ExcelliPrint 5.0

IPDS printing and archiving for IBM i and z/OS

Administrator's Guide and Support Reference

Version 5.0 · Brooks Internet Software, Inc.

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Part I · Administrator's Guide

1 Introduction

ExcelliPrint runs on a Windows computer and takes the place of an IPDS printer. IBM i and z/OS systems send it print jobs over TCP/IP exactly as they would to an IBM printer, and ExcelliPrint turns each job into a file or a printout:

- saved to a folder, local or on the network, as PDF, PDF/A, TIFF, PostScript or PCL6;
- printed on any Windows printer, or sent straight to a printer as PostScript, PCL6 or PDF;
- emailed as an attachment.

To the host, ExcelliPrint is an IBM 4028, 3812 or 3816 IPDS printer. It answers the host's questions about paper, trays and fonts, takes part in the host's error recovery, and reports each page as printed, so the host's print writer and spooled-file handling work as they do with a real printer.

1.1 How a job flows

Each **queue** you set up in ExcelliPrint listens on its own TCP port. A host printer device points at that port. When the host sends a job:

1. The queue receives the IPDS data and interprets it: text, fonts, images, graphics, bar codes, overlays and page segments.
2. The pages are drawn in the queue's **output format**.
3. The result goes to the queue's **destination**: a folder, a printer or an email recipient.
4. The job and its outcome are listed in the ExcelliPrint window, with the job's name, user and spooled-file details from the host.

1.2 What's new in version 5.0

- **A Windows program instead of a web interface.** Queues, jobs and the log are in one window. There is no web server, browser login or SSL certificate to manage.
- **One drawing engine for every format.** PDF, TIFF, PostScript, PCL6 and printed output are drawn by the same engine, so a job looks the same in every format.
- **New formats and settings:** PDF/A-2b for archiving, PDF passwords and permissions, PostScript level 2 or 3, PCL6 (PCL XL), TIFF resolution and color, and tray and output-bin mapping for printers.
- **Windows Driver** output prints through any printer's own Windows driver, following the host's trays, output bins, duplex and copies.
- **Credentials without impersonation.** Folders and printers on other computers are reached as a user you store in ExcelliPrint; passwords are protected by Windows.
- **Font mapping.** Choose the TrueType font for each IPDS typeface. OCR-A, OCR-B and a Letter Gothic font are included.

- **Clear job outcomes.** A job that can't be finished is marked failed, with the reason in the log; partial output is never delivered.
- **Backup and restore.** File > Backup Database saves a copy of the configuration and history while ExcelliPrint runs, and Restore Database puts one back (4.6).
- **Diagnostics and job details.** Settings > Diagnostics switches on diagnostic logging without a restart (13.6), and Job > Properties shows a job's details as the host sent them (4.2).

2 Installation

2.1 Requirements

Item	Requirement
Windows	Windows 10 or 11, or Windows Server 2016 or later; 64-bit (x64) only
Rights	An administrator account to install. ExcelliPrint runs as a Windows service; no one needs to be logged in for it to receive jobs.
Network	TCP/IP between the host and the ExcelliPrint computer. Setup adds the Windows Firewall rule the queues need (2.4).
Memory and disk	As for Windows. Large jobs are kept in a work folder while they're processed, so allow free disk space of a few times your largest job.
IBM i	Print Services Facility (PSF) for IBM i, which drives IPDS printers
z/OS	Print Services Facility (PSF) for z/OS with TCP/IP printer support

2.2 Installing

1. Log on to Windows as an administrator and run the setup program.
2. Read the license agreement; to continue, accept it.
3. Choose the installation folder, or keep the default (C:\Program Files\Brooks Internet Software\XCP).
4. Setup installs the program, registers and starts the ExcelliPrint service, starts the trial license and adds a Windows Firewall rule for the queues (2.4). When it finishes, you can open ExcelliPrint straight away.

Setup adds these to the Start menu: ExcelliPrint, ExcelliPrint Manual, Brooks License Manager, ExcelliPrint Online and ExcelliPrint Online FAQ.

2.3 Upgrading

From an earlier 5.x version. Run the new setup program over the installed version. Your queues, jobs, stored users and settings are kept: setup copies the database aside first (xcp_*date*.db, see chapter 11) and updates it for the new version.

From ExcelliPrint 4.0. Version 5.0 is a new program and doesn't read 4.0's configuration, so set up your queues again. Note each 4.0 printer's port, emulation, code page, paper sizes, destination and format first. Some 4.0 features aren't in 5.0: the web interface and its login accounts, iSeries device and spooled-file management, the JPEG, GIF, text and PCL5 formats (for a PCL printer, use PCL6 or Windows Driver), and margins and watermarks.

4.0 and 5.0 can be installed on the same computer, but not listening on the same ports. Stop the 4.0 service (**ExcelliPrint IPDS Solution**), or give the 5.0 queues other ports, before you point a host at 5.0.

2.4 Firewall

Each queue listens on a TCP port, by default 5001, 5002 and so on. Setup adds an inbound Windows Defender Firewall rule, **ExcelliPrint queues**, that allows TCP connections to listener.exe, the program each queue runs, on every network profile, so it covers whatever ports your queues use. Upgrading leaves the rule as it is, with any changes you've made; uninstalling ExcelliPrint removes it.

IPDS has no login: anyone who can reach a queue's port could send it jobs. So each queue takes jobs only from the hosts in its **Accept jobs from** setting (5.2), and a new queue's list must be filled in before it's saved. For a second layer, which turns other computers away before they reach ExcelliPrint at all, also change the rule's Scope in Windows Defender Firewall with Advanced Security (the rule's Properties, the **Scope** tab, **Remote IP address**). With another firewall, allow listener.exe in the installation folder, or each queue's port.

