

IPP/IPPS



ZEBRA

Configuration Guide for Zebra Link-OS Printers

2025/07/07

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Introduction

The Internet Printing Protocol, or IPP, is a protocol of operations, objects, and attributes for network printing over the Internet between client devices (computers, mobile phones, tablets) and printers.

The purpose is to allow the gathering of printer capabilities, status and sending print jobs. The IPP protocol is a layer on top of the HTTP protocol, using port 631 to communicate. It can use HTTPS for encrypted connections as IPPS (IPP over HTTPS).

IPP/IPPS Support in Link-OS 7.4

Zebra printers support IPP protocol communications to provide printer status, capabilities, and printing.

- With Link-OS 7.4, IPP/IPPS printer setup is available with Windows 10/11 and Linux (CUPS).
- Users can send print files to Zebra printers with any enabled printer language (ZPL, EPL, CPCL, and emulations) and subsequently cancel, hold or release these print jobs over IPP/IPPS.
- Users can query a printer about its capabilities, defaults and status as *attributes* over IPP/IPPS.
- Users can query and obtain the status of print jobs over IPP/IPPS.

The supported print operations are *Print-Job* and *Create-Job/Send-Document*. They do not support multiple-document handling. The print data can be any of the languages enabled for the printer in use. Depending on the model, these can include ZPL, CPCL, EPL, and emulations. They should be sent with the IPP document-format of `application/vnd.zebra`. The IPP document-format of `application/octet-stream` gets passed to the Zebra parsers the same as `application/vnd.zebra`. The IPP document-format of `image/urf` and `image/pwg-raster` are not supported.

The IPP reported job status is a report of taking the data and sending it to the parsers, not the status of any print action. Adjustments to the print job must be done in the print language as part of the job. The IPP attributes will not adjust the print job. For example, to adjust the number of copies in ZPL, use the `^PQ<number of copies>` and not the IPP job attribute *copies*.

Zebra Printer's IPP attributes are set up on startup or after network reset. Many attributes will not be updated unless you do a network reset or power cycle on the printer.

Note that some aim to use IPP to replace custom print drivers. The use of an IPP driver, IPP Everywhere, for printer diagnostics is not fully supported by Zebra printers until other features, including multicast DNS, automatic IP assignment, and so on, are implemented in a later phase.

Printer Configuration

This section describes the IPP/IPPS configurations and the certificate setup for IPPS.

Enabling/Disabling IPP/IPPS on Zebra Printers

By default, IPP and IPPS are both enabled. If you want a more secure environment, change the setting to use IPPS only. It is recommended to disable IPP for security reasons if you are not using this protocol.

SGD	Description	Access	Choices/ Range	Default
ip.ipp.enable	Enable/Disable IPP	RW	on, off	on

SGD	Description	Access	Choices/ Range	Default
ip.ipp.mode	Control whether the use of TLS on the connection is required or not.	RW	ipp/ipp, ipp	ipp/ipp

Certificate Setup for IPPS

Zebra printers come with a built-in certificate for use by many services.

By default, the IPPS connections will use this certificate as the server certificate. User certificate/key are supported when placed on the printer's E drive using the file names **IPP_CERT.NRD** and **IPP_KEY.NRD**. Another option is to use the printer's CSR generation system, described in the Certificate Creation section of the [Link-OS PrintSecure Printer Administration Guide](#), to have a secure key and have the certificate signed by a trusted Certificate Authority.

