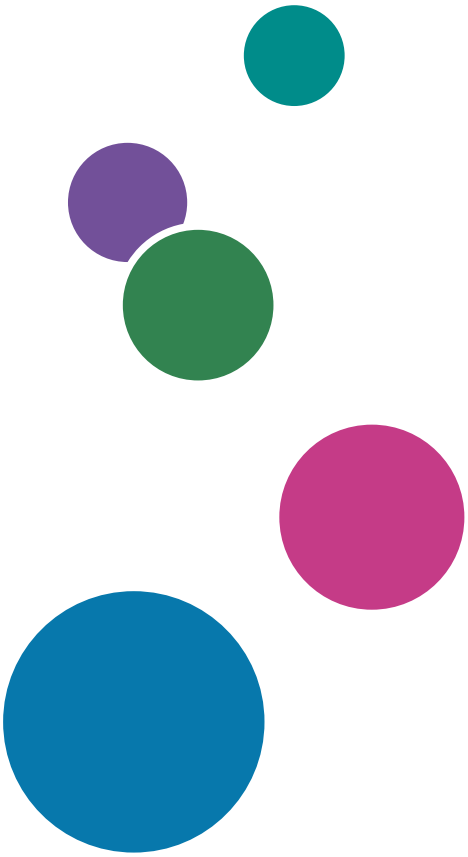
RICOH

RICOH ProcessDirector™ for Linux

Planning and Installing

Version 3.13.2

For information not in this manual, refer to the Help System in your product.



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Introduction

Important

To the maximum extent permitted by applicable laws, in no event will the manufacturer be liable for any damages whatsoever arising out of failures of this product, losses of documents or data, or the use or non-use of this product and operation manuals provided with it.

Make sure that you always copy or have backups of important documents or data. Documents or data might be erased due to your operational errors or malfunctions of the software. Also, you are responsible for taking protective measures against computer viruses, worms, and other harmful software.

In no event will the manufacturer be responsible for any documents created by you using this product or any results from the data executed by you.

Cautions regarding this guide

- Some illustrations or explanations in this guide could differ from your product due to improvements or changes in the product.
- The contents of this document are subject to change without notice.
- No part of this document may be duplicated, replicated, reproduced in any form, modified, or quoted without prior consent of the supplier.
- Throughout this publication, references to directory paths indicate the default paths only. If you install RICOH ProcessDirector or any of its components in a different location, including a different drive, you must adjust the paths accordingly.

  For example, if you install RICOH ProcessDirector on the `D:` drive of a computer running a Windows operating system, replace `C:` with `D:` in the directory paths.

Publications for this product

The RICOH ProcessDirector publications CD includes the RICOH ProcessDirector publications.

Instruction manuals

These instruction manuals are included:

- *RICOH ProcessDirector for Linux: Planning and Installing* (this publication)

  This guide explains planning and installation procedures for RICOH ProcessDirector.
- *RICOH ProcessDirector: Integrating with Other Applications*

  This guide provides technical information about the ways that you can configure RICOH ProcessDirector to exchange data with other applications.

  This guide can be opened from the Help menu.
- *RICOH ProcessDirector: Installing Document Processing Features*

This guide explains how to install RICOH ProcessDirector features that control and track both jobs and the individual documents in jobs.

- *RICOH ProcessDirector: Using RICOH ProcessDirector Plug-in for Adobe Acrobat*
  This guide explains how to use RICOH ProcessDirector Plug-in for Adobe Acrobat. You can use the Adobe Acrobat plug-in to define text, barcodes, images, and other enhancements in a PDF file. After you save your enhancements in a control file, RICOH ProcessDirector workflows can use the control file to make similar enhancements to PDF files.
- *Font Summary*
  This guide explains font concepts and the different types of fonts in the RICOH InfoPrint Font Collection. The *Font Summary* is available only in English.
- *White Paper–Using the Enhance AFP Function*
  This guide explains how to configure and use Enhance AFP control files. The guide is available only in English.
- The RICOH ProcessDirector readme file (`readme.html`).
  This file tells you how to access the other publications. The readme file is available only in English.
- The RICOH ProcessDirector release notes
  These release notes provide information about the RICOH ProcessDirector release, including new functions and updates; known limitations, problems, and workarounds; and code change requests. The release notes are available only in English.

You can also download English publications in PDF format from the RICOH Software Information Center (https://help.ricohsoftware.com/swinfocenter/).

RICOH ProcessDirector Information Center

The Information Center contains topics that help administrators, supervisors, and operators learn about and use RICOH ProcessDirector. The Information Center is available from the user interface and provides quick navigation and search features.

Help

Field help is available on many screens to provide information for specific tasks and settings.

How to read the documentation

Before using RICOH ProcessDirector

This manual contains instructions and cautions for correct use of RICOH ProcessDirector. Before using RICOH ProcessDirector, read this manual thoroughly and completely. Keep this manual handy for future reference.

How to use the manuals

Use the instruction manuals according to your needs.

To learn how to plan for, install, and start RICOH ProcessDirector:

See *RICOH ProcessDirector for Linux: Planning and Installing*.

To learn about the functions and operations of RICOH ProcessDirector and its installed features:

See the RICOH ProcessDirector Information Center.

To learn how to set property values in the user interface:

See the field help.

To learn how to install a document processing feature:

See *RICOH ProcessDirector: Installing Document Processing Features*.

To learn how to use the functions and operations of RICOH ProcessDirector Plug-in for Adobe Acrobat

See *RICOH ProcessDirector: Using RICOH ProcessDirector Plug-in for Adobe Acrobat*.

To learn how to configure RICOH ProcessDirector to exchange data with other applications:

See *RICOH ProcessDirector: Integrating with Other Applications*.

Displaying the publications

The RICOH ProcessDirector publications are available on the publications CD, so you can access them before you install the application.

Note

- A PDF viewer, such as Adobe Acrobat Reader, is required to view the publications.

To access the RICOH ProcessDirector publications CD on Windows:

1. Insert the CD in the CD drive.
   If the Windows system is configured to autorun CDs, Windows Explorer opens automatically to show the contents of the CD.
2. If Windows Explorer does not start automatically, open it and display the contents of the CD drive.
3. Open the `readme.html` file for information about the contents of the CD.

Some of these publications are also available from RICOH ProcessDirector user interface.

Note

- You must log in to the RICOH ProcessDirector user interface to view the publications.

In the banner of the RICOH ProcessDirector user interface, click the ?· button and select one of the following publications to download:

- *RICOH ProcessDirector: Integrating with Other Applications*
- *RICOH ProcessDirector: Installing Document Processing Features*
- *RICOH ProcessDirector: Using RICOH ProcessDirector Plug-in for Adobe Acrobat*
- *RICOH ProcessDirector: Release Notes*

Displaying the Information Center

The RICOH ProcessDirector Information Center is available from the user interface.

To display the Information Center:

- In the banner of the RICOH ProcessDirector user interface, click the  button and select **Help**.
- If you are not logged in to RICOH ProcessDirector, enter this URL in the address bar of your browser:

  `http://hostname:15080/pdhelp/index.jsp`

  In the URL, *hostname* is the host name or IP address of the computer where RICOH ProcessDirector is installed.

In addition, you can bookmark the location of the Information Center in your browser and open it at any time outside of RICOH ProcessDirector.

Information about using the functions and operations of features are available only when the features are installed in the system.

Related information

For information about our products, see:

- RICOH website (https://ricohsoftware.com)
- RICOH Software Information Center (https://help.ricohsoftware.com/swinfocenter/)

For information about related products, see:

- *InfoPrint Manager for AIX: Getting Started*, G550-1061
- *InfoPrint Manager for AIX: Planning Guide*, G550-1060
- *InfoPrint Manager for Linux: Getting Started*, G550-20263
- *InfoPrint Manager for Linux: Planning Guide*, G550-20262
- *InfoPrint Manager for Windows: Getting Started*, G550-1072
- *InfoPrint Manager for Windows: Planning Guide*, G550-1071
- *InfoPrint Manager: PSF and Server Messages*, G550-1053
- *InfoPrint Manager: Reference*, S550-1052
- *InfoPrint Transform Manager for Linux: Installation and User's Guide*, G550-1048
- *InfoPrint Transform Manager for Linux: afp2pdf Transform Installation and User's Guide*, G550-0538
- *RICOH InfoPrint XT for Linux: Installation and User's Guide*, G550-20375
- *RICOH InfoPrint XT for Windows: Installation and User's Guide*, GLD0-0025
- *AFP Conversion and Indexing Facility User's Guide*, G550-1342
- *IBM Print Services Facility for z/OS: AFP Download Plus*, S550-0433
- *IBM Print Services Facility for z/OS: Download for z/OS*, S550-0429

Symbols

The following symbols are used in this manual to help you to identify content quickly.