2.5 Licensing

ExcelliPrint starts on a trial license. The license, or the trial, sets how many **IPDS printers** (queues) can receive jobs at once. The status is shown in the Brooks License Manager (**Help > License**); **Help > About** shows the licensed user, company and serial number.

Status	Meaning
Trial, *n* days left	Every feature works for the trial period. Every page of output is marked "ExcelliPrint Trial".
Live trial, *n* days left	A trial extended by Brooks Internet Software. Output isn't marked.
Unlocked	Licensed; the number of IPDS printers is set by your license.
Trial expired	The ExcelliPrint service doesn't start until a license is entered.

To enter a license, choose **Help > License** (or **Brooks License Manager** in the Start menu) and follow the steps there. When the license changes, the service picks it up without a restart. Queues beyond the license's printer limit don't listen until the limit allows them; the Log says which ports are waiting.

3 Quick Start

These steps take you from a new installation to a first job saved as PDF.

1. **Open ExcelliPrint** from the Start menu.
2. **Create a queue.** Choose **Queue > Create**. The new queue is given the first free port from 5001 up and code page 1140 (IBM US/Canada with the euro). Enter a **Queue Name**, such as *Archive*, and in **Accept jobs from** the IP address of the host that will print to it (see 5.2).
3. **Choose the output.** Set **Type** to *Folder* and click **Setup**. Choose the folder for the files under **Location**, set **Format** to *PDF*, and click OK. Click OK again to save the queue. It starts listening at once.
4. **Allow the port** through the firewall (see 2.4).
5. **Point a host printer at the queue:** the ExcelliPrint computer's IP address and the queue's port. On IBM i, see 9.1; on z/OS, see 9.2.
6. **Print** a spooled file to that printer. The job appears in the **Jobs** tab and its PDF in the folder. Select the job and choose **Job > Open Output** to view it.

4 The ExcelliPrint Window

The window has the queues on the left and two tabs on the right: Jobs and Log. The window shows what the service is doing; closing it doesn't stop the service or any queue. F6 moves between the queue list and the Jobs or Log list; Ctrl+Tab and Ctrl+Shift+Tab (or Ctrl+PgDn and Ctrl+PgUp) switch between Jobs and Log.

4.1 Queues

The queue list shows each queue's port, name and jobs (how many of the queue's jobs are in the Jobs list, 4.5), in port order, with an icon for its destination (Folder, Printer or Email; an IPDS Printer queue has the printer icon). Click a column heading to sort by it, and again to reverse the order; right-click the headings to show or hide columns, including Type, Status and Queue ID (the number ExcelliPrint gives a queue when it's added, which stays the same when its port changes). A green dot on a queue's icon means a host is connected to it now; point at the queue to see which one. A queue that isn't listening for jobs is grayed; point at its port to see why, for example *Not listening: the license allows 1 IPDS printer* (queues beyond the license's printer count, by port) or *the port is in use by another program*. Double-click a queue to change its settings. Select several queues with Ctrl or Shift, or all of them with Ctrl+A, to delete several at once.

4.2 Jobs

The Jobs tab lists every job received, newest first. Click a column heading to sort by it, and again to reverse the order. Its columns:

Column	Contents
ID	ExcelliPrint's number for the job, also available to file names as {record-id}
Arrived, Completed	When the job started arriving and when its output was delivered
Port, Client IP	The queue's port, and the host's address
DGB Format	The format of the job description the host sent (the IPDS "Define Group Boundary" information), which supplies the fields below; 0 if it sent none
Job Name, Job Key, User ID, Spool ID, File Name, Form, Lib Name, Output Queue	The spooled file's details as the host sent them
Format	The output file's type
Output Path	Where the output went: the file, the printer or the email address
Pages	The pages in the output

Column	Contents
Status	*processing*, *completed*, *failed* or *interrupted* (see 12.2)

Drag a column heading to move the column, or its edge to resize it; right-click the headings to show or hide columns. The layout is remembered.

Each kind of host sends different job details, so some of those columns stay empty for yours. **Settings > Host Systems** sets which hosts you use, for everyone on this computer: IBM i (AS/400) fills all eight; z/OS, MVS and VSE fill Job Name, Job Key and Form; VM fills User ID, Spool ID, File Name and Form; AIX and Windows fill none. The Jobs list leaves out the columns none of the checked hosts fill, and they drop off the right-click menu too. All four are checked to start with.

With a job selected:

- **Job > Open Output** opens its file in the program Windows uses for that type.
- **Job > Show in Folder** opens the folder with the file selected.
- **Job > Delete** removes the selected jobs from the list. Their output files are not deleted. A job still being received or processed can't be deleted until it finishes.
- **Job > Properties** shows the job in one window: its status, queue, times, pages and output, and the details the host sent, under the names its job description format uses (for IBM i, for example, Library, Output Queue, Spooled File and Job Number). Ctrl+C copies the selected lines.

4.3 Log

The Log tab shows the service's events, oldest first; while it's scrolled to the bottom, it follows new messages. They include jobs received, completed and failed, warnings, service start and stop, and license changes. A failed job's entry says why it failed. Right-click for Copy, Export Log and Purge Log. See chapter 12 for the categories.

4.4 Menus

Menu	Commands
File	Backup Database, Restore Database (4.6), Exit (closes the window; the service keeps running)
Queue	Create, Modify, Delete
Job	Open Output, Show in Folder, Delete, Properties
Settings	Font Map (chapter 8), Users (6.4), Job History (4.5), Host Systems (4.2), Diagnostics (13.6)
Help	License, Manual, Check for Updates, About ExcelliPrint

4.5 Job history

ExcelliPrint keeps the Jobs list and the Log for a few days, then removes old entries so the database stays small. Choose **Settings > Job History** to set how long, from 1 to 30 days:

Setting	What it keeps
Keep log messages for	The Log tab's messages. The default is 3 days.
Keep job history for	The Jobs tab's entries, and the queues' capture files (13.3). The default is 7 days.

