

## **.print Engine AS/400**

Print management for host computers under OS/400  
(Version 1.2)

# Manual

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## Introduction

### Tips for using this manual

The following conventions should help make using this manual easier. The different typefaces and symbols represent recurring actions and types of text.

**Tip!**

Important tip, explanation, exception

SMALL CAPS

Menu, command, dialog panel, option

*Italic* "Name"

Proper name, emphasis, variable

Courier

Keyboard input

→

Consecutive menu or command

■

Enumeration, head note

**Example**

Example

–

Procedural steps

1.

2.

3.

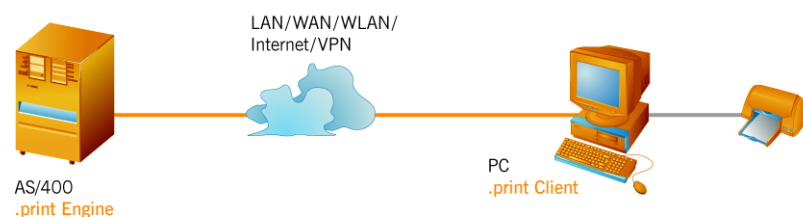
[Page 5](#)

Links

[www.thinprint.com](http://www.thinprint.com)

### What is ThinPrint .print?

ThinPrint .print is a pure software solution and consists of a server and a client component – the **.print Engine** and the **.print Client** (Illus. 1).



**Illus. 1** ThinPrint .print server and client components

#### Server component

The .print Engine server component is the actual core of the ThinPrint .print framework. The .print Engine performs three main functions:

- Bandwidth control for sending print jobs
- Print data compression (lossless) and streaming
- Print data encryption

The .print Engine can be run on machines with OS/400 (version 4.2 or later). It enables limitation of the transfer rate of print data so that other applications can continue to function without problem (“bandwidth control”). Furthermore, the print data is compressed with no loss of quality and sent to the .print Client in small packets (streaming).

Streaming print data has the advantage that the print device can begin printing as soon as it has received the first packet of print data while the .print Client receives the rest of the file. Furthermore, streaming enables even end devices with minimal resources to receive and forward large print jobs.

### Client component

On the client side, .print Client is responsible for receiving print data, decompressing and decrypting it, and sending it to the print device. Many .print Clients are available for different end devices and areas of deployment: for Linux, Solaris, and Java; for all Windows versions including Windows CE, Windows Mobile (PocketPC and Smartphone); for DOS and ActiveX; as well as for print servers (print boxes) and network printers with their own network cards.

.print Clients can be downloaded from ThinPrint's website ([Page 14](#)). It also includes devices which are already embedded with .print Clients. If you require a .print Client that is not listed on the website, please send a mail to [info@thinprint.com](mailto:info@thinprint.com).

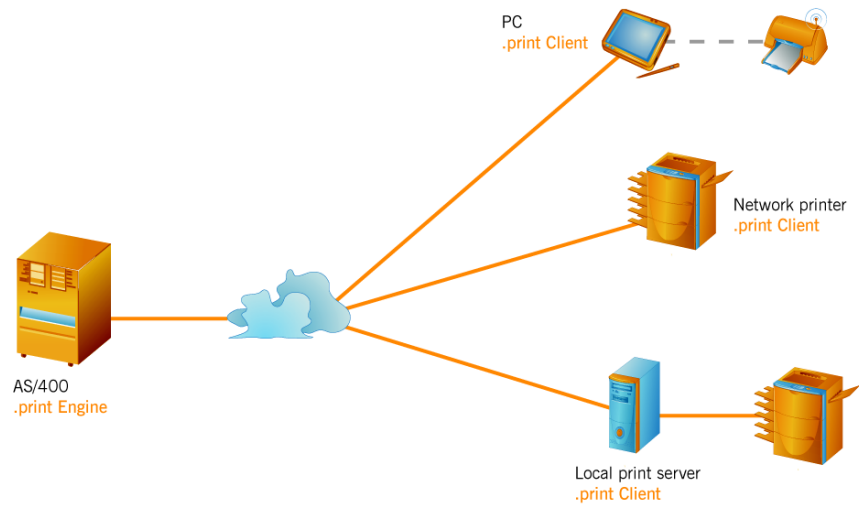
### Software

For downloads see [Page 14](#). If your .print Engine is more than one year old, you also require a current license key for product updates. This key can be purchased inexpensively as a so-called **update subscription**. For more information, please contact your dealer or [info@thinprint.com](mailto:info@thinprint.com).

