.
4. Under **UMS ID Name**, enter a name for the UMS ID.
5. Upload the certificate file you have exported in the UMS (see Obtaining Your UMS ID) and click **OK**.
The UMS ID is registered. If this is the first UMS ID you registered, or if you just defined it as the default UMS ID, the dialog **Assign loose Product Packs** is shown.
6. If the dialog **Assign loose Product Packs** is shown, click **OK** to assign Product Packs and continue with Assigning a Product Pack to the UMS ID.

For a detailed instruction with screenshots, see Registering Your UMS ID.

In the IGEL Customer Portal

1. Log in to the [IGEL Customer Portal](https://now.igel.com/csm)⁸.
2. Go to **Configure Services > UMS Registration** and select your old UMS instance.

UMS Name	X.509 Certificate	Expiration Date	Fingerprint	Enable App Portal	Created by(owned_by)	Created	Updated
UMS Ike		2042-04-09 06:10:55		true		2023-04-14 14 12:28:39	12:28:39

⁷ <https://activation.igel.com/>

⁸ <https://now.igel.com/csm>

⁹ <https://cosmos.igel.com/>



3. Click **Delete UMS Instance**.

* UMS Name <input type="text" value="UMS Ike"/>	Created by(owned_by) <input type="text" value=""/>
X.509 Certificate <input type="text" value=""/>	Created 2023-04-14 12:28:39
Expiration Date <input type="text" value="2042-04-09 06:10:55"/>	Updated 2023-04-14 12:28:39
<input checked="" type="checkbox"/> Enable App Portal	
<input checked="" type="checkbox"/> Enable Insight Service	
Fingerprint <input type="text" value=""/>	
<input type="button" value="Delete UMS Instance"/>	<input type="button" value="Submit"/>

⚠ When you delete your UMS instance, you cannot import apps to the UMS or open the local App Portal on the IGEL OS 12 devices.

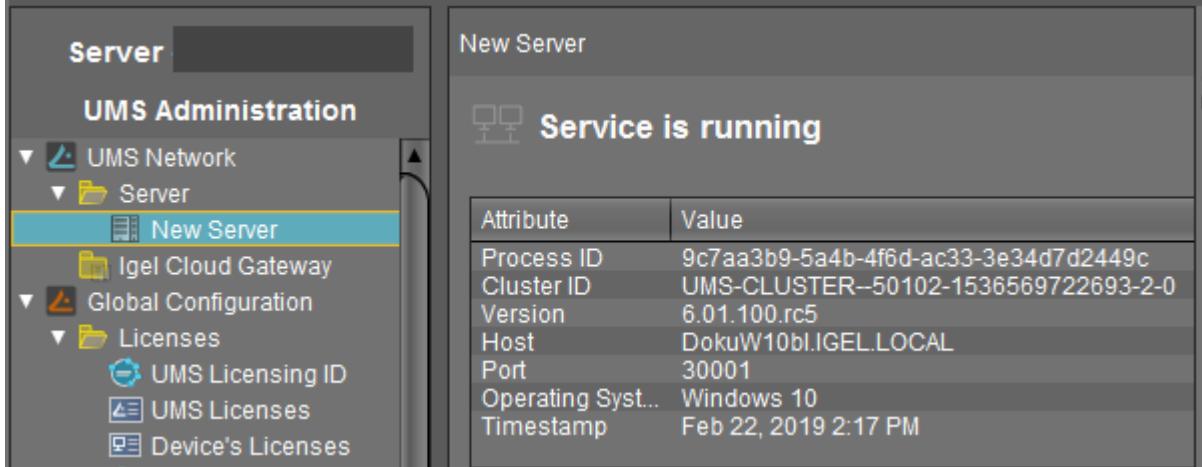
4. Register your UMS anew as described under Registering the UMS.

Updating Host Assignment for Job Execution

Job execution in the UMS uses a device to UMS Server mapping to avoid multiple executions of one job with the same device. If a UMS Server is migrated, this mapping needs to be adjusted.

- i** The mapping is relevant for High Availability (HA) and Distributed UMS installations only. In standard (single instance) installations, the host assignments do not need to be adjusted. In HA and Distributed UMS installations, follow the steps below.

1. In the UMS Console, go to **UMS Administration > UMS Network > Server > [new server]**.
2. Find the process ID of the new server.



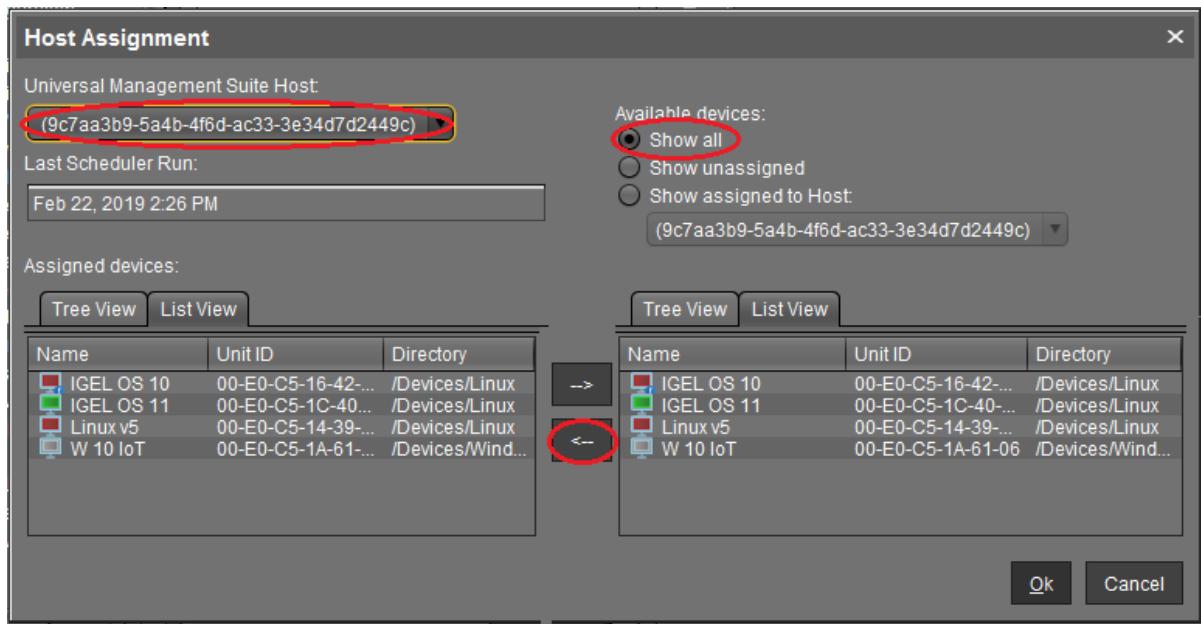
The screenshot shows the UMS Administration interface. On the left, the navigation tree is expanded to show 'Server' > 'New Server'. The right panel displays the 'New Server' configuration with the title 'Service is running'. A table lists the following attributes and values:

Attribute	Value
Process ID	9c7aa3b9-5a4b-4f6d-ac33-3e34d7d2449c
Cluster ID	UMS-CLUSTER--50102-1536569722693-2-0
Version	6.01.100.rc5
Host	DokuW10bl.IGEL.LOCAL
Port	30001
Operating Syst...	Windows 10
Timestamp	Feb 22, 2019 2:17 PM

3. In the menu bar of the UMS Console, select **Misc > Scheduled Jobs > Host Assignment**.
4. Select the new server and check the process ID.
5. Under **Available devices**, activate **Show all**.
6. In **List View** on the right side, select all devices.

i To select all devices, set the focus in the list and press [Ctrl+a].

7. Click the left arrow to assign the devices to the new host.





High Availability

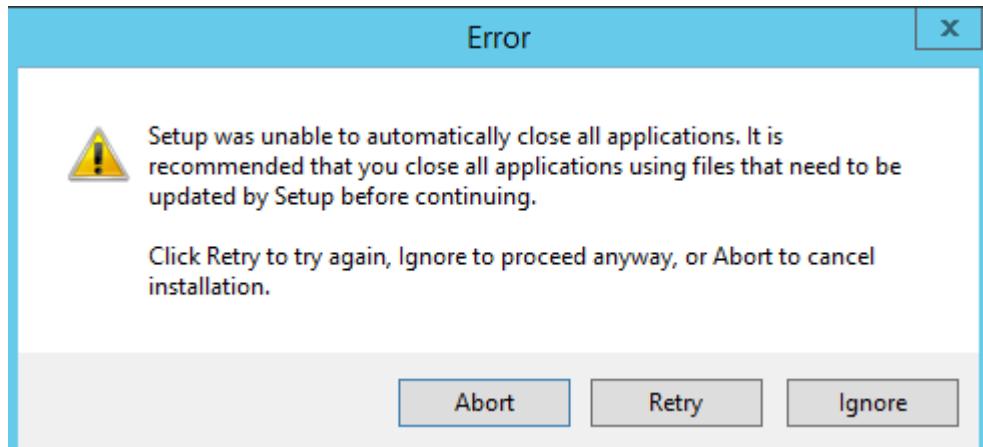
- Load Balancer Is Not Stopping during the Update of the HA Installation(see page 169)
- Which Files Are Automatically Synchronized between the IGEL UMS Servers?(see page 170)
- Load Distribution with a Number of Load Balancers(see page 174)
- Manual Synchronization of the UMS ID(see page 175)
- Error Message When Switching Back from an Externally Signed CA to the Internal CA(see page 177)



Load Balancer Is Not Stopping during the Update of the HA Installation

Symptom

When updating the High Availability (HA) installation, an error message appears saying that not all applications could be closed before the update. A retry does not solve the problem.



Environment

- UMS HA installation

Problem

The load balancer does not stop and stays in the "Stopping" mode:

Services					
Name	Description	Status	Startup Type	Log On As	
IGEL UMS Load Balancer	IGEL Universal Management Suite - High-Availability-Network Load Balancer	Stopping	Disabled	Local System	
IKE and Auth. If Sec. Keying...	THE IKEKEY SERVICE HOSTS THE INTERNET KEY EXCHANGE (IKE) AND AUTHENTICATED INTERNET P... Running		Automatic (trigger start)	Local System	
Interactive Services Detection	Enables user notification of user input for interactive services, which enables access to...		Manual	Local System	
Internet Connection Sharin...	Provides network address translation, addressing, name resolution and/or intrusion pr...		Disabled	Local System	

Solution

- Stop the load balancer manually and proceed with the update. For information regarding stopping the HA services, see IGEL UMS HA Services and Processes.



Which Files Are Automatically Synchronized between the IGEL UMS Servers?

You have a multi-instance IGEL Universal Management Suite (UMS) installation and want to know which files are automatically synchronized between the servers.

Prerequisites

- A High Availability (HA) environment with UMS version 6.06.100 or higher
- A Distributed UMS installation with UMS version 6.10.100 or higher

General Overview

The following files are synchronized between the UMS Servers automatically:

- Files registered in the UMS Console

i Files that are not created as file objects in UMS, but only stored in the file system in `ums_filetransfer`, are NOT synchronized. For details on how/where you can create a file object, see [Files - Registering Files on the IGEL UMS Server and Transferring Them to Devices and Create Firmware Customization](#).

- The files of Universal Firmware Updates if the synchronization is enabled under **UMS Administration > Global Configuration > Universal Firmware Update** and a WebDAV directory is set as the target path for the download. For details, see the section "[Synchronization of Universal Firmware Updates](#)(see page 170)" below.

The objects are synchronized immediately – unless a UMS Server is temporarily unreachable. In that case, the synchronization takes place every 5 minutes or at server startup.

The synchronization applies to the file system and does not refresh the view in any UMS Console other than the one in which the object has been created. Thus, you may need to press [F5] or the refresh button to view the object in the UMS Console on the other server.

⚠ To avoid problems with your HA installation, make sure that the time on the servers of the HA network does not differ by more than one minute. After each manual time reset, the HA services on the relevant server must be restarted.

Synchronization of Universal Firmware Updates

To enable the automatic synchronization of the firmware updates between the UMS Servers, proceed as follows:

1. In the UMS Console, go to **UMS Administration > Global Configuration > Universal Firmware Update**.



2. Activate Synchronize downloaded Universal Firmware Updates within UMS WebDAV directories.

The screenshot shows the 'Universal Firmware Update' configuration page. On the left, there's a sidebar with 'UMS Administration' and various menu items like 'UMS Network', 'Global Configuration', 'Device Network Settings', etc. The 'Universal Firmware Update' item is selected. The main panel has tabs for 'Edit...', 'Edit proxy configuration', and 'Test server connection'. Under 'Universal update settings', there's a checkbox labeled 'Synchronize downloaded Universal Firmware Updates within UMS WebDAV directories' which is checked and highlighted with a red box. Below it, a note says 'The IGEL Universal Firmware files are downloaded from: fwus.igel.com'. There are sections for 'Proxy server' and 'Connection test'. At the bottom, there are fields for 'Protocol' (FTP, FTP passive, etc.), 'Host', 'Port', and 'User name'.

3. When adding a firmware update under **Universal Firmware Update > [context menu] > Check for new firmware updates, set a WebDAV directory as a target path for the download.**

The screenshot shows the 'Universal Firmware Updates' dialog. On the left, there's a sidebar with 'IGEL Universal Management Suite 6' and various categories like 'Profiles', 'Devices', 'Views', etc. The 'Universal Firmware Update' item is selected. The main panel lists 'Universal Firmware Updates' with columns for 'Name', 'Product', and 'Version'. One row for 'IGEL OS 11 (IGEL M340C)' is selected. At the top right of the dialog, there's a 'Select the WebDAV target directory' button with a folder icon, which is highlighted with a red box. At the bottom right, there are 'Download' and 'Cancel' buttons.

High Availability



When the download is complete, you can see under **Synchronization Status** the servers for which the firmware update has already been synchronized.

The screenshot shows the UMS Administration interface. On the left, there's a sidebar with various management options like Universal Management, Profiles, Firmware Customizations, Devices, Views, Jobs, Files, and Universal Firmware Updates. Under Universal Firmware Updates, several firmware versions are listed: IGEL OS 11-11.03.580, IGEL OS 11-11.04.130, IGEL OS 11-11.04.200, and IGEL OS 11-11.04.200. The main panel displays 'Firmware Update Settings' with fields for Product (IGEL OS 11), Version (11.03.580), Release Notes (HTML Text), Host (<PUBLIC_ADDRESS/HOST>), Protocol (HTTPS (UMS WebDAV)), Port (<PUBLIC_WEB_PORT/WEB_PORT>), Target URL (/ums_filetransfer/IGEL_OS_11-11.03.580), Snapshot file (empty), User (IGEL_INTERNAL_FIRMWAREUPDATE_USER), and Password (redacted). Below this is the 'Download Status' section with a progress bar showing 'OK' and 'Finished'. At the bottom is the 'Synchronization Status' table:

Synchronization Status		
Server Name	Host (external if set)	Firmware Update is present
miraculix4	miraculix4	✓
miraculix6	miraculix6	✓

- ⚠** Universal Firmware Updates are synchronized between the UMS Servers only if **HTTPS (UMS WebDAV)** or **HTTP (UMS WebDAV)** is selected under **Protocol**. These protocols are used for transferring the firmware update files from the UMS WebDAV directory to the devices.

A close-up of the 'Firmware Update Settings' section. The 'Protocol' field is highlighted with a red box and contains the value 'HTTPS (UMS WebDAV)'. Other fields shown are Host (<PUBLIC_ADDRESS/HOST>) and Port (<PUBLIC_WEB_PORT/WEB_PORT>).

With any other protocol, firmware updates are not synchronized between the servers.

Connection Data Used during the Update

When a firmware update is assigned to a device, the connection information of the current server is sent to the device if the firmware update is present in the UMS WebDAV directory of the server. If the firmware update is absent for some reason, the connection information of a server with the firmware update available is sent.

The connection information contains

- a **Public Address** if it is configured for the server under **UMS Administration > UMS Network > Server > [server's context menu] > Edit**. Otherwise, the stored hostname is used.
- a **Public Web Port** if it is configured for the server under **UMS Administration > UMS Network > Server > [server's context menu] > Edit**. Otherwise, the stored web port is used.

High Availability



The screenshot shows the UMS Administration interface. On the left, a tree view under "UMS Network" includes "Server" (selected), "Load Balancer", "IGEL Cloud Gateway", "Events", "Global Configuration", "Licenses" (selected), "UMS Licensing ID", "UMS Licenses", "Device's Licenses", "Deployment", "UDC2 Deployment", "Certificate Management", "Mobile Devices", "Device Network Setting", "Server Network Settings", "Cloud Gateway Options", "Device Attributes", "Administrative Tasks", and "Proxy Server". A "Process tasks" section has "Start service" and "Stop" buttons. In the center, a table titled "Service is running" lists attributes like Process ID, Cluster ID, Version, Host, Last Known IP, Public Address, Device Communication Port, Web Port, Public Web Port, and Operating System. Below this is a "Process Configuration" dialog for "miraculix4" with fields for "Display Name" (miraculix4), "Public Address" (empty), and "Public Web Port" (-1). The "Public Address" and "Public Web Port" fields are highlighted with a red border.

Since the connection information is dynamically adjusted, **Host** and **Port** data are not editable for the downloaded firmware update (with the HTTP(S) (UMS WebDAV) protocol set):

The screenshot shows the "Firmware Update Settings" dialog. On the left, a sidebar lists "Shared Workplace Users", "Views (0)", "Jobs (0)", "Files (2)" containing "Test1.txt" and "Test6.txt", and "Universal Firmware Update" (selected, showing "IGEL OS 11-11.03.580"). The main area shows "Firmware Update Settings" with fields: "Host" (Host <PUBLIC_ADDRESS/HOST>), "Protocol" (HTTPS (UMS WebDAV)), "Port" (Port <PUBLIC_WEB_PORT/WEB_PORT>), "Target URL" (/ums_filetransfer/IGEL_OS_11-11.04.200), and "Snapshotfile" (empty). The "Host" and "Port" fields are highlighted with a red border.



Load Distribution with a Number of Load Balancers

If a UMS Server and Load Balancer are installed on a shared computer, the UMS Server communicates with the endpoint devices via port 30002, otherwise via port 30001 as is customary with a single server installation. The Load Balancer always communicates with the devices via port 30001.

Load distribution to the load balancers can be performed as follows. When booting, the devices attempt to establish contact with the UMS Server in this order:

- Name `igelrmserver` in the DNS (*Record Type A*)
- DHCP tag 224
- Local list of **Remote Management Servers** (in the specified order)

In a UMS High Availability network, the load balancers are automatically specified in the list of remote management servers in the local device configuration.

If the DNS entry `igelrmserver` or DHCP tag 224 is used in an HA network, the IP of a load balancer must be entered.

If neither this DNS entry nor the DHCP tag 224 is used, endpoint devices always connect to the first load balancer in the setup list, i.e. all devices are communicating with a single load balancer. The other load balancers are merely stand-bys and will be used only if the first load balancer in the list is not available.

To achieve load distribution between the load balancers, you can however use the DNS entry `igelrmserver` with a *Round Robin DNS*. To do this, the IP addresses of all load balancers are recorded in the DNS as a *Resource Record Set* for the `igelrmserver` entry (cf. https://en.wikipedia.org/wiki/Round-robin_DNS). The devices then connect randomly to one of the available load balancers, thus distributing the query load of all devices.



Manual Synchronization of the UMS ID

When the main UMS ID is not synchronized between the IGEL UMS Servers, **UMS ID status** under **UMS Administration > Global Configuration > UMS ID** reads "Not in sync, please restart server", see UMS ID. However, even when you restart the UMS Server, the UMS ID sometimes remains unsynchronized. In this case, the manual synchronization is required.

Environment

- UMS 12.01.100 or higher
- High Availability (HA) or Distributed UMS environment

Instructions

The manual synchronization of the UMS ID includes the following steps:

1. Locating the server holding the main UMS ID(see page 175)
2. Creating a backup of the UMS ID(see page 175) on that server
3. Restoring the created backup on all servers with the UMS ID unsynchronized(see page 176) and restarting all servers

Locating the Server Holding the Main UMS ID

To find out which server of the HA or Distributed UMS installation holds the **Main UMS ID**:

1. Open **UMS Console** and navigate to **UMS Administration > Global Configuration > UMS ID**.
2. Find the server with **UMS ID status** saying "Main UMS ID".

Host name	Server status	UMS ID status	UMS ID	UMS ID fingerprint
td-ums-srv2012	Running	Main UMS ID	MIIFW/CCA0...WJl0Yql...	52:46:2E:90:37:32:C0:74:83:C8:8...

Creating a Backup of the UMS ID

1. Open the UMS Administrator on the server with the main UMS ID you located in the previous step.
2. Go to **UMS ID Backup** and create a backup as described under UMS ID Backup in the IGEL Administrator.



3. Transfer the created backup to every server where the UMS ID is not in sync.

Restoring the Backup on All Servers with the UMS ID Unynchronized

1. Open the UMS Administrator on every server where the UMS ID is not in sync.
2. Go to **UMS ID Backup** and restore the backup as described under UMS ID Backup in the IGEL Administrator.
3. Repeat the procedure for all servers with the UMS ID unsynchronized.
4. When the backup restoring procedure is complete, restart all servers if you have not yet done so. In the UMS Console, the **UMS ID status** under **UMS Administration > Global Configuration > UMS ID** should show that the UMS ID is now synchronized on all servers.



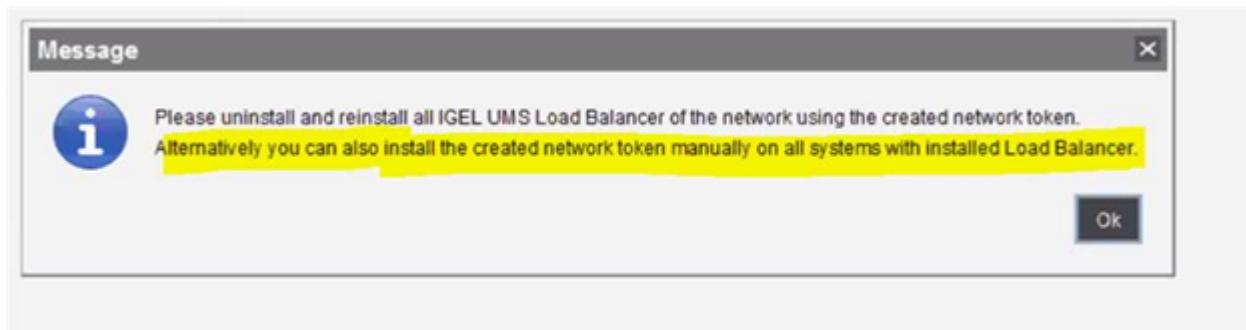
Error Message When Switching Back from an Externally Signed CA to the Internal CA

⚠ Solution Based on Experience from the Field

This article provides a solution that has not been approved by the IGEL Research and Development department. Therefore, official support cannot be provided by IGEL. Where applicable, test the solution before deploying it to a productive environment.

Symptom

After testing externally signed CA, if switch back to the internal one, an error message will come up:



Environment

- UMS HA; UMS version: any

Solution

1. Run the installer again.
2. Choose **Repair**.
3. Point to the HA 'token' / certificate and install it that way.



Device

- Device Scan or Online Check fails(see page 179)
- Registration of a Device in the IGEL UMS Fails(see page 180)
- Device Registration fails with Error Message: Unexpected end of input stream(see page 183)
- Device Registration Behind SonicWall Firewall Fails(see page 184)
- Renaming IGEL OS Devices(see page 185)
- Changing the Hostname of an Endpoint Device via IGEL UMS(see page 189)
- Monitoring Device Health and Searching for Lost Devices(see page 191)
- Managing IGEL OS Devices by Device Specific Data - What Device Attributes Can Do for You(see page 203)



Device Scan or Online Check fails

Symptom

Although a device responds to a ping command, it does not appear in the UMS Console's list of scanned devices, can not be registered or shows up as offline (red) in the UMS Console's navigation tree.