- This symbol indicates points to pay attention to when using the product. Be sure to read these explanations.

- This symbol indicates helpful supplementary information that is not essential to completing a task.

Bold

Bold type indicates the names of dialogs, menus, menu items, settings, field labels, buttons, and keys.

Italic

Italic type indicates the titles of manuals and variables that you must replace with your own information.

`Monospace`

`Monospace type` indicates computer input and output.

Abbreviations

AFP

Advanced Function Presentation

API

Application Programming Interface

CSV

Comma-Separated Values

DNS

Domain Name System

GID

Group ID

HTTP

Hyper Text Transfer Protocol

IP

Internet Protocol

JDF

Job Definition Format

LPD

Line printer daemon

PDF

Portable Document Format

PSF

Print Services Facility

REST

Representational State Transfer

SOAP

Simple Object Access Protocol

SSL

Secure Sockets Layer

UID

Default user ID

WSDL

Web Service Description Language

YaST

Yet Another Setup Tool

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The proper names of the Windows operating systems are as follows:

- Windows XP:

  Microsoft Windows XP Professional

  Microsoft Windows XP Enterprise
- Windows 7:

  Microsoft Windows 7 Professional

  Microsoft Windows 7 Ultimate

  Microsoft Windows 7 Enterprise
- Windows 10:

  Microsoft Windows 10 Pro

  Microsoft Windows 10 Enterprise
- Windows 11:

  Microsoft Windows 11 Pro
- Windows Server 2008:

  Microsoft Windows Server 2008 Standard

  Microsoft Windows Server 2008 Enterprise
- Windows Server 2016:

  Microsoft Windows Server 2016 Standard
- Windows Server 2019:

  Microsoft Windows Server 2019 Standard
- Windows Server 2022:

  Microsoft Windows Server 2022 Standard

Other product names used herein are for identification purposes only and might be trademarks of their respective companies. We disclaim any and all rights to those marks.

New in this release

These new functions and updates have been included in RICOH ProcessDirector Version 3.13.2

New functions and updates in Version 3.13.2

- **Communicate inside RICOH ProcessDirector with Notes**

  Added by customer request: Communicate with your colleagues right from the user interface to enable effective, real-time collaboration. Open the **Notes** panel from the banner to leave messages for the next shift, alert operators about service updates, and report status. You can create, edit, and delete messages, with support for reactions and replies to facilitate dynamic conversations.

  You can tag colleagues and incorporate hashtags to link messages to specific objects or workflows, keeping conversations contextually relevant. Selecting a tag or hashtag filters the content to display only messages where those terms appear.

  Additionally, the entire message history in **Notes** is fully searchable, allowing for fast retrieval of past communications.

- **Order Management feature enhancements**

  In Version 3.13.2, the Order Management feature becomes even more powerful! Orders and order properties are more integrated with the user interface and other features. Added function includes:

  - Define custom properties for orders.
  - Include order properties on banner pages.
  - Collect order data using the Reports feature and a new data collector.
  - Include orders and order properties in custom portlets.
  - Reference order properties from jobs.
  - Use order properties in connector logic.

- **Set locations at the group level**

  Make managing access to resources by location more efficient by setting locations at the group level. Previously, locations were set for each user and updated individually. Now, you can set locations for a group and all users added to the group inherit the settings. Move a user to a different group and their locations are updated automatically.

- **RICOH Supervisor™ renamed to RICOH Predictive Insight™**

  In April 2025, RICOH Supervisor was renamed to RICOH Predictive Insight. RICOH ProcessDirector is now updated to reflect that product name change.

- **Updated PostgreSQL**

  The version of PostgrSQL provided by RICOH ProcessDirector is updated to version 17.4.

- **Improved support for Custom PDF printers**

  Custom PDF printers are easier to manage with the introduction of the Printer Definition object. Now, when you upload a GPZ file from a Ricoh representative, you create a Printer Definition, then use the printer definition when you add the Custom PDF printer. With this change, you can migrate printer definitions and Custom PDF printers using Migration Assistant more easily.

New functions and updates in Version 3.13.1

- **Updated translations**

  The content of the Version 3.13 product interface and the help system have been translated into these languages:

  – Brazilian Portuguese
  – French
  – German
  – Italian
  – Japanese
  – Spanish

  To see the translated user interface and help content, download and install the Language Pack for your language.

- **Updated PostgreSQL**

  The version of PostgreSQL included with RICOH ProcessDirector is updated to version 16. If you previously installed the PostgreSQL database provided with RICOH ProcessDirector, you now have the option to update that database during the installation process. You can also choose to complete the installation without updating the database and install the database update later.

- **Usability improvements**

  This release includes improvements in the behavior of the user interface, including:

  – In the Workflow Editor step template list, moved the **Favorites** group to the top of the list.
  – In the **Jobs** portlet, added a collapsible area for filters, so they take up less space on the screen.
  – In the **Orders** portlet, made order numbers active, so clicking on them opens the order property notebook.

- **Optimizing the BuildPDFFromDocuments step**

  For very large PDF jobs or jobs with complex processing requirements, the BuildPDFFromDocuments step can run for hours to finish processing. In this release, we introduce advanced configuration options to help optimize the step to complete faster. If you are interested in exploring this option, contact your Ricoh representative.

New functions and updates in Version 3.13

- **Order Management feature**

  At long last, order support comes to RICOH ProcessDirector! The Order Management feature adds the ability to create and track orders submitted from your MIS or order processing system, or to build orders manually in the **Submit Jobs** portlet. Submit your order file in XML format and RICOH ProcessDirector interprets the file, creating orders and jobs to your specifications.

  The Order Management feature is included with the base product as a no-charge feature, but is not installed by default.

- **MarcomCentral Connect improvements**

  With the addition of the Order Management feature, integration with MarcomCentral is easier than ever. Sample workflows provided in the MacomCentral Connect feature have been updated to use the objects introduced by Order Management for faster integration with your Marcom storefront.

- **Improved license key installation**

We have redesigned the license installation process to improve the experience. The process is now faster and has better messaging and feedback, so you know which feature licenses are activated.

- **Support for RICOH Pro 8400 series printers**
  RICOH ProcessDirector now supports sending jobs to these printers with the Fiery EB-36 digital front end:
  - Pro 8400S
  - Pro 8410
  - Pro 8410S
  - Pro 8420
  - Pro 8420S
  - Pro 8420Y (Japan only)
- **Usability improvements**
  - On the **Workflow Editor**, step templates and step chains have been moved to a stationary side panel, instead of displaying in a floating window. In the panel, both step templates and step chains have also been grouped into categories, to make finding the item you need easier.
  - In the **Migration Assistant**, you can now cancel and revert a migration in progress. Objects and files that were migrated are reverted to their pre-migration versions.
- **Operating system support changes**
  - With this release, we are adding support for two Linux operating system levels: Red Hat 9.2 through latest 9.X and Rocky Linux 9.0 through latest 9.X
  - In addition, we now support installing the PostgreSQL database provided by RICOH ProcessDirector in a Podman container on all supported versions of Linux. You must install Podman 5.2.3 or higher before you install RICOH ProcessDirector.
  - We are removing support for Red Hat 7 and CentOS 7. With this change, CentOS is no longer a supported operating system.

New functions and updates in Version 3.12.2

- **Integrate document composition using FusionPro into your workflows**
  With this release, we introduce the **FusionPro Connect** feature, which lets you send jobs from RICOH ProcessDirector to **FusionPro Server** for composition and/or impositioning.
- **Run RICOH ProcessDirector with your own PostgreSQL database**
  You can now configure RICOH ProcessDirector to use a PostgreSQL database that you install, instead of using the version installed with the product or using IBM DB2. Your database can be installed on the primary computer or anywhere in your network that the primary server can access.
- **Migration Assistant enhancements**
  The Migration Assistant makes moving from one system to another easier with two major improvements:
  - **Configuration file migration**
    You can now migrate configuration files stored in the `/aiw/aiw1` directory to the target system without manual intervention.
  - **Reports database configuration and migration**

The Migration Assistant can help you set up your Reports database on the target system. Whether you want to set up the target system to connect to the same Reports database that the source system currently uses, or you want to create a new database and move your existing data into it, the Migration Assistant makes the process easier.

In addition, you can now pause/resume and cancel a migration that is in progress.