## Scenario

Under OS/400, .print Engine enables computers to compress, stream, and encrypt print data across limited bandwidth to various types of .print Clients (Illus. 2).

If there are only network printers in use on the client side and a local print server is available for them, then the .print Client only needs to be installed on the local print server and not on each end device. The local print server can also receive all print jobs for all printers connected to PCs (or terminals), decompress them, and then forward them to the end devices (= .print Client Gateway).



Illus. 2 .print Engine on an AS/400 machine and various .print Clients (example)

## Installation

### Technical restrictions

#### Operating system requirements

.print Engine AS/400 runs on OS/400 version V4R4M0 or later.

#### Hardware requirements

.print Engine AS/400 is designed for installation on IBM AS/400 or compatible machines running a supported operating system. Installation requires around 500 KB disk space for the program library. The product is delivered on CD and can be installed either via a CD-ROM drive on an AS/400 or via a client PC with a CD-ROM drive and an FTP connection to the AS/400.

#### Administrator permissions

Installation and configuration of .print Engine AS/400 requires a user to log on with \*IOSYSCFG special authority. This can be the AS/400 (QSECOFR) security administrator or a specifically defined administrator user profile. Further information on the \*IOSYSCFG special authority is found in the relevant AS/400/iSeries documentation.

#### .print Clients

##### Supported .print Clients

- Linux, Solaris
- Java (e.g.: Mac OS X, OS/2, and Unix)
- Windows NT/XP/2000/2003; XP: Service Pack 1 or later
- Windows NT/XP/2000/2003 as a service; XP: Service Pack 1 or later
- Windows 9x/ME
- Windows CE
- MS-DOS
- Windows 3.11

## Safety warning

All ThinPrint products are pure software solutions. For safety warnings for your hardware, please consult the technical documentation provided by the respective manufacturer of each hardware device and component.

## Installing .print Engine under OS/400

### Alternative 1: FTP installation

1. If not already on the system, add library (CRTLIB LIB(mylib)).
2. Allocate save file THINP400:  
(CRTSAVF FILE(mylib/THINP400))
3. File transfer via FTP
4. Restore the installation library:

**AS/400:**  
CRTSAVF mylib/THINP400

**PC:**

**Syntax**

```
ftp <Internet-Address>  
<Enter user name>  
<Enter password>  
cd <AS400-library>  
binary  
put <pc-file> <as400-file.mbr>  
quit
```

**Example entries**

```
ftp 192.168.0.100  
root  
pass  
cd mylib  
binary  
put thinp400.savf thinp400  
quit
```

**AS/400:**  
RSTLIB SAVLIB(THINP400) DEV(\*SAVF) SAVF(mylib/THINP400) RSTLIB(instlib)

### Alternative 2: CD installation

1. Insert the CD
2. Restore the installation library:

RSTLIB SAVLIB(THINP400) DEV(OPT01) OPTFILE(XPSTAPE) RSTLIB(instlib)

## Access privileges for .print Engine AS/400

The **THINP400** driver uses published APIs to access the spool files. The program must therefore be given sufficient privileges to do so. The level of privilege required can be taken from the "System API Reference Handbook". Look for the **QSPOPNSP API**.

To be sure the driver program is authorized to process all spool files, the program has been set to use the user profile of the program user:

USRPRF(\*OWNER)