Problem

The packets for scanning the devices or checking their online status are getting blocked within the network, e.g. by a firewall or VPN.

Solution

Make sure UDP packets on port 30005 are not blocked within your network. Those packets are used for both, scanning for devices as well as checking the status of the clients.

See also [IGEL UMS Communication Ports](#)(see page 4).



Registration of a Device in the IGEL UMS Fails

The following article explains the possible reasons and solutions for device registration failure in the IGEL Universal Management Suite (UMS).

Symptom

Although a device can be scanned from the UMS Console, it cannot be registered on the UMS Server. One of the following error messages will appear in the UMS Console:

- Cannot connect to remote management server
- Protocol state invalid
- Certificate invalid

Problem

This may be caused by

- the server's firewall blocking the process
- an already existing UMS certificate on the device
- some database service hanging
- network transfer delays or losses affecting the registration process
- not correct time / date on the device or the UMS Server

Solution

Solving the Firewall Problem

1. On your system running the UMS Console and UMS Server, add the following port to the Windows firewall as an exception:

- **Name** = IGEL RMGUIServer
- **TCP Port** = 30001

i If you have changed the standard port 30001 in the UMS Administrator, open the firewall accordingly for this port. For more details on ports, see [IGEL UMS Communication Ports](#)(see page 4).

2. Make sure no other firewall within the network is blocking ports 30001 and 30005.
3. Try to import the device again.



- ⓘ It can also be useful to check the network firewall for SSL inspection.

Solving the Certificate Problem

- ▶ Delete the `server.crt` certificate from `/wfs/` folder on the device. Try to register the device again.

OR

- ▶ Reset the device to factory defaults and try to register the device again. For how to reset the IGEL OS device to factory defaults, see [Reset to Factory Defaults](#).

OR

- ▶ If you know from which UMS Server exactly the device has received the certificate and have access to this UMS Server, you can remove the certificate as described under [Removing a UMS Certificate from the Device](#)(see page 264).

Solving the Database Problem

- ▶ In the **UMS Administrator > Datasource**, disable the currently active data source and re-activate it again. Try to register the device again.

For details on the UMS Administrator, see [The IGEL UMS Administrator](#).

Checking the Network

- ▶ Check if the network is fine by sending pings from the device console to your UMS Server:
`ping -s -c 10 -M do`

Start with SIZE =1500 and decrease the size of packages until all packages got transferred without fragmentation or package loss. 1440 / 1400 / 1350 / 1300 are good values to test with.

- ⓘ For "pinging" the UMS Server on a device with IGEL OS, you can use the built-in network tools (by default, **Start menu > System > Network Tools**; see [Network Tools](#)).

Checking Time and Date

- ▶ Check if the time and date are set correctly on the device (see [Time and Date](#)) and on the UMS Server.

✓ **Tip**

- If you have problems with device registration in the UMS, it is generally recommended to check
- if the registration directly from the endpoint device functions, see [UMS Registration](#). If not, it is usually a sign of some network problems.
 - if there is another UMS on the network, and the DHCP and/or DNS server configuration points to the "wrong" UMS.



Related Topics

[Thin Client Registration fails with Error Message "Unexpected end of input stream"\(see page 183\)](#)

[Device Registration Behind SonicWall Firewall Fails\(see page 184\)](#)

[Device Scan or Online Check fails\(see page 179\)](#)



Device Registration fails with Error Message: Unexpected end of input stream

Symptom

UMS console shows an error message like "Unexpected end of input stream found at ..." during registration of devices.

Problem

Devices cannot register with UMS over a remote link via VPN gateway, router, firewall or other networking device due to issues with large packets.

The error may occur even if there is no NAT used and the networking device seems to be configured correctly so e.g. pinging is successful in both directions.

Solution

Please consult the documentation for your network device and look up the options for handling large packets. In the case of SonicWall devices the solution is setting the `Ignore Don't Fragment Bit` option.



Device Registration Behind SonicWall Firewall Fails

Symptom

The devices are detected by the UMS during a scan, but registration fails. UMS console shows an error message like "Unexpected end of input stream found at ...".

Possible Causes

The following causes have been reported with firewalls by SonicWall;

- Large packets: See [Thin Client Registration fails with Error Message "Unexpected end of input stream"](#)(see page 183).
- SonicWall DPI-SSL replaces the UMS certificate: If SonicWall DPI-SSL is enabled, it functions as intermediate CA and sends its own certificate to the devices instead of the original UMS certificate. As a consequence, the devices refuse to register because they would only accept the original UMS certificate.

Solution

1. In SonicWall, under **DPI-SSL Status**, add the IP address of the UMS server to the list of DPI-SSL exclusions.
2. Restart the VPN tunnel.



Renaming IGEL OS Devices

By default, if no naming convention is activated and the original hostname of the IGEL OS device has not been changed, the name a device gets upon registration in the UMS is composed of the prefix "ITC" ("TC-", in the case of import with the serial number) and the MAC address of the device.

Example: ITC00E0C520XXXX; TC-00E0C520XXXX

- ⓘ Before renaming/registering the devices, it is recommended, first of all, to pay attention to the following settings in **UMS Console > UMS Administration > Global Configuration > Device Network Settings > Adjust Names of Devices**. Activate them according to your needs:

The screenshot shows the UMS Administration interface with the 'Device Network Settings' section selected. The 'Adjust Names of Devices' section is highlighted with a red box. It contains two checkboxes: 'Adjust UMS-internal name if network name has been changed' and 'Adjust network name if UMS-internal name has been changed'. Both checkboxes are currently unchecked.

Renaming upon Registration

Option 1: Via UMS Console > Device Network Settings > Naming Convention

1. Before registering the devices, activate and define **Naming Convention** in the UMS under **UMS Administration > Global Configuration > Device Network Settings**, see Device Network Settings.
2. If the network name, i.e. terminal name, of the device, should be adjusted, enable **Device Network Settings > Adjust network name if UMS-internal name has been changed**.
3. Save the changes.

Tip

If the network name remained unchanged after the device registration is complete, click **Other commands > Settings UMS->Device** from the device's context menu.

Option 2: Via UMS Console > System > Import > Import Devices (Short or Long Format Only) If the Required Names Are Preliminarily Defined in the Import File

If the **Naming Convention** option does not suit your needs, you can import the devices with the names that fulfill your requirements. For the general instruction, see Importing Devices.



1. When preparing the import file, specify the required device names. See Import with Short Format or Import with Long Format.
2. If the network name, i.e. terminal name, of the devices, should be adjusted, enable **UMS Administration > Global Configuration > Device Network Settings > Adjust network name if UMS-internal name has been changed**.

Option 3: Via IGEL Setup > Accessories > UMS Registration (only for IGEL OS 11 or Earlier)

If the **Naming Convention** is not activated and you need to register only a small number of devices, you can specify the required name when registering the device as follows:

- ▶ On the device, open **IGEL Setup > Accessories > UMS Registration** and specify the device name you need under **New host name**. For more information, see Using UMS Registration Function.

Option 4: Via IGEL Setup > Network

If the **Naming Convention** is not activated:

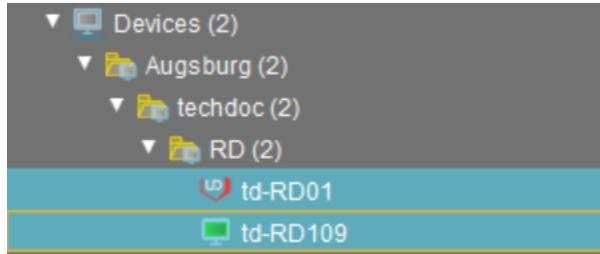
- ▶ Before registering the device in the UMS, adjust its name locally
 - IGEL OS 12: under **IGEL Setup > Network > Computer name**
 - IGEL OS 11 and earlier: under **IGEL Setup > Network > LAN Interfaces > Terminal name**

When the device is registered, this name will also be used in the UMS.

Renaming Already Registered Devices

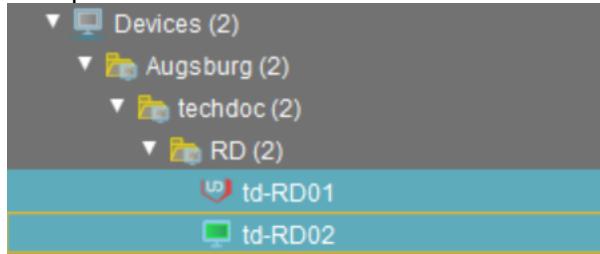
Option 1: Via UMS Console > Device Network Settings > Naming Convention

1. Activate and define **Naming Convention** in the UMS under **UMS Administration > Global Configuration > Device Network Settings**, see Device Network Settings.
2. If the network name, i.e. terminal name, of the device should be adjusted, enable **Device Network Settings > Adjust network name if UMS-internal name has been changed**.
3. Save the changes.
4. To rename the devices, select one of the following options:
 - **Rename all devices:** All devices registered in the UMS will be renamed in accordance with the naming convention.
Example:



- **Rename and renumber all devices:** All devices will be renamed in accordance with the naming convention. If the parameter Identifier under **UMS Administration > Global Configuration > Device Network Settings** has been set to **Sequential Number** (UMS 12.02.120 or higher) or you are using UMS 12.02.100 or lower, this will result in continuous, end-to-end numbering. All names will be reallocated. If numbers have become free because devices were taken out of service, these numbers will be used for other devices. For details on the naming options, see Device Network Settings.

Example:



Tip

If the network name remains unchanged, click **Other commands > Settings UMS->Device** from the device's context menu.

Option 2: Via UMS Console > System > Import > Import Devices (Short or Long Format Only) If the Required Names Are Preliminarily Defined in the Import File

If the **Naming Convention** option does not suit your needs, you can reimport the devices with the names that fulfill your requirements. For the general instruction, see Importing Devices.

1. When preparing the import file, specify the required device names. See Import with Short Format or Import with Long Format.
2. If the network name, i.e. terminal name, of the devices, should be adjusted, enable **UMS Administration > Global Configuration > Device Network Settings > Adjust network name if UMS-internal name has been changed**.

Option 3: Via UMS Console > [device's context menu] > Rename or via Setup > Network

- If you have to rename individual devices, see [Changing the Hostname of an IGEL Device via UMS](#)(see page 189).



Option 4: Via IGEL Management Interface (IMI)

- ▶ If you are using IMI, you can rename your devices as described under [PUT /v3/thinclients/{tcld}](#).

⚠ General Notes

- After renaming via UMS, it may be necessary to reboot the endpoint up to three times before the changed network name is displayed correctly.
- Scripts under **System > Firmware Customization > Custom Commands** as well as some DNS or DHCP infrastructure settings may interfere and obstruct the renaming of devices.



Changing the Hostname of an Endpoint Device via IGEL UMS

There are two different ways to change the hostname of an endpoint device via the IGEL Universal Management Suite (UMS):

Option 1:

If **Adjust UMS-internal name if network name has been changed** is checked under **UMS Console > UMS Administration > Global Configuration > Device Network Settings**:

For IGEL OS 12:

1. In the **UMS Web App > Devices**, select the device.
2. Click **Edit Configuration**.
3. Go to **Network > Computer name** and specify the required hostname.
4. Save the settings.
5. Select that you want the settings to be applied **Now**.
6. Refresh the browser window in order to see the changed hostname.
7. Reboot the device.

For IGEL OS 11 and earlier:

1. In the **UMS Console > Devices**, right-click the device.
2. Choose **Edit Configuration**.
3. Go to **Network > LAN Interfaces**.
4. Change **Terminal name**.
5. Click **Save**.
6. Select that you want the settings to be applied **Now**.
7. Click the **Refresh** button in the UMS in order to see the changed hostname.
8. Reboot the device.



Option 2:

If **Adjust network name if UMS-internal name has been changed** is checked under **UMS Console > UMS Administration > Global Configuration > Device Network Settings**:

1. In the **UMS Console > Devices**, right-click the device.
2. Choose **Rename**.
3. Change the name.
4. Click **OK**.
5. Right-click the device.
6. Choose **Other commands > Settings UMS -> Device**.
7. Reboot the device.



Monitoring Device Health and Searching for Lost Devices

Overview

You have two possibilities of monitoring the devices' health:

- Online check: The UMS initiates a regular poll to all devices.
- Last contact between the UMS and the devices: The UMS is aware of the time and date when it had its last interaction with devices; with IGEL OS 11.05.100 or higher, devices can send periodical heartbeat signals to the UMS.

Both methods can be combined; it is recommended to review the advantages and disadvantages. Generally speaking, a combination makes sense if network load is not an issue.

Environment

- Reportable heartbeat: Endpoint devices with IGEL OS 11.05.100 or higher or with IGEL OS 12.01.100 or higher
- Checking the last contact between the device and the UMS: UMS 12.01.100 or higher
- UMS and endpoint devices are connected directly or via ICG

Online Check (UMS Polls the Devices)

The UMS Server polls the devices in a configurable time interval. When a device responds to the poll, its icon is green ; when a device does not respond, its icon turns red . (When the online check is disabled, the icon is grey). For more information on icons, see:

- for the UMS Console: Devices
- for the UMS Web App: Devices - View and Manage Your Endpoint Devices in the IGEL UMS Web App

The online check can be enabled or disabled under **Misc > Settings > Online Check**; also, the time interval can be configured there.

Advantages:

- Works with any firmware version (and any UMS version).
- Provides an instant insight into device health by means of colored icons.
- Status updates can be very frequent (max. every 0.1 seconds).

Disadvantages:

- Causes relatively high network load, as all devices are polled at the same time (the overall network load is dependent on the time interval).
- Offline devices cannot be traced systematically, must be looked up manually in the structure tree.



Last Contact between Device and UMS (Devices Send Data to the UMS)

You can search explicitly for devices that did not have any interaction with the UMS for a given time. By creating an appropriate view, you can determine which device last had contact with the UMS at which time. This may be useful for detecting devices that are not operational anymore.

In addition to the previously existing contacts, devices with IGEL OS 11.05.100 or higher can send periodical heartbeat signals to the UMS to indicate that they are still operational.

Advantages:

- Systematic searches for lost devices are possible.
- The search results can be saved and sent by e-mail.
- Low network load, or no additional load at all:
 - When the heartbeat feature is used: The heartbeat signals are sent with random delay times. (Of course, the overall network load is dependent on the time interval).
 - When the heartbeat feature is not used: No additional network load is generated.

Disadvantage:

- Status updates cannot be as frequent as with the online check.

Tracing Devices by Their Last Contact with the UMS

Tracing a Specific Device

UMS Console:

1. In the UMS Console, go to **Devices** or use the search slot to find the desired device.



2. In the **Advanced System Information** area, check out the value of the **Last contact**.

Advanced System Information	
Attribute	Value
Unit ID	005056930CAD
MAC address	00:50:56:93:0C:AD
Last IP	192.168.30.106
Product	IGEL OS 11
Product ID	UC1-LX
Version	11.04.240.01
Firmware Description	
IGEL Cloud Gateway	
Expiration date of OS 10 maintenance subscription	
Last contact	Mar 17, 2021 11:42:22 AM
Last Boot Time	Jan 22, 2021 11:22 AM
Network Name (at Boot Time)	ITC005056930CAD
Runtime since last Boot	18:41:50
Total Operating Time	234 days
Battery Level	

UMS Web App:

1. In the UMS Web App, go to **Devices** and select the required device.

2. Under **System Information**, check out the value of the **Last contact**.

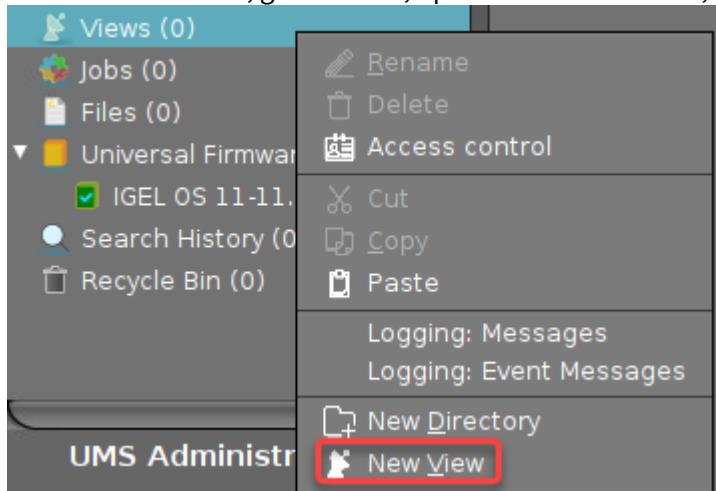
The screenshot shows the UMS Web App interface. The top navigation bar includes 'UMS 12', 'Devices' (which is highlighted), 'Configuration', 'Apps', 'Network', and '2 more'. Below the navigation is a 'Directory Tree' on the left with categories like 'Devices (4)', 'Augsburg (2)', 'techdoc (2)', 'Quality Assurance (1)', 'RD (1)', 'Bremen (2)', and 'RD1 (2)'. The main content area shows a list of devices under 'RD' with one item selected: 'ITC005056938D22'. A red box highlights this selection. To the right, there's a detailed view of the selected device. At the top of this view is the device's name 'ITC005056938D22' with a edit icon. Below it are buttons for 'Edit Configuration', 'Shadow', 'Assign object', 'Reboot', and 'Shutdown'. A 'Properties' section follows. On the far right, there are tabs for 'Assigned Objects', 'System Information' (which is highlighted with a red box), 'Licenses', and 'Network Adapter'. The 'System Information' tab displays various details: 'Firmware Description' (IGEL Cloud Gateway), 'Last Contact' (Mar 7, 2023, 4:12 PM), 'Expiration Date of OS10-Maintenance Subscription', 'Last Boot Time', and 'Runtime since last Boot' (2 days 20:04:10).

- i** For IGEL OS 11 devices, the **Last contact** timestamp is updated on each command sent from a device to the UMS. Or, if you configure a reportable heartbeat interval, a heartbeat command will be sent in a certain time period if no other command has been sent, and the timestamp will be updated correspondingly.
 For IGEL OS 12 devices, the **Last contact** timestamp is updated not on each command, but only in the configured heartbeat interval (for online devices only).
 For how to configure a reportable heartbeat interval, see [Configuring Devices to Send a Reportable Heartbeat](#)(see page 200) below.

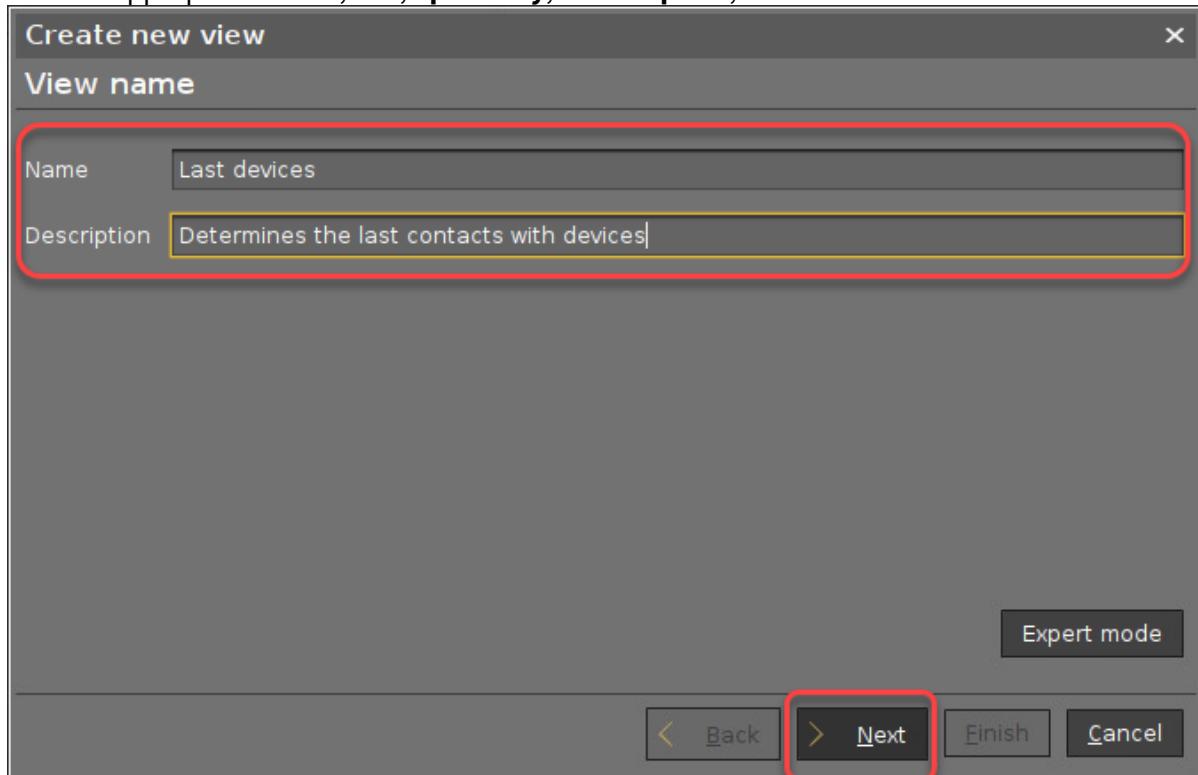


Finding Devices That Have Not Shown Up since a Given Time

1. In the structure tree, go to **Views**, open the context menu, and select **New View**.



2. Enter an appropriate **Name**, and, **optionally**, a **Description**, and click **Next**.





3. In the search field, type "contact" to reduce the number of criteria.

A screenshot of a software window titled "Create new view". The main area is titled "Select criterion" and contains a search bar with the text "contact" highlighted by a red rectangle. Below the search bar, there is a section titled "Asset Inventory" with two radio button options: "Last Contact Time (Absolute)" (selected) and "Last Contact Time (Relative)". At the bottom of the window are buttons for "Back", "Next", "Finish", and "Cancel".

Create new view

Select criterion

contact

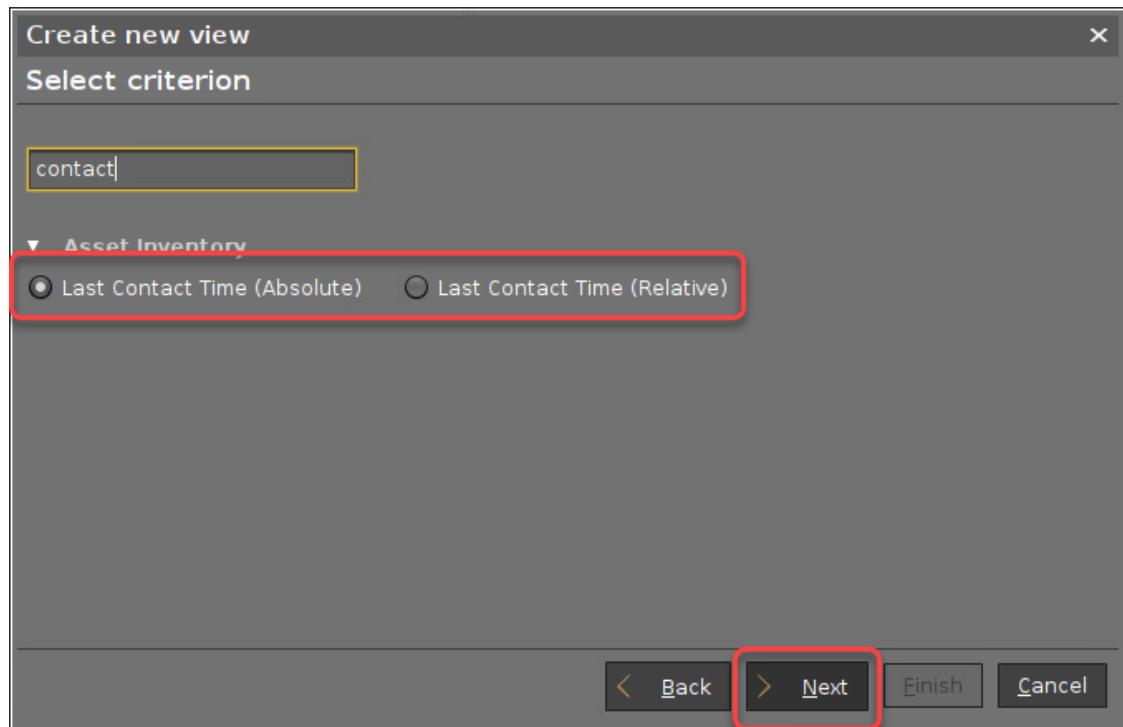
▼ Asset Inventory

Last Contact Time (Absolute) Last Contact Time (Relative)

< Back > Next Finish Cancel

4. Choose one of the following criteria and click **Next**:

- **Last contact time (relative)**: The time interval between the last contact between the UMS and the device and now. This can be the last received heartbeat or any other kind of communication.
- **Last contact time (absolute)**: The date of the last contact between the UMS and the device. This can be the last received heartbeat or any other kind of communication.