The service removes older entries when it starts and every hour after that, and records what it removed in the Log as a **History** message. Output files are never deleted; only the list entries go. Jobs still being received or processed are never removed.

4.6 Backing up and restoring

File > Backup Database saves a copy of ExcelliPrint's database: the queues and their settings, stored users, the font map, the job history and the log. It can be made while ExcelliPrint runs and jobs arrive.

1. Choose **File > Backup Database**.
2. Choose where to save the copy. The suggested name has today's date, for example ExcelliPrint 2026-10-10.db.

To put a backup back:

1. Choose **File > Restore Database** and choose the backup. ExcelliPrint checks that it's an ExcelliPrint database and isn't damaged.
2. Confirm. Restoring replaces every queue, setting and stored user, the job history and the log with the backup's. The queues stop listening while it's restored; a job being received is interrupted, and the host normally sends it again.
3. When it's done, the queues in the backup start listening.

Before restoring, ExcelliPrint saves the current database in ...\XCP\backup (chapter 11), keeping the last five. The ExcelliPrint service must be running to restore.

Passwords. Stored passwords (users', email and PDF passwords) are encrypted for the computer that stored them. When a backup comes from another computer, ExcelliPrint says how many of its passwords can't be read here, and after the restore asks for each of them again. Any you skip can be entered later: a user's in Settings > Users (6.4), a queue's in its output settings. Until then, jobs that need one fail.

5 Queues

A queue is one IPDS printer as the host sees it: a port, the IBM printer it emulates, and what happens to its jobs. Create one queue for each kind of output you want: for example, one that archives invoices as PDF/A, one that prints reports on a departmental printer, and one that emails statements.

5.1 Creating, changing and deleting queues

- **Create:** Queue > Create. A new queue gets the first free port from 5001 up and code page 1140. Fill in **Accept jobs from** (5.2) before saving it.
- **Change:** select the queue and choose Queue > Modify, or double-click it. A queue reads its settings when the host connects, so changes apply from the host's next connection. With the release timers suggested in chapter 9, that's seconds after the host's last job.
- **Delete:** select one or more queues and choose Queue > Delete. The queue stops listening, and its jobs are removed from the Jobs tab. Output files are kept.

5.2 Queue settings

A change to a queue's output (its output type's settings, the format and its settings, and Make each page the size of the tray's paper) applies to the next job, even while the host stays connected; a job already being written keeps the settings it started with. The rest (Emulation, Code Page, Paper Trays, Apply font attributes, Enable capture and Accept jobs from) are the printer the host is connected to, so they apply when the host connects again: vary the printer device off and on at the host, or restart the queue's writer. Changing a queue to or from IPDS Printer is the same.

Setting	What it does
Queue Name	A name for the queue, shown in the queue list and available to file names as {queue}.
Listening Port	The TCP port the host connects to, from 1 to 65535. Each queue needs its own port, one that no other program uses; a port another queue has isn't accepted. Ports from 5001 up are customary. Changing the port keeps the queue's jobs with it; the Jobs list's Port column still shows the port each job arrived on. A host still connected to the old port is disconnected when the job it's sending ends (and right away if it's between jobs), so no job is cut off; point it at the new port. Deleting a queue does the same.
Enable capture	Saves the raw data the host sends, so a job can be reproduced for troubleshooting (see 13.3). New queues capture by default; capture files are deleted with the job history (4.5). Turn it off for a queue whose jobs shouldn't be kept in another form.

Setting	What it does
Accept jobs from	The hosts that may send this queue jobs: IPv4 addresses, such as 10.1.2.3, and ranges, such as 10.1.4.0/24 (10.1.4.0 to 10.1.4.255), separated by commas or spaces. Required: a queue never accepts every host by default. To accept any host, enter 0.0.0.0/0. Host names aren't accepted, so that a forged name lookup can't let another computer in. A connection from any other address is closed at once and logged as **Connection refused** (12.1). See also 2.4.
Output: Type	Folder, Printer or Email. Click **Setup** to choose the destination and the format (chapter 6). The line below shows the current choice. **IPDS Printer** passes the host's data through to a real IPDS printer instead, for troubleshooting (6.6); the emulation, code page and paper tray settings don't apply to it, and it always captures.
Printer Emulation	The IBM printer the host sees: IBM 4028 (the usual choice), 3812 or 3816. The host formats its jobs for that printer's capabilities; see appendix A.
Apply font attributes	Off (the default), the queue does what a real IBM laser printer does: it ignores the bold and italic a host asks for in its font list. Hosts don't always send them correctly; an AS/400 printing part of a spooled file has marked Times Roman italic, for example. Turning this on prints the styles the host asks for, such as bold or italic for a font the printer doesn't have in that style; leave it off if text then comes out bold or italic when it shouldn't. The impact printer emulations (IBM 4224 and 4230) always apply them.
Code Page	The host's default code page, used when a job doesn't name one. Choose the one your host uses, for example 37 (US/Canada), 1140 (US/Canada with the euro), 273 (Germany/Austria) or 285 (UK).
Paper Trays	The paper in each of the emulated printer's trays, as reported to the host. The host uses it to choose trays and lay out pages. Click a tray's paper to change it.
Make each page the size of the tray's paper	On, each page is the size of the paper in the tray the host selected (Paper Trays), turned the page's way, as a printer would print it. The host's logical page, the area it lays the page out on, is often a little smaller than the paper (for example 8" x 10.67" for letter), and sometimes a different size altogether: a smaller logical page leaves the rest of the sheet blank, and anything the host puts beyond the paper is cut off. Off (the default), each page is the size of the host's logical page instead, whatever that is: nothing is ever cut off, but a page can come out an unusual size, such as a few inches square for a label job. For PDF, PostScript, PCL6 and TIFF; Windows Driver prints on the tray's paper either way.