- **Improved security with fapolicyd support**
  If your company uses the File Access Policy Daemon (fapolicyd) to secure your computing environment, RICOH ProcessDirector now provides scripts to generate the list of the standard directories that it uses and a list of rules that permit RICOH ProcessDirector to run.
- **Support for requesting a printer preset with a job**
  If you print AFP jobs, you can now send a printer preset request along with the job. If the printer supports the function, it changes its settings to use that preset automatically before printing the job.
- **Embedded Tomcat version updated**
  To address security and functionality issues, the version of Tomcat included in RICOH ProcessDirector has been updated to version 9.

New functions and updates in Version 3.12.1

- **Updated translations**
  The content of the Version 3.12 product interface and the help system has been translated into these languages:
  - Brazilian Portuguese
  - French
  - German
  - Italian
  - Japanese
  - Spanish

  To see the translated user interface and help content, download and install the Language Pack for your language.
- **Upgrade and migrate to PostgreSQL on the same system**
  In RICOH ProcessDirector version 3.12, we introduced support for PostgreSQL as the main database underlying RICOH ProcessDirector. To move to PostgreSQL, you were required to install version 3.12 on a different server and use the Migration Assistant to migrate your data. With version 3.12.1, you can upgrade and migrate your data on the same system. Install RICOH ProcessDirector, making sure to choose the PostgreSQL database configuration. After the installation completes, follow the instructions to migrate your data, then remove IBM DB2 from your primary computer.
- **Manual failover now supported for PostgreSQL configurations**
  Manual failover configurations for system redundancy are now supported on RICOH ProcessDirector with PostgreSQL as well as DB2.
- **XML-RPC calls no longer supported**
  The Connect extension, which let you connect to RICOH ProcessDirector remotely and use XML-RPC calls in scripts, is deprecated and no longer supported. We recommend using RICOH ProcessDirector web service API instead.

- **Additional updates include:**
  - Ability to save the **View job in workflow** image
  - Added the **StepChainDemo** workflow to illustrate the use of step chains
  - Updated prerequisites for the Preprinted Forms Replacement feature, so customers with the AFP Support Feature can install Preprinted Forms Replacement without also installing PDF Document Support.
  - Usability updates for the Migration Assistant

New functions and updates in Version 3.12

- **Primary database options now available**

  After many years of supporting only one database, RICOH ProcessDirector can now run with PostgreSQL as its primary database. While IBM DB2 is still supported in the same configuration as it has been, PostgreSQL is now the default database configuration. Existing customers can upgrade to version 3.12 and continue to use DB2 with no interruptions, or can choose to migrate their data to a PostgreSQL database.

  Note

  To migrate data from DB2 to PostgreSQL, you must install RICOH ProcessDirector version 3.12 on a different computer. You cannot install the PostgreSQL configuration on the same system as an existing DB2 configuration.

  The PostgreSQL database is installed in a Docker container, so Docker Engine must be installed on the primary computer.

- **Migration simplified**

  One of the most challenging aspects of moving to a new version of an application is ensuring that everything still works. Especially when the upgrade requires moving to a new system, it is challenging to know that you have copied everything that needs to be there. The RICOH ProcessDirector Migration Assistant now makes the process much easier.

  Install the base product on a new system, then log in and start the Migration Assistant. Use the Assistant to connect to your existing installation, choose the objects and settings to migrate to the new one, and let the Assistant do the work. The Migration Assistant can handle moving data from an existing DB2 database to PostgreSQL, and can even work across operating systems.

- **RICOH ProcessDirector for AIX replacement**

  In version 3.12, RICOH ProcessDirector for AIX has been discontinued. Customers running on AIX can continue to use the application until the end of support date. Alternately, they can migrate to version 3.12 on Linux or Windows and use the Migration Assistant to port their data to a new system.

- **New Supported Printers**

  RICOH ProcessDirector now supports printer models with the new Fiery® N-series Controller Digital Front Ends, based on Fiery and Ricoh technology. You can define these new printer models as Ricoh PDF printers:

  - RICOH Pro C7500
  - RICOH Pro C9500

- **Updated operating system support**

  You can now install RICOH ProcessDirector on these operating system versions:

- Rocky Linux 8.4 through latest 8.X
- Rocky Linux 9.0 through latest 9.X

Note

You can only install the PostgreSQL configuration on these operating systems. IBM DB2 is not supported on Rocky Linux.

Release notes for prior versions of RICOH ProcessDirector are available on the RICOH Software Information Center here: Release notes: RICOH ProcessDirector

1. Overview

- **Components**
- **Compatible products**
- **System configurations**

RICOH ProcessDirector lets you manage all aspects of your printing processes from a comprehensive web browser-based user interface. RICOH ProcessDirector supports job submission from other systems using file copying methods. You can copy or move jobs into directories that you specify (*hot folders*), and you can configure RICOH ProcessDirector so that it continually monitors the directories and automatically processes jobs as they arrive. You can also submit jobs from any system that uses the line printer daemon (LPD) protocol for file transmission. In addition, RICOH ProcessDirector lets you control and track individual documents in PDF jobs.

The extensive database that RICOH ProcessDirector uses provides detailed audit information about your printing workload and tasks.

You can access RICOH ProcessDirector from a supported browser on workstations in your network. You do not need to install RICOH ProcessDirector on the workstations that you use to access the user interface; you only need to install RICOH ProcessDirector on the computer that is managing your workflow.

If you have purchased and installed the AFP Support feature, RICOH ProcessDirector lets you control and track jobs and individual documents in Advanced Function Presentation (AFP) format. The feature adds support for AFP and PCLOut printers and job submission from z/OS host systems using Download for z/OS and AFP Download Plus.

Important

If you purchased RICOH ProcessDirector without the AFP Support feature, instructions for download input devices, AFP and PCLOut printers, and other AFP-specific system objects and functions do not apply to your RICOH ProcessDirector installation.

You can purchase RICOH ProcessDirector, which provides a perpetual license, or RICOH ProcessDirector Subscription, which provides access to the product for 1-5 years with renewal options for longer term use. You purchase a subscription for the base product and for each feature that you want to install.

Components

The RICOH ProcessDirector base product is made up of these components:

RICOH ProcessDirector primary server

The RICOH ProcessDirector primary server manages all job activities, including input devices that create the jobs and printers that print the jobs. The server also processes jobs through workflows, some of which include other programs. It controls both the flow of jobs and the database tables that store system information.

In addition, you can set up your installation to have a standby computer to use as a backup (or failover) computer. RICOH ProcessDirector is installed on both the active computer and the backup computer, but it can only run on one computer at a time. Both computers must have access to an NFS file server, where print jobs and systems objects are stored. In the event of an outage on the active computer, you can run scripts provided with RICOH ProcessDirector to move processing to the backup computer without losing objects or print jobs.

Note

- You must purchase a license key for both your active and backup computers.

RICOH ProcessDirector stores system information and manages jobs as they flow through the system using a database. Two databases are supported: PostgreSQL and IBM DB2.

Note

- PostgreSQL is the default database configuration starting in version 3.12.
- IBM DB2 was that default database configuration prior to version 3.12.

Existing customers can continue to use IBM DB2 or migrate their data to PostgreSQL. You can use the PostgreSQL database included with RICOH ProcessDirector or use a separate instance of the PostgreSQL database installed locally or on other computer. For details, see Upgrading, p. 89, in Chapter 3.

RICOH ProcessDirector is supported on several varieties of Linux. Consult the table to find the operating system and database combination that suits your environment, including other software requirements. We recommend installing the latest service pack of all operating systems.

Supported operating system and database configurations

Operating system	Supported PostgreSQL configurations	Supported IBM DB2 configurations
Red Hat 8.1 through latest 8.X	• RICOH ProcessDirector-installed versionNote 1, p. 21 • Separately installed versionNote 2, p. 21	• RICOH ProcessDirector-installed version • Separately installed IBM DB2Note 3, p. 21
Red Hat 9.2 through latest 9.X	• RICOH ProcessDirector-installed versionNote 4, p. 21 • Separately installed versionNote 2, p. 21	• RICOH ProcessDirector-installed version • Separately installed IBM DB2Note 3, p. 21
Rocky Linux 8.4 through latest 8.X	• RICOH ProcessDirector-installed versionNote 1, p. 21 • Separately installed versionNote 2, p. 21	• Not supported
Rocky Linux 9.0 through latest 9.X	• RICOH ProcessDirector-installed versionNote 1, p. 21 • Separately installed versionNote 2, p. 21	• Not supported
SUSE Linux Enterprise Server (SLES) 12.0 with Service Pack 4 or above for x86_64	• RICOH ProcessDirector-installed versionNote 1, p. 21 • Separately installed versionNote 2, p. 21	• RICOH ProcessDirector-installed version • Separately installed IBM DB2Note 3, p. 21

Operating system	Supported PostgreSQL configurations	Supported IBM DB2 configurations
SUSE Linux Enterprise Server (SLES) 15.0 with Service Pack 1 or above for x86_64	• RICOH ProcessDirector-installed versionNote 1, p. 21 • Separately installed versionNote 2, p. 21	• RICOH ProcessDirector-installed version • Separately installed IBM DB2Note 3, p. 21

Notes:

1. You must install Docker Engine or Podman before you install RICOH ProcessDirector to use this version of PostgreSQL.
2. A separately installed PostgreSQL database can be on the same computer as the RICOH ProcessDirector base product or on a different computer.
3. A separately installed IBM DB2 database can be on the same computer as the RICOH ProcessDirector base product or on a different computer.
4. You must install Podman before you install RICOH ProcessDirector to use this version of PostgreSQL. Docker Engine is not supported on Red Hat 9.2 and above.