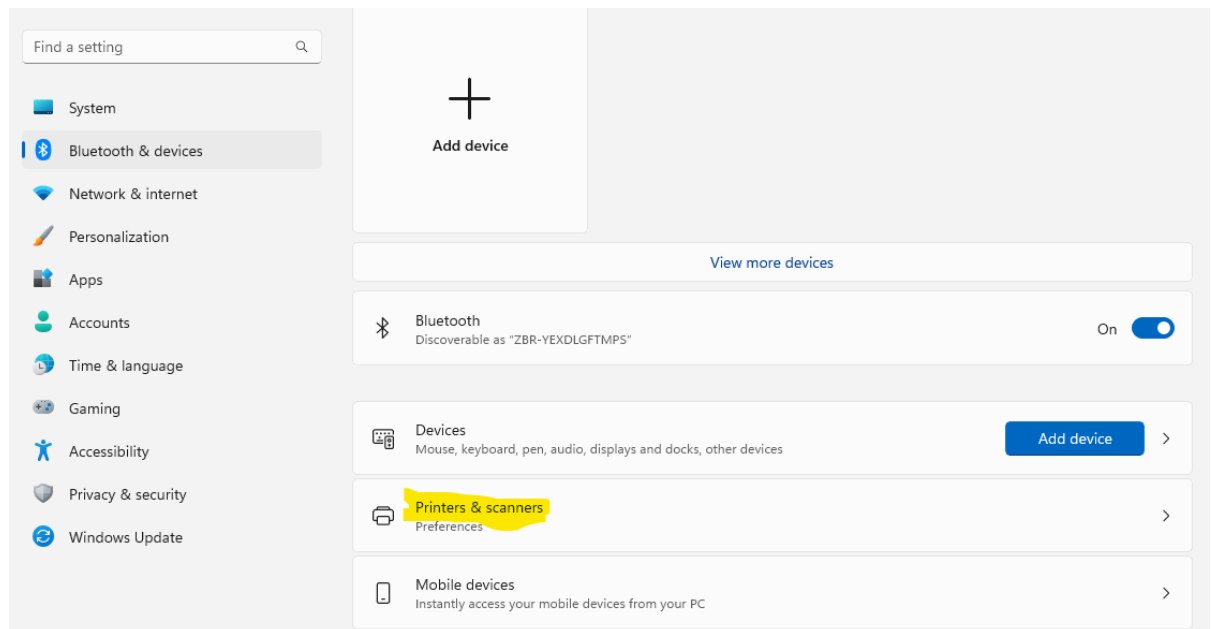
Windows Printer Setup

This section describes the printer setup and configurations for Windows.

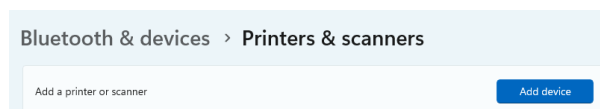
Adding an IPP Printer

This section describes how to add an IPP printer.

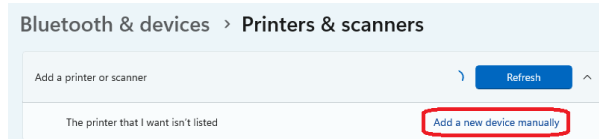
1. To add a Zebra IPP printer under Windows 10 or 11, navigate to **Settings > Bluetooth & Devices > Printers & Scanners**.