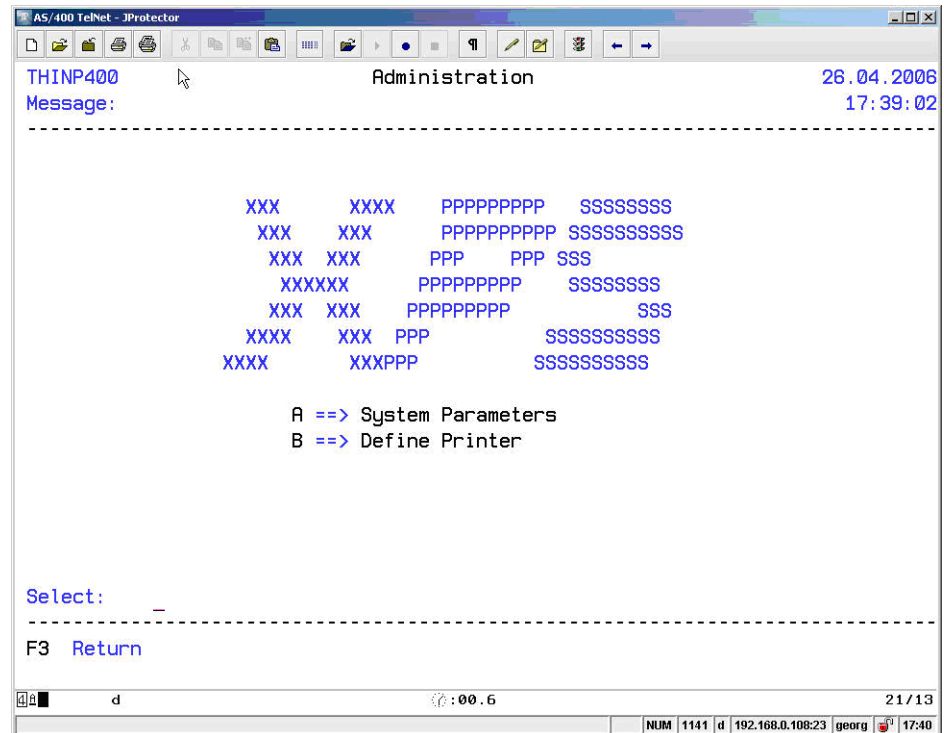
This user should have sufficient authorizations; e.g., QSYS.

## Administration

ThinPrint/400 online administration can be started with the following command:

```
CALL PGM(xpslib/XPSADMIN)
```

The following menu is available for selecting the functions of the ThinPrint/400 online administration:



The administration menu offers the following functions:

- SYSTEM PARAMETERS
- PRINTER DEFINITIONS

### Function key assignment

F3	Quit the administrator transaction
----	------------------------------------

### Description of input fields

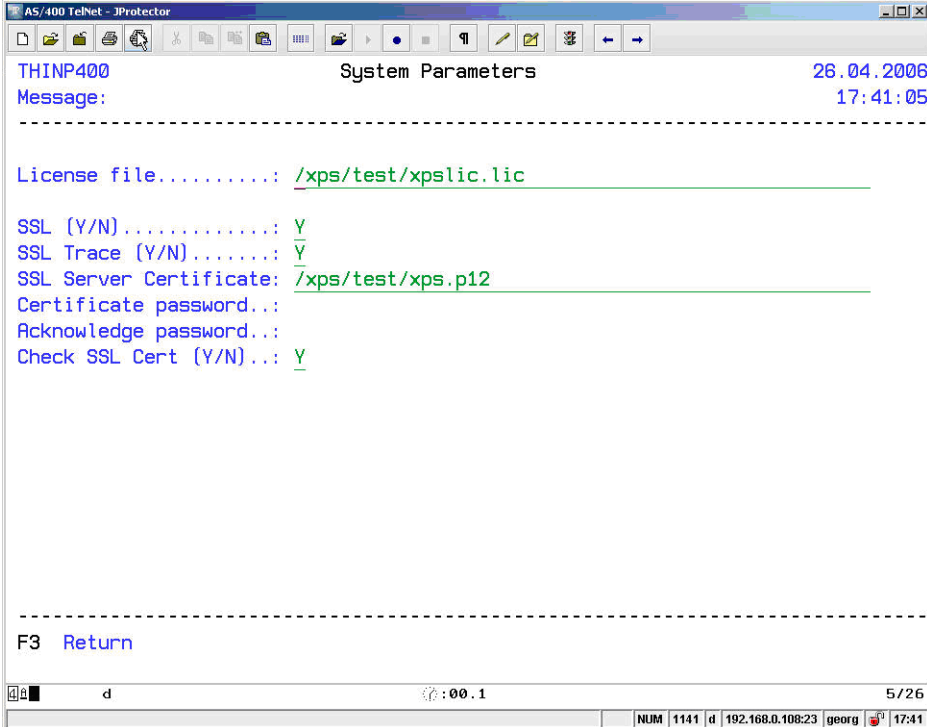
SELECT

Enter a letter to start the desired function.

## “System Parameters” function

The save location of the license file is specified here. It is also possible to specify whether SSL encryption is to be applied to print data. All changes made here take effect immediately.