If you choose to use PostgreSQL as the main database for RICOH ProcessDirector, you can:

- Install the PostgreSQL database included in the RICOH ProcessDirector installation. The PostgreSQL database is installed in a Docker or Podman container. You must install Docker Engine or Podman on the primary computer before you install RICOH ProcessDirector.
- Install your own copy of PostgreSQL on the primary computer or on a different computer.

If you choose to use DB2 as the main database for RICOH ProcessDirector, you can:

- Install DB2 during the RICOH ProcessDirector installation. If you choose this option, you cannot use this DB2 installation for any other purpose.
- Install your own copy of DB2 on the computer that you plan to use for the RICOH ProcessDirector primary server.
- Install your own DB2 server on a different computer and a DB2 client on the primary computer.

You do not have to install the database or database-related software on computers where you install Secondary Server features; secondary servers share the database that is installed on the primary computer.

RICOH ProcessDirector user interface

The RICOH ProcessDirector user interface is a browser-based interface that lets you manage the printing process. Users can access the user interface from a supported web browser on a Windows or Linux workstation as long as they have a RICOH ProcessDirector user ID. The workstation must have the most recent version of one of these browsers installed:

- Mozilla Firefox
- Google Chrome
- Microsoft Edge

The user interface also has a web-based file viewer that uses the Adobe Acrobat Reader (or similar PDF viewer plug-in) to display AFP or PDF files so you can select pages to reprint.

To access the user interface, enter this URL in the address bar of a browser, replacing *hostname* with the hostname or IP address of the computer that the primary server runs on: `http://hostname:15080/pd`

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After you are authenticated, you can explore the user interface. Highlights of the user interface include:

- The **Main** page includes portlets that show system health, job status, and device status in graphical ways by using colors and graphics. Users can tell at a glance the overall status of their system and easily drill down for more detail as desired.
- On the **Main** page, you can move portlets by clicking the title bar, dragging the portlet to a different position, then releasing the mouse button to drop the portlet. You can also maximize any portlet, so that it fills the entire browser window. The **Fit portlets to window** action, lets you resize all the portlets at once so they fill the available window size.
- You can customize the columns available in all portlets and object tables, using the **Manage columns** action under the **Settings** (⚙) menu. If a table appears on both the **Main** and **Administration** pages, you can save different columns on each page.
- Both the **Main** and **Administration** pages are automatically updated to show property and status changes. You do not need to refresh the browser to see the most recent information.

  Note

  – If there are more than 1500 jobs in the **Jobs** table, property and status changes for jobs are not updated automatically. Other portlets continue to update automatically.
- You can add, copy, and delete all types of devices from the **Main** page as well as from the **Administration** page. On both pages, **Copy** and **Delete** are available on the **More actions** menu. On the **Administration** page, the **Add** action is available at the top of the table on the right side. On the **Main** page, the **Add** action is on the **Settings** (⚙) menu.
- The **Jobs** table displays up to 1500 jobs without using pagination controls. You can scroll through the entire list of jobs in the same table, instead of advancing through them page by page.
- Most portlets and tables include a filter that you can use to find entries easily. Click the **Filter** icon ( ) and type in the box. The portlet or table displays only rows that include the text you entered.
- The **Jobs** portlet includes an **Advanced filter**. Click the arrow to the left of the **Advanced filter** title to expand the filter and specify the conditions that you want to use to filter the **Jobs** table.
- You can manage access to objects on both the **Main** and **Administration** pages based on location properties. If you assign objects such as printers, input devices, and jobs to specific locations, you can use the **Allowed locations** property for each user to define which locations they can see in the user interface.

  The **Locations to show** property lets users select which of their allowed locations to display in the user interface. If a user chooses to show a subset of the allowed locations, a location icon ( ) displays in the banner area.
- The help window that opens when you click the ? can be moved to a different position and resized to show more or less information. You can also highlight text in the window, so you can copy it.

The user interface is available in these languages:

- Brazilian Portuguese (pt_BR)
- English (en_US)
- French (fr_FR)
- German (de_DE)
- Italian (it_IT)
- Japanese (ja_JP)
- Spanish (es_ES)

RICOH ProcessDirector information center

The information center contains topics that help users learn about and use RICOH ProcessDirector.

Open the information center by clicking **?** → **Help** in the banner of the user interface. In addition, you can bookmark the location of the information center in your browser and open it outside of RICOH ProcessDirector.

Features

RICOH ProcessDirector features provide more functions or let you add support for devices like inserters to the system. The modular design of RICOH ProcessDirector lets you add features to the base product as your business needs change.

Most features are integrated seamlessly into the user interface and are installed using the **Feature Manager** utility on the **Administration** page of the user interface. When you install a feature with Feature Manager, the feature is in trial mode. To continue using a feature after the trial period, you must purchase the feature and install a license key for it. If you do not install a license key, the feature stops working at the end of the trial period.

RICOH ProcessDirector extended features are custom software components that you can purchase from your Ricoh support representative. The Ricoh support representative installs the extended features on the existing RICOH ProcessDirector primary computer.

No-charge product enhancement features

These features provide support for adding languages, stronger security, and some frequently added job properties to your system. They also add the ability to work with the individual PDF documents inside a job and collect data about your system for reporting purposes.

These features are provided with the base product, but are not installed by default. They do not require an additional license.

Common Properties

The Common Properties feature adds a collection of job and document properties that are useful for transaction processing and tracking purposes. These job properties are not associated with specific step templates, but can be set in a workflow using the **AssignJobValues** step or the **Manage job defaults** action.

Language packs

Language packs include translations for the user interface and help system. Each language pack includes the translated files for one language. Supported languages are:

- Brazilian Portuguese
- French
- German
- Italian
- Japanese
- Spanish

PDF Document Support

The PDF Document Support feature adds functions and objects that let you control and track individual documents in PDF jobs. The feature includes RICOH ProcessDirector Plug-in for Adobe Acrobat. The plug-in lets you identify individual documents, extract data from the documents, and add enhancements such as barcodes, OMR marks, images, hidden areas, and text. Step templates let you add steps to your workflows that use the extracted data to sort, split, and group the documents into new jobs.

Reports

The Reports feature lets you capture selected job properties and printer status changes in a PostgreSQL database. To extract data and visualize it, you can use a business intelligence tool, such as Tableau.

Security

The Security feature provides advanced functions, including password requirements, that increase the security of user accounts. If you have a Lightweight Directory Access Protocol (LDAP) or Active Directory server, the feature lets you use LDAP user IDs and passwords to authenticate to RICOH ProcessDirector.

AFP datastream support

These features provide support for processing AFP jobs and documents. The AFP Support feature is a prerequisite for the other features in this section.

AFP Support

The AFP Support feature lets you control and track jobs and individual documents in AFP format. AFP provides a transaction-oriented data stream that guarantees integrity between the RICOH ProcessDirector server and its printers. The printers can deliver the exact status of every page as it is received, printed, and stacked. The feature adds support for AFP and PCLOut printers.

The feature includes RICOH Visual Workbench with AFP Indexer, Document Property Designer, and AFP Enhancer modes. RICOH Visual Workbench lets you identify individual documents in AFP files and extract data from the documents. Step templates let you add steps to your workflows that use the extracted data to sort, split, and group the documents into new jobs.

Without this feature, you can view but not print AFP data, and you can pass AFP jobs to other programs.

AFP Editor

AFP Editor lets you create barcodes and hide areas in indexed AFP files. You can create barcodes that contain index values, job properties, and static text.

For example, if the postal codes in an AFP file are index values, you can create barcodes that contain the postal codes. You can hide areas in AFP files. No one can see the data in the hidden areas, and the data does not print. For example, you can hide areas that contain existing barcodes that you want to replace. In addition, AFP Editor can automatically replace POSTNET barcodes with Intelligent Mail barcodes (IMBs) that have the same routing code. You can also add text strings, such as *Page x of y*, to formatted AFP files.