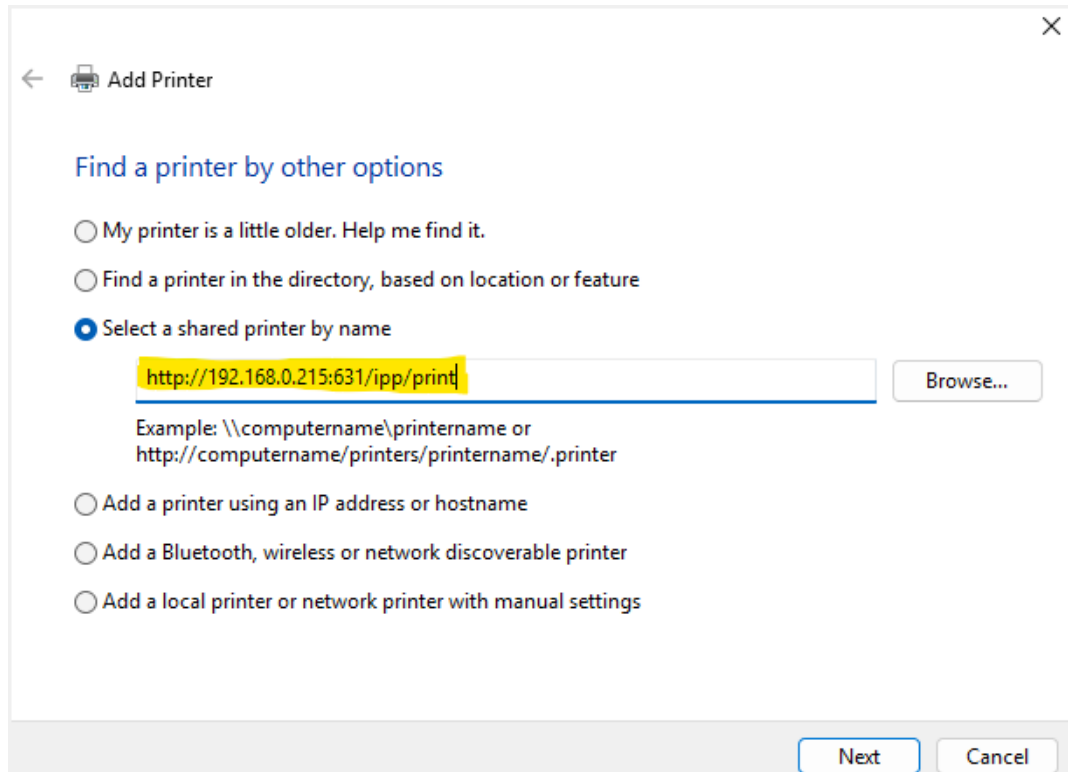
2. Click **Add device**.



- Windows will scan, but will not be able to discover the printer using IPP. You will need to add it manually, click **Add a new device manually**.



- In the dialog window that appears, choose **Select a shared printer by name**.
- Type `http://printerIPAddress:631/ipp/print` for IPP. Replace `http` with `https` if you want to use IPPS.