6 Output

A queue's output has a **destination** (Folder, Printer or Email) and a **format**. The IPDS Printer type (6.6) is for troubleshooting, and has neither. Choose the queue's Type and click **Setup**. The output dialog has the destination first, then the credentials for reaching it, then the format and file naming.

6.1 Folder

Setting	What it does
Location	The folder for the files: a local folder (D:\Archive\Invoices) or a network share (\\server\share\folder). A folder on a mapped drive letter is saved as its network path, because the service doesn't see the drive letters a user maps.
Credentials	The user ExcelliPrint connects as to reach a folder on another computer (see 6.4). *ExcelliPrint User* means the service's own account, which normally can't reach network shares.
Format	PDF, TIFF, PostScript or PCL6. Click **Setup** beside it for the format's settings (chapter 7).
Filename Formatting	The template for file names (see 6.5). The default is {record-id}_{file-name}.{ext}.

If a file of the same name already exists, ExcelliPrint adds -1, -2 and so on to the name rather than overwriting it. If the folder can't be written, ExcelliPrint tries again for about 45 seconds (a network folder can be briefly unavailable); if it still can't, the job is marked failed, nothing is left in the folder, and the log says why.

6.2 Printer

Setting	What it does
Location	The printer: one installed on this computer, or a shared printer (\\server\printer).
Credentials	The user ExcelliPrint connects as to reach a printer shared from another computer (see 6.4).
Format	**Windows Driver** prints through the printer's own Windows driver and works with any printer. **PostScript**, **PCL6** and **PDF** are sent to the printer as they are, bypassing the driver; choose one the printer understands (PDF needs a printer that accepts PDF directly). Click **Setup** for the format's settings. If the printer can't be opened or doesn't take the whole job, the job is marked failed, and a partly sent job is cancelled so nothing half-printed comes out.

Setting	What it does
Filename Formatting	The template for the print job's name in the Windows print queue (see 6.5).

> **Windows Driver and the service account.** The Windows Driver format uses the printer's driver as the service's user. A printer that is installed only for one Windows user can't be used: install it for the computer (an administrator adding it in Settings > Printers & scanners is enough), or use a shared printer with credentials.

6.3 Email

Setting	What it does
Format	The attachment's format: PDF, TIFF, PostScript or PCL6.
From, To	The sender's address, and the one recipient's: to send each job to several people, use a distribution list. Both can include the job's details with the variables in 6.5, for example {user-id}@example.com.
Subject, Message	The message's subject and text. Both can include the job's details with the variables in 6.5, for example Report {file-name} for {user-id}; click **Customize** beside the subject to insert them.
Attachment Name Formatting	The template for the attachment's file name (see 6.5).
SMTP Server, Port	The mail server ExcelliPrint sends through, and its port: usually 587 (submission), 465 (TLS from the start) or 25.
Login, Password	The account on the mail server, if it requires one. The password is stored encrypted, as stored users' passwords are (6.4).
Use a secure (TLS/SSL) connection	On (the default): the connection is encrypted, with TLS from the start on port 465 and STARTTLS on other ports; a server that can't encrypt is refused. Off: a plain connection, for an internal mail relay without TLS. Don't send a login and password over a plain connection.
Allow self-signed certificates	Accepts a mail server whose certificate isn't issued by a trusted authority, such as an internal server. Use it only for a server you trust.

If the mail server doesn't accept the message, the job is marked failed, with the server's reply in the log. Many mail servers reject large messages (10 MB is a common limit). For long jobs, PDF is usually the smallest format.

Microsoft 365 (Exchange Online). ExcelliPrint signs in to the mail server with a user name and password (SMTP AUTH), which Microsoft 365 turns off by default. Send through a mail relay or an SMTP server of your own, or have your Microsoft 365 administrator allow SMTP AUTH for the sending mailbox.

6.4 Credentials for shares and shared printers

ExcelliPrint runs as a Windows service, which normally can't reach folders and printers on other computers. Give a queue a **credential**, a Windows user with access, and ExcelliPrint connects to the share or the printer's server as that user before it delivers each job.

1. In the queue's Folder or Printer output dialog, enter the **Location** first.
2. Click **Add User**. Enter the **Domain**, **User name** and **Password** twice. For a user of the other computer rather than a domain user, enter that computer's name as the domain.
3. Click **Test access** to check that the user can reach the location, then OK.
4. Choose the user under **Credentials**. Users you've added are listed for every queue.

Passwords are stored encrypted with Windows' data protection for this computer, and can't be read on another computer or from a copy of the database.

Settings > Users lists the stored users and the queues that use each. Select one and click **Change Password**, for example after its password changed in Windows, or **Remove**; a removed user's queues connect as the service's account again. **Add** stores a user without testing it against a location.

> **One user per server.** Windows allows only one set of credentials per server at a time. If two queues reach folders or printers on the same server, give them the same user, or the second fails with "multiple connections ... by the same user" (error 1219). The same applies to a connection someone has made to that server in the service's session.

6.5 File name templates

A template builds each file's name, print job name or attachment name from the job's details, and the email's From, To, Subject and Message use the same variables. Click Customize to build one: choose a variable and click Insert; the Example shows the result. Text outside braces is used as written.

Variable	Value	Variable	Value
{record-id}	ExcelliPrint's job number	{YYYY} {YY}	Year, 4 or 2 digits
{job-name}	Job name	{MM} {DD}	Month, day
{job-id}	Job number or key	{HH} {min} {SS}	Hour, minute, second
{user-id}	User who created the spooled file	{MS}	Milliseconds
{file-name}	Spooled file name	{month}	Month name
{spool-id}	Spooled file number	{weekday}	Weekday name
{form}	Form type	{queue}	Queue name

Variable	Value	Variable	Value
{lib-name}	Library name	{port}	Queue's port
{outq}	Host output queue	{sequence}	Job sequence number
{ext}	The format's extension		

The job details come from the host. IBM i sends them when the printer device's PSF configuration allows; z/OS sends what PSF is configured to send. A detail the host didn't send is left empty, so include {record-id} or a time in templates to keep names unique.