Whitespace Manager

Whitespace Manager lets you define available areas of white space in AFP files. You can fill the white space with content, such as images and text, during the print production process. You place content in a white-space area based on rules you define to target content for specific customers or for the best use of available space.

WPM Connect

WPM Connect lets you integrate the WPM tool into RICOH ProcessDirector workflows for more processing. WPM is not included in the WPM Connect feature; it is a product that must be purchased separately.

This feature is only available in Japan.

Integration features

Integration features help you connect RICOH ProcessDirector to other products, including products from certain other companies. These features provide objects that make integrating with the other applications easier. The other applications must be purchased separately.

Avanti Slingshot Connect

With the Avanti Slingshot Connect feature, you can receive jobs and JDF job tickets from the Avanti Slingshot MIS system and process them with RICOH ProcessDirector. RICOH ProcessDirector can then provide status of the job back to Avanti Slingshot as it moves through the system.

Cut Sheet Support for Kodak

With this feature, you can define and drive Kodak cut sheet printers from RICOH ProcessDirector. RICOH ProcessDirector converts media and stapling requests into the KDK format used by these printers.

Cut Sheet Support for Xerox

With this feature, you can define and drive Xerox cut sheet printers from RICOH ProcessDirector. RICOH ProcessDirector converts media and stapling requests into the XRX or XPIF format used by these printers.

FusionPro Connect

The FusionPro Connect feature lets you integrate file composition operations provided by FusionPro Server into your print workflow. The FusionPro Connect feature provides a step template that sends print jobs to FusionPro Server and waits for them to return to continue processing. In the step, you can choose a FusionPro template and an imposition template to use with the job. The feature also includes a sample workflow that you can use to test your configuration.

This no-charge feature is provided with the base product but is not installed by default.

MarcomCentral Connect

The MarcomCentral Connect feature lets you integrate the online-storefront and web-to-print functions of MarcomCentral into your production workflows. Sample web service input devices retrieve orders for print, digital, and other items from MarcomCentral. RICOH ProcessDirector creates a job for each order and notifies MarcomCentral when the items in the job complete specified steps in the sample workflow.

Prerequisites: Order Management and Web Services Enablement

PitStop Connect

The PitStop Connect feature lets you integrate preflight operations that use Enfocus PitStop Server 10 into your print workflows for PDF print jobs.

Quadient Inserter Express

The Quadient Inserter Express feature is a simplified version of the Inserter feature, which includes support for only Quadient inserters. The feature provides sample objects that you can use as templates for configuring RICOH ProcessDirector to communicate with Quadient inserters.

Prerequisite: AFP Support or PDF Document Support

Quadient Inspire Connect

Quadient Inspire Connect extends RICOH ProcessDirector to make it easier to interact with Quadient® Inspire V8 or above. The feature adds system objects tailored to work with files created by Quadient Inspire so they can be submitted to the processing engine to generate print jobs as part of a print workflow.

You must have the AFP Support feature installed to create AFP files with Quadient Inspire.

RICOH Predictive Insight Connect

The RICOH Predictive Insight Connect feature lets you send data collected by the **Reports** feature in the PostgreSQL database to the RICOH Predictive Insight application in the cloud.

Ultimate Impostrip® Connect

The Ultimate Impostrip® Connect feature lets you integrate the imposition functions of Ultimate Impostrip® Automation or Scalable into your RICOH ProcessDirector workflows.

Document processing features

Document processing features expand the capabilities of a workflow from controlling and tracking jobs to controlling and tracking individual documents in a job.

Without changing the application that creates the job, you can change how the individual documents are processed, using business rules to indicate what processing to do. You can pull documents out of a workflow, attach documents to email, or reprint individual documents. The documents in the job can be split into multiple jobs, sorted based on document-specific information such as address data, or grouped into subset jobs based on data in the document.

Two features add basic functions and objects for processing documents. You must install one or both of these features before you can install the other document processing features:

- PDF Document Support adds functions and objects for processing documents in PDF jobs. This no-charge feature is provided with the base product but is not installed by default.
- AFP Support adds functions and objects for processing documents in AFP jobs.

PDF Document Support and AFP Support let you identify individual documents within a job and map data, such as customer names or postal codes, in the documents to RICOH ProcessDirector document properties. RICOH ProcessDirector stores the document properties and their values in a document properties file.

Available Document processing features are:

Archive

The Archive feature lets you store jobs, documents, and job processing history in a repository and retrieve them by searching for job and document properties. For example, you search for documents by job name, customer name, and account number. After you retrieve a job or document, you can view it, review the properties that were stored with it, and check the production history. You can save the job or document to your workstation, or submit it to a workflow for reprinting or other processing.

Electronic Presentment

The Electronic Presentment feature works with the Archive feature, but must be installed separately. It is available at no charge and does not require a separate license.

The feature provides a collection of sample objects to demonstrate the process of storing information in a repository. The sample workflow receives jobs from an input device and uses a history record notification to capture the times when jobs are printed and mailed. The workflow stores jobs, documents, property values, and history information in a repository.

Automated Verification

The Automated Verification feature lets you add barcodes to the documents in a print job. By reading barcodes, cameras or barcode scanners detect documents that failed to complete a step in their workflow. You can automatically reprint missing documents or manually pull them out of their workflow. A job log records the disposition of the documents in each job and the user ID of the operator who did the dispositions.

Inserter

The Inserter feature automates the insertion of printed documents and inserts (such as marketing materials) into envelopes. The feature can communicate with inserter controllers by sending control files to them and receiving results files from them. Using information in the results file, the feature tracks the insert status of each document in the job. Jobs are reconciled automatically (or manually, with operator control). Reprints are automatically generated for damaged documents.

Postal Enablement

The Postal Enablement feature lets you extract mailing address data from the documents in a job and prepare the data for processing by external postal software. After the postal software verifies the addresses and improves their quality, Postal Enablement updates the documents in the job with the results from the postal software.

Postal software is not included in this feature. You can use your choice of external postal software.

Preference Management

The Preference Management feature lets you update document property values with values from an external preferences file. These values can be used to change the content of selected documents or to change the processing of those documents.

This no-charge feature is provided with the base product, but not installed by default.

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Preprinted Forms Replacement

The Preprinted Forms Replacement feature lets you print jobs that previously required preprinted forms on plain paper . You update the definition of each media object for the media requested by these jobs to include the electronic equivalent of the preprinted form data. The application that submits the print files to RICOH ProcessDirector can continue to specify the media for the jobs in the same way.

With the AFP Support feature, the Preprinted Forms Replacement feature also lets you insert PDF forms into AFP jobs.

Datastream transforms

These features provide support for converting jobs in one datastream to another.

Advanced Transform

The Advanced Transform feature lets you transform print jobs to or from these file formats:

- AFP
- PCL
- PDF
- PostScript
- BMP, GIF, JPEG, PNG, TIFF (only as input data streams)

You can purchase and install any combination of these transform options.

Note

- A separate license key is required for each input and output transform that you purchase. For example, if you buy **InputPostScript** and **OutputAFP**, you need two license keys.
- **InputPDF** is a prerequisite for the **InputImage** transform.

RICOH Transform features

RICOH Transform features provide a powerful and cost-effective system for transforming jobs to or from the format for AFP printing. The RICOH Transform features are:

- PostScript/PDF to AFP
  Converts PDF and PostScript into AFP
- RICOH PCL to AFP
  Converts PCL into AFP
- RICOH SAP to AFP
  Converts SAP OTF and ABAP into AFP
- RICOH AFP to PDF
  Converts AFP into PDF

Prerequisite: AFP Support

Note

- You use the InfoPrint Transform Manager user interface and help system for some Transform configuration tasks. If you install more than one Transform feature, they share the InfoPrint Transform Manager interface.
- All RICOH Transform features include image transforms (GIF to AFP, JPEG to AFP, and TIFF to AFP), which convert GIF, JPEG, and TIFF images to AFP.
- A separate license key is required for each purchased transform.
- You cannot install any of the RICOH Transform features using Feature Manager.
- The APPE conversion tool is installed with the RICOH Transform features.

Advanced workflow features

Advanced workflow features add complexity to your workflow system, so you can track deadlines, manage groups of jobs as a unit, and connect to other applications using SOAP or REST APIs.

Deadline Tracker

Deadline Tracker lets you manage your progress toward meeting your delivery deadlines. If you have service level agreements with your customers, this feature helps you make sure that their jobs are on schedule to be completed on time. You can see when jobs are behind schedule or risk missing their deadlines. This information helps operators prioritize work and act to bring jobs back on track for on-time delivery. You can monitor expected work (jobs that you expect to receive at set intervals). If the jobs do not arrive in time, you can inform the sender.