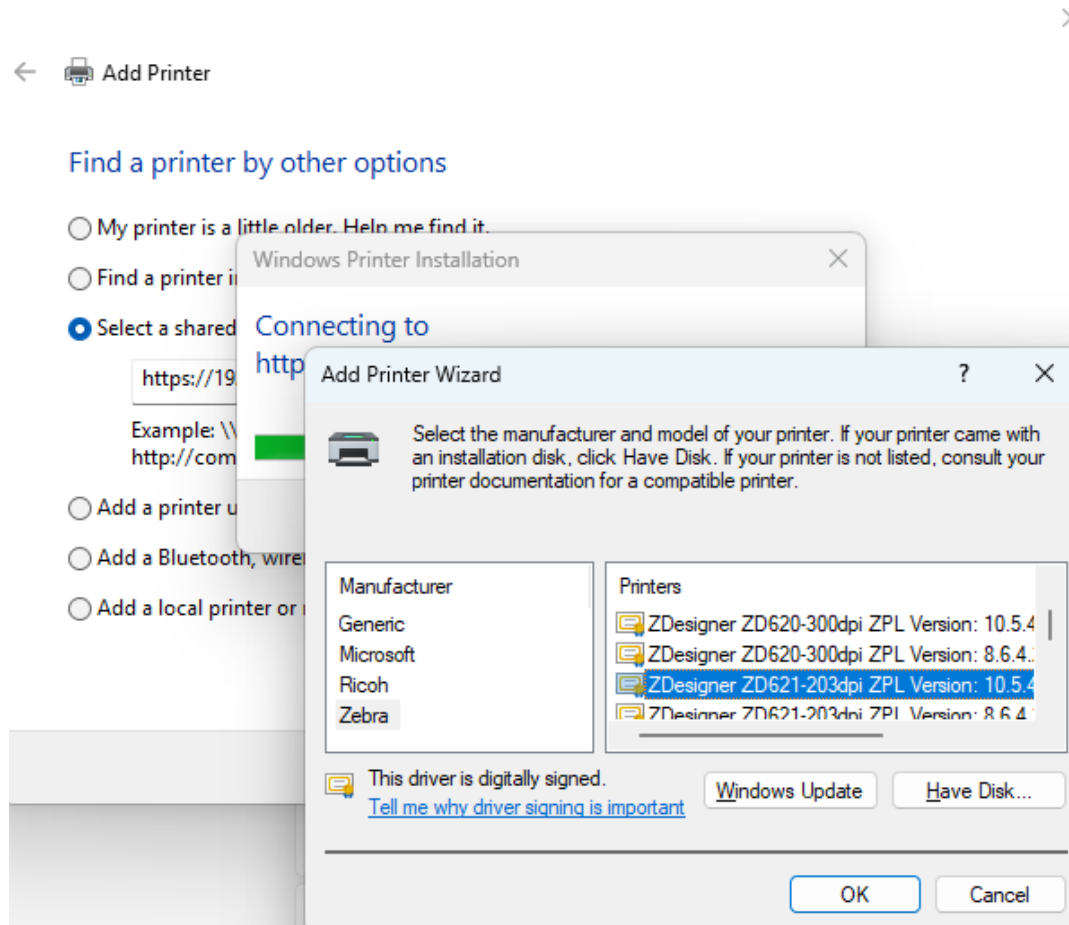


Do not select **Add a printer using an IP address or hostname**. This option will present a pull-down for adding an IPP device and assumes a printer with the IPP Everywhere driverless printing support, which is not currently supported.



IMPORTANT: If you are using IPPS, Windows must trust the certificate in the printer. Windows will report that it is unable to connect to the printer if it does not trust the certificate. Windows does not raise an error about the untrusted certificate, and a network trace will show Windows is, in fact, connecting to the printer via TLS and then disconnecting. See [Configuring Windows to Trust a Printer Certificate](#) on how to configure Windows to trust a printer's certificate.

6. After the printer is connected, Windows will prompt you to choose the printer manufacturer and model. Select Zebra as the manufacturer and choose the appropriate printer model.



7. Click **OK**.

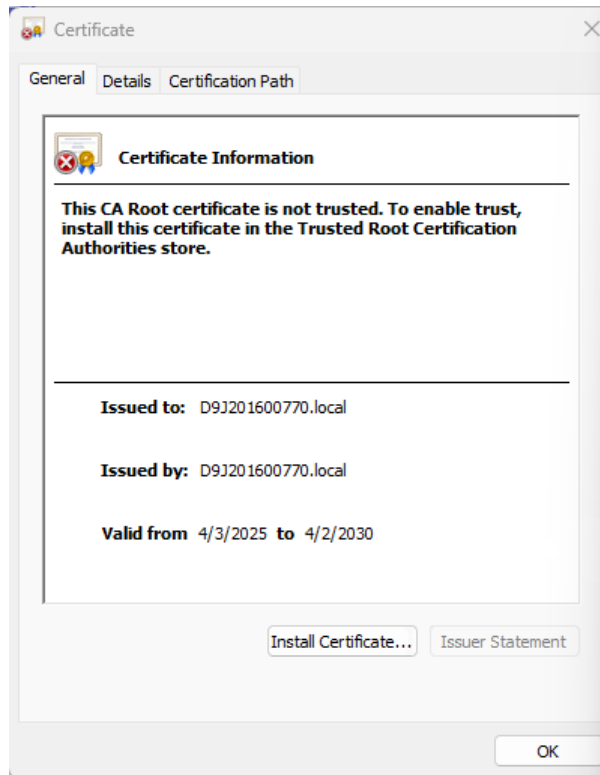
You can then configure the Zebra driver, choosing the relevant printer settings for media type, dimensions, and so on. The printer should now be usable.