6.6 IPDS Printer (passthrough, for troubleshooting)

When ExcelliPrint's output differs from what your IPDS printer prints, support needs to see what the host sends that printer, and what the printer answers. An IPDS Printer queue passes the host's connection through to the printer unchanged, so the job prints there as usual, and captures both sides of the conversation.

1. Add a queue (or change a spare one) with Type **IPDS Printer**, and click **Setup**.
2. Enter the printer's host name or IP address, and its IPDS port (usually 5001). **Test Connection** opens a session with the printer from this computer, as a host does, and checks that it answers as an IPDS printer (nothing prints). It tells you if something else answers on that port, such as a printer's raw printing port (usually 9100), and OK then asks before saving that address. A printer that is busy with another host refuses connections, so test while the host isn't using it.
3. On the host, point a printer device at ExcelliPrint and the queue's port, instead of at the printer, and print the job.
4. Send support the capture (13.3), whose name ends in .passthrough.ebc, with a description of how the printed output differs.
5. Point the host back at the printer, and delete the queue or set it back to another type.

Nothing is converted, so the emulation, code page and paper tray settings don't apply, and no job appears in the Jobs tab. The Log shows each connection (Passthrough), and why one failed (Passthrough error); if the printer can't be reached, the host's connection is closed and the host tries again, as it would with a printer that's off. The queue counts toward the license's IPDS printers like any other.

7 Formats

Every format is drawn by the same engine, so text, images, bar codes and overlays are placed identically in all of them. The formats with settings have a **Setup** button beside the Format list.

7.1 PDF

PDF is the usual choice for archiving and email. Text is real text that can be searched and copied. Fonts are embedded where needed; the standard Courier, Times and Helvetica are used as PDF's own standard fonts unless PDF/A requires embedding.

Setting	What it does
PDF/A-2b, for archives	Writes PDF/A-2b (ISO 19005-2), the archiving standard: every font embedded, colors defined, nothing that depends on outside resources. Courier, Times and Helvetica are embedded as Windows' Courier New, Times New Roman and Arial. A PDF/A file can't have passwords.
Password to open	Required to open the file.
Owner password	Lifts the restrictions below. Without an owner password, nobody can lift them.
Allow printing, copying text and images, changes	What the file allows without the owner password.

> OCR-A characters that the OCR-A standard doesn't define (accented letters, for example) are printed as the plain letter in PDF/A, so the file stays within the font's character set.

7.2 TIFF

One multi-page TIFF file per job.

Setting	What it does
Resolution	72, 100, 150, 200, 300 (the default), 400 or 600 dpi
Color	**Color** (the default), **Grayscale**, or **Black and white**, compressed with CCITT Group 4, the smallest and the usual choice for document imaging
BigTIFF	A TIFF file can't exceed 4 GB. With BigTIFF on, larger files are written in the BigTIFF variant, which not every program opens. With it off, a job that would exceed 4 GB fails, with the page it reached in the log; use a lower resolution, grayscale or black and white instead.

7.3 PostScript

For PostScript printers, or for files to be converted or printed later.

Setting	What it does
Language Level	**Level 3** (the default) makes smaller files; **Level 2** is for printers older than about 1998.
Paper Trays	The printer's tray for each tray the host can select: its *MediaPosition* number, as the printer's PPD file gives it. *The printer chooses* leaves it to the printer, by the paper the page needs.
Output Bins	The printer's name for each output bin the host can select (its *OutputType*, from the PPD file). Empty: the printer's own choice.
PJL Header	Adds a PJL header with the job's name and user, which many printers show on their panel and in their job log. Extra PJL lines can be added; {job-name} and {user} are filled in.

The host's duplex, tray, output bin and copies requests are carried into the file for each page.

7.4 PCL6 (PCL XL)

For PCL6 printers, which include most office laser printers. Text is placed exactly as in PDF; Courier, Arial and Times New Roman are the printer's own fonts, and other fonts are sent to the printer as needed.

Setting	What it does
Paper Trays	The printer's tray for each tray the host can select: Auto select, Manual feed, Tray 1 (multi-purpose), Tray 2, Tray 3, Tray 4, the envelope feeder, or further trays. *The printer chooses*: by the paper the page needs.
Output Bins	The printer's bin for each bin the host can select: face down (top bin), face up (rear bin), job offset, or bins 1 to 8 of a mailbox or stacker.
PJL Header	As for PostScript. A PCL6 job always starts with a PJL line that selects the language; this adds the job's name and user.

Landscape pages are printed in landscape orientation on portrait paper, as a printer driver would print them. The host's duplex and copies requests are followed.

7.5 Windows Driver

The Windows Driver format draws each page through the printer's own driver, so it works with any printer Windows can print to: laser, inkjet, label and virtual printers such as Microsoft Print to PDF. Its Setup button shows:

Setting	What it does
Input Trays	The printer's paper source for each tray the host can select, chosen from the sources the driver lists. *Automatic* (the default) lets the driver choose. If the printer has only one source, there is nothing to set. If you change the queue's printer, the mapping is cleared.
Output Bins	The printer's output bin for each of the host's output bins, from the bins the driver lists.
New Print Jobs	Many drivers take duplex and the output bin only at the start of a print job. With this on (the default), ExcelliPrint starts a new Windows print job when the host changes duplex or the output bin, so every page is printed as the host asked; another job may print between the parts. With it off, the job stays together, with the duplex and bin it started with.

Copies are printed by ExcelliPrint, so they work the same with every driver.

