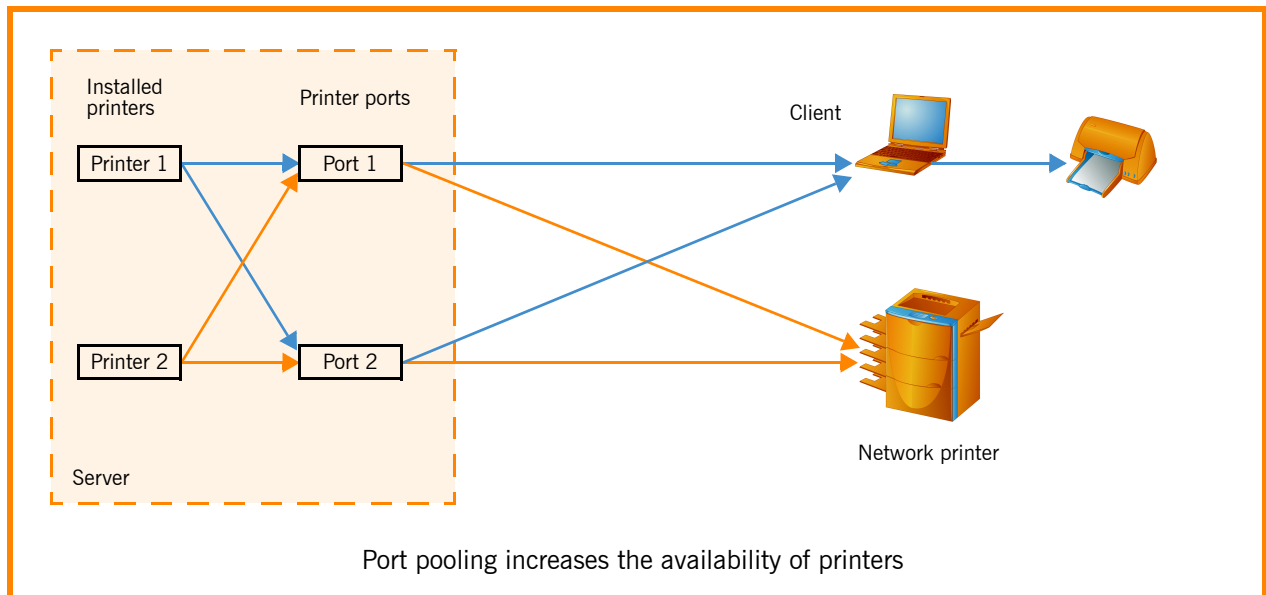


ThinPrint ports

How to optimize ThinPrint configuration



To print with ThinPrint, printers must be associated with ThinPrint ports at the server or at the virtual desktop. The ports are offered by the monitor of the ThinPrint Engine. ThinPrint ports are configured in the Microsoft Management Console (MMC). Up to 1,500 ports with 2,000 printer queues can be created per server. It is, however, unnecessary to create a own port for each printer; several printers can be connected to the same port.

This white paper will introduce you to ThinPrint ports. Specifically, port properties are explained and tips for optimal configuration are given. For concrete application, please refer to the respective ThinPrint Engine user manual.

Introduction

- Overview of ThinPrint
- ThinPrint Engine's 3-tier architecture
- Other properties of ThinPrint ports
- Port pooling

Various Deployment Strategies for ThinPrint

- No bandwidth control necessary
- Bandwidth control necessary

Examples

- Remote printing in a corporate network with branch offices
- Driver Free Printing in a LAN

Appendix

- Customer service and technical support
- Additional sources

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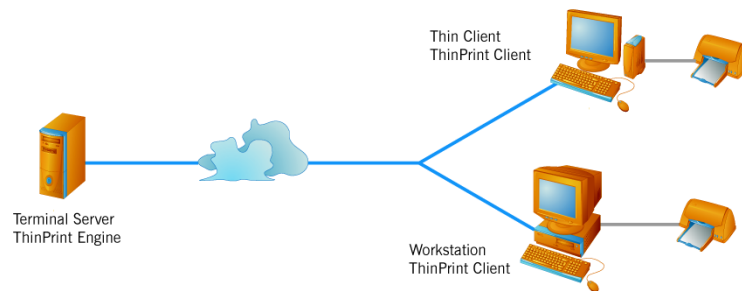
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Introduction

Overview of ThinPrint

ThinPrint is a software solution for comfortable print management. It consists of a server (or virtual desktop) and a client component (Illus. 1).