5. Provide the data, depending on whether you chose **Last contact time (relative)** or **Last contact time (absolute)**, and then click **Next**.
 - If you have selected **Last contact time (relative)**:
 - **Within the last [number of] days**: Find devices whose last contact with the UMS was between yesterday and the given number of days ago.
 - **More than [number of] days ago**: Find devices whose last contact with the UMS is more than the given number of days ago.
 - **In range from [number] to [number of] days ago**: Find devices whose last contact with the UMS was within the given time interval.



Create new view

Date Search Relative

Within the last days

More than days ago

In range from to days ago

- If you have selected **Last contact time (absolute)**:
 - **Date range:** Find devices whose last contact with the UMS was within the given date range.
 - **Date:** Find devices whose last contact with the UMS was on the given date.

Create new view

Date search

Date range Date

from

to

6. Review your settings and click **Finish**.



Create new view

Finish view creation

Name: Lost devices?

Description: No heartbeat received after a given time

View criteria

Boot Time within the last 3 days

Create view
 Narrow search criterion (AND)
 Create additional search criterion (OR)

Finish Back Next Cancel

7. If the devices are not shown immediately, click **Load devices**.

Name: Lost devices

Description: Determines the last contacts with devices

Rule: Last Contact more than 2 days ago

Result list was last updated at 1:18 PM.

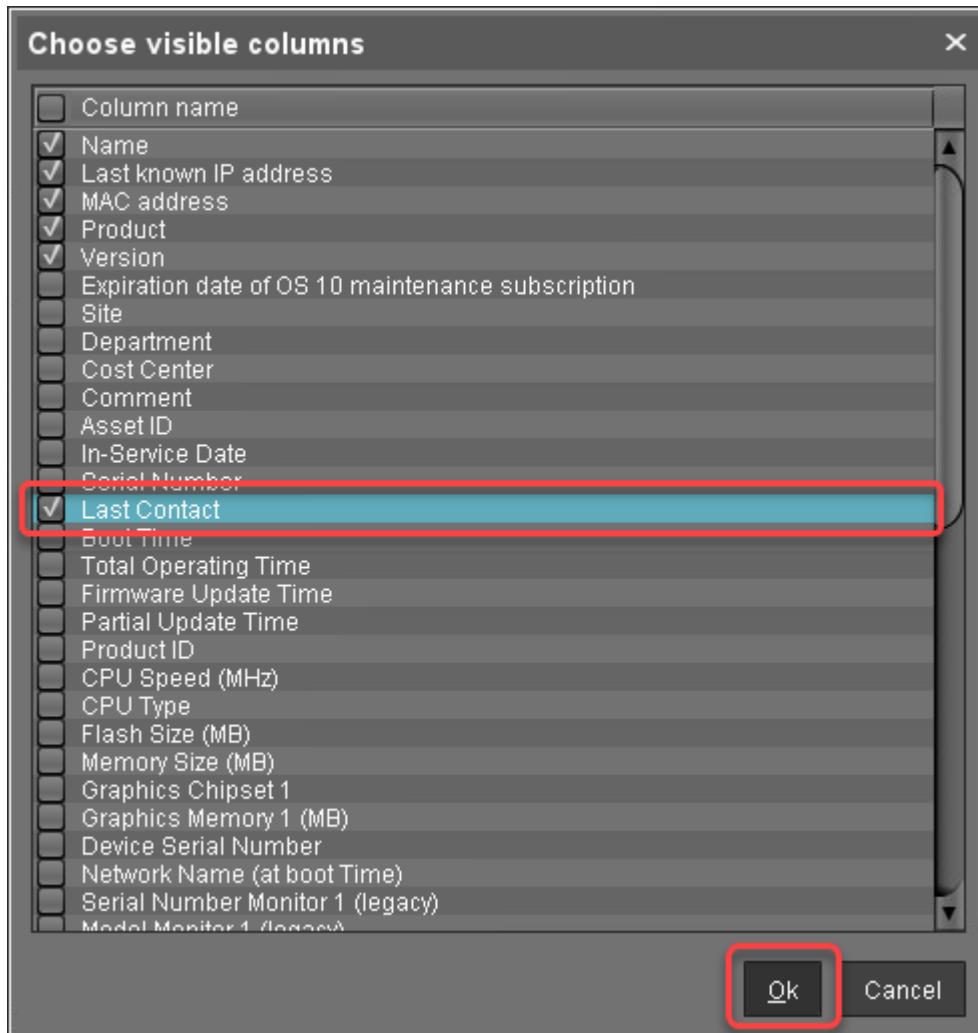
Load devices Refresh

Settings

6 matching devices found.

8. To make the **Last contact** column visible, click the icon that is shown underneath and then select **Last contact** in the **Choose visible columns** dialog.

Name	Last contact							
Description	Determines the last contacts with devices							
Rule	Last Contact within the last 2 days							
Result list was last updated at 11:58 AM.	Load devices Refresh							
Settings								
Matching devices (3 devices)								
Name	Last known IP address	MAC address	Product	Version				
IGEL OS(RPI4)	192.168.30.103	DCA632C18C3B	IGEL OS(RPI4)	11.01.110				
techdoc010	192.168.30.101	005056931508	IGEL Universal Desktop OS 2	5.13.100.01				
techdoc08	192.168.30.100	005056938970	IGEL Universal Desktop OS 2	5.13.100.01				



The results are shown.

Name	Last contact				
Description	Determines the last contacts with devices				
Rule	Last Contact within the last 2 days				
Result list was last updated at 11:58 AM. Refresh Settings					
Matching devices (3 devices)					
Name	Last known IP address	MAC address	Product	Version	Last Contact
IGEL OS(RPI4)	192.168.30.103	DCA632C18C3B	IGEL OS(RPI4)	11.01.110	Mar 22, 2021 11:23:17 AM
techdoc010	192.168.30.101	005056931508	IGEL Universal Desktop OS 2	5.13.100.01	Mar 22, 2021 11:23:02 AM
techdoc08	192.168.30.100	005056938970	IGEL Universal Desktop OS 2	5.13.100.01	Mar 22, 2021 11:22:47 AM

You can save the results in various formats (see [Saving the View Results List](#)) or send them via e-mail (see [Sending a View as Mail](#)).



Configuring Devices to Send a Reportable Heartbeat

1. In the UMS Console, go to **UMS Administration > Device Network Settings** and edit the settings as follows:

- Activate **Configure devices to send periodic contact signal**
- Set **Heartbeat interval** to the desired value.

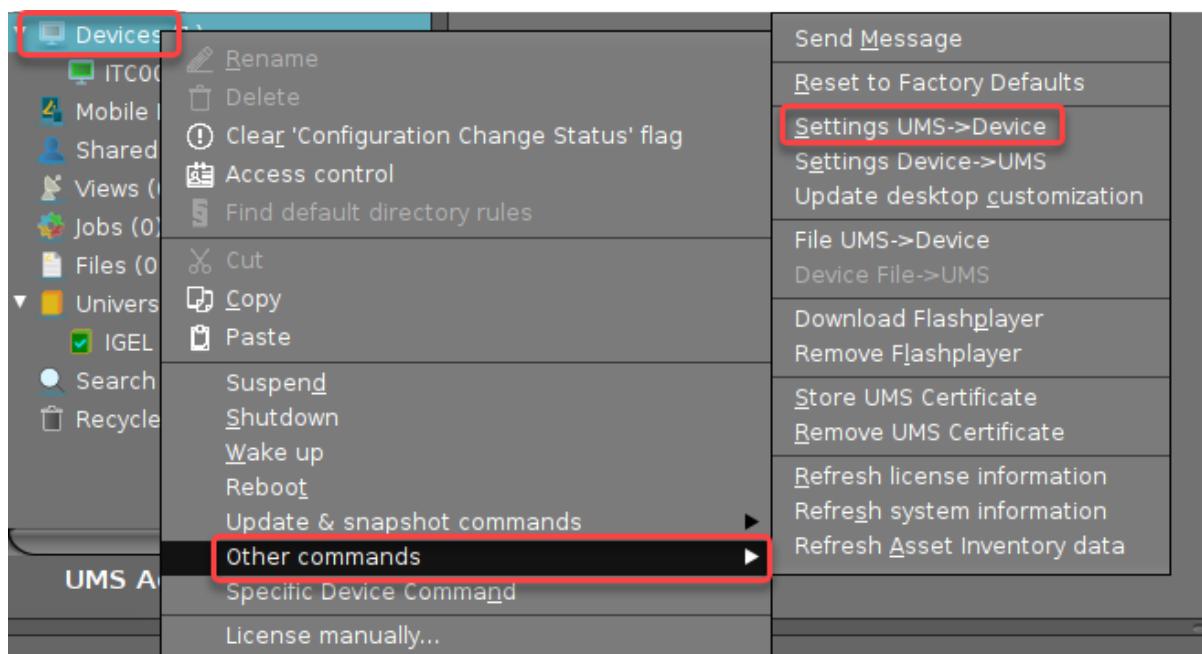
i The heartbeat signal will have a random delay of 0 to 10 minutes. This is to avoid overloads which might occur when large amounts of devices send their heartbeat signals simultaneously.

The screenshot shows the 'Device Network Settings' configuration page. It includes sections for 'Configuration of the System Information Update' (with a checked checkbox for updating system information on device selection) and 'Advanced Device's Status Updates' (with a checked checkbox for devices sending updates). The 'Heartbeat Signal' section is highlighted with a red oval. Inside this section, the 'Configure devices to send periodic contact signal' checkbox is checked. Below it, a dropdown menu for 'Heartbeat interval' is open, showing options: 1 hour, 2 hours, 3 hours (which is selected and highlighted in blue), 4 hours, 5 hours, 6 hours, 12 hours, and 24 hours. The 'Automatic Registration' section contains an unchecked checkbox for enabling automatic registration. The 'Device Requests' section has an unchecked checkbox for enabling device requests and a text input field set to '50' for the maximum number of concurrent threads.

2. Click to save your settings.

The settings will become effective the next time the devices receive their settings from the UMS.

3. To make the new settings effective immediately, go to **Devices**, open the context menu, and select **Other commands > Settings UMS->Device**.

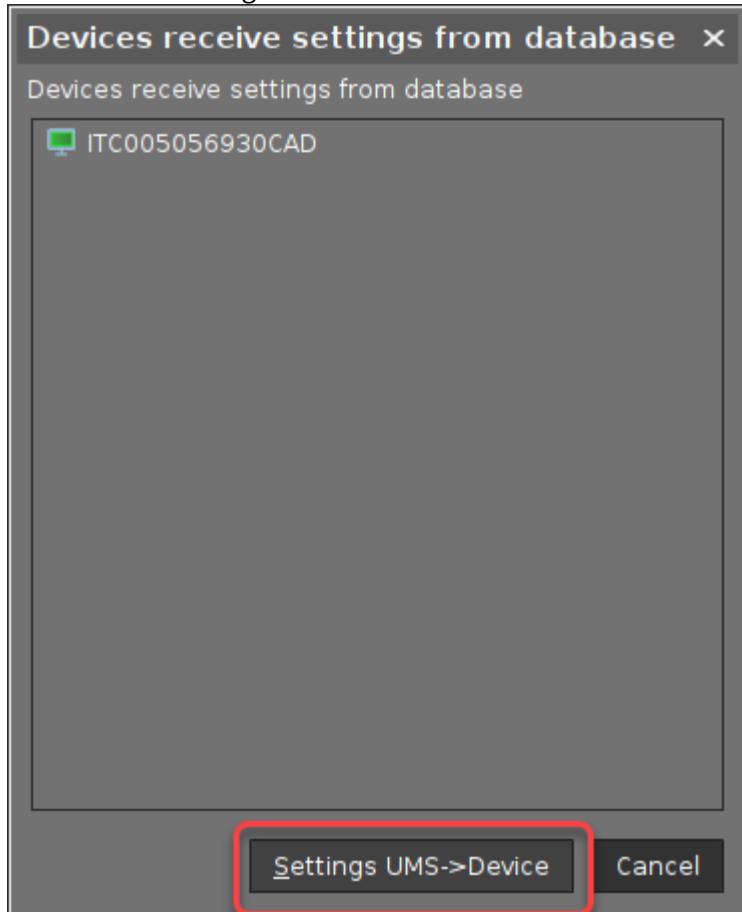


A screenshot of a computer screen showing a context menu for a selected device. The menu is organized into several sections:

- Devices**: A section containing options like Rename, Delete, Clear 'Configuration Change Status' flag, Access control, and Find default directory rules.
- Cut/Copy/Paste**: Standard file operations.
- Power Management**: Options like Suspend, Shutdown, Wake up, and Reboot.
- System Commands**: Options like Update & snapshot commands, Other commands (which is expanded to show Specific Device Command and License manually...), and License manually... (disabled).
- Network and System Info**: Options like Send Message, Reset to Factory Defaults, Settings UMS->Device (highlighted with a red box), Settings Device->UMS, Update desktop customization, File UMS->Device, Device File->UMS, Download Flashplayer, Remove Flashplayer, Store UMS Certificate, Remove UMS Certificate, Refresh license information, Refresh system information, and Refresh Asset Inventory data.



4. Confirm with Settings **UMS->Device**.





Managing IGEL OS Devices by Device Specific Data - What Device Attributes Can Do for You

Self-defined device attributes can be used to configure devices with the IGEL Universal Management Suite (UMS) according to device-specific data like location, department, or attached hardware.

To use this functionality, you create a custom script on the device that retrieves the desired data and sets the value of the relevant device attribute accordingly.

Note that you must use the UMS internal name of an attribute, not the display name. The UMS internal identifier is displayed in the UMS Console under **UMS Administration > Global Configuration > Device Attributes**; see also Managing Device Attributes for IGEL OS Devices.

Also, note that permission to change attribute values must be granted by the UMS. This is the case if the **Overwrite Rule** is set to **Devices** or **All** in the UMS Console under **UMS Administration > Global Configuration > Device Attributes**; see also Managing Device Attributes for IGEL OS Devices.

- ⓘ The character limit for device attributes is 100 characters. Longer entries will not be synchronized with the UMS.

Environment

- IGEL UMS 6.10 or higher
- Devices with IGEL OS 11.07.100 or higher

Command Reference

List All Device Attributes

```
/sbin/rmagent-devattrs-enum
```

Lists all device attributes including the current value for this device. The enumeration is ordered according to the attribute's order id.

Example:

```
root@ITC005056930CAD:~# rmagent-devattrs-enum
country:range:US
division:range:First division
location:range:San Francisco
root@ITC005056930CAD:~#
```



Device Attribute of the Type "List": List All Possible Values

```
/sbin/rmagent-devattrs-enum-range <ATTRIBUTE_NAME>
```

Enumerates entries of the given range. The enumeration is ordered according to the range item's order id.

Example:

```
root@ITC005056930CAD:~# rmagent-devattrs-enum-range location
Augsburg
Karlsruhe
San Francisco
root@ITC005056930CAD:~# █
```

Print Attribute Type

```
/sbin/rmagent-devattrs-get-type <ATTRIBUTE_NAME>
```

Prints the type of the given attribute. Possible types are:

- string
- number
- date (format: yyyy-mm-dd)
- range

Example:

```
root@ITC005056930CAD:~# rmagent-devattrs-get-type location
range
root@ITC005056930CAD:~# █
```

Print Attribute Value

```
/sbin/rmagent-devattrs-get <ATTRIBUTE_NAME>
```

Prints the current value of the given attribute.

Example:



```
root@ITC005056930CAD:~# rmagent-devattrs-get location  
San Francisco  
root@ITC005056930CAD:~# █
```

Set Attribute Value

```
/sbin/rmagent-devattrs-set <ATTRIBUTE_NAME> <ATTRIBUTE_VALUE>
```

Sets the given attribute to the specified value. If the overwrite rule for this attribute does not permit the device to change the value, an error is returned. Note that this command does not check the value type.

Example:

```
root@ITC005056930CAD:~# rmagent-devattrs-set location "San Francisco"  
root@ITC005056930CAD:~# rmagent-devattrs-get location  
San Francisco  
root@ITC005056930CAD:~# █
```

Reset Attribute Value

```
/sbin/rmagent-devattrs-reset <ATTRIBUTE_NAME>
```

Resets the given attribute to an empty value.

Example:

```
root@ITC005056930CAD:~# rmagent-devattrs-get location  
Augsburg  
root@ITC005056930CAD:~# rmagent-devattrs-reset location  
root@ITC005056930CAD:~# rmagent-devattrs-get location  
  
root@ITC005056930CAD:~# █
```

Send Attributes to UMS If a Value Has Been Changed by Device

```
/sbin/rmagent-devattrs-sync
```

If any of the attribute values have been changed by the device, the complete set of attributes is sent to the UMS.



Send Attributes to UMS

```
/sbin/rmagent-write-device-attributes
```

The complete set of attributes is sent to the UMS.



Start of the UMS Console / Web App

- [UMS Web App: The Browser Displays a Security Warning \(Certificate Error\)](#)(see page 208)
- [Starting UMS Console Crashes NX Session](#)(see page 225)
- [UMS Console doesn't start on Linux System without X11](#)(see page 226)
- [UMS Web App: "404 - System Error" Message](#)(see page 227)



UMS Web App: The Browser Displays a Security Warning (Certificate Error)

Symptom

When opening the UMS Web App, the browser displays a security warning and/or reports a certificate error.

Environment

- UMS Web App (UMS 6.06 or higher)

Problem

The customer uses an end certificate from a root CA that is not known to the browser. This is the case for self-signed certs, e.g. the default implementation.

Solution

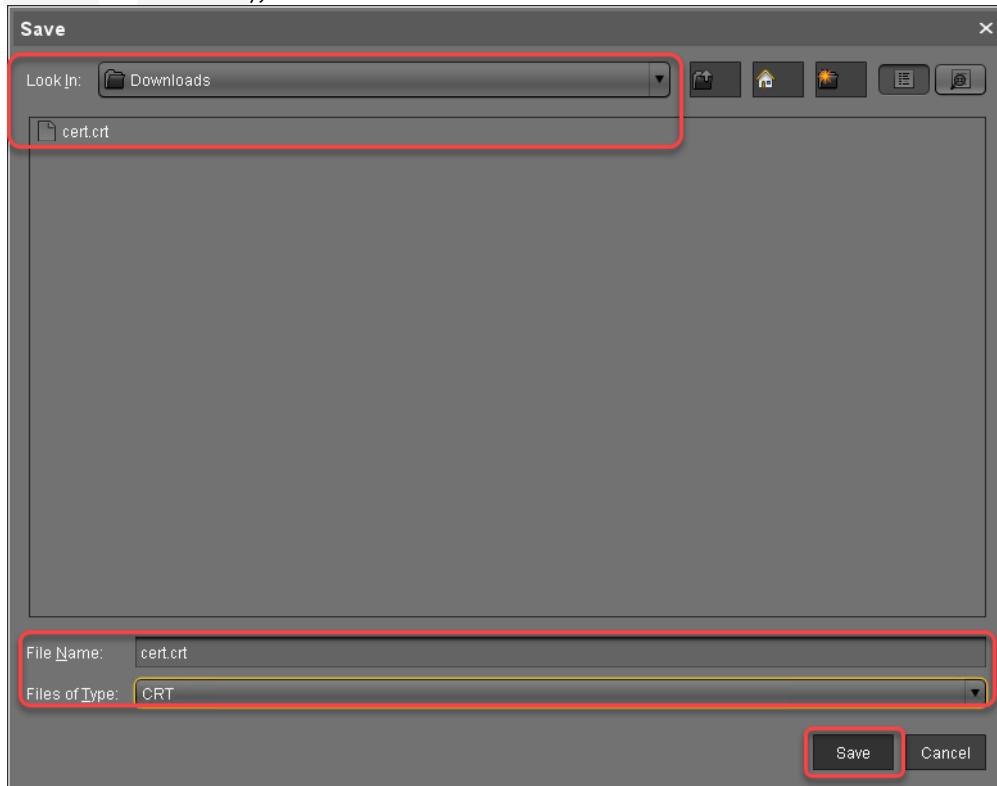
Exporting the Certificate from the UMS

1. In the UMS Console, go to **UMS Administration > Global Configuration > Certificate Management > Web**.
2. Make sure all end certificates in use are derived from the same root CA certificate.
3. Select the root CA certificate in use, open the context menu, and select **Export certificate**.

A screenshot of the UMS Administration interface. On the left, there is a tree view of certificates under 'RootCA.crt'. One certificate, '1d007110-7aac-4891-a54c-313c13735fb' (highlighted with a red box), has a context menu open. The menu items are: Show certificate content, Assign server, Create signed certificate, Import signed certificate, Import decrypted private key, Import certificate chain from Keystore, Export certificate (highlighted with a red box), Export certificate chain to keystore, Renew/Clone certificate, and Remove certificate.



4. Select an appropriate location, select the correct file extension for your browser (most common: *.crt or *.cert), and click **Save**.



5. Add the certificate to the trusted certificates of your browser. For instructions, see [Importing the Certificate into the Browser](#)(see page 209).

Importing the Certificate into the Browser

⚠ The procedures described here may differ if you have a different browser version.