8 Fonts

IPDS jobs name fonts by IBM typeface; ExcelliPrint draws them with TrueType fonts. By default:

IBM typefaces	Drawn with
Courier, Pica, Prestige, Elite, and other fixed-pitch faces	Courier (Courier New in printed and PDF/A output)
Times, Roman and other serif faces (Sonoran Serif, Century, Palatino, ...)	Times (Times New Roman)
Helvetica, Gothic and other sans-serif faces (Sonoran Sans Serif, Futura, ...)	Helvetica (Arial)
Letter Gothic	The included Letter Gothic font (IBM Plex Mono)
OCR-A, OCR-B	The included OCR-A and OCR-B fonts

Fonts the host downloads to the printer (raster or outline) are used as sent.

OCR fonts are printed at the size their standard sets: if the requested size would make the characters wider than the pitch, they're made smaller all round rather than squeezed, so scanners can read them.

8.1 Font Map

Settings > Font Map chooses the TrueType font for an IPDS typeface. The typefaces your jobs have used are listed first, with how often each was seen.

1. Select a typeface.
2. Under **Regular**, **Bold**, **Italic** and **Bold Italic**, click **Browse** and choose a .ttf file for each style you want. A style left empty uses the Regular file. **Clear** removes a choice.
3. Click **Close**. The change applies to the next job in every queue.

Choose fonts with the same character widths as the IBM font where text must line up in columns; fixed-pitch text is placed at the host's positions either way.

9 Host Setup

For each queue, the host needs a printer device that sends IPDS over TCP/IP to the ExcelliPrint computer's address and the queue's port. In the examples, replace:

Placeholder	Meaning
XCPPRT1	The name of the printer device on the host
XCPPSF1	The name of its PSF configuration object (IBM i)
10.1.1.20	The IP address (or DNS name) of the ExcelliPrint computer
5001	The queue's port

9.1 IBM i

1. Check that IBM i can reach the ExcelliPrint computer:

```
PING RMTSYS('10.1.1.20')
```

2. Create a PSF configuration object. IPDSPASTHR(*YES) lets SCS spooled files print through the same device; RLSTMR(*SEC15) releases the device 15 seconds after the last job, so other systems can use the queue too.

```
CRTPSFCFG PSFCFG(QGPL/XCPPSF1) IPDSPASTHR(*YES) RLSTMR(*SEC15)
TEXT('ExcelliPrint 10.1.1.20:5001')
```

3. Create the printer device:

```
CRTDEVPRT DEVD(XCPPRT1) DEVCLS(*LAN) TYPE(*IPDS) MODEL(0)
LANATTACH(*IP) AFP(*YES) PORT(5001) FONT(11)
FORMFEED(*AUTOCUT) RMTLOCNAME('10.1.1.20')
USRDFNOBJ(QGPL/XCPPSF1 *PSFCFG)
TEXT('ExcelliPrint 10.1.1.20:5001')
```

4. Vary the device on and start its writer:

```
VRYCFG CFGOBJ(XCPPRT1) CFGTYPE(*DEV) STATUS(*ON)
STRPRTWTR DEV(XCPPRT1)
```

To point an existing device at ExcelliPrint, end its writer (ENDWTR), vary it off, change RMTLOCNAME and PORT with CHGDEVPRT, and vary it on and start the writer again.

> To have the job's details (job name, user, spooled file name and so on) for file names and the Jobs list, make sure the PSF configuration doesn't suppress them; IBM i sends them by default.

9.2 z/OS

Define the printer to JES as an AFP printer driven by PSF, and add a PRINTDEV entry with the ExcelliPrint computer's address and the queue's port to the PSF startup procedure. The relevant part:

```
//XCPPRT1  CNTL
//XCPPRT1  PRINTDEV FONTDD=*.FONT01,      /* FONT LIBRARY DD       */
//         OVLYDD=*.OLAY01,               /* OVERLAY LIBRARY DD    */
//         PSEGDD=*.PSEG01,               /* PAGE SEGMENT LIB. DD  */
//         PDEFDD=*.PDEF01,               /* PAGEDEF LIBRARY DD    */
//         FDEFDD=*.FDEF01,               /* FORMDEF LIBRARY DD    */
//         PAGEDEF=1PRT,FORMDEF=1PRT,
//         FAILURE=WCONNECT,              /* RETRY WHEN NOT READY  */
//         TIMEOUT=REDRIVE,
//         CONNINTV=0,                    /* KEEP TRYING TO CONNECT */
//         DISCINTV=15,                   /* RELEASE AFTER 15 SEC  */
//         MGMTMODE=OUTAVAIL,             /* CONNECT WHEN OUTPUT   */
//         IPADDR='10.1.1.20',            /* EXCELLIPRINT COMPUTER */
//         PORTNO=5001                    /* THE QUEUE'S PORT      */
//XCPPRT1  ENDCNTL
```

With MGMTMODE=OUTAVAIL and DISCINTV=15, PSF connects when there is output and releases the queue after 15 seconds without output, so several systems can share one queue.

9.3 z/VSE

PSF for z/VSE drives ExcelliPrint like any TCP/IP IPDS printer: add a PRINTDEV macro with IPADDR= the ExcelliPrint computer's address and PORTNO= the queue's port to the PSF startup job.

9.4 AIX (InfoPrint Manager)

> **Not yet tested with ExcelliPrint.** These steps follow IBM's documentation for a TCP/IP-attached IPDS printer in InfoPrint Manager for AIX. Please tell Brooks Internet Software support how they work for you.

On AIX, IPDS printers are driven by InfoPrint Manager (PSF for AIX in earlier versions). Define each ExcelliPrint queue as a **PSF TCP/IP** printer.