Configuring Windows to Trust a Printer Certificate

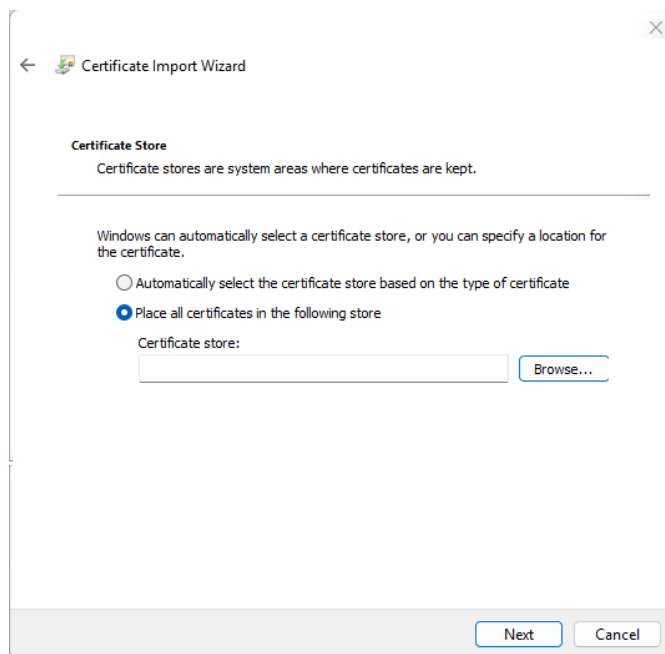
For Windows to trust the IPPS server, you need to load a new certificate onto the printer, where the CN is the DNS name (if your network supports DNS names for the printers) or where the SAN includes the IP address of the printer (so the printer will have a consistent IP address).

You can download your own trusted or self-signed certificate/key for IPP by following the instructions at [Certificate Setup for IPPS](#). Add the certificate from either the CA that signed the printer certificate or the printer's certificate to the Windows certificate store. If the certificate name ends in `.crt`, you may be able to open it in the certificate viewer by double-clicking and adding it to the printer.

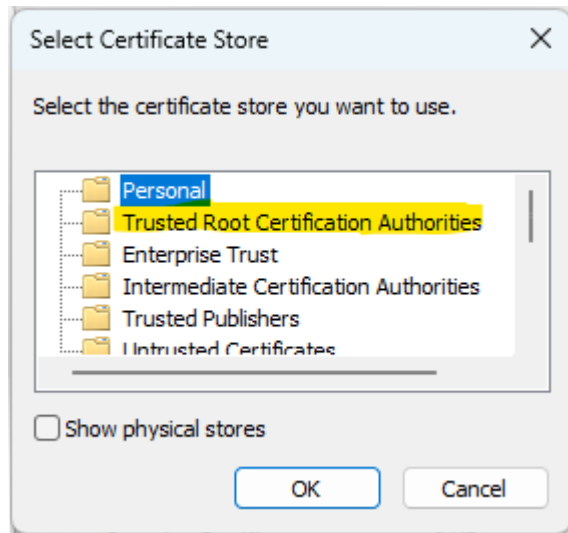
1. Click **Install Certificate**.



2. On the Certificate Import Wizard window, select **Place all certificates in the following store**, and then click **Browse**.



3. Choose **Trusted Root Certification Authorities**, and then click **OK**.



You should see a message that indicates that the certificate was successfully installed. At this point, you can add the printer via HTTPS so it uses IPPS as described earlier in this document.

Linux (CUPS) Printer Setup

This section describes the printer setup and configurations for Linux.

Print Queue Creation

You can add the printer using the **lpadmin** command on the command line. This assumes CUPS is already installed.