The following browsers are described here:

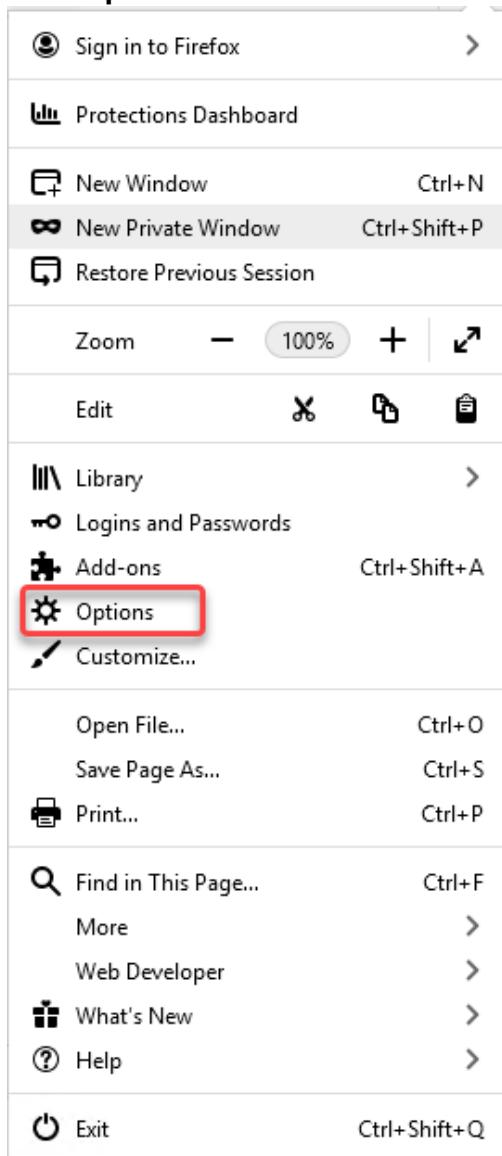
- [Firefox](#)(see page 209)
- [Chrome](#)(see page 213)
- [Microsoft Edge](#)(see page 220)

Firefox

1. Click to open the menu.



2. Select **Options**.





3. Select **Privacy & Security**.

-  General
-  Home
-  Search
-  Privacy & Security
-  Sync

4. Scroll down to Certificates and click **View Certificates**.

Certificates

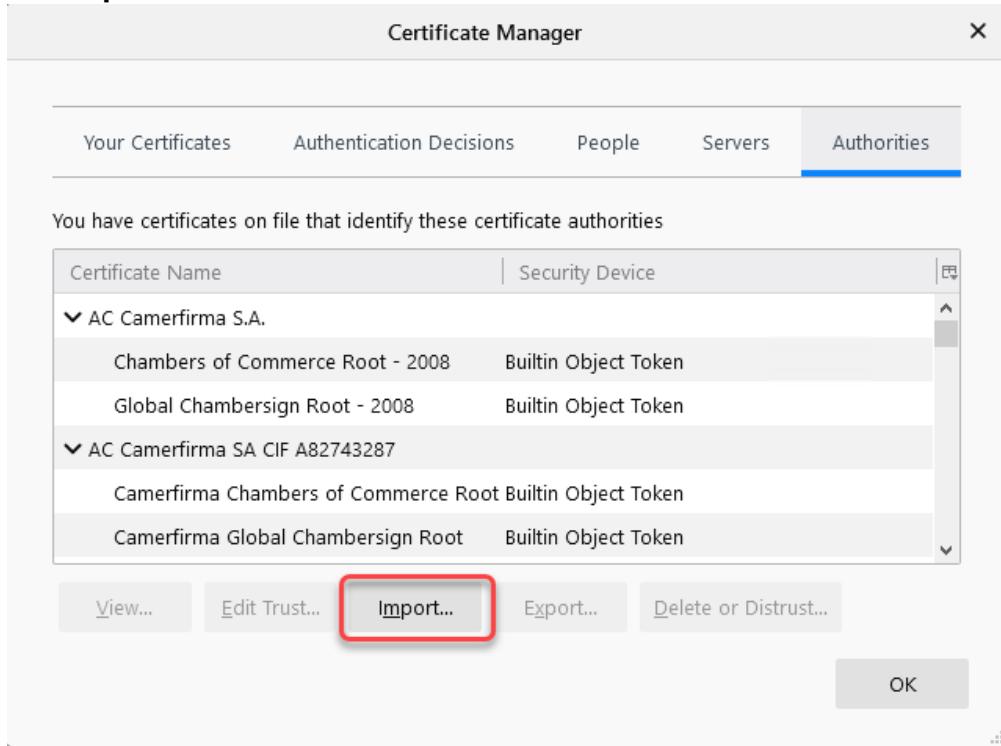
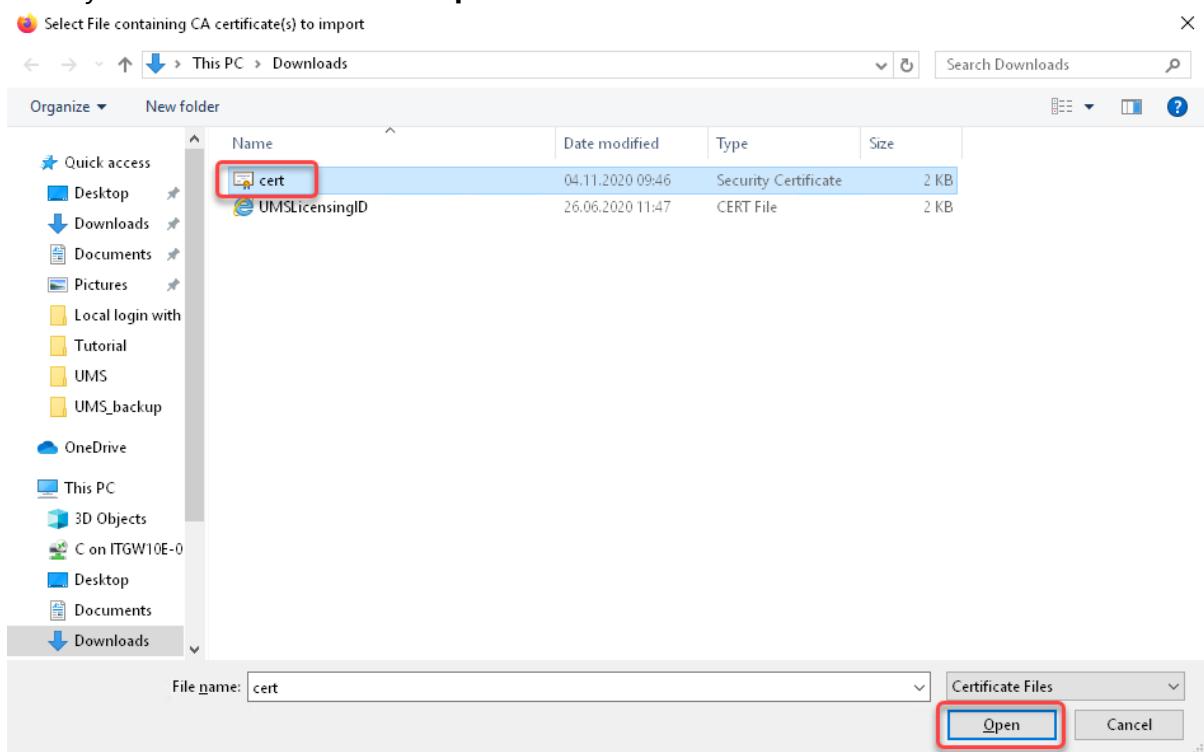
When a server requests your personal certificate

- Select one automatically
- Ask you every time

Query OCSP responder servers to confirm the current validity of certificates

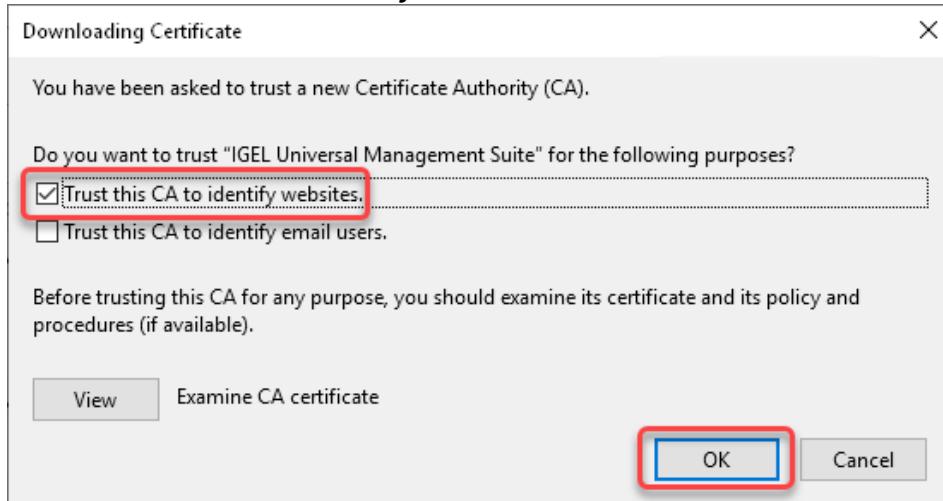
[View Certificates...](#)

[Security Devices...](#)

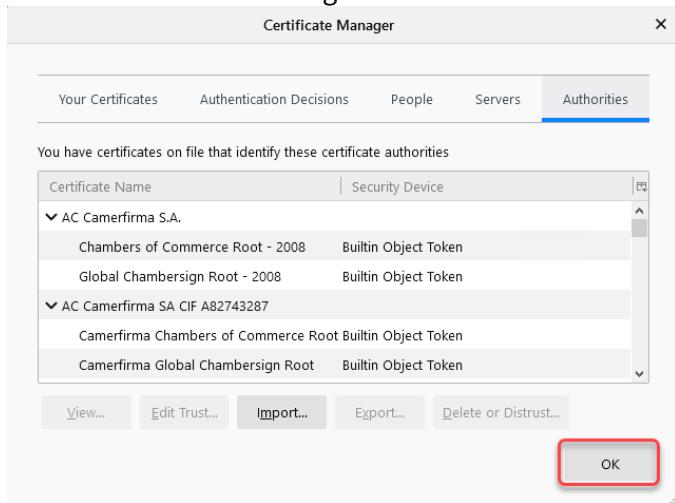
5. Click **Import**.6. Select your certificate file and click **Open**.



7. Activate **Trust this CA to identify websites** and click **OK**.



8. Close the Certificate Manager window with **OK**.



9. Restart the browser.

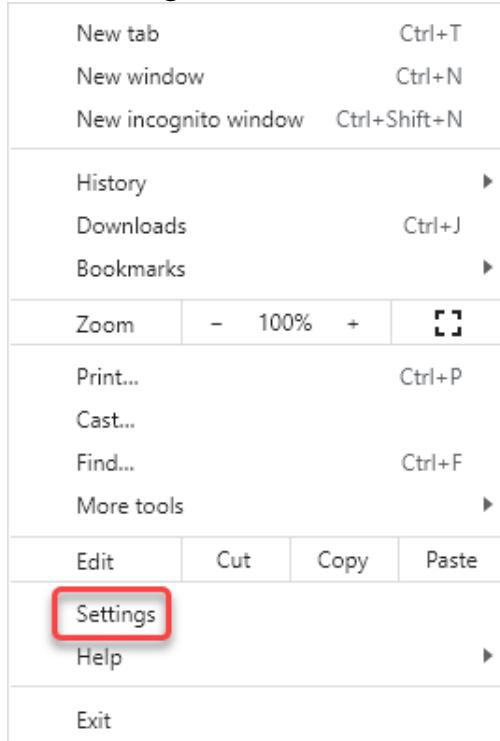
The browser can access the UMS Web App without problems.

Chrome

1. Click to open the menu.



2. Select **Settings**.



3. Go to **Privacy and security** and select **Security**.

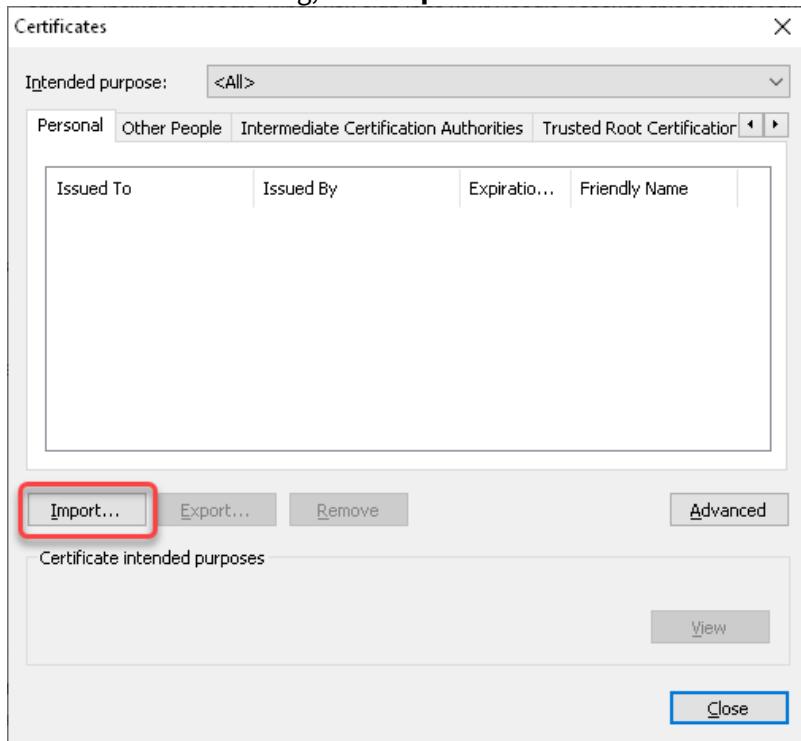
A screenshot of the "Privacy and security" settings page. On the left, there is a sidebar with icons for You and Google, Autofill, Safety check, Privacy and security (highlighted with a red box), Appearance, Search engine, Default browser, and On startup. The main content area shows sections for Clear browsing data, Cookies and other site data, Security (highlighted with a red box), and Site Settings.

4. Scroll down and click the symbol next to **Manage certificates**.

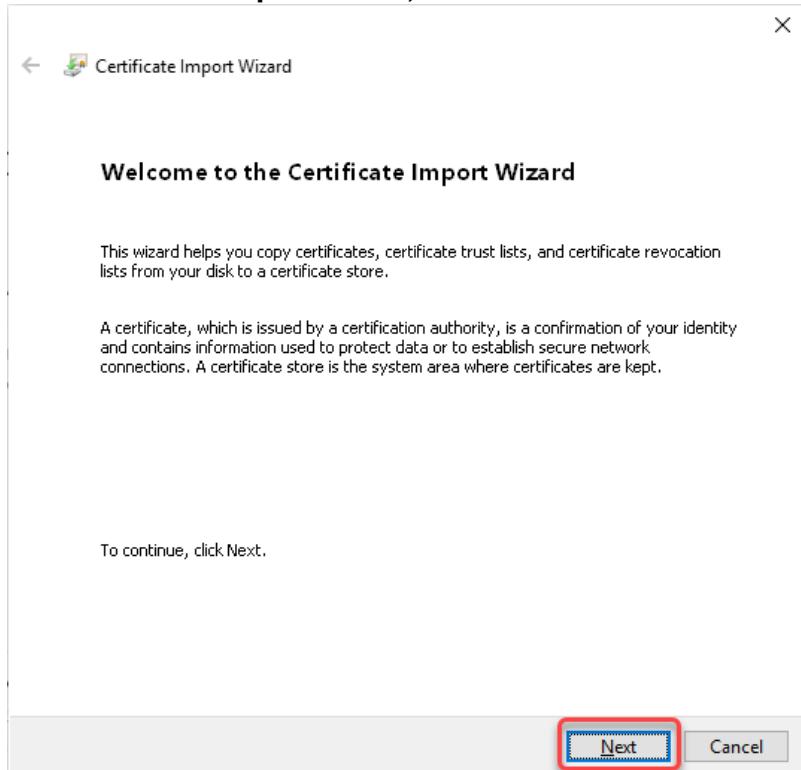
A screenshot of a list of security-related options. The items include: Manage security keys, Reset security keys and create PINs; Manage certificates (with a red square icon next to it), Manage HTTPS/SSL certificates and settings; Google Advanced Protection Program, Safeguards the personal Google Accounts of anyone at risk of targeted attacks.