In the InfoPrint Manager Administration GUI:

1. Choose **Printer > Create > PSF > TCP/IP**.
2. Type a name for the printer, check the server, and choose a model. Enter the ExcelliPrint computer's IP address and the queue's port, and click Next.
3. Type a name for the logical destination that sends jobs to this printer, then for the queue that feeds it, clicking Next after each.
4. Accept the defaults on the remaining panels and click Finish.

From the AIX command line, the same printer is created with pdcreate and put in service with pdenable:

```
pdcreate -c destination \
-x destination-realization=actual \
-x device-support-system=psf \
-x attachment-type=tcpip \
-x destination-model=IBM4028 \
-x destination-tcpip-internet-address=10.1.1.20 \
-x destination-tcpip-port-number=5001 \
-x destination-release-timer=15 \
-x associated-queue=server1-default-queue \
server1:XCPPRT1
pdenable server1:XCPPRT1
```

- destination-model is required for a PSF printer; it is a description of the printer model. IBM4028 names the printer ExcelliPrint emulates.
- destination-release-timer=15 releases the queue 15 seconds after the last job, so other systems can use it. The default, 9999, never releases it.
- With the older PSF for AIX, the printer is defined in SMIT. Set its **Connect Timeout** to 30 seconds.

Part II · Support Reference

10 How ExcelliPrint Works

ExcelliPrint has three programs:

Program	Role
XCPSrv.exe	The Windows service (**ExcelliPrint**, service name xcp). It checks the license, keeps the database, and starts one listener per queue, restarting it if it stops.
listener.exe	One per queue. It accepts the host's connection on the queue's port, runs the IPDS conversation with the host, writes the job's pages to a work file, then draws the output format and delivers it.
xcpui.exe	The ExcelliPrint window. It reads and changes the database; closing it affects nothing else.

A job passes through these stages:

1. **Receiving.** The listener accepts the connection and answers the host as an IPDS printer. The pages are interpreted as they arrive and written to a work file.
2. **Processing.** At the end of the job (or of each document, when the host marks document boundaries), the work file is drawn in the queue's format.
3. **Delivery.** The output is saved, printed or emailed; with credentials, ExcelliPrint first connects to the share or print server.
4. **Completed or failed.** The job's status and an event are recorded. Work files are removed.

Drawing and delivery run alongside receiving, so the next job can arrive while the last is still being written. Jobs are delivered in the order they arrived.

11 Files and Folders

Location	Contents
C:\Program Files\Brooks Internet Software\XCP	The programs, the license files and fonts\ (the included OCR-A, OCR-B and Letter Gothic fonts, with their license)
C:\ProgramData\Brooks Internet Software\XCP\xcp.db	The database: queues, jobs, the event log, stored users, font map and settings. xcp_*date*.db files beside it are copies made before an upgrade changed the database.
...\XCP\tmp	Each job's work files while it's processed; they're deleted when the job ends. Any left behind when the service stopped in the middle of a job are deleted with the job history (4.5).
...\XCP\capture	Captured host data (see 13.3), deleted with the job history (4.5)
...\XCP\logs	Diagnostic logs of the service and listeners, written when they're switched on in Settings > Diagnostics (13.6)
...\XCP\backup	Copies of the database saved before each restore (4.6); the last five are kept

To back up ExcelliPrint's configuration and history, use File > Backup Database (4.6). Stored passwords can only be read on the computer that stored them; restoring a backup on another computer asks for them again.

12 Jobs and Events

12.1 Event categories

Category	Meaning
Job received	A job arrived on a queue.
Job completed	The output was delivered, with its format, pages and destination.
Job warning	A Windows Driver job completed, but not quite as set up: for example, a mapped tray or output bin the printer no longer has, so the driver's automatic choice was used.
Job failed	No output was delivered. The reason follows: the format couldn't be drawn, the folder or printer couldn't be reached, a credential was refused, the TIFF 4 GB limit, and so on.
Job incomplete	The host's connection ended in the middle of a job. The job is finished with what was received; the host normally resends it.
Stream error, ProcessPacket error	The data from the host couldn't be read as IPDS. Capture the job (13.3) and send it to support.
Listener	A queue's listener started, or stopped because its queue was changed or deleted, the license changed, or the service is stopping. A stopping listener closes each host connection when the job it's receiving ends, and logs each one; a job still arriving after 5 minutes is stopped as it is.
AvalonInit error, Listener fatal, Crash handler	A queue's listener couldn't start, or stopped unexpectedly. The service restarts it; if it keeps happening, capture a job (13.3) and contact support.
ExcelliPrint startup, ExcelliPrint shutdown	The service started (with the serial number and whether it's licensed) or stopped.
License	The license changed, or queues are waiting because of the license's printer limit.
History	The service removed old Jobs and Log entries and capture files (4.5).
Database	A database restore finished, or failed and why (4.6).
Queue changed	A queue was changed to or from the IPDS Printer output type while its host was connected. The jobs on that connection use the queue's previous output settings until the host connects again (5.2).
Connection refused	A computer not in a queue's **Accept jobs from** list (5.2) connected, with its address. A queue whose list is empty (set outside ExcelliPrint) refuses every host. Logged once in 10 minutes for each address.

Category	Meaning
Passthrough, Passthrough error	An IPDS Printer queue (6.6) forwarded a connection to its printer, with the capture's file name and how much was sent each way; or couldn't, and why (the printer's name couldn't be found, or it refused the connection).

12.2 Job statuses

Status	Meaning
processing	Being received or drawn
completed	Delivered. A job with no pages (only control commands, for example) completes with no output.
failed	Not delivered; the log says why. A partial file is never delivered.
interrupted	The service or listener stopped while the job was in progress. The host normally resends it.