Illus. 1 Using of ThinPrint with server and client components (example)

Server or desktop component

The ThinPrint Engine is the actual core of the ThinPrint framework. It provides complete printer driver management including V-Layer. The ThinPrint Engine performs the following main functions:

- Bandwidth control of print data
- Compression and streaming of print data
- Driver Free Printing and V-Layer
- Print data encryption

Client component

A software component on the client side, ThinPrint Client, is generally responsible for receiving print data, decompressing and decrypting it, and sending it to the print devices. Many ThinPrint Clients are available for different end devices and areas of deployment: for all Windows versions including Windows CE, for Linux, DOS, Java, as well as for internal or external print servers of network printers.

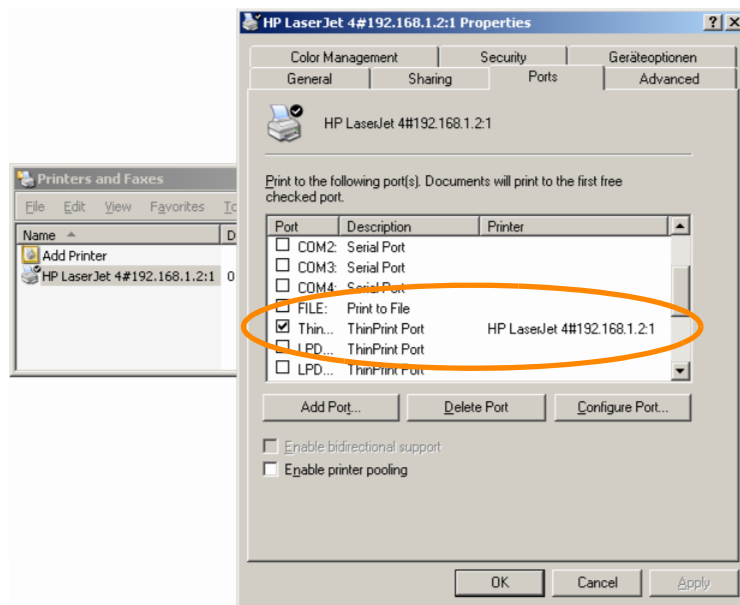
ThinPrint Engine's 3-tier architecture

Under Windows the ThinPrint Engine and has a 3-tier architecture:

- Print monitor
- Printer port
- Printer

The print monitor offers ports; the printers are configured onto the ports. The printers can use either conventional printer drivers or the ThinPrint Output Gateway. In both cases, bandwidth control, compression, streaming, and encryption are possible.

To print with ThinPrint, printers must be associated with ThinPrint ports at the server (Illus. 2).



Illus. 2 Printer HP LaserJet 4#192.168.1.1:2 on a ThinPrint port (example)

ThinPrint ports are added and configured with the MMC based ThinPrint configuration console or with ThinPrint Management Center. Up to 1,500 ports with 2,000 printer queues can be created per server. It is, however, unnecessary to create a port for each printer; several printers can be connected to the same port.

Other properties of ThinPrint ports

A ThinPrint port sets the bandwidth for print data¹. ThinPrint ports have the following basic properties which must be considered during configuration.

1. Bandwidth is set separately for each port; each port can have a different bandwidth setting.
2. All print jobs sent to printers on the same ThinPrint port are processed consecutively. On the other hand, print jobs from the same printer object but from different sessions could be printed at the same time, if the printer object is connected to several ThinPrint ports using port pooling (see below).

To ensure **optimal performance** with efficient bandwidth control as well as the highest possible print rate, the following should be observed:

- Correct number of ports
- Correct bandwidth setting per ThinPrint port
- Correct assignment of printers to the ThinPrint ports

¹ Exception: ThinPrint RDP Engine

The following criteria should be considered to find the **optimal number** of ThinPrint ports:

- Too few ThinPrint ports should not be created; otherwise, print processing could become too slow, or a “hanging” print job could block others.
- Too many ThinPrint ports should not be created, so that bandwidth can be used and regulated optimally – multiple ThinPrint ports per (WAN) connection increase bandwidth traffic.