Order Management

The Order Management feature adds functions and objects that let you group jobs and process them as a group. With this feature, you can manage the orders for your customer to make sure that orders are on schedule and completed on time. You can see when orders are behind schedule or at risk to miss their due date. This information helps operators set order priority and act to bring orders back on track for on-time delivery.

You can manually submit job files through the **Submit Job** portlet, or automatically create an order by submitting an XML file from your order management system.

Web Services Enablement

The Web Services Enablement feature lets you call REST and SOAP web services from your production workflows to exchange data with third-party applications.

The feature adds support for input devices, step templates, and notification objects that can send web service requests.

Extended features

RICOH ProcessDirector extended features are custom software components that you can purchase from your Ricoh support representative. The Ricoh support representative installs the extended features on the existing RICOH ProcessDirector primary computer.

Secondary servers

Secondary servers let you distribute processing, so that your RICOH ProcessDirector system runs more efficiently.

You can use secondary servers to do some of the more processing-intensive steps in your various workflows and to prevent the primary server from becoming overloaded. The primary server works with the secondary servers to coordinate the movement of all jobs across the system. The secondary servers do not have their own embedded databases for storing system information. All the servers work with the database that is installed on the primary computer.

RICOH ProcessDirector supports different types of secondary servers:

Local secondary servers

Created directly on the primary computer. Require minimal configuration.

Remote secondary servers

Created on a Linux computer that is separate from the primary computer. You must install a Secondary Server feature on the remote computer and set up communication between the secondary server and the primary server.

Container secondary servers

Created either on the Linux primary computer or on a Linux computer that is separate from the primary computer. You must install Docker Engine 19.03 or above on the computer that will host the container secondary server. On a remote computer, you must also set up communication between the secondary server and the primary server. In addition, you might need to install a Secondary Server feature.

Then, you create the container secondary server in RICOH ProcessDirector. Creating the server loads an image into a Docker container on the computer. The image contains a Linux operating system and everything needed to run a RICOH ProcessDirector secondary server.

Secondary servers can manage all types of RICOH ProcessDirector objects, such as input devices, steps, and printers. They can also run external programs that RICOH ProcessDirector accesses through external steps. External programs can do more processing or special types of processing.

For installations that have many printers and a high volume of jobs, adding secondary servers to the system can increase job throughput. The throughput increases because each server has a smaller number of printers and jobs to monitor and control.

For AFP printers, you can set up secondary servers to stage work to the remote server so that RICOH ProcessDirector keeps the pipeline to the printer full, reducing the likelihood that the printer waits for data. This configuration is particularly useful if you installed RICOH ProcessDirector on an externally hosted or distributed network, such as a virtualized or cloud environment that is far removed from the physical printers. Properties of the AFP printer object allow you to specify a directory on the secondary server to receive the print files. The secondary server then manages releasing jobs to the AFP printer when the printer needs work.

You can create secondary servers on the primary computer or install the Secondary Server feature on these systems:

- Red Hat 8.1 through latest 8.X

- Red Hat 9.2 through latest 9.X
- Rocky Linux 8.4 through latest 8.X
- Rocky Linux 9.0 through latest 9.X
- SUSE Linux Enterprise Server (SLES) 12.0 with Service Pack 4 or above for x86_64

Application server

An application server is a Windows system configured to communicate with RICOH ProcessDirector. If your workflows require processing by applications that run on Windows, you can access those applications by installing RICOH ProcessDirector application server code on a Windows computer.

Application servers share the database that the primary server uses and work with the primary server to process jobs effectively. Because application servers are installed on Windows computers, they can run steps that require applications on Windows. They cannot run other steps, such as **PrintJobs**.

Application servers can be the parent servers for Ricoh PDF printers, Custom PDF printers, and Passthrough printers. They cannot be the parent servers for other kinds of printers.

You can install application servers on these operating systems:

- Windows 10 Pro or Enterprise 64-bit
- Windows 11 Pro
- Windows Server 2019 64-bit
- Windows Server 2022 64-bit

Compatible products

You can use these products from Ricoh and its subsidiaries with RICOH ProcessDirector:

RICOH InfoPrint Manager

InfoPrint Manager for AIX (Program Number 5765-F68), InfoPrint Manager for Linux (Program Number 5648-F40-0003L, and InfoPrint Manager for Windows (Program Number 5639-N49) are print servers that handle scheduling, archiving, retrieving, and assembly of a print job and its related resource files. InfoPrint Manager cannot be installed on the same server as RICOH ProcessDirector.

MarcomCentral

MarcomCentral is a distributed marketing software platform that you can use to customize and distribute marketing materials. With the MarcomCentral Connect feature, you can integrate MarcomCentral with your RICOH ProcessDirector workflows.

RICOH InfoPrint XT

RICOH InfoPrint XT for Linux (Program Number 5765-XTA) and RICOH InfoPrint XT for Windows (Program Number 5765-XTA) transform Xerox metacode and line conditioned data stream (LCDS) jobs to AFP.

If you plan to install RICOH InfoPrint XT for Linux on the same server as RICOH ProcessDirector, make sure that it is installed after RICOH ProcessDirector.

Requires the AFP Support feature.

FusionPro

FusionPro is an application suite for Variable Data Printing (VDP) that offers a wide range of document personalization functions. With the FusionPro Connect feature, you can integrate FusionPro with your RICOH ProcessDirector workflows.

RICOH Predictive Insight

RICOH Predictive Insight is a cloud-based application that helps you monitor, understand, and improve your print production environment through visual representations. With the Reports and RICOH Predictive Insight Connect features, you can collect data about your print operations, send them to RICOH Predictive Insight, and create custom dashboards to display the data.

You can use these products from other companies with RICOH ProcessDirector:

AFP Download Plus

AFP Download Plus is a separately ordered feature of IBM Print Services Facility for z/OS (IBM Program Number 5655-M32) that transforms line data to MO:DCA-P data and then transmits the print job with all required resources to RICOH ProcessDirector.

Requires the AFP Support feature.

Avanti Slingshot

Avanti Slingshot is a JDF-certified print management information platform. With the Avanti Slingshot Connect feature, you can use RICOH ProcessDirector and Slingshot together, passing jobs and data between the programs.

Download for z/OS

Download for z/OS is a separately ordered feature of IBM Print Services Facility for z/OS (IBM Program Number 5655-M32) and is used to submit jobs to RICOH ProcessDirector. Download for z/OS automatically transmits output across the TCP/IP network from the host system to RICOH ProcessDirector for printing or archiving.

Requires the AFP Support feature.

Enfocus PitStop Server

PitStop Server provides PDF preflight functionality. With the PitStop Connect feature, you can include steps to send PDFs jobs to PitStop in your RICOH ProcessDirector workflows.

Ultimate Impostrip®

Ultimate Impostrip® optimizes prepress imposition processes. With the Ultimate Impostrip® Connect feature, you can integrate the imposition functions of Ultimate Impostrip® Automation or Scalable into your RICOH ProcessDirector workflows.

Quadient Inspire

Quadient Inspire enables organizations to create and deliver personalized, compliant customer communications across all digital and traditional channels, from one centralized hub. With the Quadient Inspire Connect and AFP Support features, you can send AFP jobs to Quadient Inspire for processing during your RICOH ProcessDirector workflows.