5. In the **Certificates** dialog, click **Import**.

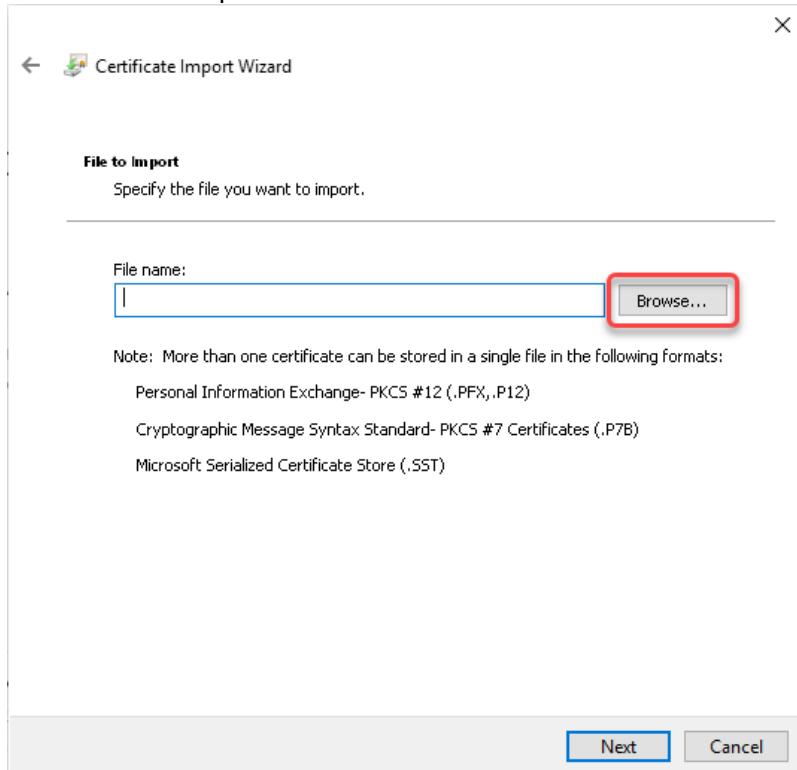


6. In the **Certificate Import Wizard**, click **Next**.

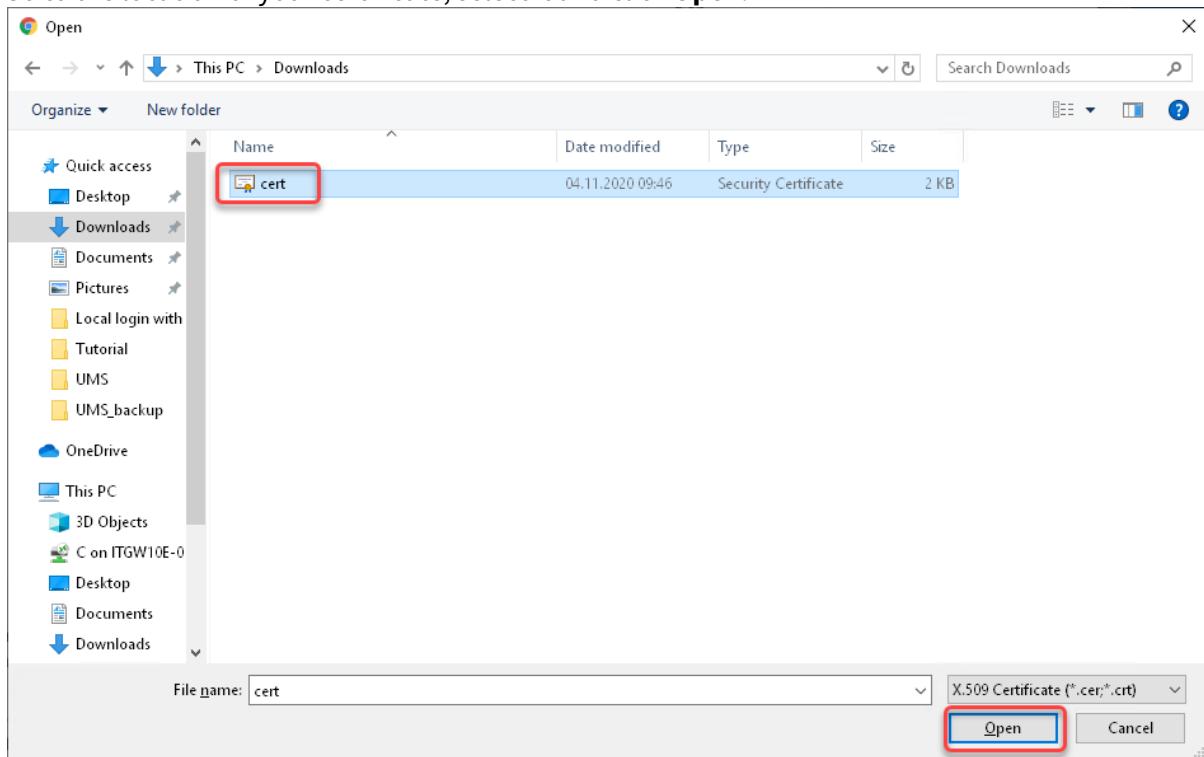




7. Click **Browse** to open the file chooser.

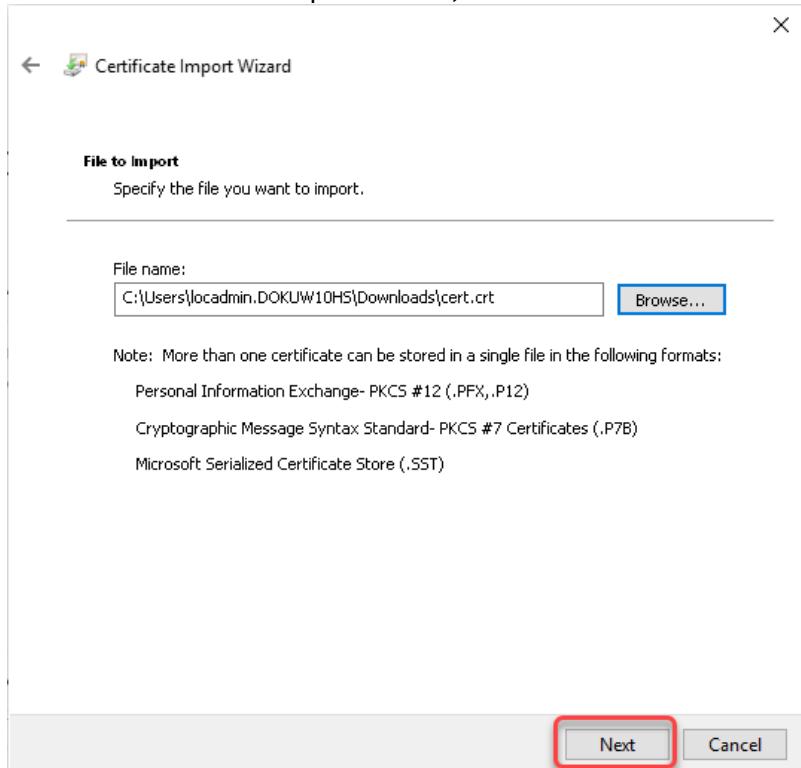


8. Go to the location of your certificate, select it and click **Open**.



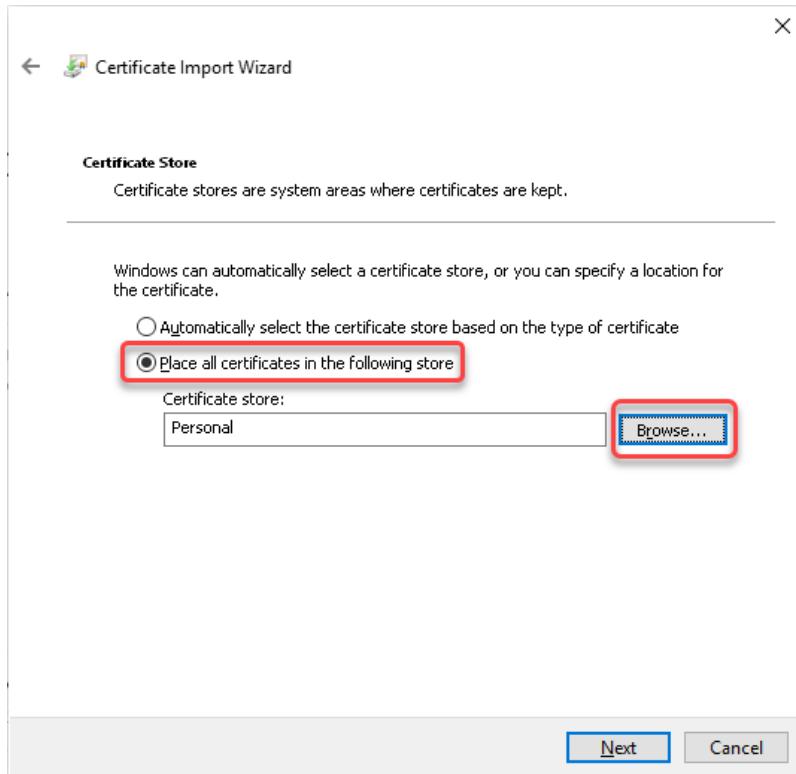


9. Back in the Certificate Import Wizard, click **Next**.

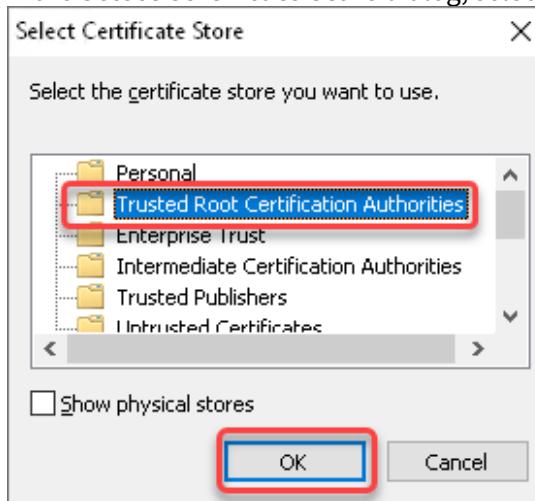




10. Select **Place all certificates in the following store** and click **Browse** to determine the certificate store.

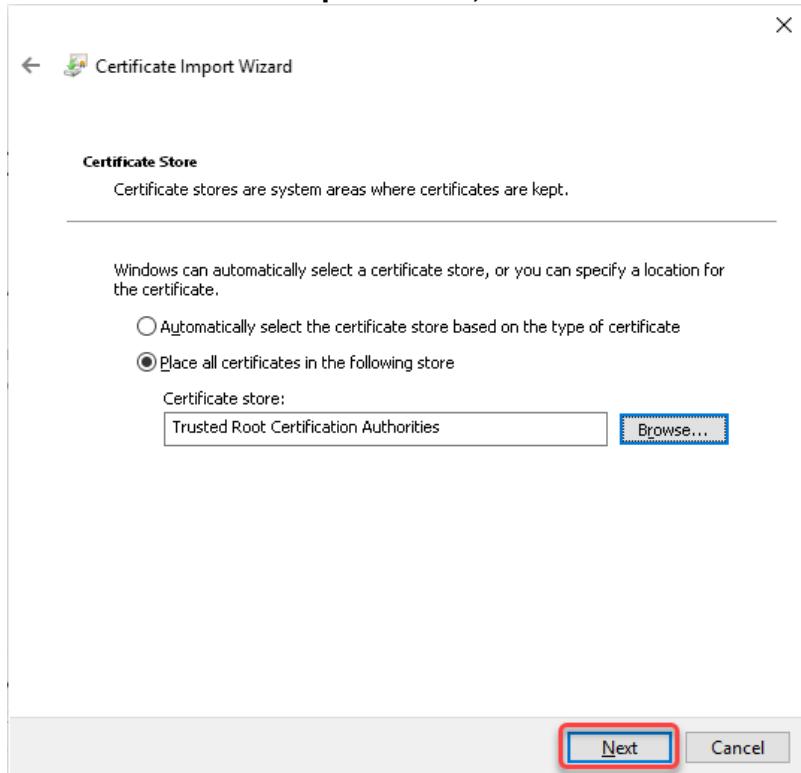


11. In the **Select Certificate Store** dialog, select **Trusted Root Certificate Authorities** and click **OK**.

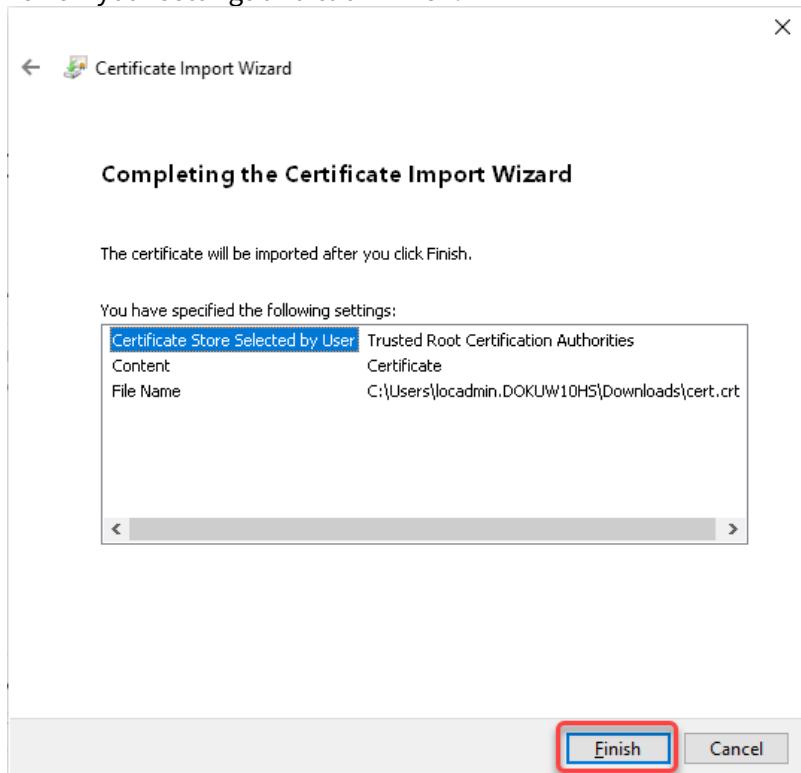




12. Back in the **Certificate Import Wizard**, click **Next**.

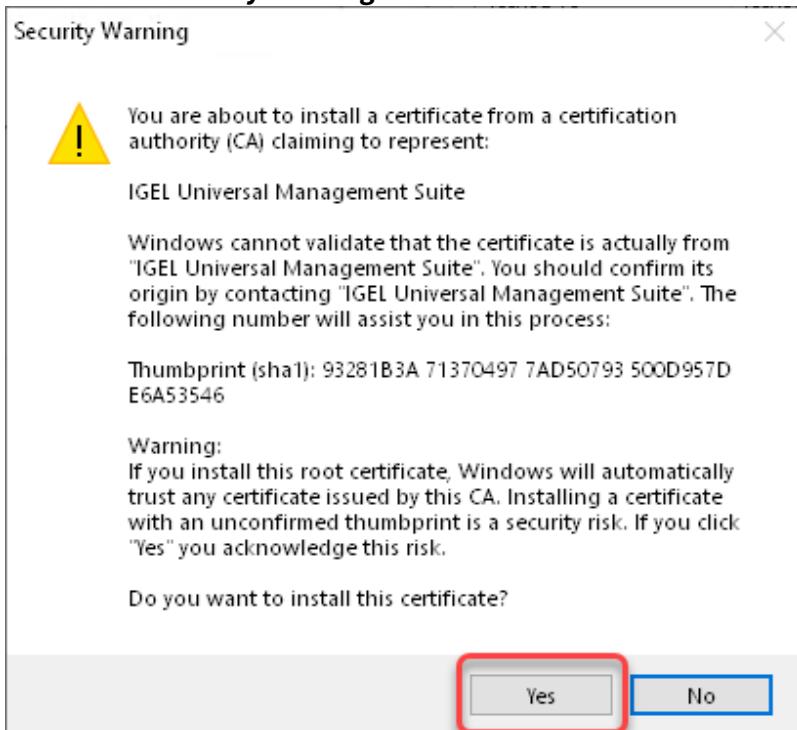


13. Review your settings and click **Finish**.

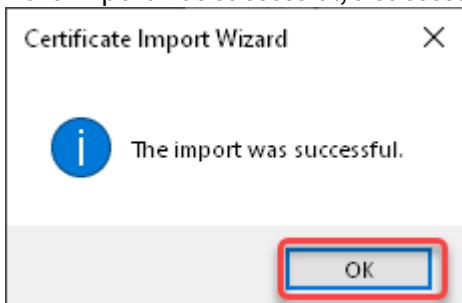




14. Confirm the **Security Warning** with **Yes**.



15. If the import was successful, a success message is displayed.



The certificate is installed on your system.

16. Restart the browser.

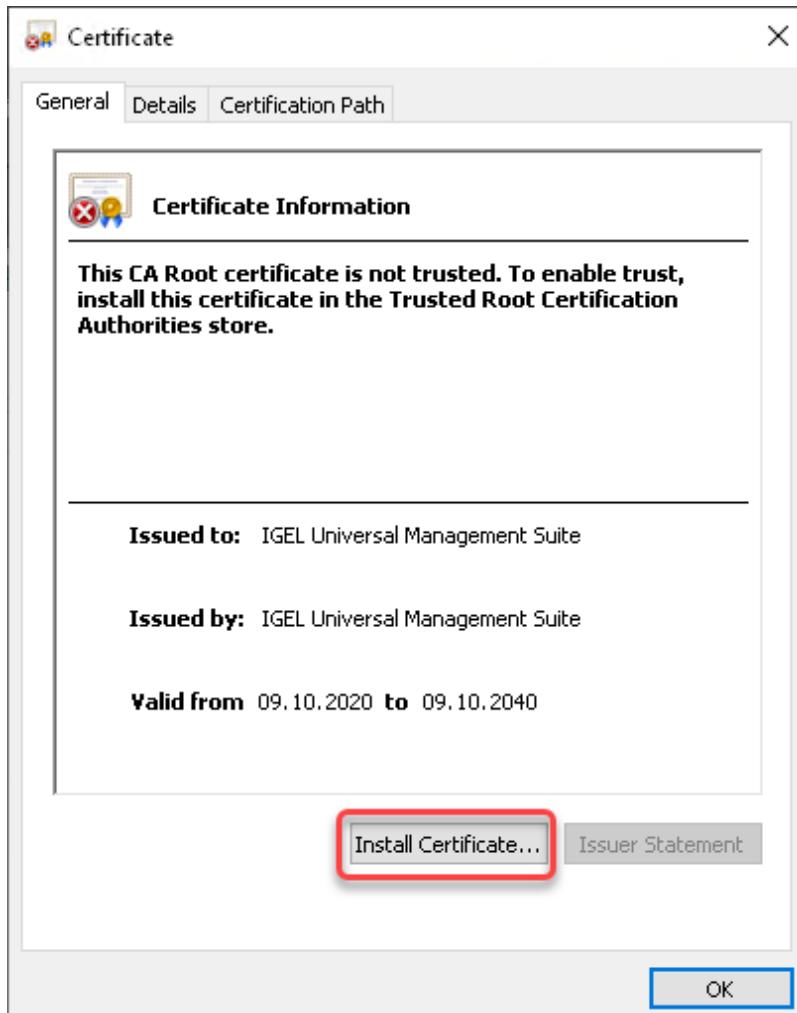
The browser can access the UMS Web App without problems.

Microsoft Edge

1. Make sure you have administrator permissions.
2. Go to the location where you have stored the certificate and double-click the certificate file.
The **Certificate** dialog of your Windows system opens.

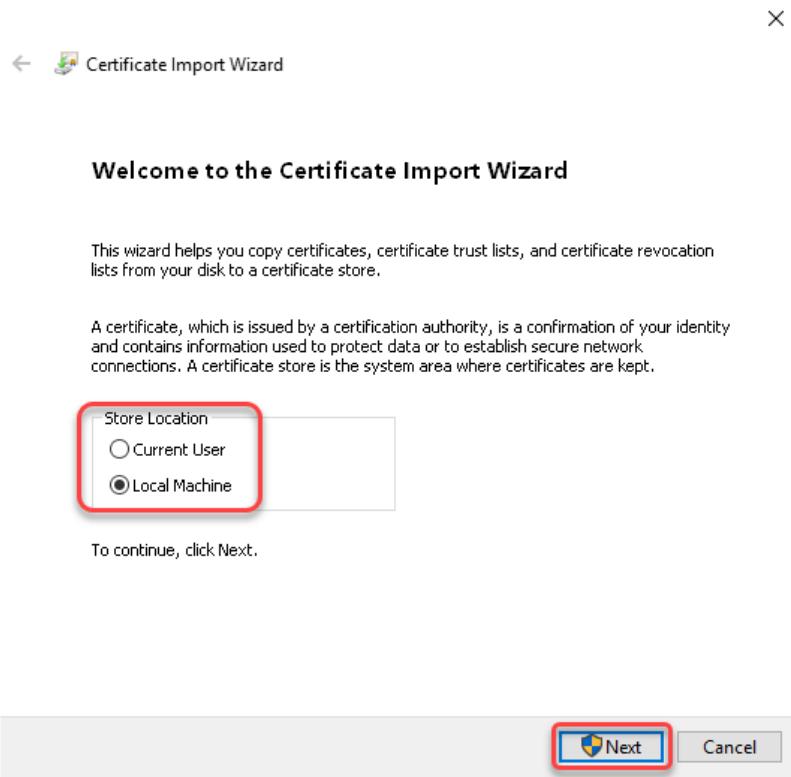


3. Click **Install Certificate...**





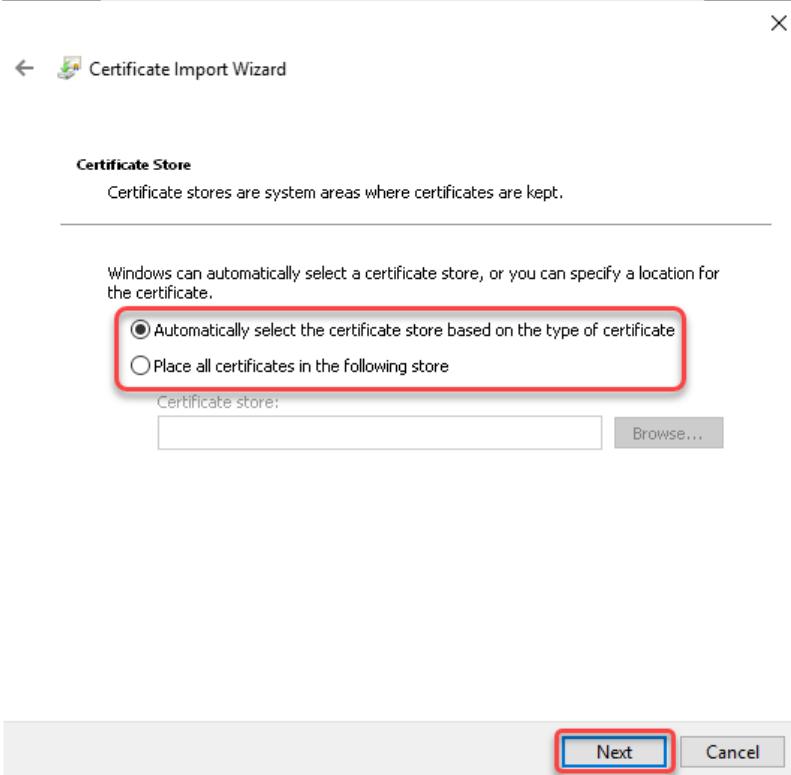
4. Define whether the certificate should be installed for the current user only or for all users (**Local Machine**) and click **Next**.



5. Confirm the **User Account Control** dialog.

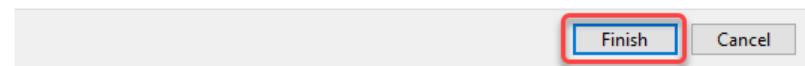
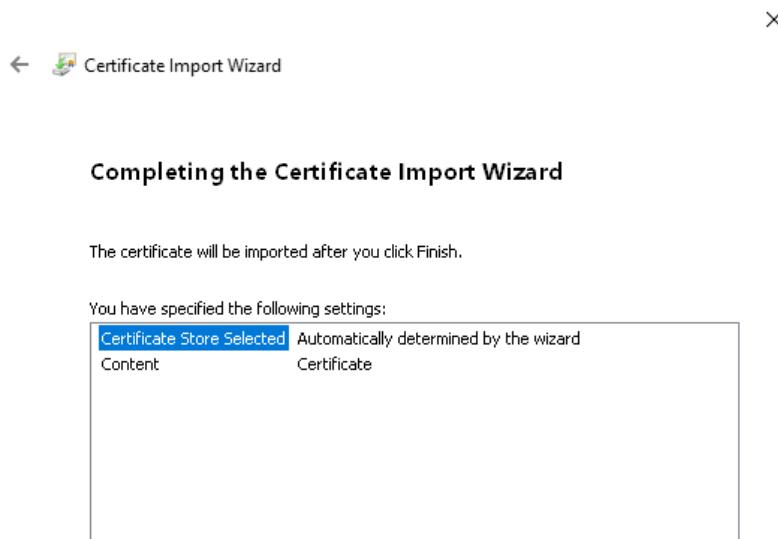


6. Define whether the certificate store should be determined automatically or manually and click **Next.**

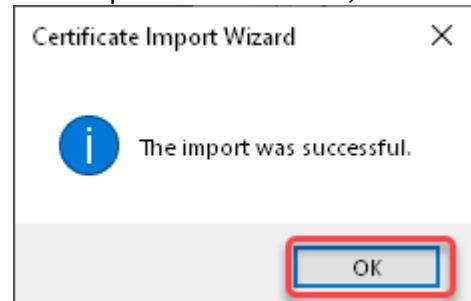




7. Review your settings and click **Finish**.



If the import was successful, a success message is displayed.



The certificate is installed on your system.

8. Restart the browser.
The browser can access the UMS Web App without problems.



Starting UMS Console Crashes NX Session

Symptom

When you are connected to an Ubuntu host via NX, starting the UMS Console on the Ubuntu host crashes the NX session.

Solution

1. Become **Root** on the Ubuntu host.
2. Open the configuration file `/opt/IGEL/RemoteManager/rmclient/RemoteManager.bin.config` in a text editor.
3. Add the line `vmparam -Dsun.java2d.xrender=false` to the file.
4. Save the file.
5. Become a regular user.
6. Start the UMS Console.



UMS Console doesn't start on Linux System without X11

Symptom

IGEL UMS doesn't start on Linux system without X11.

Problem

The UMS console application needs X11 to run.

Solution

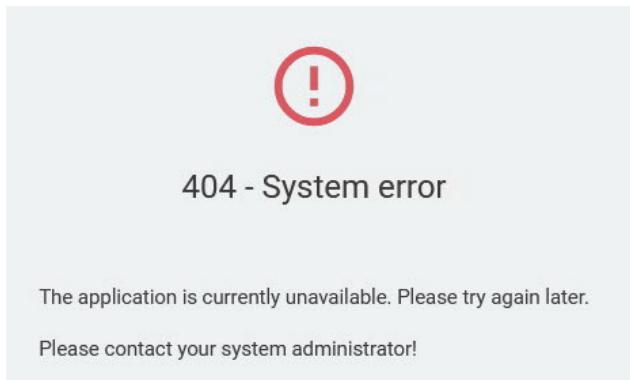
- ▶ Install X Window System (X11) to run IGEL UMS.



UMS Web App: "404 - System Error" Message

Symptom

After the installation of the Universal Management Suite, the UMS Web App starts with a 404 system error.



Environment

- UMS 6.08.100 or higher with the embedded database
- Microsoft Windows Server 2019

Problem

This might happen at startup when the UMS Web App is starting faster than the UMS Server service.

Solution

- Restart the Windows service `IGEL_RMGUIServer`. Details on how to do this can be found under [IGEL UMS HA Services and Processes](#).



Logon failures

- UMS Console Logon fails(see page 229)
- UMS Console Login with AD User Account fails(see page 230)
- Login to the UMS Fails after the Update(see page 231)

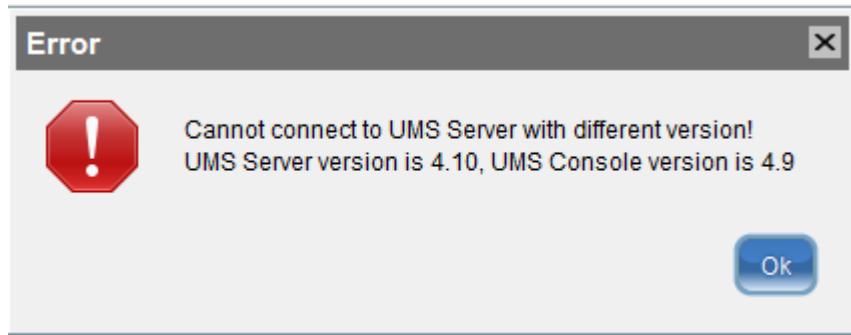


UMS Console Logon fails

Symptom

When you try to log on to the console you get the error message **Unable to load tree**.

More recent UMS versions show the following error message:



Problem

Problems with the connection between the UMS console and the UMS server may be caused by a difference in software versions, e.g. if the UMS server was updated but the console still uses an old version.

Solution

Check the version status:

1. Check the version of the console by selecting **Help > Info** from the UMS console menu.
2. Check the version of the server by selecting **Help > Info** from the UMS administrator menu.
3. If necessary, update the UMS console to the same version as the server or newer.



UMS Console Login with AD User Account fails

Symptom

UMS console login fails for Active Directory user.

Problem

1. Open catalina log file `C:\Program Files\IGEL\RemoteManager\rmguiserver\logs\catalina.log`
2. Check the log for message KDC has no support for encryption type (14)

Solution

If this happens, the following things needs to be done/checked:

1. Have a look at <http://technet.microsoft.com/en-us/library/cc733991.aspx>.
2. Disable **DES encryption** for the AD user account, this can be done in the account setup of the Windows user administration > Account options.
3. Follow <http://docs.oracle.com/javase/6/docs/technotes/guides/security/jgss/tutorials/Troubleshooting.html>.



Login to the UMS Fails after the Update

Symptom

You cannot log in to the UMS after an update or the installation of the UMS Server.

An error message with the URL `https://[ums_server_host]:8443/info` appears:



Problem

The IGEL RMGUI Server Service has not fully started yet.

Solution

Wait for a few minutes more. After that, try to log in again.



Active Directory / LDAP

- [Integrating Active Directory \(see page 233\)](#)
- [Problems When Configuring an Active Directory with LDAP over SSL \(see page 245\)](#)
- [Import of Administrator Accounts from Active Directory Fails \(see page 246\)](#)



Integrating Active Directory

Problem

Instead of creating and organizing UMS administrators manually you are looking for an easy way of importing them from your existing Active Directory.

Reason

You would like to import users and user groups from the Active Directory to the UMS, using the same AD group assignments and credentials as already defined in the AD.

Solution

In this paper we explain the best way of importing users from the Active Directory as UMS administrator accounts.

We will import users from the Active Directory to the UMS console in three steps by:

- Configuring the connection to the Active Directory
- Selecting the users to be imported and starting the import
- Assigning permissions

-
- [Configuring an AD Connection](#)(see page 234)
 - [Importing Users from AD to UMS](#)(see page 236)
 - [Assigning Permissions](#)(see page 239)
 - [Configuring an LDAP Connection](#)(see page 243)



Configuring an AD Connection

Perform the following steps to set up the connection between the UMS and the Active Directory of your company:

1. If you have user and group dependencies between different configured domains/subdomains, then you might want to activate **Include all configured AD domains for search and import of AD users / groups**. This option activates the group search for a user within all configured domains. On activation, a confirmation dialog is shown.

i If this option is activated, a user may gain additional permissions. This will be the case if

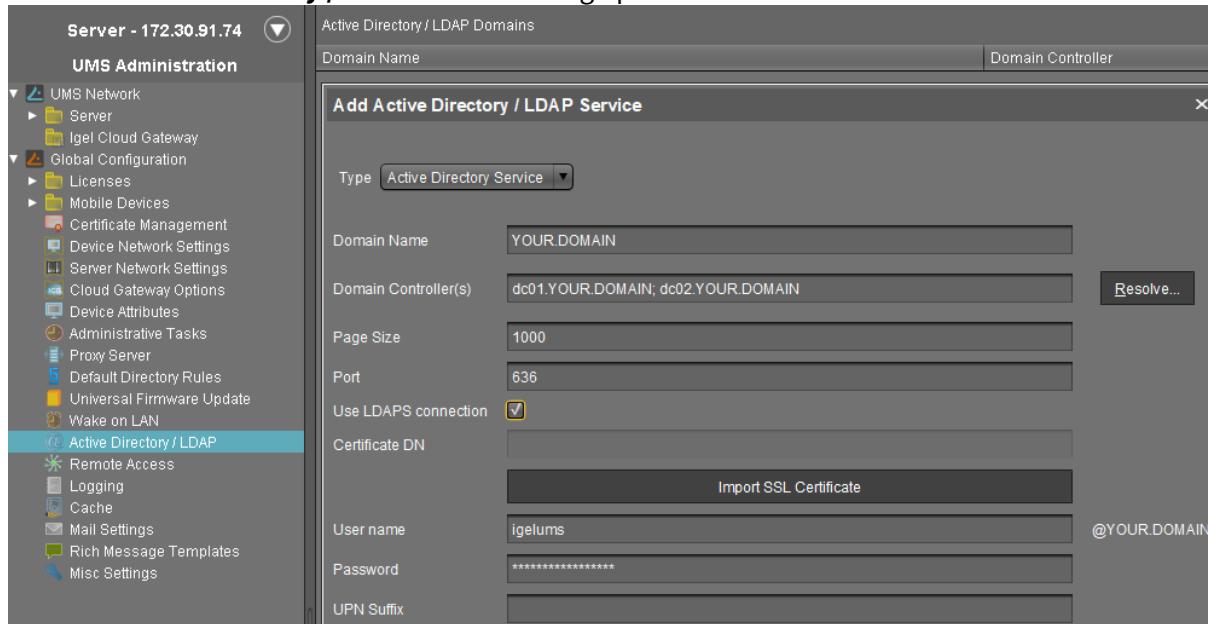
- the user is in a group that has been discovered due to this option,
- this group has been imported under **System > Administrator accounts**,
- and permissions have been assigned to this group i.e. permissions the user would not have otherwise.

