

A Comparison  
Of  
USB over IP Printing  
With  
Conventional Network Printing Protocols  
LPR, RawTCP (HP JetDirect), IPP, and SMB  
2009 08 11 Tue

The main advantage of USB over IP printing over conventional network printing protocols, including LPR, RawTCP (HP JetDirect), IPP, and SMB, is that USB over IP printing greatly reduces service calls.

Conventional network printing protocols cannot adequately be applied to the following cases, while USB over IP printing can support these cases.

## 1 Multifunction Printer

When a user first connects a multifunction printer to a router, the user expects to be able to quickly install the driver on his or her personal computer, set up the network printing parameters, print, scan, and perhaps fax and access the memory cards.

### 1.1 Install Multifunction Printer Driver

The biggest disadvantage of conventional printing protocols occurs when a user installs the multifunction printer driver on his or her Windows or MacOS.

In a word, for most multifunction printer models, the user needs to connect the multifunction printer's USB cable to the Windows or MacOS personal computer during driver installation.

In other words, if there are say 20 computers in an office, the user needs to move the multifunction printer around and connect its USB cable to each of the 20 computers to install the driver on each of the 20 computers.

This disadvantage alone eliminates the possibility that we can just connect a newly purchased multifunction printer to a router and then start installing its driver and using it. We have to move the multifunction printer around, successively connect it to personal computers and the router, during driver installation and test printing. The disadvantage greatly increases service calls.

1.1.1 For most Lexmark, Canon, and Samsung multifunction printers, and for some Epson multifunction printers, the multifunction printer must be physically connected to the personal computer during driver installation.

1.1.2 Some HP multifunction printers may not require direct physical USB connection during driver installation. During the driver installation, the installation program prompts the user to insert the multifunction printer's USB cable to the personal computer. The user can click "NO" (meaning install the driver without the multifunction printer physically connected), but the driver installation may not be complete.

With USB over IP printing, the user does not have to physically move the multifunction printer to each of the personal computers to install driver. The user needs only connect the multifunction printer to the router's USB port during driver installation on every computer in home or office.

## 1.2 Set Up Network Printer Driver

Once the multifunction printer driver is installed on the personal computer, with conventional printing protocols, the user needs to set the router's IP address into the LPR, RawTCP, SMB, and IPP's IP parameters on Windows.

USB over IP's automatic printing feature eliminate this step.

## 1.3 Print

While the printer part of some multifunction printers can be supported by conventional printing protocols, there are also many multifunction printers whose printer part cannot be supported by conventional printing protocols, and have to rely on USB over IP printing.

#### 1.4 Scan

Every multifunction printer comes with a scanner. When using the scanner, the scanned image can be transmitted directly to the user's personal computer over the network.

USB over IP supports this feature while conventional printing protocols don't.

#### 1.5 Send Fax

If the multifunction printer comes with a fax, one common use is to send fax.

A user can edit a document on Windows or MacOS, and fax out the document over network.

USB over IP supports this feature while conventional printing protocols don't.

#### 1.6 Access Memory Cards

The user can access, read and write the memory cards inserted to the memory slots of the multifunction printer.

USB over IP supports this feature while conventional printing protocols don't.

## 2 GDI or Host-Based Printer

Many low cost printers (such as HP LaserJet 1000, HP LaserJet 1020, HP Color JaserJet 3500 in our QA lab), due to the lack of computing power in the printer,

rely on the computing power of Windows or MacOS-based personal computers to convert, or rasterize, printing data into graphics data printable by the printer's raw hardware.

The printer hardware may have to instruct and report status to Windows or MacOS how to process the printing data, a direction of communication opposite to the direction of sending the printing data.

### 3 Bidirectional Printer

Many inkjet or laser printers report status, including ink level, out of paper, etc., back to Windows and MacOS. The user won't be able to see any of these statuses.

Many low cost inject printers, such as Canon Pixma 1000, return ink level to Windows and MacOS.