Selection of this menu option branches into the overview of previously defined VTAM printer entries.



```
AS/400 TelNet - JProtector
THINP400          System Parameters          26.04.2006
Message:         17:41:05
-----
License file.....: /xps/test/xpslic.lic
SSL (Y/N).....: Y
SSL Trace (Y/N).....: Y
SSL Server Certificate: /xps/test/xps.p12
Certificate password..:
Acknowledge password..:
Check SSL Cert (Y/N)..: Y
-----
F3 Return
-----
d                               :00.1          5/26
NUM 1141 d 192.168.0.108:23 georg 17:41
```

### Function key assignment

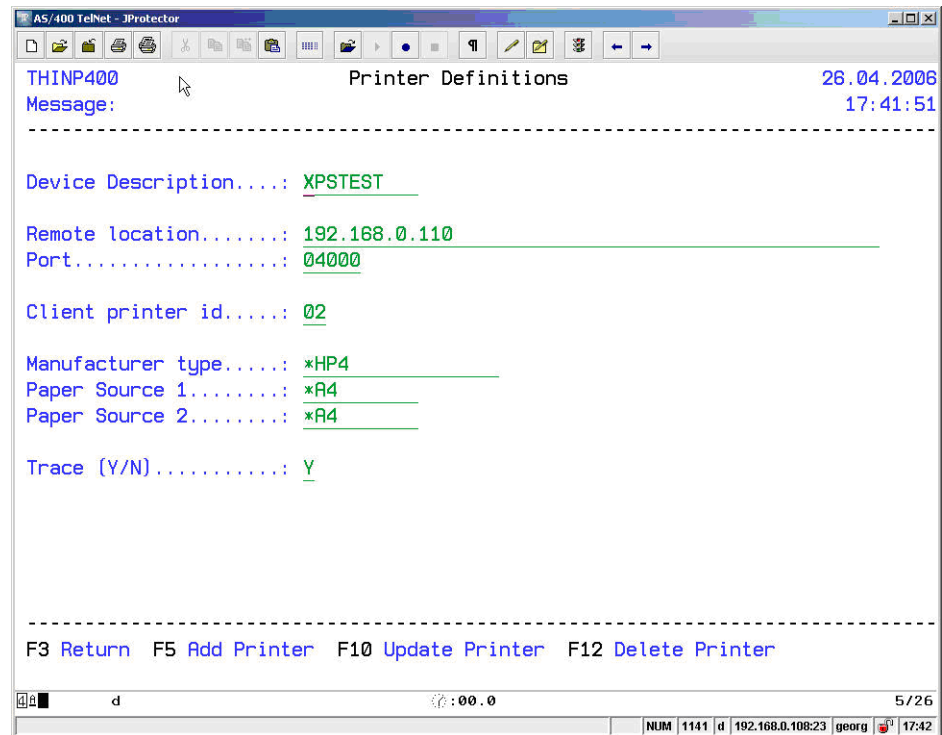
F3	Return to administrator menu
----	------------------------------

### Description of input fields

Parameter	Description
License file	Specifies the save location of the license file for .print Engine AS/400. This file must be loaded as binary to the AS/400-IFS file system.
SSL (Y/N)	Enter SSL=Y to establish an SSL/TLS-encrypted printer session. If yes, the <b>SSL Server Certificate</b> and <b>Certificate password</b> parameters must be given valid values (below). Also note that SSL encryption requires at least one .print Client in version 6.2.
SSL Trace (Y/N)	Enter SSLTrace=Y to list the program process sequence of an SSL connection for analysis.
SSL Server Certificate	Enter the save location of the server certificate. This file must be loaded as binary to the AS/400 IFS file system. Creating server certificates is described in the ThinPrint white paper, "Creating SSL/TLS certificates for printing with .print" ( <a href="#">Page 14</a> ).
Certificate password	Enter the password for the server certificate. Careful: case sensitive!
Acknowledge password	Confirm the password for the server certificate.
Check SSL Cert (Y/N)	If CheckSSLCert=Y is entered, the client certificate is checked to see whether it was issued by the same certificate server as the "SSL Server Certificate" server certificate; if not, the connection will not be established.

## Creating virtual printers (Define Printer)

You should create a printer description for each .print printer. Use this description to set up the IP address and TCP port number where the .print Client is installed. This is also where you define print characteristics like printer model or page size. There is no limit to how many printer descriptions can be allocated per THINP400 driver.