Please note that, due to the additional lookups, this option might have an impact on the performance in the following areas:

- UMS login
- Permission dialogs
- Shared Workplace (SWP)

2. Click **Add (+)** under UMS console > **UMS Administration > Global Configuration > Active Directory / LDAP**.

The **Add Active Directory / LDAP Service** dialog opens.



3. Select **Active Directory Service** as Type.
4. Enter the **Domain Name**.



- i** Several Active Directories can be linked. You should therefore ensure that you provide the correct domain when logging in (e.g. to the UMS console).

- Enter the **Domain Controller(s)** manually or click **Resolve...** for the automatic search. To separate domain controllers, use a semicolon.

- !** If the option **Use LDAPS connection** (see below) is enabled, make sure that a fully qualified name of the **Domain Controller** has been entered. See [Problems When Configuring an Active Directory with LDAP over SSL\(see page 245\)](#).

- Enter **Page Size**.

The **Page Size** property sets the maximum number of items in each page of results that will be returned by a search. It affects query performance, but not the number of overall results. The standard value is "1000". Change this value in line with your server configuration.

- Activate **Use LDAPS connection** to secure the connection with the provided certificate.

The **Port** changes automatically to default "636".

- Click **Import SSL Certificate** to configure the certificate and to verify the **Certificate DN**.

- i** Since the name of the **Domain Controller** is checked against the certificate, they must correspond. If more than one domain controller is used, the root certificate of the domain must be configured. See [Problems When Configuring an Active Directory with LDAP over SSL\(see page 245\)](#).

- i** The supported certificate formats are **.cer**, **.pem** and **.der**

- Under **User name** and **Password**, enter your user credentials.

- Enter **UPN Suffixes** (aliases) if you have defined any (semicolon separated list). Example: **domain.local;test.local**

- i** The settings must correspond to the configuration of the Active Directory. If there are registered UPN suffixes in the AD, they should be known also by the UMS.

- Click on **Test Connection** to check that you have entered a valid configuration.

- Click **Ok** to confirm your settings.

The Active Directory domain is listed under **Active Directory / LDAP Domains**.

Active Directory / LDAP Domains		
Domain Name	Domain Controller	Page Size
YOUR.DOMAIN	dc01.YOUR.DOMAIN; dc02.YOUR.DOMAIN	1000

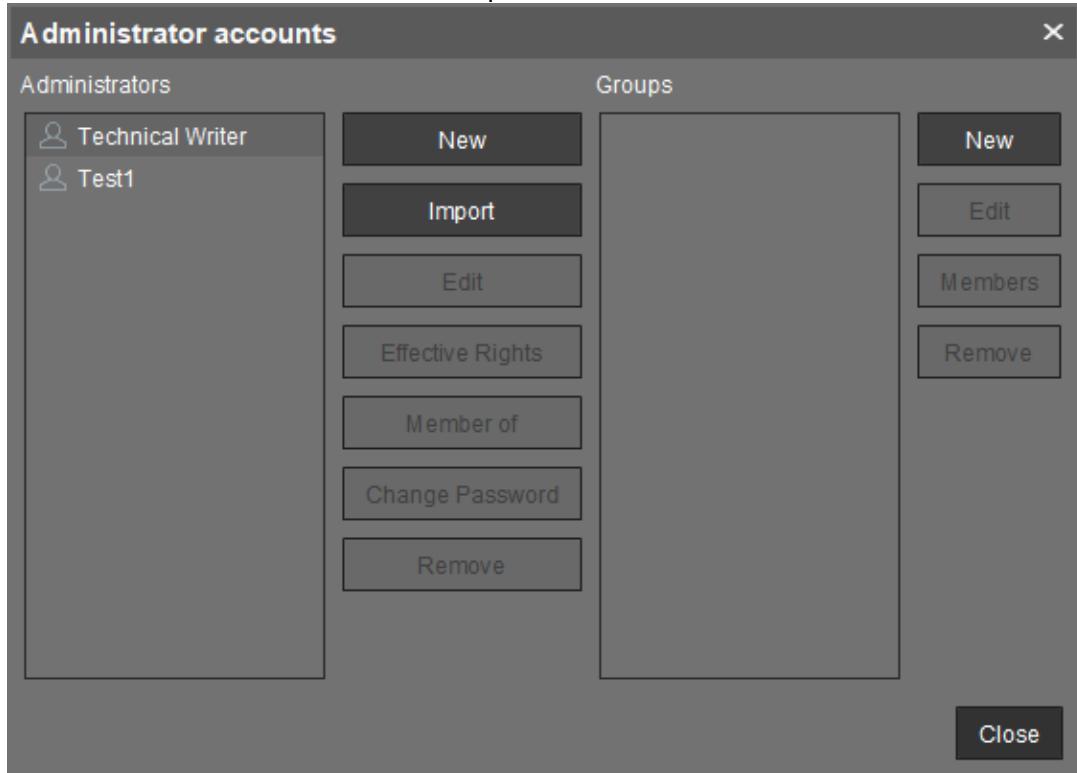


Importing Users from AD to UMS

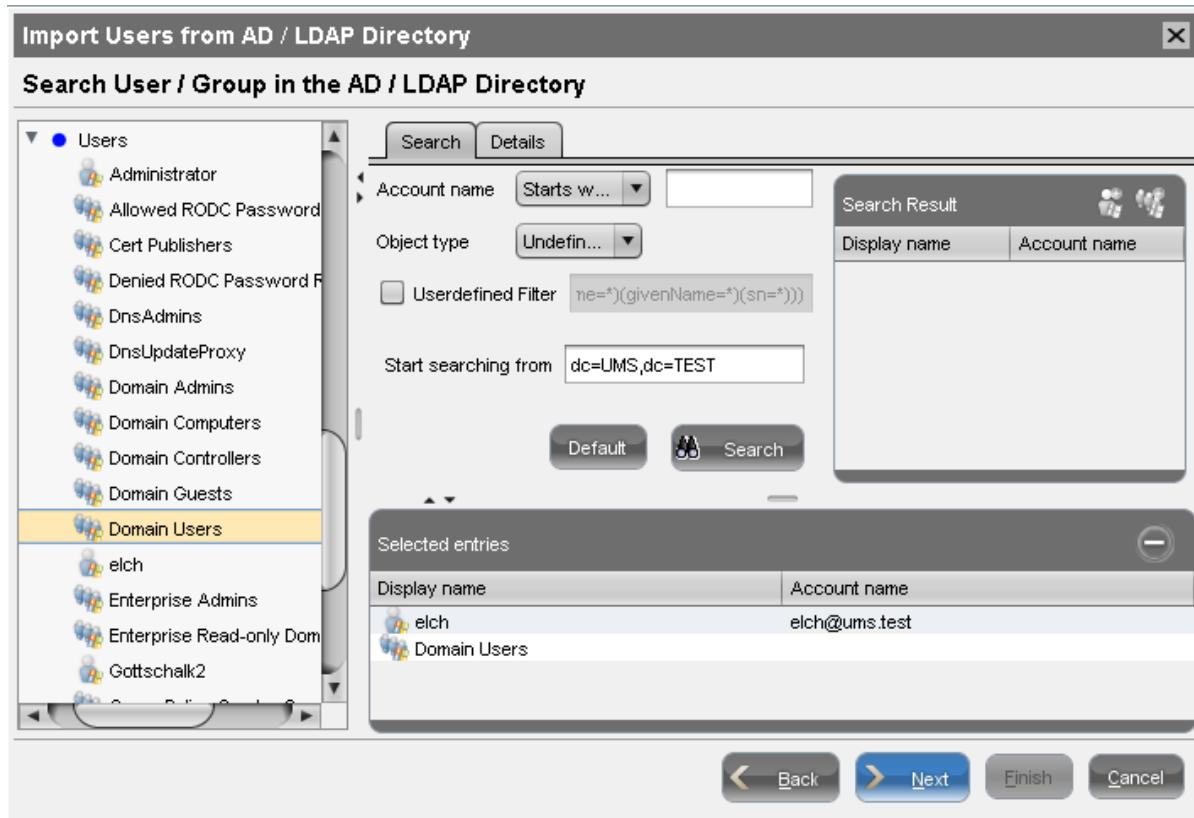
After connecting the Active Directory you can import users or user groups to the UMS:

1. Click **System > Administrator Accounts**.

The **Administrator Accounts** window opens:

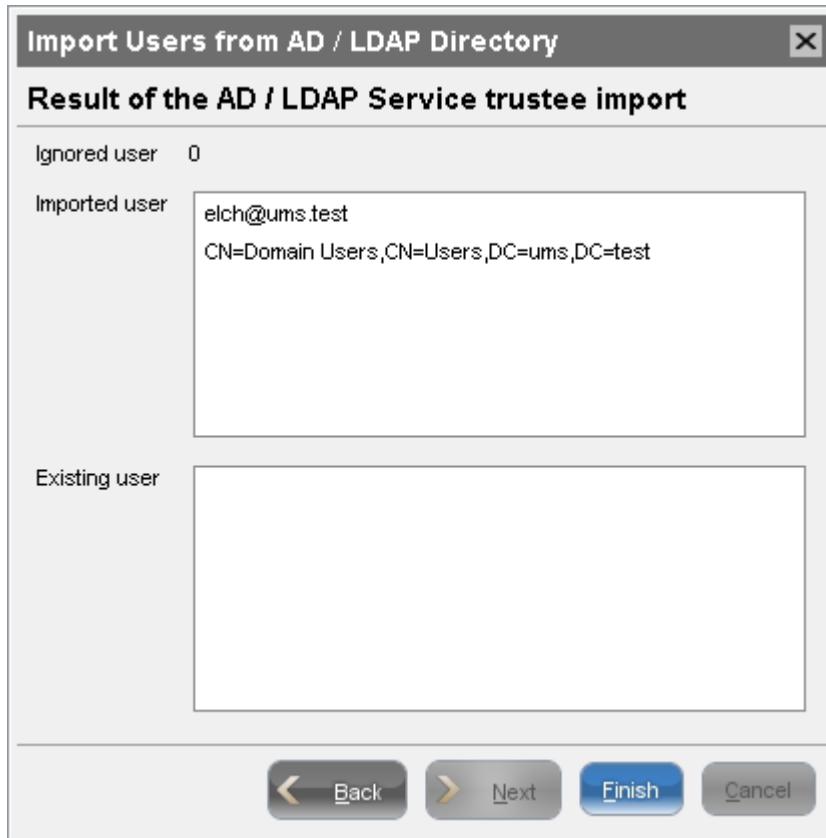


2. Click **Import** to log in to the AD/LDAP service.
3. Select the domain and enter your credentials, if not already defined.
4. Click **Next** to open the Active Directory browser.
5. Select individual users or groups from the structure tree of your AD.
6. Use drag and drop to add your selection to the **Selected Entries** list.



i As an alternative to navigating in the structure tree, you can also add users or groups to your selection using the Search function.

7. Click **Next** and confirm to start the import.
A result list of imported accounts opens.



8. Click **Finish** to complete the import.

If the result list is either empty or some accounts are missing from the list, see [Import of Administrator Accounts from Active Directory Fails](#)(see page 246).

- i** A UMS administrator set up by mistake must be deleted manually using the dialog 'Administrator accounts'. The IGEL UMS uses the 'User logon name' from the AD as the name of the imported user.

Assigning Permissions

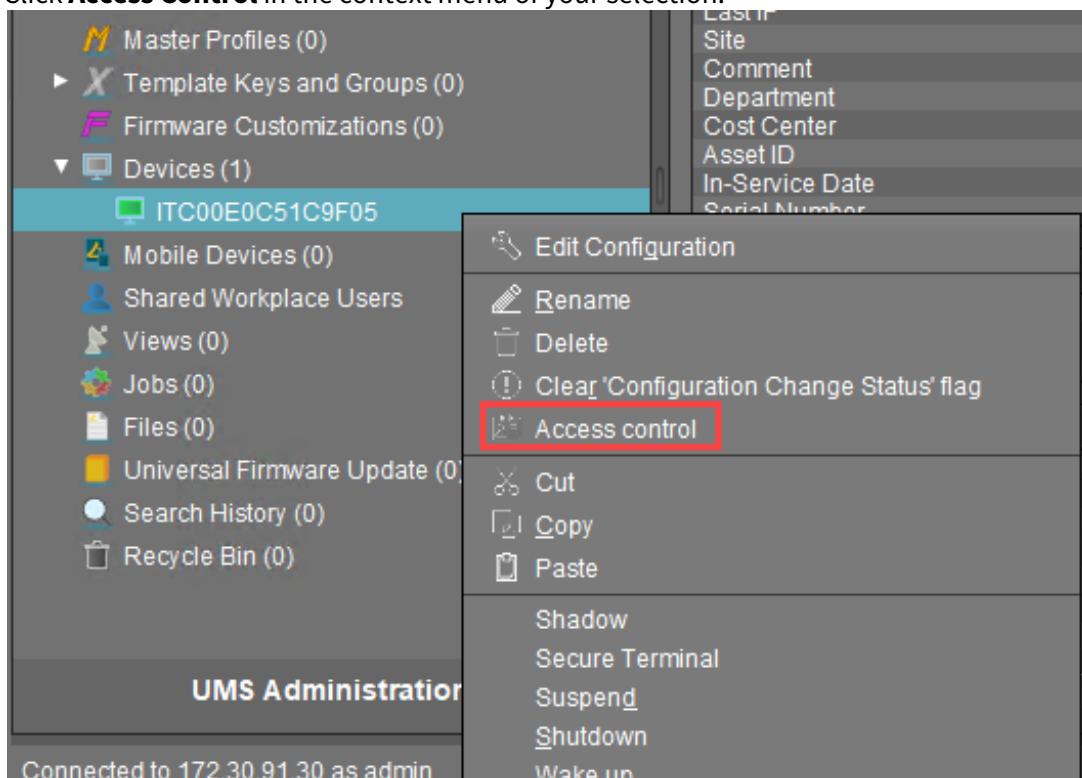
After the AD users have been imported, they can access the UMS with their Active Directory credentials.

As UMS administrators, the users still need individual access rights.

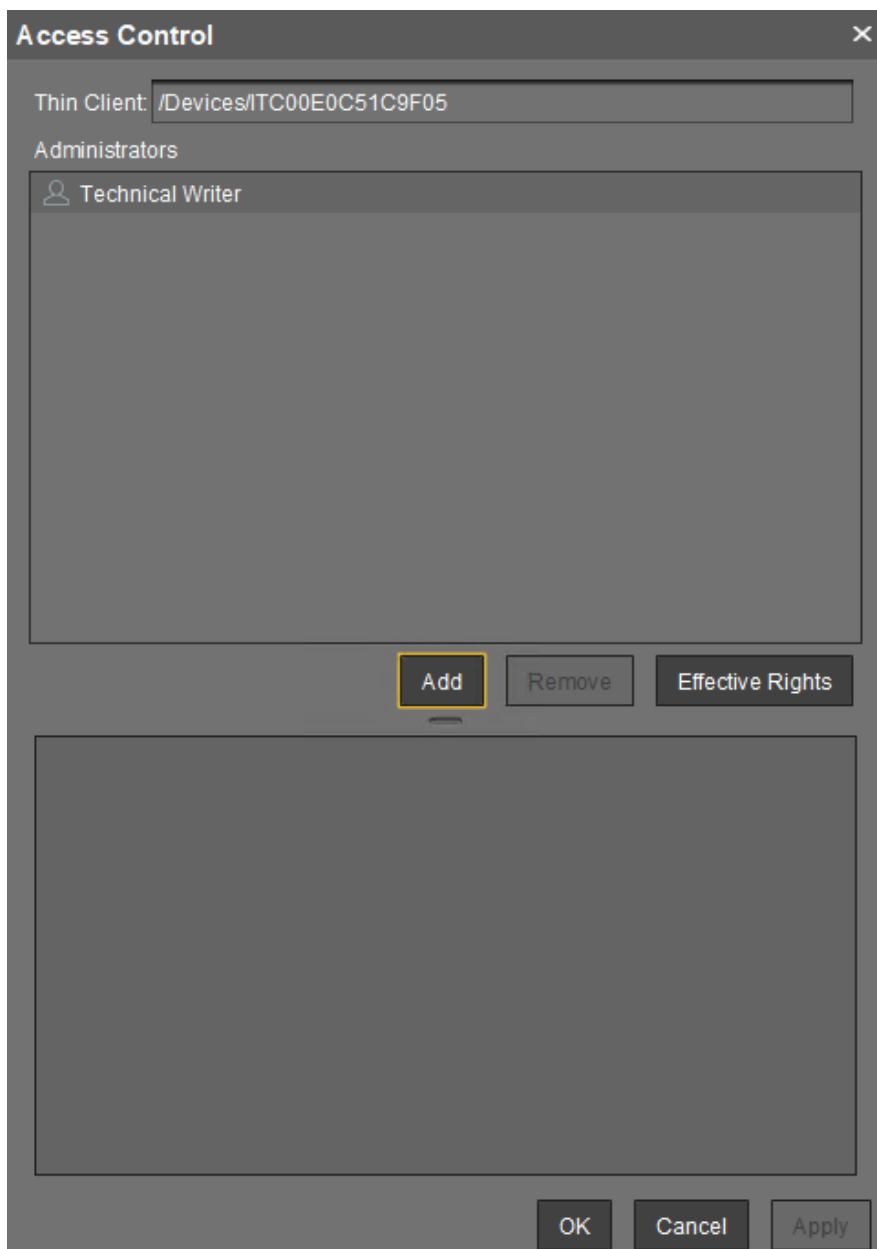
- ⓘ The logon to the UMS is not possible via the 'pre Windows 2000 logon name' ('DOMAIN\logon name'), but only via the format 'logon name@DOMAIN'.
- ⓘ For example, in order to be able to change the configuration of a thin client, a user requires authorization to browse the thin client's directory path and configure the thin client itself.

To assign these rights, proceed as follows:

1. In the structure tree of the UMS console choose the **Devices** node or a subgroup of devices or a single client.
2. Click **Access Control** in the context menu of your selection.



3. The **Access Control** window opens.



4. Click **Add** to select your new user/group.
5. The corresponding **Effective Rights** will be listed in the lower part of the mask.



Access Control

Thin Client: /Devices/ITC00E0C51C9F05

Administrators

- Technical Writer
- Test1

Add Remove Effective Rights

Permission	Allow	Deny	Effective Rights
Browse	<input checked="" type="checkbox"/>	<input type="checkbox"/>	allowed for user Test1
Read	<input checked="" type="checkbox"/>	<input type="checkbox"/>	allowed for user Test1
Move	<input type="checkbox"/>	<input type="checkbox"/>	not set
Edit Configuration	<input type="checkbox"/>	<input type="checkbox"/>	not set
Write	<input type="checkbox"/>	<input type="checkbox"/>	not set
Edit System Information	<input type="checkbox"/>	<input type="checkbox"/>	not set
Access Control	<input type="checkbox"/>	<input type="checkbox"/>	not set
Assign	<input type="checkbox"/>	<input type="checkbox"/>	not set
Power Control	<input type="checkbox"/>	<input type="checkbox"/>	not set
Firmware Control	<input type="checkbox"/>	<input type="checkbox"/>	not set
Settings Control	<input type="checkbox"/>	<input type="checkbox"/>	not set
Remote access	<input type="checkbox"/>	<input type="checkbox"/>	not set

OK Cancel Apply

6. **Allow or Deny** the rights of the selected group or user for access to the selected devices
7. Confirm the settings with **OK**.
8. Click the **Refresh** button of the console to apply the changes in the UMS.

Info: If you have changed the rights of registered users they only take effect after a refresh.

For further details about authorization rules see our How-To [IGEL UMS: User Authorization Rules](#)(see page 66).



- ⓘ Access rights to objects or actions within the IGEL UMS are attached to the administrator accounts and groups. The rights of the database user account cannot be restricted. They are created during installation or when setting up the data source. The account always has full access rights in the UMS.



Configuring an LDAP Connection

As a variant you may connect other LDAP directory services, i.e. Novell eDirectory and OpenLDAP, to the UMS:

1. Click **Active Directory / LDAP** in the **UMS Administration** area of the UMS console.
2. Click **Add (+)** in the **Active Directory / LDAP Domains** mask.
3. The **Add Active Directory / LDAP Service** mask opens.

Add Active Directory / LDAP Service

Type **Other LDAP Service**

Base DN	
Host(s)	
Port	636
Certificate DN	
	Import SSL Certificate
LDAP Access UserDN	
LDAP Access Password	
Naming Attribute	
Additional term for LDAP search	
Group attribute	
Page Size	1000

Test connection

Ok **Cancel**

The screenshot shows a configuration dialog for adding an LDAP service. The 'Type' dropdown is set to 'Other LDAP Service'. The 'Port' field is set to '636'. There is a 'Import SSL Certificate' button. The 'Page Size' field is set to '1000'.

4. Select **Other LDAP Service** as **Type**.
5. Enter the **Base DN** and the **LDAP Access UserDN** in accordance with the LDAP Data Interchange Format.
6. Enter the IP of your device in the **Host(s)** field; for more devices, use a comma separated list.
7. The default **Port** for LDAP over SSL is 636.

i For security reason UMS supports secure LDAP connections only.



8. Under **LDAP Access UserDN/Password** enter the credentials of the LDAP Service access. The user needs to have read rights on the whole directory service, because it will be used for the determination of the structure in the directory service.
9. Under **Naming Attribute** enter the name of the LDAP attributes, which contains the distinct user account name.
10. Optionally, you can add an **Additional term for LDAP search**, which will be attached to the search for users. This way, performance can be optimized.
11. As **Group attribute** enter the name of the LDAP attribute, which contains the group membership of a user.
12. Define the **Page Size**. This property sets the maximum number of items in each page of results that will be returned by a search. It affects query performance, but NOT the number of overall results. The standard value is 1000. Change this value in line with your server configuration.
13. Click **Import SSL Certificate** to verify the **Certificate DN**.



Problems When Configuring an Active Directory with LDAP over SSL

Symptom

You cannot configure an AD Connection under **Active Directory / LDAP** with the option **Use LDAPS connection** activated. When testing the connection, one of the following types of error messages appears:

- "The connection to the LDAP service failed! Check the certificate and server name";
- "simple bind failed".
The log file looks like:
 - "2019-05-23 14:13:38,512 ERROR [https-jsse-nio-8443-exec-151] dec: simple bind failed: QA-DC01:636 javax.naming.CommunicationException: simple bind failed: QA-DC01:636 [Root exception is javax.net.ssl.SSLHandshakeException: java.security.cert.CertificateException: No subject alternative DNS name matching QA-DC01 found.]"
or
 - "javax.naming.CommunicationException: simple bind failed:
dc01.your.domain:636
[Root exception is javax.net.ssl.SSLHandshakeException: PKIX path building failed: sun.security.provider.certpath.SunCertPathBuilderException: unable to find valid certification path to requested target]"

Problem

The **Domain Controller(s)** name and the certificate configured under **Import SSL Certificate** do not match.