System configurations

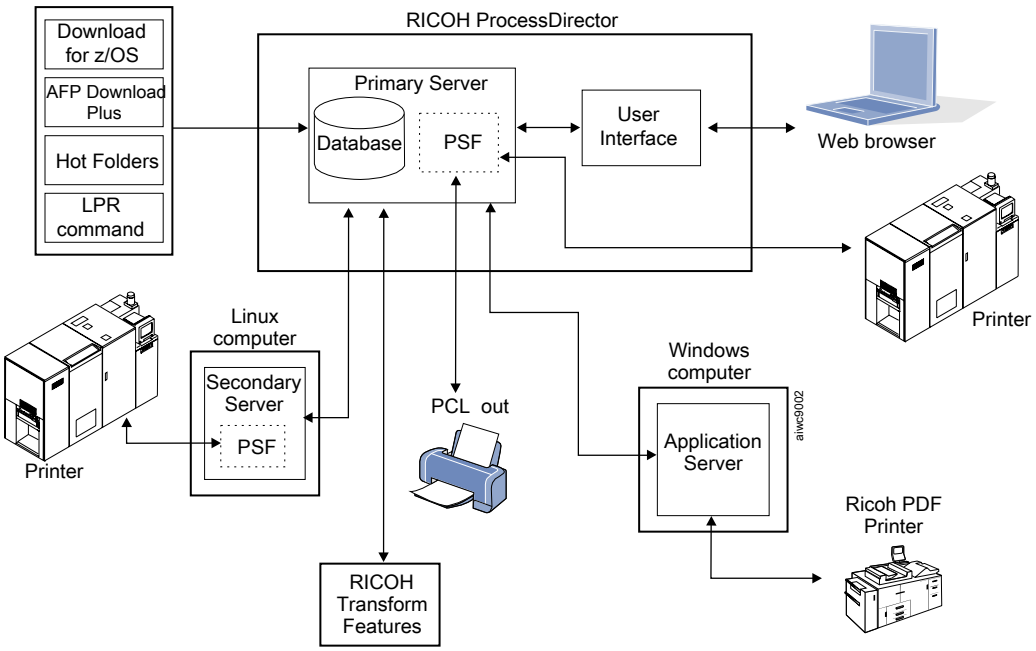
You can install RICOH ProcessDirector with various system configurations. The hardware configurations can include:

- Primary computer
- Primary computer with one or more secondary servers on the same computer
- Primary computer with an application server on a Windows computer
- Primary computer with one or more secondary servers on different computers
- Primary computer with a backup (failover) computer and an NFS-mounted file system

  In this configuration, only one primary server can be running at a time. System objects are created and stored on the mounted file system, so they can be accessed from the backup computer in case of a hardware failure or other outage.

Example of a system configuration, p. 33 shows a configuration of RICOH ProcessDirector with the AFP Support feature. The configuration has a primary server and a secondary server on a separate Linux computer. It also shows RICOH ProcessDirector components, including the optional RICOH Transform features, and the optional products you might use with RICOH ProcessDirector, including Download for z/OS and AFP Download Plus.

Example of a system configuration



Example of a configuration with active and backup computers using an NFS server, p. 34 shows a configuration with two primary computers (an active and a backup) and an NFS server that holds their shared file systems.

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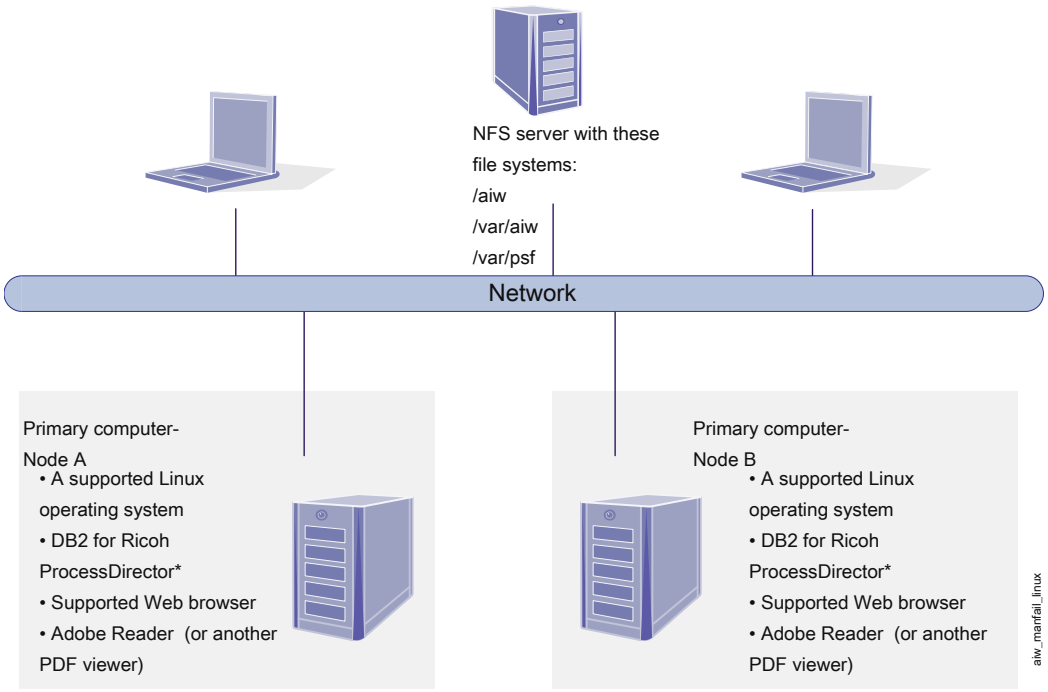
Example of a configuration with active and backup computers using an NFS server



* DB2 is either installed on both Node A and Node B or installed on neither.
If not installed on either node, it is accessed on a remote server.

2. Planning for installation

- **Task checklist**
- **Hardware requirements**
- **Planning for file systems**
- **Creating system groups and users**
- **Secure Sockets Layer and Transport Layer Security support**
- **Considerations for virtual and cloud environments**
- **Installing required software**
- **Running the prerequisite checker**
- **Planning for optional software**

Before you install or upgrade RICOH ProcessDirector, you must do these planning tasks:

- Obtain required hardware.
- Determine your file system setup.
- Determine your database configuration.
- Install required software.
- Install optional software.

You can use the checklist in Installation planning checklist, p. 197 and the Task checklists at the beginning of each chapter to help you keep track of the planning tasks you have completed.

Note

- Your software installs in trial mode. The trial license expires after 60 days. For more information about obtaining and installing license keys, see Downloading and installing license keys, p. 161.

When you finish preparing your computers, continue with the appropriate section:

- Upgrading, p. 89
- Installing, p. 111

Task checklist

Here are the tasks in this chapter that you need to verify are complete. Check each item as you verify it.

Checklist for verifying that planning is complete

	Task
	The installation planning checklist is complete. See Installation planning checklist, p. 197.
	Required hardware has been obtained. See Hardware requirements, p. 36.
	Required software had been installed. See Installing required software, p. 55.
	Optional software that you want to use has been installed. See Planning for optional software, p. 82.

Hardware requirements

The computer or computers that you install the RICOH ProcessDirector base product on must meet minimum requirements. If you install RICOH ProcessDirector features on the same computer, it might need more memory, storage space, CPU, or network bandwidth.

Different components and features of RICOH ProcessDirector are installed on separate computers. Those computers have different minimum requirements than the one that the base product and all other features are installed on. These components are:

- Application servers
  See Application server computers, p. 39 for hardware requirements.
- Secondary Server
  See Secondary computers, p. 39 for hardware requirements.
- RICOH ProcessDirector Plug-in for Adobe Acrobat (part of the PDF Document Support feature)
  See *RICOH ProcessDirector: Installing Document Processing Features*, G550-20312, for a description of the requirements.

The performance of RICOH ProcessDirector and its attached printers depends on the availability and efficiency of memory, processors, disk space, and network resources in the system configuration. Performance also depends on the content of the print data streams being processed and the overall load on the system. For example, complex print jobs, such as those containing images or bar codes, require more resources than those containing plain text. For help determining which hardware configuration meets your print requirements, contact your Ricoh representative to request a workload analysis and system sizing.

Important

- References to the amount of RAM or free disk space are precise. Using commonly accepted estimates in your calculations might cause your system to fail prerequisite validation. For example:
  - 4 GB of free disk space is equal to 4,096 MB or to 4,294,967,296 bytes.
    4 GB is not equal to 4,000 MB or to 4,000,000,000 bytes.

    If the requirement is 4 GB, 4,000 MB is not enough.
  - 12 GB of free disk space is equal to 12,288 MB or to 12,884,901,888 bytes.
    12 GB is not equal to 12,000 MB or to 12,000,000,000 bytes.

    If the requirement is 12 GB, 12,000 MB is not enough.
- Hardware requirements stated for other computing resources including memory, disk space, network I/O, and disk I/O should also be considered as requirements for a virtualized environment.

Important

- RICOH ProcessDirector hardware requirements are for physical processors and CPU cores. As an alternative, you can run RICOH ProcessDirector on a properly configured virtual machine (VM) guest. Define the VM guest so that the number of dedicated CPUs exceeds the recommended minimum hardware requirements for your configuration.
  - Using fewer than the recommended number of physical processors can result in RICOH ProcessDirector workflow performance issues especially under load, failure of the RICOH ProcessDirector system, or failure to install RICOH ProcessDirector or any of its features.

  Examples:

  - On a physical server with 16 cores, do not configure the RICOH ProcessDirector guest environment to have 24 CPUs.
  - On a physical server with 16 cores, do not run two guest systems, each allocated 8 CPUs, where one guest is running the RICOH ProcessDirector software because the host software requires some resources.
  - Do not install RICOH ProcessDirector on a virtual host that is configured to overcommit the physical CPU resources.