Parameter	Description
Device Description	Specifies the name of the unit description
Remote Location	IP address of the .print Client
Port	TCP port number for communication with the .print Client
Client printer id	Printer ID in .print Client for targeting a specific printer
Manufacturer type	Displays manufacturer, type, and model of a printer; this value is used by the OS/400 HostPrint Transform program to determine which control characters are to be used when the spool file is converted from SCS or AFPDS to ASCII (default: *HP4).
Paper source 1	Paper format in paper tray 1; see table below for valid paper formats

Parameter	Description
Paper source 2	Paper format in paper tray 2; see table below for valid paper formats
Trace (Y/N)	Enter Trace=Y to list the program process sequence of an SSL connection for analysis. The trace output file is created with the name <b>T_devd</b> ; devd is the name of the device description.

Valid paper sizes for parameters **Paper source 1** and **Paper source 2**:

*LETTER	Letter (8.5 x 11 inch)
*LEGAL	Legal (8.5 x 14 inch)
*LEDGER	Ledger (11 x 17 inch)
*EXECUTIVE	Executive (7.25 x 10.5 inch)
*A3	A3 (297 x 420 mm)
*A4	A4 (210 x 297 mm)
*A5	A5 (148 x 210 mm)
*B4	B4 (257 x 364 mm)
*B5	B5 (182 x 257 mm)
*CONT80	Continuous (8.0 inch)
*CONT132	Continuous (13.2 inch)
*NONE	No paper source specified

## Statistics

At time of installation, the file "statistic" was created in the ThinP400 library. This file is used to register the print jobs, compression ratios, and compression savings. The following shows an example of the file's contents.

ThinPrint compression statistics

```
-----
```

Total:	KB before:	17814	KB after:	2216	Ratio:	87.56%	
-----							
Printer	Spoolfile	Jobname	User	JobNr	Bytes before/after compress	Ratio	
TPRINT	THINP400	QPADEV0002	GEORG	031811	1536512	181939	88.16%
TPRINT	QPJOBLOG	SCPF	QSYS	031688	85996	4455	94.82%
TPRINT	QPJOBLOG	QZRCRVS	QUSER	031675	56281	3248	94.23%
TPRINT	QPJOBLOG	QSYSARB	QSYS	031520	26912	2302	91.45%
TPRINT	QPJOBLOG	QPWFSEVSD	QUSER	031607	29179	2317	92.06%
TPRINT	QPJOBLOG	QPWFSEVSD	QUSER	031607	29179	2333	92.00%
TPRINT	QPSRVDMP	TPRINT	QSPLJOB	031816	141691	27154	80.84%

## Starting and stopping

### Starting .print Engine AS/400

A virtual printer is started using the following command:

```
STRPRTWTR DEV(TPRINT)
```

This command assigns a printer to an output queue. Executing this command sends spool files in the output queue to the printer.

### Stopping .print Engine AS/400

Stop a virtual printer using the following command:

```
ENDWTR WTR(TPRINT) OPTION(*IMMED)
```

The spool output program will be stopped and the assigned device freed for system use.

## Appendix

### Customer service and technical support

*Customer Service* [www.thinprint.com/](http://www.thinprint.com/) → SUPPORT  
[support@thinprint.com](mailto:support@thinprint.com)

*XPS website* [www.xps-software.de](http://www.xps-software.de)

### Additional sources

Further information about ThinPrint .print can be downloaded from our website.

*Manuals* At [www.thinprint.com/](http://www.thinprint.com/) → PRODUCTS → OVERVIEW → .PRINT ENGINE AS/400 | SYSTEM I → MANUALS you will find manuals for the various .print Clients.

*White papers* At [www.thinprint.com/](http://www.thinprint.com/) → PRODUCTS → OVERVIEW → .PRINT ENGINE AS/400 | SYSTEM I → WHITE PAPERS you will find a few additional documents (white papers) on “.print Engine AS/400”, including:

- Creating SSL/TLS certificates for printing with .print
- IAPS ThinPrint as a .print Client Gateway
- SEH TPG60 as a .print Client Gateway
- SEH ISD300 as a .print Client Gateway
- Intermate 101 as a .print Client Gateway
- Windows machine as a .print Client Gateway

*Thin clients and gateways* ■ Thin Clients with embedded .print Client as well as ThinPrint gateway appliances can be found at [www.thinprint.com/](http://www.thinprint.com/) → PRODUCTS → OVERVIEW → .PRINT SERVER ENGINE → SUPPORTED ENVIRONMENTS → SUPPORTED DEVICES.