13 Troubleshooting

13.1 The host can't connect

- **Is the queue listening?** In an administrator command prompt, netstat -ano | findstr :5001 should show LISTENING. If not, check the Log for a listener error or a License entry saying the port is waiting for the printer limit.
- **Is the port free?** Another program, or ExcelliPrint 4.0, may hold it. Give the queue another port, or stop the other program.
- **Firewall.** Allow the port inbound (2.4). From the host, a PING succeeding doesn't prove the port is open.
- **Accept jobs from.** The host's address must be in the queue's list (5.2); a **Connection refused** entry in the Log gives the address the queue saw. A host behind NAT or a proxy connects from that device's address, not its own.
- **Host side.** On IBM i, WRKCFGSTS *DEV XCPPRT1 shows the device's status, and the writer's messages (WRKWTR, or the QSYSOPR message queue) show connection errors. On z/OS, see the PSF messages in the system log.

13.2 A job failed

The Log entry for the job says why. The common reasons:

Message contains	What to do
couldn't connect to *server* as *user*: [1326]	The user name or password was refused. Change the user's password in Settings > Users (6.4).
[1219] ... multiple connections	Another credential is already connected to that server. Use the same user for every queue that reaches that server.
[5] or Access is denied	The user (or, with no credential, the service's account) can't write to the folder or print to the printer. Grant access, or use a credential.
[53], [67] or network path was not found	The server or share name is wrong, or the server can't be reached.
the printer couldn't be opened	Windows Driver: the printer isn't installed for the computer (see the note in 6.2), or its name changed.
the printer *name* couldn't be opened, didn't accept the job, sending the job ... failed	PostScript, PCL6 or PDF sent to a printer: the printer's name is wrong ([1801]), it's offline or paused, or the user can't print to it. The Windows error follows.

Message contains	What to do
couldn't send to smtp://...	Email: the mail server couldn't be reached, refused the login, or rejected the message; its reply follows. "STARTTLS not supported" means the server can't encrypt: turn off **Use a secure (TLS/SSL) connection** only if it's an internal relay (6.3).
4 GB	TIFF output would exceed 4 GB. Use a lower resolution, grayscale or black and white, or turn on BigTIFF (7.2).

13.3 Capturing a job for support

Support can reproduce almost any problem from a capture of the data the host sent. Queues capture by default, so a capture of a recent job is usually there already.

1. Find the capture in C:\ProgramData\Brooks Internet Software\XCP\capture. It's named with the date, time and port the job arrived on, and ends in .ebc.
2. If there isn't one (capture is off for the queue, or the job is older than the job history setting), tick **Enable capture** in the queue's settings and print the job again from the host.
3. Send the file to support with a description of what's wrong (and, if you can, the output and what you expected).

> Captures contain the job's full contents. Handle them as you would the printed documents.

13.4 Output looks wrong

- **Text in the wrong font**: check the Font Map (8.1); the Log's job warnings name fonts that weren't available.
- **Text bold or italic when it shouldn't be, or plain where the host asked for bold or italic: Apply font attributes for the queue (5.2) is set the wrong way for this host. Off is right for most hosts.**
- **Wrong characters** (accents, currency signs): the queue's code page doesn't match the host's (5.2).
- **Wrong paper size or tray**: check the queue's Paper Trays (5.2), and the format's tray mapping (chapter 7).
- **Overlays or logos missing in one PDF viewer but not another**: send the PDF and a capture to support.
- **Different from what your IPDS printer prints**: capture the job going to the printer with an IPDS Printer queue (6.6), and send it to support with the output.

Because every format is drawn the same way, saving the same job as PDF is a quick way to tell a printer or driver problem from a problem in the job.

13.5 Starting and stopping the service

Use Windows' Services console (services.msc), service **ExcelliPrint**, or from an administrator command prompt:

```
net stop xcp
net start xcp
```

Stopping the service ends every queue's listener; jobs in progress are marked interrupted and are normally resent by the host.

13.6 Diagnostic logging

Support may ask for a diagnostic log. Settings > Diagnostics lists the log categories of the service and of the queues' listeners; each one ticked is written to ...\XCP\logs (chapter 11).

1. Choose **Settings > Diagnostics**.
2. Under **Program**, choose **Service** or **Listeners**, and tick the categories support names.
3. Click **OK**. The change applies within a few seconds, without restarting anything.
4. Print the job again, then open Settings > Diagnostics, click **Log Folder** and send support the newest log files.

Switch the categories off again afterwards: some write a great deal. The ExcelliPrint service saves the change, so it must be running (or run ExcelliPrint as administrator).

Appendix A IBM Printer Emulations

The emulated printer sets what the host sends. IBM's documentation lists these limits of the three printers; ExcelliPrint follows them because the host does:

Printer	Limits
IBM 4028	No double-byte character sets. Enlarged or reduced characters aren't printed with type 2 or type 3 fonts. Vertical text isn't supported with type 1 fonts. Black only. Graphics only with *CONTENT print fidelity.
IBM 3812	As the 4028; also no Code 128 or POSTNET bar codes.
IBM 3816	As the 4028.

Choose IBM 4028 unless the host's applications were written for a 3812 or 3816.

Appendix B Glossary

Term	Meaning
AFP	Advanced Function Presentation: IBM's architecture for documents of text, images, graphics and bar codes, printed through PSF.
IPDS	Intelligent Printer Data Stream: the two-way data stream PSF uses to drive AFP printers.
PSF	Print Services Facility: the IBM program on IBM i and z/OS that turns spooled files into IPDS and drives the printer.
SCS	SNA Character String: the simpler line-printer data stream of IBM i, printed through an IPDS printer with IPDS pass-through.
Overlay, page segment	Forms, logos and images stored on the host and printed with the job's pages.
Code page	The table that maps the host's character codes to characters.
Queue	One ExcelliPrint printer: a port, an emulation and an output.
Port	The TCP port number a queue listens on.
PDF/A	The ISO standard for long-term archiving of PDF documents.
PJL	Printer Job Language: commands at the start of a print job that name it and set printer options.