Solution

1. Check that a *fully qualified name of the domain controller* has been entered, e.g. "dc01.your.domain". An IP address or a short name such as "dc01" will not be accepted when the domain controller name is checked against the certificate.
2. If several domain controllers are used, make sure that the *root certificate* has been configured.



Import of Administrator Accounts from Active Directory Fails

Symptom

The import of UMS administrators from an Active Directory fails, the result list of imported accounts is either empty or some accounts are missing on the list.

Problem

Active Directory user accounts may have an empty User Principal Name (UPN). This occurs when updating an older Active Directory (e.g. on Windows NT 4.0) to a new one migrating the AD user accounts to the new AD.

Solution

1. Set the UPN of each AD account to be imported.
2. Retry the import of AD users in IGEL UMS.



Profiles

- Find Out a Profile's Priority in the IGEL UMS(see page 248)
- Precedence of IGEL UMS Profiles and Universal Firmware Updates(see page 249)
- Assigning Profiles to Devices filtered by Views or Search(see page 251)



Find Out a Profile's Priority in the IGEL UMS

Using profiles is a very powerful method to manage and configure one, ten, or thousands of endpoint devices with the IGEL Universal Management Suite (UMS). However, when you are deploying a great number of profiles, things can get confusing. Some profiles may have overlapping scopes and thus try to set different values for one specific parameter on a device. One profile will always win, but which one is it? Luckily, the UMS can show the order of priorities at a glance.

For a comprehensive reference of profiles, see [Profiles in the IGEL UMS](#); the prioritization is covered in [Prioritization of Profiles in the IGEL UMS](#).

The following example shows how to find out a profile's priority:

1. In the **UMS Console > Devices**, select the device for which you want to see the order of profile priorities.
2. Take a look at the **Assigned objects** area. All profiles that are assigned to the device are listed by priority, in descending order. The profile with the highest priority is listed first, and so on.

In the following screenshot, the profile with the highest priority is a so-called priority profile. It is followed by a firmware customization, which has in turn higher priority than a standard profile, see [Firmware Customizations in the IGEL UMS](#). And at the bottom, the object with the lowest priority is displayed – a standard profile with the lower profile ID.

A screenshot of the IGEL UMS interface. On the left, the navigation tree shows 'Server' with 'IGEL Universal Management Suite 12' expanded, revealing 'Profiles (6)', 'Priority Profiles (1)', 'Firmware Customizations (1)', and 'Devices (1)'. Under 'Devices', 'Augsburg (1)' is expanded, showing 'TD-RD02' selected. To the right, the main panel displays 'TD-RD02' with its 'System Information' table. The table includes columns for 'Attribute' and 'Value', with entries for Name (TD-RD02), Site, Comment, Department, and Cost Center. On the far right, a sidebar titled 'Assigned objects' lists four items: 'Browser' (orange icon), 'Background' (purple icon), 'Corporate Design' (green icon), and 'Screensaver' (green icon). The 'Screensaver' entry is highlighted with a mouse cursor, and a tooltip 'Screensaver(ID: 1555)' appears below it.



Precedence of IGEL UMS Profiles and Universal Firmware Updates

This article explains which firmware update settings will be effective when several concurring settings are assigned to your IGEL OS devices. Firmware update settings can be defined locally on the device, by one or more profiles, or by one or more Universal Firmware Update.

General Order of Priority

Generally, the order of priority is as follows, from highest to lowest priority:

- Universal Firmware Update
- Profile
- Local settings

For details, see the following sections.

Universal Firmware Update vs. Profile

If both a Universal Firmware Update and a profile that contains update settings are assigned to your device, the Universal Firmware Update has priority over the profile. This is also valid if the profile is a so-called priority profile; for further information, see Prioritization of Profiles in the IGEL UMS.

The following settings under **System > Update > Firmware Update** are overwritten by the Universal Firmware Update:

- **Protocol**
- **Server name**
- **Port**
- **Server path**
- **User**
- **Password**

Profile vs. Local Settings

The settings of a profile always overwrite the local settings.

Universal Firmware Update vs. Universal Firmware Update

If several Universal Firmware Updates are assigned to one device, the rules described below apply.

Assignment to Different Levels in a Hierarchical Order of Folders

If several Universal Firmware Updates are assigned to a device via different folders and subfolders, the one that is closest to the device has priority over all others.

Example: A Universal Firmware Update for IGEL OS 10.05.100 is assigned to a folder named "devices", which contains our device. Another Universal Firmware Update which contains IGEL 10.06.100 is assigned to a folder named "teamA". The folder "teamA", on this part, contains the folder "devices". As a result, the devices will be

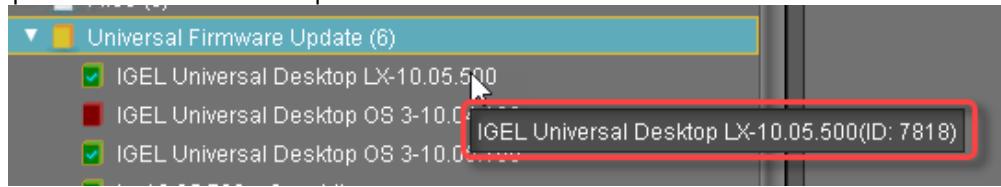


updated to IGEL OS 10.05.100 (or keep IGEL OS 10.05.100) because the Universal Firmware Update for IGEL OS 10.05.100 is closer to the device in the folder hierarchy.

Assignment on the Same Level

If several Universal Firmware Updates are assigned to a device on the same hierarchical level, the one with the highest ID has priority over the others.

To find the ID of a Universal Firmware Update, move the mouse pointer over the Universal Firmware Update in question and read the tooltip:



In this example, the ID is 7818.

Compatibility

Only those Universal Firmware Updates are effective which are compatible with the device.



Assigning Profiles to Devices filtered by Views or Search

Valid for UMS version 5.02.100 and higher.

If you need to assign a profile to a group of devices which meet a certain criterion, you can proceed in the following way:

1. Define a view which filters the clients with a certain criterion (e. g. all devices which contain a USB storage hotplug).
2. Right-click the view to open the context menu.
3. Click **Assign profiles to the thin clients of the view**.
The **Assign profiles** window opens.
4. Select the relevant profile (e. g. the profile which allows USB storage hotplug).
5. Click to move it from the left to the right column.
6. Confirm the setting with **OK**.

In the same way you can assign profiles to devices of a search result:

1. Right-click the search result to open the context menu.
2. Click **Assign profiles to the thin clients of the search**.
The **Assign profiles** window opens.
3. Select the relevant profiles and click to move them from the left to the right column.
4. Confirm the setting with **OK**.

► To cancel the profile assignment, click **Detach profiles from the device of the view or search**.

- You can also assign profiles to views or search results automatically and regularly as an administrative task.



Misc

- [Where Can I Find the IGEL UMS Log Files?\(see page 253\)](#)
- [Clearing up the UMS\(see page 262\)](#)
- [Removing a UMS Certificate from the Device\(see page 264\)](#)
- [How to Configure Notifications in the IGEL UMS\(see page 265\)](#)
- [Updating Timezone Information \(Daylight Saving Time, DST\)\(see page 270\)](#)
- [E-Mail Settings for Gmail Accounts\(see page 273\)](#)
- [Searching with Regular Expressions in the UMS\(see page 275\)](#)
- [Copy Sessions in Setup or UMS\(see page 276\)](#)
- [Drag & Drop Acceleration for Large Structure Trees\(see page 277\)](#)
- [Which UMS Directories Should Be Scanned for Viruses, Which Can Be Excluded?\(see page 278\)](#)
- [Licensing with Smartcard fails\(see page 279\)](#)



Where Can I Find the IGEL UMS Log Files?

The following article details where you can find and configure IGEL Universal Management Suite (UMS) log files.

For enabling the logging of UMS user actions and actions initiated by a device, see [Logging](#).

If you manage IGEL OS 12 devices, see [Debugging / How to Collect and Send Device Log Files to IGEL Support](#).

If you require UMS log files for IGEL Support, see [Save Support Information / Send Log Files to Support](#).

UMS 12.01 or Higher

To change the logging settings for UMS 12.01 or higher, see the file `README.md` under `[IGEL installation directory]/RemoteManager/rmguiserver/logs`.

If you change the logging configuration, the restart of the UMS Server is not required.

UMS Server

<code>rmguiserver/logs</code> (Read <code>rmguiserver/logs/README.md</code> for configuring the logs)	
<code>stderr.log</code>	Error output of the Apache Tomcat server
<code>stdout.log</code>	Standard output of the Apache Tomcat server
<code>ums-api.log</code>	Logging of the API service
<code>ums-server.log</code> (= <code>catalina.log</code> before UMS 12)	Central log file for all logging events
<code>ums-server-err.log</code>	
<code>device-connector.log</code>	Logging of the device connector
<code>device-connector-err.log</code>	
<code>ums-device-service.log</code>	Logging of OS 12 device functionality
<code>ums-device-service-err.log</code>	
<code>ums-appproxy.log</code>	Logging of the UMS as an Update Proxy
<code>ums-appproxy-err.log</code>	
<code>rmguiserver/logs/ ums-server</code> (<code>rmguiserver/conf/logback.xml</code> - for configuring the logs)	
<code>ums-server-msg.log</code>	Logging of the Apache ActiveMQ messaging (High Availability and Distributed UMS)



ums-server-communication.log	Logging of communication with UMS Console or devices Edit at <!-- Logging of UMS communication -->
ums-server-threaddump.log	Periodic logging of the threads
ums-server-icg-communication.log	Logging of communication with ICG Edit at <!-- Logging of UMS communication -->
ums-server-health.log	Logging of the UMS HA Health Check
ums-server-monitoring.log	Performance logging Edit at <!-- Logging of monitoring data -->; change INFO to DEBUG to get detailed information on each method call

Example of where to edit the logging configuration for the UMS Server

This is an example of `rmguiserver/conf/logback.xml` where you can configure the logs for the UMS Server, i.e. switch the logging on/off, change the scan period or the number of days for the logging history, etc.:

```
<?xml version="1.0" encoding="UTF-8"?>
-<configuration scanPeriod="60 seconds" scan="true" debug="false">

<!-- The length of logging history in days -->
<property value="30" name="logs.history"/>

<!-- The maximum size of one log file -->
<property value="100MB" name="logs.maxsize"/>

<!-- The maximum size of the history -->
<property value="1GB" name="logs.historysizecap"/>

<!-- Logging of monitoring data -->
<!-- Elevate to 'DEBUG' to see the individual calls -->
<property value="INFO" name="monitoring.level"/>

<!-- Logging of UMS communication -->
<!-- Set to 'ALL' to enable and 'OFF' to disable -->
<property value="OFF" name="server2console.level"/>
<property value="OFF" name="server2tc.level"/>
<property value="OFF" name="server2usg.level"/>
```



```

<property value="OFF" name="usg2server.level"/>
<property value="OFF" name="server2server.level"/>

<!-- Logging level of domain service -->
<!-- OFF, INFO, DEBUG, ERROR -->
<property value="WARN" name="domainservicelog.level"/>
<!-- The appenders -->

```

rmguiserver/logs/unifiedprotocol

communication.log	<p>Logging of communication between the device and UMS (both ingoing and outgoing commands)</p> <p>Edit <code>rmguiserver/webapps/device-connector/WEB-INF/classes/config/logback.xml</code> for configuring the logs.</p> <p>Edit at <code><!-- Logging of device communication --></code> ; change <code>OFF</code> to <code>INFO</code> for logging command headers or to <code>ALL</code> for logging command headers and payload</p>
domain-service.log	<p>Central log file for all events in the command handling</p> <p>Edit <code>rmguiserver/conf/logback.xml</code> for configuring the logs.</p> <p>Edit at <code><!-- Logging level of domain service --></code></p>
device-auth.log	<p>Logging of device onboarding and device authentication issues</p>

UMS Load Balancer

umsbroker/etc/work/logs (umsbroker/etc/conf/logback.xml - for configuring the logs)	
ums-broker.log	Central log file for all logging events
ums-broker-msg.log	Logging of the messages exchanged
ums-broker-health.log	Logging of the UMS HA Health Check
ums-broker-monitoring.log	<p>Performance logging</p> <p>Edit at <code><!-- Logging of monitoring data --></code> ; change <code>INFO</code> to <code>DEBUG</code> to get detailed information on each method call</p>



UMS Watchdog

<code>umswatchdog/etc/work/logs</code> <code>(umswatchdog/etc/conf/logback.xml - for configuring the logs)</code>	
<code>ums-watchdog.log</code>	Central log file for all logging events
<code>ums-watchdog-msg.log</code>	Logging of the messages exchanged
<code>ums-watchdog-health.log</code>	Logging of the UMS HA Health Check

UMS Console

<code>\$HOME/.igel</code>	
<code>RMClient.exe.log</code>	Startup logging
<code>\$HOME/.igel/logs</code> <code>(rmclient/logback.xml - for configuring the logs)</code>	
<code>ums-console.log</code>	Central log file for all logging events

UMS Administrator

<code>\$HOME/.igel</code>	
<code>RMAdmin.exe.log</code>	Startup logging
<code>rmguiserver/logs</code> <code>(rmadmin/logback.xml - for configuring the logs)</code>	
<code>ums-admin.log</code>	Central log file for all logging events

UMS 6.10.110 or Higher

In UMS version 6.10.110, the outdated logging framework Log4j 1.x was replaced with [Logback](#)¹⁰; see also ISN 2022-19: Log4j 1.x Remainder in UMS.

To change the logging settings for UMS 6.10.110 or higher, use `logback.xml`.

UMS Server

<code>rmguiserver/logs</code> <code>(rmguiserver/conf/logback.xml - for configuring the logs)</code>	
<code>catalina.log</code>	Central log file for all logging events

¹⁰ <https://logback.qos.ch/>



ums-server-msg.log	Logging of the Apache ActiveMQ messaging
ums-server-communication.log	Logging of communication with UMS Console or devices Edit at <!-- Logging of UMS communication -->
localhost.log	Technical logging of the Apache Tomcat server
stderr.log	Error output of the Apache Tomcat server
stdout.log	Standard output of the Apache Tomcat server
ums-server-threaddump.log	Periodic logging of the threads
ums-server-icg-communication.log	Logging of communication with ICG Edit at <!-- Logging of UMS communication -->
ums-server-health.log	Logging of the UMS HA Health Check
ums-server-monitoring.log	Performance logging Edit at <!-- Logging of monitoring data -->; change INFO to DEBUG to get detailed information on each method call (the server restart is then required)

Example of where to edit the logging configuration for the UMS Server

This is an example of `rmguiserver/conf/logback.xml` where you can configure the logs for the UMS Server, i.e. switch the logging on/off, change the scan period or the number of days for the logging history, etc.:

```
<?xml version="1.0" encoding="UTF-8"?>
<configuration debug="false" scan="true" scanPeriod="60 seconds">
<!-- General settings -->

<!-- Logging of monitoring data -->
<!-- Elevate to 'DEBUG' to see the individual calls -->
<property name="monitoring.level" value="INFO" />

<!-- Logging of UMS communication -->
<!-- Set to 'ALL' to enable and 'OFF' to disable -->
<property name="server2console.level" value="OFF" />
<property name="server2tc.level" value="OFF" />
<property name="server2usg.level" value="OFF" />
<property name="usg2server.level" value="OFF" />

<!-- The base folder for log files -->
<property name="base.dir" value="${catalina.home}/logs" />
<!-- The default logging pattern -->
<property name="pattern.format" value="%-5(%d{[yyyy-MM-dd HH:mm:ss.SSS]})%-5level [%thread] %logger{10}.%M - %msg%n" />
<!-- The length of logging history in days -->
<property name="logs.history" value="30" />
```



<!-- The appenders -->

rmguiserver/logs
 (rmguiserver/conf/logback.xml - for configuring the logs)

ums-api.log	Logging of the API service
-------------	----------------------------

UMS Load Balancer

umsbroker/etc/work/logs
 (umsbroker/etc/conf/logback.xml - for configuring the logs)

ums-broker.log	Central log file for all logging events
ums-broker-msg.log	Logging of the messages exchanged
ums-broker-health.log	Logging of the UMS HA Health Check
ums-broker-monitoring.log	Performance logging Edit at <!-- Logging of monitoring data --> ; change INFO to DEBUG to get detailed information on each method call (the server restart is then required)

UMS Watchdog

umswatchdog/etc/work/logs
 (umswatchdog/etc/conf/logback.xml - for configuring the logs)

ums-watchdog.log	Central log file for all logging events
ums-watchdog-msg.log	Logging of the messages exchanged
ums-watchdog-health.log	Logging of the UMS HA Health Check

UMS Console

\$HOME/.igel	
RMClient.exe.log	Startup logging
\$HOME/.igel/logs (rmclient/logback.xml - for configuring the logs)	
ums-console.log	Central log file for all logging events



UMS Administrator

\$HOME/.igel	
RMAdmin.exe.log	Startup logging
rmguiserver/logs (rmadmin/logback.xml - for configuring the logs)	
ums-admin.log	Central log file for all logging events

Before UMS 6.10.110

UMS Server

rmguiserver/logs (rmguiserver/conf/log4j.properties - for configuring the logs)	
catalina.log	Central log file for all logging events
ums-server-msg.log	Logging of the Apache ActiveMQ messaging
communication.log	Logging of communication with UMS Console or devices Edit at # communication logging - define the log levels ; refer to Log4j documentation ¹¹
license_deployment.log	Logging of licenses Edit at # license deployment logging ; refer to Log4j documentation ¹²
localhost.log	Technical logging of the Apache Tomcat server
stderr.log	Error output of the Apache Tomcat server
stdout.log	Standard output of the Apache Tomcat server
umsthreaddump.log	Periodic logging of the threads Edit with # threaddump logging ; refer to Log4j documentation ¹³
usgcommunication.log	Logging of communication with ICG Edit at # communication logging - define the log levels ; refer to Log4j documentation ¹⁴

¹¹ <https://logging.apache.org/log4j/2.x/manual/index.html>

¹² <https://logging.apache.org/log4j/2.x/manual/index.html>

¹³ <https://logging.apache.org/log4j/2.x/manual/index.html>

¹⁴ <https://logging.apache.org/log4j/2.x/manual/index.html>



health.log	Logging of the UMS HA Health Check
monitoring.log	Performance logging Edit at # execution monitoring ; change INFO to DEBUG to get detailed information on each method call (the server restart is then required)
<code>rmguiserver/logs</code> (<code>rmguiserver/conf/log4japi.properties</code> - for configuring the logs)	
api.log	Logging of the API service

UMS Load Balancer

<code>umsbroker/etc/work/logs</code> (<code>umsbroker/etc/conf/log4j.properties</code> - for configuring the logs)	
<code>igel-ums-broker.log</code>	Central log file for all logging events
<code>broker-msg.log</code>	Logging of the messages exchanged
<code>broker-health.log</code>	Logging of the UMS HA Health Check
<code>broker-monitoring.log</code>	Performance logging Edit at # monitoring logging ; change INFO to DEBUG to get detailed information on each method call (the server restart is then required)

UMS Watchdog

<code>umswatchdog/etc/work/logs</code> (<code>umswatchdog/etc/conf/log4j.properties</code> - for configuring the logs)	
<code>igel-ums-watchdog.log</code>	Central log file for all logging events
<code>watchdog-msg.log</code>	Logging of the messages exchanged
<code>watchdog-health.log</code>	Logging of the UMS HA Health Check

UMS Console

<code>\$HOME/.igel</code>	
<code>RMClient.exe.log</code>	Startup logging
<code>\$HOME/.igel/logs</code> (<code>rmclient/log4j.properties</code> - for configuring the logs)	
<code>igel-ums-console.log</code>	Central log file for all logging events



UMS Administrator

\$HOME/.igel	
RMAdmin.exe.log	Startup logging
rmguiserver/logs (rmadmin/log4j.properties - for configuring the logs)	
igel-ums-admin.log	Central log file for all logging events



Clearing up the UMS

Problem

You have several firmware versions in the UMS. Your collection of clients and profiles has become large and confusing. You are losing track of assignments and connections between these elements.

Goal

You want to minimize the variety of firmware and profiles to simplify processes. You just want to see what you need. The firmware, clients, and profiles are interdependent. So, what is the best way to proceed?

Solution

- ⓘ We advise making a back-up of the UMS before deleting any components. You can also use the UMS recycle bin for the deleted objects.

The following are the main steps for reorganizing the UMS:

1. Download the new firmware.
2. Move clients to the new firmware.
3. Move profiles to the new firmware.
4. Delete old firmware, clients, and profiles that are no longer required.

Downloading the new Firmware

1. Check our [download server](#)¹⁵ to see whether there are new updates that are relevant for your applications.
2. Download the relevant update files. Install an update directory for the files on the UMS server or on your FTP server.

Moving Clients to the New Firmware

Find out how many different firmware versions you really need.

Upgrading all clients to the same firmware:

1. Create a new **View** to search for all clients using a firmware version older than the current version.
Example:
View Name: Show all UD LX devices with old firmware
Rule: Product name is like (!reg!)(?i).*Universal Desktop LX.* AND Firmware version is less than 5.04.100

¹⁵ <https://www.igel.com/software-downloads/>



2. Assign the update directory to these devices.
3. Start the update process.

Moving Profiles to New Firmware

Examine your profiles and decide which of them are relevant for the new firmware. You have three possibilities you can do now:

- Adjust the firmware version the profiles are based on, to be sure that they will work with the new firmware.
- Leave the profile settings as they are.
If the parameters of the new firmware match the parameters of the old version, a profile will work anyway. If they do not match, these parameters will be ignored.
- Create new profiles.

For more information see UMS Manual: Creating Profiles.

Deleting old Firmware, Clients and Profiles that are no longer required

To finally clear up the UMS you now should delete obsolete objects.

- Use again Views to select the clients, which are no longer required.
For more Information see UMS Manual: How to Create a New View in the IGEL UMS.
- Select the obsolete profiles. You can do this manually or by using the search option: **Misc > Search > Profiles > Product&Firmware**.
- Delete old firmware which is not assigned any longer to a client or profile: **Misc > Remove Unused Fimwares**.

Do you have also obsolete **Views, Jobs, Template Keys**? Delete them as well.

For **Template Keys** the **Profile Relation** is shown in the setting mask.



Removing a UMS Certificate from the Device

The IGEL Universal Management Suite (UMS) allows you to remove the UMS Server certificate from the devices.

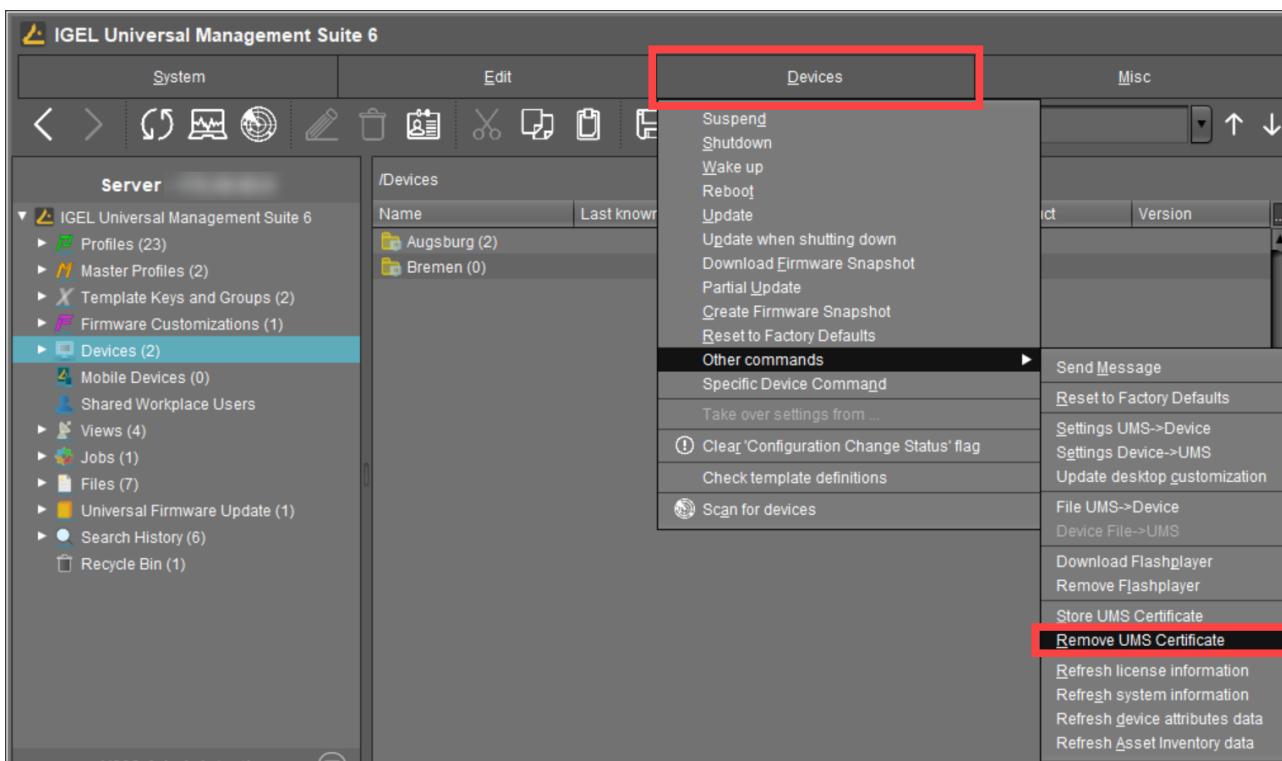
The removal of the certificate from devices may be necessary

- in order to prepare for moving a device from the test environment to the productive environment
- in order to prepare for replacing the server certificate

To remove the certificate, proceed as follows:

- Under **Devices > Other commands**, select **Remove UMS Certificate**.