Admin privileges are required, so you would either do this as the root user or use `sudo`:

```
sudo lpadmin -p <queue name> -E -v ipp<optional s>://<dns name/ip address>/ipp/print -m raw
```

In this example,

- `<queue name>` is the name of a print queue to add to CUPS.
- `<optional s>` is added to use TLS for communication.
- `<dns name/ip address>` is the DNS name (if available) or IP address of the printer.

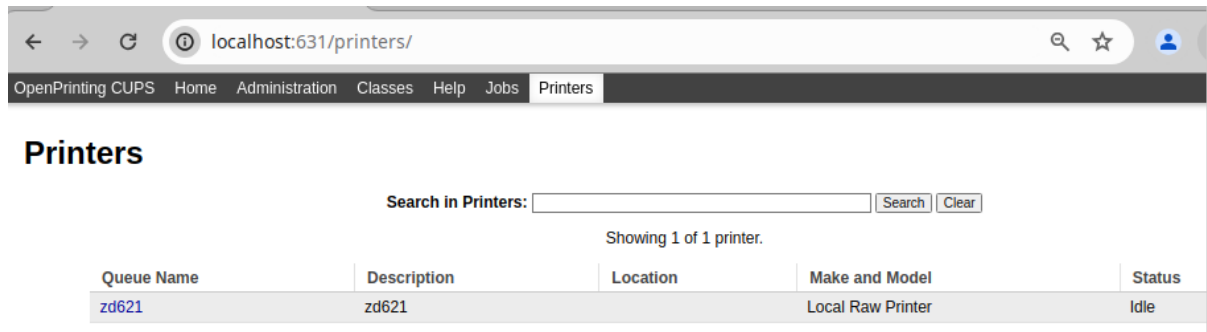
This will add the Zebra printer as a *raw* print queue, meaning any print jobs sent to it will not be interpreted or post-processed by CUPS; they will be sent as-is to the printer. This implies the data sent to the print queue must be properly formatted ZPL, EPL, CPCL, or an emulation language supported by the printer.



NOTE: The `lpadmin` command will return a warning if CUPS 2.4 or later is used, which says *lpadmin: Raw queues are deprecated and will stop working in a future version of CUPS*. In CUPS 3.0, the plan is to remove raw printing support. When this occurs, CUPS will no longer be a preferred method for printing to label printers in an enterprise environment, as CUPS 3.0 will require IPP Everywhere support from all printers. The current proposal from the PWG for enterprise label printing is to use the application `lprint`, which will support raw data printing rather than requiring every print job to be a bitmap (which is what IPP Everywhere requires). Because

CUPS 3.0 is still in development, it may be too early to recommend lprint, as most of our Linux customers will likely be more comfortable using CUPS for now.

The added print queue can also be viewed via the CUPS web interface on the Linux system.



Printing a Test Label

To print a test label using the lp command:

```
lp -d <queue name> <test label filename>
```

Media Reporting

The printer system performs media detection. IPP reports the values the printer has determined to match a predefined list of standard media sizes. To select the media name and dimensions to report, it takes the reported dimensions and check them against standard label sizes. Sizes do not have to be exact, just within a pre-determined tolerance, for a standard media size to be selected. If one of the predefined label sizes is not found to match the current setup, it will create a media name in the format `custom_<width>x<length>in-<width>x<length>in`.

Troubleshooting

- If you are using IPPS and having connection issues - You need to ensure that your machine trusts the printer's certificate.
- Attributes not showing the current value of the setting - Perform a network reset on the printer and the values should then show the updated values.
- All the job names are *Untitled* - Your IPP client needs to set the **job-attribute-tag** of the **job-name** to the desired job name.
- IPP reports job-completed-success but there is no printout - Check the data you are sending to ensure it is valid. You can try sending it via some other protocol and you should get the same result as sending over IPP.
- lptool returning the following error `status-code = server-error-internal-error` - You need to ensure that the firmware version supports IPP, and IPP is enabled (`ip.ipp.enable`), and you are using IPP mode as **ipp/ipp** (`ip.ipp.mode`).