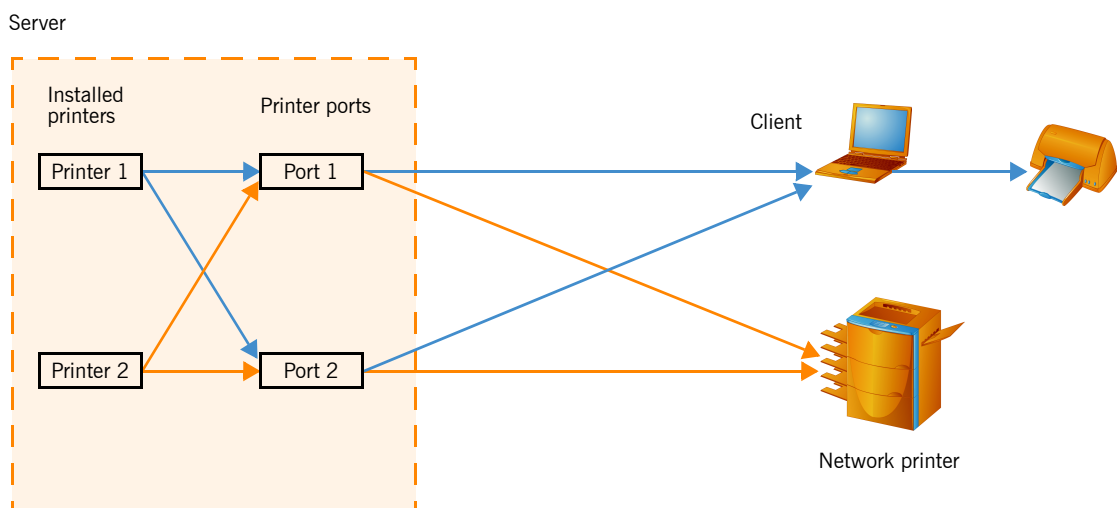
More detailed information about the right number of ports, optimal bandwidth settings, and proper assignment of printers to ports is found in “Sample scenarios” [Page 10](#).

See the “ThinPrint addressing” white paper ([Page 13](#)) to learn about print protocols and addressing of ThinPrint print jobs. Further information about installing ThinPrint Engine and configuring ThinPrint ports can be found in the “ThinPrint Application Server Engine” manual ([Page 13](#)).

Port pooling

Pooling ports with ThinPrint means you can connect a printer with several ThinPrint ports (Illus. 3). This has the following advantages:

- Improved performance
- Little chance of blockage from very large or “hanging” print jobs
- Less printer (objects) on the server



Illus. 3 Port pooling increases the availability of printers

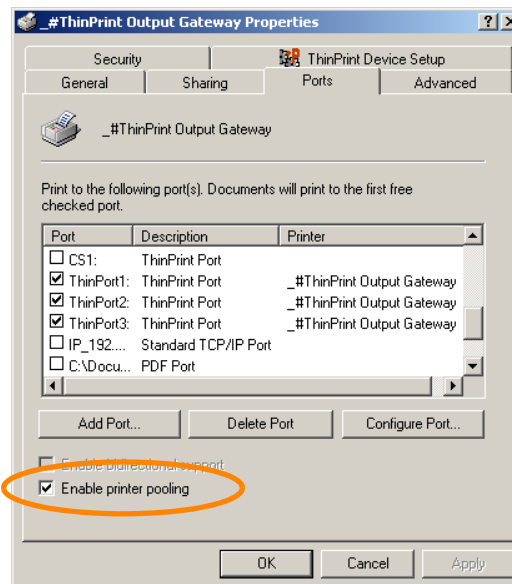
Port pooling is supported by:

- ThinPrint ports
- ThinPrint Output Gateway
- AutoConnect
- ThinPrint Management Center

Port pooling is mainly used to improve print performance. It is important to note, though, that all ThinPrint ports in a pool have the same properties. Port pooling with ThinPrint ports in combination with ThinPrint Output Gateway and AutoConnect, however, brings on terminal servers more than maximum performance; this method also offers especially simple administration.

On central print servers, use Management Center to configure port pooling.

To enable port pooling on terminal servers, open the printer folder, select a printer's properties, and then choose to ENABLE PRINTER POOLING (Illus. 4). In contrast to Windows, with ThinPrint, all address information for sending print jobs is found in the printer name, not the port name (exception: LPD). That means that multiple printers can be connected to the same port, although they have a different net address. If such ports are then pooled (Illus. 3 and 4), this becomes a true port pool, in which print jobs can be sent to the same printer from different ports. This is why ThinPrint does not refer to printer pooling.