*Downloads* ■ Download the .print Engine: [www.thinprint.com/](http://www.thinprint.com/) → PRODUCTS → OVERVIEW → .PRINT ENGINE AS/400 | SYSTEM I → DEMO VERSION  
 ■ Download the .print Client Windows:  
[www.thinprint.com/](http://www.thinprint.com/) → SUPPORT → THINPRINT .PRINT CLIENTS & TOOLS

### Abbreviations

<b>API</b>	Application Programming Interface
<b>CA</b>	Certification Authority (computer on which SSL/TLS certificates are created; e.g., with OpenSSL or a Microsoft certificate server)
<b>CD</b>	Compact Disk
<b>COM</b>	Component Object Model
<b>DOS</b>	(Microsoft) Disk Operating System (MS-DOS)

<b>FTP</b>	File Transfer Protocol
<b>ID</b>	Identification (number)
<b>IP</b>	Internet Protocol (see TCP/IP)
<b>JPEG</b>	Joint Photographic Experts Group
<b>LAN</b>	Local Area Network
<b>LPD</b>	Line Printer Daemon
<b>LPR</b>	Line Printer Remote
<b>NAT</b>	Network Address Translation
<b>OS</b>	Operating System
<b>PC</b>	Personal Computer (= workstation)
<b>PCL</b>	Printer Command Language
<b>PDA</b>	Personal Digital Assistant
<b>RAW</b>	Standard Print Data Type
<b>RFC</b>	Request for Comments; series of documents, begun in 1969, which describe the Internet Protocol Suite and relevant experiments
<b>ROM</b>	Read-Only Memory
<b>SSL</b>	Secure Socket Layer
<b>TCP/IP</b>	Transport Control Protocol/Internet Protocol
<b>TLS</b>	Transport Layer Security
<b>TP</b>	ThinPrint
<b>ULA</b>	User License Agreement
<b>WAN</b>	Wide Area Network

## .print Engine feature comparison

	.print Application Server Engine	.print RDP Engine	.print Server Engine	.print Engine for VMware View	.print Desktop Engine	.print Engine AS/400 + Host
<b>Recommended server environments</b>						
• Terminal servers with Windows Server 2003/2008 (x64) with/without Citrix XenApp	●	●	–	–	–	–
• Other Windows 2003/2008 (x64) servers as well as environments with central dedicated print servers	–	–	●	● <sup>a</sup>	–	–
• PCs with Windows XP Prof. (x64)	–	–	–	–	●	–
• Virtual Windows XP (x64) desktops (e.g. VMware or Citrix XenServer)	–	–	–	–	●	–
• Linux, Solaris, AIX, or HP-UX, OS/400, MVS, OS/390, or z/OS	–	–	–	–	–	●
<b>Supported client environments</b>						
• Windows Vista, Vista x64, XP, XP x64, 2003, 2003 x64, 2000, NT 4, 9x, ME	●	●	●	●	●	●
• Linux, Java, Windows CE, 3.x, MS-DOS	●	● <sup>b</sup>	●	●	● <sup>b</sup>	●
<b>Plug-and-play installation</b>						
	●	●	–	–	●	–
<b>User-based licensing</b>						
	●	–	●	–	–	–
<b>MMC configuration</b>						
	●	–	●	●	–	–
<b>SSL/TLS encryption</b>						
	●	● <sup>c</sup>	●	–	● <sup>c</sup>	●
<b>Driver Free Printing</b>						
	●	●	●	●	●	–
<b>Native printing</b>						
	●	●	●	●	●	●
<b>Multiple printers per user</b>						
	●	●	●	●	–	●
<b>Bandwidth control</b>						
	●	–	●	●	–	●
<b>Network protocols</b>						
• TCP/IP (sockets)	●	–	●	●	–	●
• ICA	●	–	● <sup>d</sup>	–	–	–
• RDP	●	●	● <sup>d</sup>	● <sup>d</sup>	●	–
• LPR/LPD	●	–	●	●	–	–
<b>Supported .print components</b>						
• AutoConnect	●	●	●	●	●	–
• Virtual Channel Gateway	–	–	●	●	–	–
• Printer Virtualization Layer (V-Layer)	–	–	●	●	–	–
• Tracking Service	●	–	●	–	–	–
• Connected Gateway	●	–	●	–	–	–
• Queue Manager	●	–	●	–	–	–
• Host Integration Service	●	–	–	–	–	–

a Central print servers in VMware View environments only

b Linux and Windows CE only

c Per encryption of RDP connection only

d Via .print Virtual Channel Gateway