Each IGEL UMS Server can now access the device configuration until one of the servers registers the device.



Related Topics

If you face problems during the device registration because of certificate issues: [Registration of a Device in the IGEL UMS Fails](#) (see page 180)

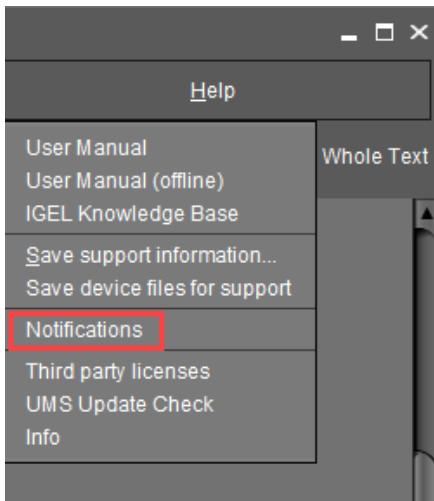


How to Configure Notifications in the IGEL UMS

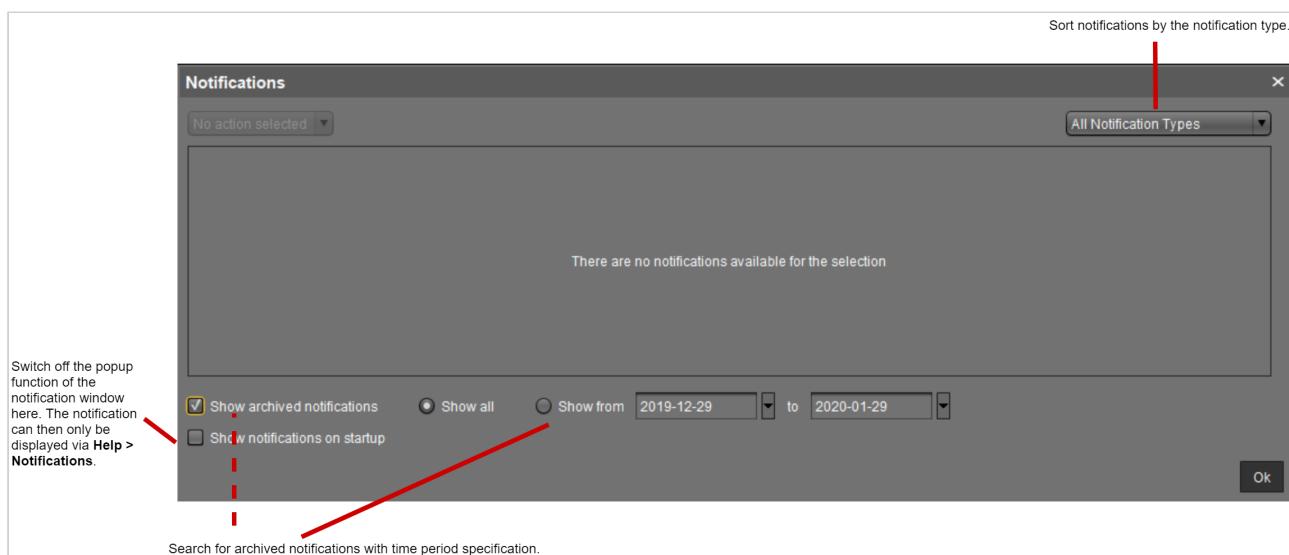
In the IGEL Universal Management Suite (UMS), you can get notifications about newly available firmware updates, device licenses, etc. By default, notifications are enabled and pop up when you start the UMS Console. In this article, you will learn how to adapt this feature to your needs.

About Notifications

Basically, all users with read permission can see the notifications. The notifications are displayed after starting the UMS Console. When the dialog is closed, the notifications can still be viewed anytime under **Help > Notifications**.



The Notification Window





Enabling the Notification Function

1. In the UMS Console, go to **UMS Administration > Global Configuration > Misc Settings**.
2. Activate **Enable notifications**.

The notification feature is active. The notifications can be viewed under **Help > Notifications**.

Exporting Notifications and Sending Them by Email

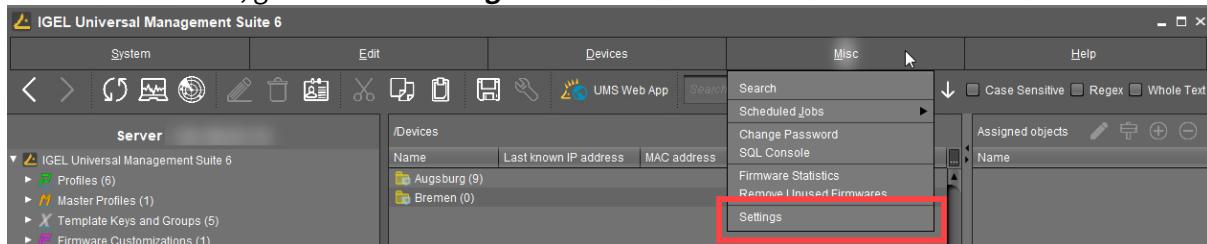
Notifications can be exported and sent via email: **UMS Administration > Global Configuration > Administrative Tasks > add > Action: "Send notification information via email"**.

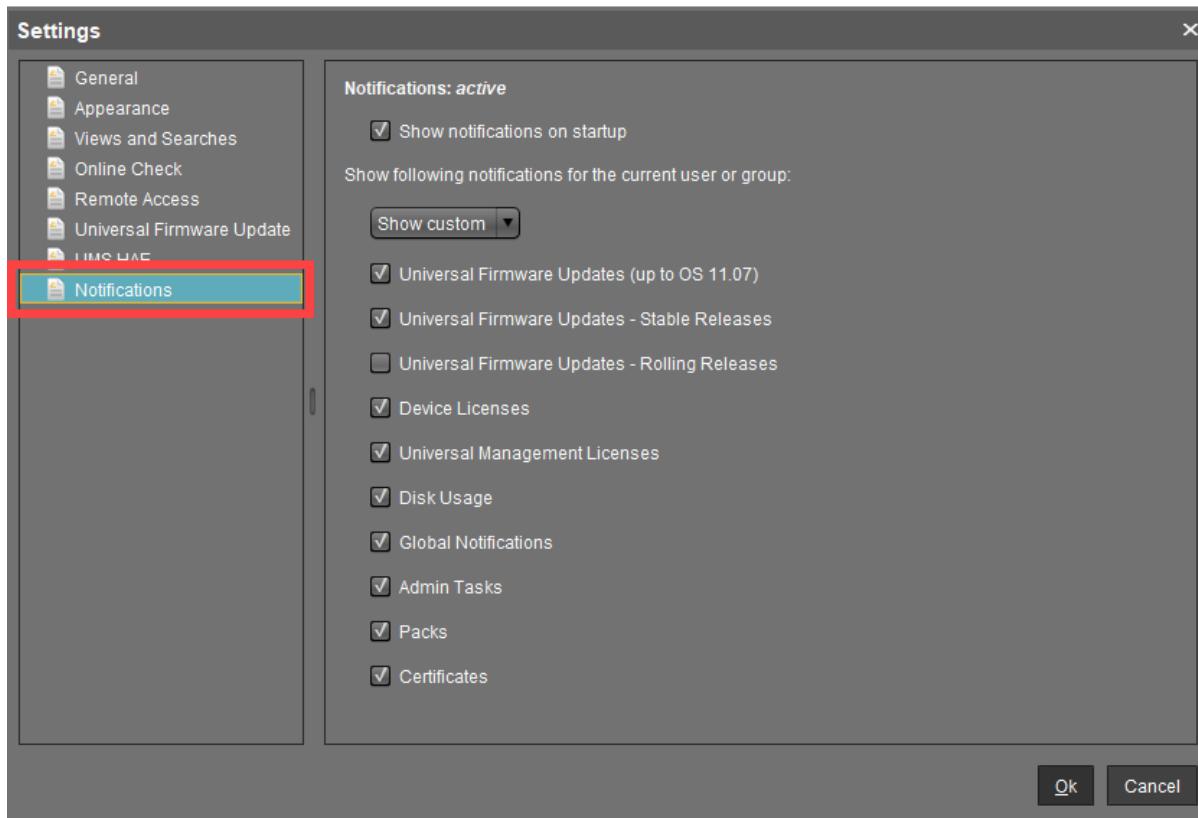
For more information, see Administrative Tasks - Configure Scheduled Actions for the IGEL UMS.

Configuring the Notification Pop-Up and Notification Types

To configure and customize the notification pop-up:

1. In the UMS Console, go to **Misc > Settings > Notifications**.





2. Enable **Show notifications on startup** to display the notification window as a pop-up every time the UMS Console is started.
3. Under **Show following notification for the current user or group**, select **Show custom**.
4. Specify which content should be displayed in the notification.
Possible options (as of UMS 6.10.110):
 - **Universal Firmware Updates (up to 11.07)**: Informs about the latest firmware updates for devices with IGEL OS versions before 11.07.

i To view notifications generated by UMS version below 6.10.110, leave the feature **Universal Firmware Updates (up to 11.07)** activated.
 - **Universal Firmware Updates - Stable Releases**: Informs about the latest Stable Releases. The feature is officially supported for devices with IGEL OS version 11.07 or higher.
 - **Universal Firmware Updates - Rolling Releases**: Informs about the latest Rolling Releases. The feature is officially supported for devices with IGEL OS version 11.07 or higher.
 - **Device Licenses**: Informs about the expiration of device licenses.



- **Universal Management Licenses:** Informs about the expiration of UMS licenses and if the available license amount is exceeded.
- **Disk Usage:** Informs about a critical value of free disc space. For more details, see "Disk Usage" below.
- **Global Notifications:** Informs about important news like maintenance times and bug fixes. For more details, see "Global Notifications" below.
- **Admin Tasks:** Automatically informs in a set of cases if no administrative task has been defined. For more details, see "Admin Tasks" below.
- **Packs:** Informs if license packs will expire.
- **Certificates:** Informs if certificates will expire.

5. Confirm the settings with **Ok**.

Disk Usage

This notification informs the user when there is not enough free drive space anymore. The individual critical drive space value can be set under **UMS Administration > Global Configuration > Misc Settings > Notifications**.

- i** Each server executes an administrative task every 6 hours to check the available space on the drive and deliver the disk usage information to the notification system. In order to display the notification, the server must have been running continuously for up to 6 hours.
Disk usage admin tasks executions older than 24 hours are considered out-of-date: An additional warning message is shown.

Types of disk usage notifications:

- Specific notification for each connected server: The server hostname and the available drive space will be shown in the notification message.
- Installation path and database path are on different file systems: Two notifications for each file system will be shown.

Global Notifications

This notification type informs the user about important news like maintenance times and bug fixes.

Global Notifications can include an additional web link that can provide more information. The web link is displayed as a blue link button next to the global notification.

Global Notifications			
Notification Type	Message	Message created	Message updated
error	This is a global notification of type "error".	Feb 13, 2019	
warning	This is a global notification of type "warning".	Feb 13, 2019	
info	New feature "global notifications"	Feb 13, 2019	
info	Link Read something about the UMS.	Feb 13, 2019	



- ▶ Click the link to open the web page in the standard browser.
- ▶ Move the mouse over the link to display the URL.

Admin Tasks

Notifications of this type are displayed in the following cases:

- When an embedded database is active, but NO administrative task for **creating a database backup** has been set.
- When logging is enabled, but NO administrative task for **deleting logging data** has been set.
- When at least one job is available, but NO administrative task for **deleting job execution data** has been set.

For detailed information on administrative tasks, see Administrative Tasks - Configure Scheduled Actions for the IGEL UMS.



Updating Timezone Information (Daylight Saving Time, DST)

Symptom

The device is showing an incorrect time of day for your location, although you have set the correct time zone.

Problem

The time zone or the regulation for Daylight Saving Time (DST) for your location has changed.

Solution

Update the time zone information files via IGEL Universal Management Suite (UMS). This is known to work for

- IGEL Linux version 10.01.100 or newer
- IGEL Linux version 5.04.100 or newer
- IGEL Linux version 4.14.100 or newer
- IGEL Linux ARM version 1.09.100 or newer.

Retrieving current time zone information files:

On Windows

- Use your web browser to download the following package files:
 - <http://packages.ubuntu.com/xenial-updates/all/tzdata/download> for *IGEL Linux* version 10.x
 - <http://packages.ubuntu.com/trusty-updates/all/tzdata/download> (for *IGEL Linux* version 5.x)
 - <http://packages.ubuntu.com/precise-updates/all/tzdata/download> (for *IGEL Linux* version 4.x)
- Extract the package contents using the program 7-Zip (freely available from <http://www.7-zip.org>).
- Find the file for your location in the extracted directory in `usr/share/zoneinfo/`, e.g. `usr/share/zoneinfo/Africa/Casablanca` for Morocco.

On Linux

- Update your system time zone information with these commands:
`sudo apt-get update`
`sudo apt-get install tzdata`
- Find the file for your location in the system directory `/usr/share/zoneinfo/`, e.g. `/usr/share/zoneinfo/Africa/Casablanca` for Morocco.

Distributing the files from IGEL Universal Management Suite

- Select **System > New > New File** from the UMS Console menu bar or go to **Files** in the tree structure and select **New File** from the context menu.



- Select the time zone file for your location under **Local File**.
- Select **Undefined** under **Classification**.
- Specify `/wfs/zoneinfo/` as the **Devices file location**.
- Set the **Access rights** to Read and Write for the Owner, and to Read for Others.
- Select Root as the **Owner**.
- Click **OK** to confirm the settings.

New file

File source

Upload local file to UMS server

Local file ...

Upload location (URL) `https://<server:port>/ums_filetransfer` ...

Select file from UMS server

File location (URL) ...

File target

Classification Undefined

Devices file location `/wfs/zoneinfo/`

Access rights

	Read	Write	Execute
Owner	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Others	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Owner

Ok **Cancel**

On a device, you can verify the transfer and activation of the new time zone information files:

- In the **Local Terminal**, enter `grep 'timezone_config' /var/log/messages`

i On *IGEL Linux version 10.x*, use: `journalctl | grep 'timezone_config'`



- The output should look like the following:

```
Feb 27 11:28:13 (none) timezone_config: loading /wfs/zoneinfo/Casablanca  
to /usr/share/zoneinfo/Africa/Casablanca  
Feb 27 11:28:13 (none) timezone_config: loading /wfs/zoneinfo/Casablanca  
to /usr/share/zoneinfo posix/Africa/Casablanca  
Feb 27 11:28:13 (none) timezone_config: configure timezone Africa/  
Casablanca
```



E-Mail Settings for Gmail Accounts

Purpose

You want to send views from the IGEL Universal Management Suite by email using a Gmail account.

Solution

- ⓘ In order to allow the UMS to send emails via Gmail, you have to make the following setting in your Google account:
- Log in to Google.
 - Go to **My Account > Sign-in & security > Connected apps & sites**.
 - Set **Allow less secure apps** to **ON**.

1. Go to **UMS Administration > Global Configuration > Mail Settings**.
2. Enter `smtp.gmail.com` as the **SMTP Host**.
3. Enter your Gmail address under **Sender Address**.
4. Enable **Activate SMTP Auth**.
5. Enter your Gmail address under **SMTP User**.
6. Enter your Gmail password under **SMTP Password**.
7. Enter `465` under **SMTP Port**.
8. Enable **Activate SMTP SSL**.
9. Under **Mail recipient**, enter the email address you want administrative emails from the UMS to be sent to.



Mail Settings

Mail Settings

SMTP Host	smtp.gmail.com
Sender Address	user@gmail.com
<input checked="" type="checkbox"/> Activate SMTP Auth	
SMTP User	user@gmail.com
SMTP Password	*****
SMTP Port	465
<input checked="" type="checkbox"/> Activate SMTP SSL	
<input type="checkbox"/> Activate SMTP Start TLS	

Send Test Mail Result: [Empty box]

Recipient for administrative task result and service mails

Mail recipient	user@example.com
----------------	------------------

10. Click **Send Test Mail** to test your settings.

Additional Information

<https://support.google.com/a/answer/176600?hl=en>



Searching with Regular Expressions in the UMS

The IGEL Universal Management Suite (UMS) can help you to manage large device installations. Often you will want to search or filter for objects with certain properties, and the UMS offers a wide selection. For advanced searches, however, you might need regular expressions, a powerful feature built into the UMS.

You can use them in:

- Quick Search
- **Misc > Search**
- **Views > New View**
- **Edit > Edit Configuration > System > Registry > Search parameter ...**
- **UMS Administration > Global Configuration >Default Directory Rules**

The UMS uses Java regular expressions. These are different from the globbing patterns that you may know from the DOS/Windows Command Prompt or the Linux commandline. For example, instead of using `*` to match any number of characters, you use in the UMS:

`.*`

Here the `.` matches any character. The `*` acts as a quantifier, stating how often the preceding pattern may occur, in this case zero or more times.

So, if you want to find something that begins with IGEL, use:

`IGEL.*`

Something beginning with IGEL and ending with 12:

`IGEL.*12`

If you want to find something ending with IGEL:

`*.IGEL`

Find out more about Java regular expressions in [Oracle's documentation¹⁶](#).

¹⁶ <https://docs.oracle.com/javase/7/docs/api/java/util/regex/Pattern.html>



Copy Sessions in Setup or UMS

Sometimes you want to create a session that differs from another only in a few details. *IGEL* Linux version 5.10.100 or newer and UMS version 5.02.100 or newer let you copy complete sessions. Once the session is copied, you can easily adapt the required settings.

Copying is available in the **Sessions** section of *IGEL* Setup (and occasionally in some other sections) as well as in the **Edit Configuration** function in UMS.

To copy a session, proceed as follows:

1. In the setup, open the menu path **Sessions > [Session Type] > [Session Type] Sessions**.
Example: **Sessions > RDP > RDP Sessions**
The existing sessions are shown.
2. Highlight the session that you want to copy.
3. Click .
A copy of the session will be created within the same folder.



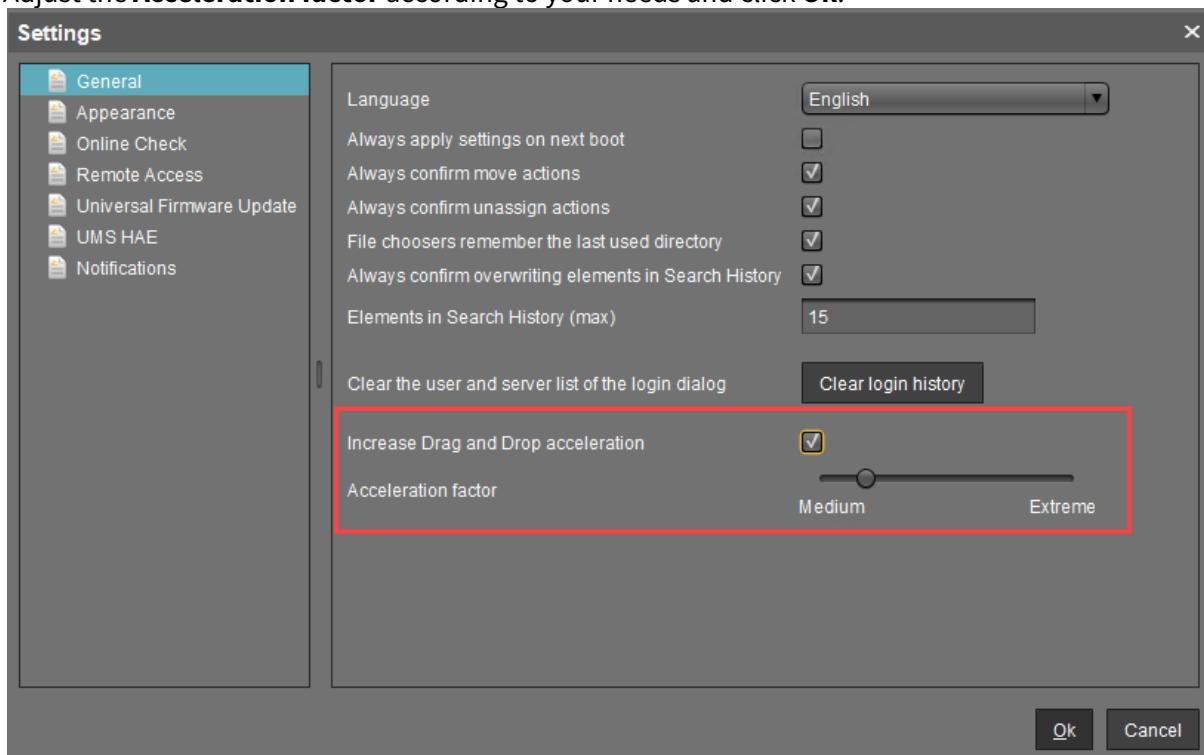
Drag & Drop Acceleration for Large Structure Trees

If you have a really large number of objects in your IGEL UMS (Universal Management Suite), it can be tedious to drag and drop an object to a new position if the new position is quite far away from the current position.

But with UMS version 5.03.100 or newer, you can increase your scrolling speed. As soon as the object you are moving touches the bottom edge of the structure tree window, the acceleration starts.

To enable drag and drop acceleration:

1. Open the UMS and go to **Misc > Settings > General**.
2. Activate **Increase Drag and Drop acceleration**.
3. Adjust the **Acceleration factor** according to your needs and click **Ok**.



Drag & drop acceleration is ready.



Which UMS Directories Should Be Scanned for Viruses, Which Can Be Excluded?

Question

Which UMS directories can be excluded from antivirus scanning, which directories should be scanned?

Environment

This article is valid for the following environment:

- UMS 5.08 or higher
- UMS is installed on Microsoft Windows server

Answer

Everything in `C:\<Program Files>\IGEL\RemoteManager\` can be excluded.

If your UMS also manages Windows devices, the downloadable files in `C:\<Program Files>\IGEL\RemoteManager\rmguiserver\webapps\ums_filetransfer\` should be scanned.



Licensing with Smartcard fails

Symptom

You can not create licenses from smartcard in IGEL UMS (**License Management**) although valid licenses are stored on the SIM / smartcard and the smartcard reader's driver is installed to your system.

- ▶ The smardcard reader shows a problem in the Windows Hardware Manager [!].

Problem

Another smartcard reader (eg. built-in cardreader) overrides the access.

Solution

Deactivate or deinstall all other smartcard readers in the Windows Hardware Manager.