Illus. 4 Enabling ThinPrint port pooling

Various Deployment Strategies for ThinPrint

The best configuration for ThinPrint ports depends on what you want to achieve with ThinPrint. This can be divided into two basic scenarios:

No bandwidth control necessary

If the main function of ThinPrint is to be Driver Free Printing² or V-Layer³ and no bandwidth control is required (i.e., printing in a LAN), the following strategy should be applied for configuring ThinPrint ports:

- Many ThinPrint ports, ports are not necessarily assigned to specific connections
- High bandwidth setting for ports
- Printer assignment to ports is relatively freely variable; a somewhat uniform load of print data traffic over the ThinPrint ports is desirable

Bandwidth control necessary

If ThinPrint is run to control bandwidth – with or without Driver Free Printing or V-Layer – (i.e., when printing over a WAN connection), the following strategy should be applied for configuring ThinPrint ports:

- ThinPrint ports assigned to connections; number of ports mainly depends on the number of connections
- Individual bandwidth setting for each port according to connection properties
- Printers which will print over specific connections are configured to the ThinPrint port which has been set up for that connection

Because bandwidth is regulated per connection and ThinPrint Engine regulates bandwidth per ThinPrint port, the ports should be assigned to a specific connection. At least one port should be set up per remote connection (i.e., one port per branch office). Multiple ports per connection prevent one print job from blocking another and enable simultaneous processing of multiple print jobs. It must be noted though, that bandwidth traffic control is less effective as the number of ports grows.

2 Use of ThinPrint Output Gateway instead of native printer drivers on terminal servers, virtual desktops, or central print servers; the printer drivers are only installed on the client machines.

3 Use of ThinPrint Output Gateway instead of native printer drivers on terminal servers or virtual desktops; the printer drivers are only installed on central print servers.

Example

Task Print data is to be sent over a 900 kbit/s WAN connection; 120 kbit/s should be used for printing.

2 solutions

- a) 1 port with 900 kbit/s: better use and control of bandwidth for printing, but one large print job could block others
- b) 3 ports, each with 300 kbit/s: parallel print data processing of multiple print jobs; individual rates are slower, though; if all ports are not used simultaneously, the 900 kbit/s are not used optimally for printing⁴ (when using multiple ports, it can be advantageous if the total of individual bandwidth is less than the total bandwidth allocated for printing, because all ports will not always be in simultaneous use; in this example, for instance, 3 ports could be set up with 350 kbit/s each.)

For connections with lower bandwidth (e.g., 64 kbit/s) and fewer users, a single port per connection is sufficient. For higher bandwidth (e.g., 1 Mbit/s) and many users, several ports would be advisable.

The optimal bandwidth setting for each ThinPrint port is based on different criteria:

- Available bandwidth
- (Terminal-)session load
- Frequency and volume of printing
- Priority for print data

It is not possible to give an exact recommendation for each individual case because the specific conditions vary too greatly. Because the bandwidth setting – on Windows servers – can be changed easily in the MMC (or with Management Center), the best thing is just to try out different settings; if you don't know where to start, try, for example, half of the available bandwidth.

If a system has individual users, each with their own connection (e.g., home user), an extra port for each user is not necessary. Printers of several users can be grouped to a single port, or port pool, intelligently (i.e., several users who are given the same amount of bandwidth).

⁴ The selected bandwidth is only used, though, when something is actually being printed. After printing, the bandwidth is again free. If in this example data is printed simultaneously over two ports, a total of 600 kbit/s is used for printing. The remaining 300 kbit/s are free for other traffic.

Sample scenarios

Remote printing in a corporate network with branch offices

Situation Your company has:

- Windows terminal servers
- 10 home users with 64 kbit/s ISDN and local printers
- 2 small branch offices, each with 128 kbit/s, each with 5 simultaneously working users, each with a local printer
- 1 large branch office with 2 Mbit/s, 75 users, each with a local printer, plus 2 network printers

Infrequent, small to medium sized print jobs are printed over the local printers; many and large print jobs are printed over the network printers. The sessions of all clients are often slower during printing.

Goal ■ Bandwidth control and compression improve session performance

Configuration For both small offices (small to medium sized print jobs):

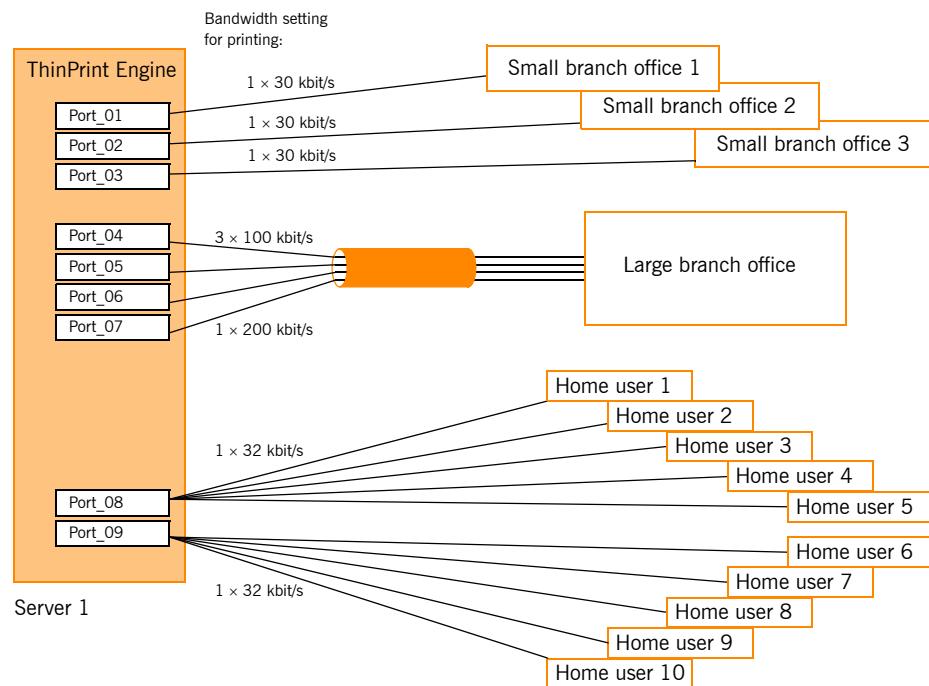
- 1 ThinPrint port per each office, bandwidth 30 kbit/s for each port

For the large office:

- 3 ports, each with 100 kbit/s, one port each for the printers for 25 people
- 1 port with 200 kbit/s for the network printers

For the home users:

- 2 ports with 32 kbit/s, one port each for the printers for 5 people



Illus. 5 Example of port assignment

Illus. 5 clarifies the concept of assigning ports to connections. Different variations to this concept are also shown:

- One port per connection (small office)
- Several ports per connection (large office)
- Shared use of a port from several similar, less frequent connections (home user)

Driver Free Printing in a LAN

Situation Your company has:

- A LAN with 6 terminal servers (load balanced) and 300 users, printers mainly local to the clients, individual network printers which are also accessible from client work stations

Goal ■ The terminal servers should be freed of printer drivers – Driver Free Printing –; bandwidth control is not important.

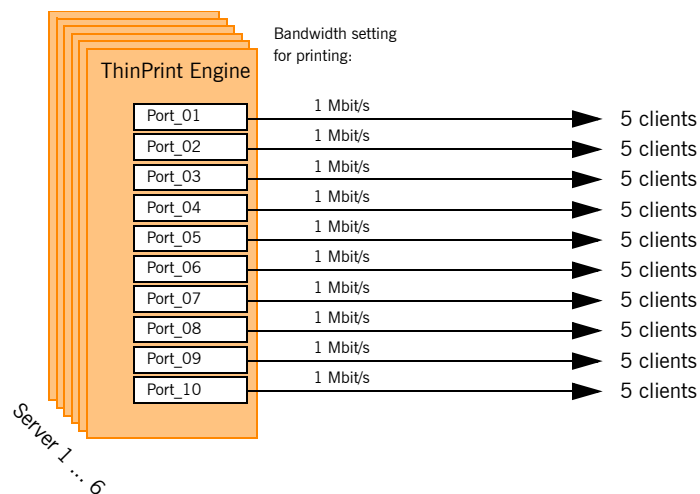
Configuration Configure each terminal server with:

- 10 ThinPrint ports, each with a ThinPrint Output Gateway (“TPOG1” to “TPOG10”); the ports are set with a maximum bandwidth of 1 Mbit/s.

The users' printers should be divided evenly between ports. There are two ways to do this:

- a) Using permissions for server printer objects, only specific printers are made available for specific users
- b) AutoConnect is run: printer templates are made out of the ThinPrint Output Gateways (_#TPOG1..._#TPOG10). Assign the same number of users (here: 30) to each template, using Dynamic Printer Matrix or Map Additional Printers.

At login AutoConnect is run automatically with a script; printers are then connected to the respective ThinPrint Output Gateway and thus the relevant ThinPrint port.



Illus. 6 average number of clients per port – under the assumption that the 30 clients are evenly distributed with the same class names across 6 identical servers with load balancing

Appendix

Customer service and technical support

www.thinprint.com/ → SUPPORT & SERVICES
support@team.cortado.com

Additional sources

Further information about ThinPrint can be downloaded from our website.

Manuals The following manuals (amongst others) are available at
www.thinprint.com/ → PRODUCTS → OVERVIEW → <product name>:

- ThinPrint Application Server Engine
- ThinPrint Server Engine
- ThinPrint RDP Engine
- ThinPrint Desktop Engine
- ThinPrint Client user manuals

White papers The following white papers (amongst others) are available at www.thinprint.com/
→ SUPPORT → WHITE PAPER DOWNLOAD:

- ThinPrint addressing
- Licensing
- Support information