Primary computer

The system hardware requirements for the computer that the RICOH ProcessDirector base product (and most features) is installed on are:

- An x86 computer that can run a supported 64-bit Linux operating system.
  See Supported operating system and database configurations, p. 20 for more information.
- 200 GB free hard-drive space
- Minimum of 8 GB available RAM is required
  More available RAM is required for high system loads. Large jobs, many jobs, jobs with many documents, workflow steps that run in parallel, and memory-intensive external programs all increase system loads.

Important

- A minimum of 16 GB available RAM is required when you are using one or more document processing features, for example:
  - AFP Support
  - PDF Document Support
  - Archive
  - Automated Verification
  - Inserter
  - Postal Enablement
  - Preference Management

  Depending on the number of documents you process, you might need more RAM or free hard-drive space.

The operating system level does not have to be the same on the primary computer and on the computers that the Secondary Server features are installed on.

If you plan to install the base product on two computers so you can have an active computer and a backup (failover) computer, both computers must meet the minimum requirements for the RICOH ProcessDirector base product and features you are installing. The hardware does not have to be identical, but the operating system must be identical, including version, release, and service updates. You must also configure an NFS-mounted file system that your computers can access. That file system must have enough free space to hold the required file systems. The recommended size for the mounted file system is at least 110 GB.

The following features have more hardware requirements. These requirements are added to the requirements listed for the primary computer; they do not replace those requirements.

- Advanced Transform feature
  - Minimum 1 GB **more** free hard-drive space allocated to the RICOH ProcessDirector `/opt` file system
  - Minimum 2 GB **more** free hard-drive space allocated to the `/aiw/aiw1` file system

    Note
    - Large jobs sometimes require more RAM to process efficiently.
- RICOH Transform features

  These requirements apply only to the RICOH Transform features (such as, PostScript/PDF to AFP and Ricoh PCL to AFP), not to the Advanced Transform feature.
  - Minimum of an extra 10 GB free hard-drive space.
  - An extra 1 GB RAM for every CPU core, but no less than 4 GB.

    For example, if the computer has:
    - One dual-core processor, it must have an extra 4 GB RAM.
    - Two quad-core processors, it must have an extra 8 GB RAM.
    - Three quad-core processors, it must have an extra 12 GB RAM.

- ♦ Four quad-core processors, it must have an extra 16 GB RAM.

Secondary computers

You can install RICOH ProcessDirector Secondary Server features on computers that meet these requirements:

- An x86 computer that can run a supported 64-bit Linux operating system.
  See Secondary servers, p. 30 for more information.
- If you only plan to run steps on the secondary server, you need 20 GB of free hard-drive space. If you plan to define printers on the secondary server, you need 200 GB or more of free hard-drive space.
  We recommend that this space is not in the rootvg volume group on Logical Volume Manager (LVM) systems.
- Minimum of 1 GB available RAM for each secondary server. You might require more RAM, depending on the type and number of steps that you run on the secondary server and the number of printers that you define on the secondary server.

Application server computers

An application server has these hardware requirements:

- An x86 computer that can run one of these operating systems:
  - Windows 10 Pro or Enterprise 64-bit
  - Windows 11 Pro
  - Windows Server 2019 64-bit
  - Windows Server 2022 64-bit
- A minimum of two, 2.0 GHz CPU cores
- At least 4 GB RAM

Other hardware requirements

- If you plan to install the RICOH ProcessDirector base product using physical DVDs, choose one of these options:
  - Use a DVD drive that is installed in either the primary or the secondary computer. In this case, you run the installation programs from the DVDs or CDs.
  - Use a DVD drive on another UNIX-based system in your network. In this case, you copy the installation program and supporting files into a remote location on a UNIX-based system in your network and use the network installation procedure to install RICOH ProcessDirector.

Note

- Due to operating system incompatibilities, you cannot use a DVD drive on a Windows system to copy the files into a staging location on a Linux computer.

You can either copy the installation program and supporting files onto the primary computer, the secondary computer, or onto a separate file server.

Note

- Features are included with the base product, but updated features might be provided on DVDs, CDs, or as ISO images.

- If you plan to install using ISO files or by copying installers to a system in your network, the directory that you store the installers in must have sufficient room for the downloaded files:
  - Mount the ISO image to the server that you plan to install on. For instructions about how to mount an ISO file, see Mounting an ISO file, p. 116.
  - The ISO **Downloads** page on the Ricoh website specifies how much space is required for each package. See Downloading installation files, p. 115 for more details.
- If you install RICOH ProcessDirector with IBM DB2 provided by Ricoh, you must mount two discs or ISO files at the same time. If you install RICOH ProcessDirector using physical discs, make sure you have two drives available. If you do not, follow the procedure for Installing from a remote directory, p. 116 to copy one of the installers to a server and install from there.
- If you install your own licensed copy of the PostgreSQL or DB2 server on a different computer, the computer that the PostgreSQL or DB2 server is installed on must have a minimum of 4 GB available RAM for each PostgreSQL or DB2 instance that you create for RICOH ProcessDirector to use.
- If you install the PDF Document Support feature, the RICOH ProcessDirector Plug-in for Adobe Acrobat must run on a Windows computer. See *RICOH ProcessDirector: Installing Document Processing Features*, G550-20312, for hardware requirements.

Supported RICOH printers

These printers can be defined in RICOH ProcessDirector as Ricoh PDF printers. Find your printer and controller/DFE below to determine which datastream and port values to use when you define the printer.

Note

- Some printers support more than one controller. As a result, printer models might be listed in more than one table.

Printers with the Ricoh standard internal controller

These printers must have the PostScript option installed. For these printers, set the **Datastream to send** value to PostScript and the **Port** value to 9100.

Gestetner DSm7110	MP C7501SP	Pro C7110S	Pro 8210
Gestetner DSm7135	Pro 1106EX	Pro C7110SX	Pro 8210S
Gestetner DSm790	Pro 1107	Pro C7110X	Pro 8220
Gestetner P7675	Pro 1107EX	Pro C7200	Pro 8220S
IM C6500	Pro 1107EXP	Pro C7200e	Pro 8300S
IM C8000	Pro 1356EX	Pro C7200S	Pro 8310
Infoprint 2190	Pro 1357	Pro C7200SL	Pro 8310S
Infoprint 2210	Pro 1357EX	Pro C7200SX	Pro 8320
Infoprint 2235	Pro 1357EXP	Pro C7200X	Pro 8320S
Lanier LD1100	Pro C5100S	Pro C7210	Pro 906EX
Lanier LD1135	Pro C7100SX	Pro C7210S	Pro 907
Lanier LD190	Pro C5110S	Pro C7210SX	Pro 907EX
Lanier LD260c	Pro C5200S	Pro C7210X	Pro 907EXP
Lanier LD275c	Pro C5210S	Pro 8100EX	Savin C6055
Lanier LD365C	Pro C5300S	Pro 8100S	Savin C7570
Lanier LD375C	Pro C5300SL	Pro 8100Se	SAVIN 8090
Lanier LP275	Pro C5310S	Pro 8110	SAVIN 8110
Lanier SP 9100	Pro 6100	Pro 8110e	SAVIN 8135
MP 1100	Pro 6100HE	Pro 8110S	Savin C9065
MP 1350	Pro 6100HT	Pro 8110Se	Savin C9075
MP 9000	Pro C7100	Pro 8120e	Savin MLP175n
MP C6000	Pro C7100S	Pro 8120S	SP 9100DN
MP C6501SP	Pro C7100X	Pro 8120Se	
MP C7500	Pro C7110	Pro 8200S	

Printers with the RICOH TotalFlow Print Server

For these printers, set the **Datastream to send** value to JDF/PDF. Use the default value for the **Port** setting.

Pro C7100	Pro C7110SX	Pro C7200SX	Pro C7210X
Pro C7100S	Pro C7110X	Pro C7200X	Pro C9100
Pro C7100SX	Pro C7200	Pro C7210	Pro C9110
Pro C7100X	Pro C7200e	Pro C7210S	Pro C9200
Pro C7110	Pro C7200S	Pro C7210SX	Pro C9210
Pro C7110S			

Printers with N- series EFI Fiery controllers

For these printers, set the **Datastream to send** value to Ricoh API for Fiery. Use the default value for the **Port** setting.

Pro C7500 Pro C7500H Pro C7500HT (Japan only)	Pro C9500 Pro C9500H	Pro Z75 Pro Z75 (Japan version)

Printers with E- and EB- series EFI Fiery controllers

For these printers, set the **Datastream to send** value to JDF/PDF. Set the **Port** value to 9102 to send jobs to the Print queue or 9103 to send jobs to the hold queue.

Note

- RICOH ProcessDirector only supports these printers with the controllers listed. If your printer uses a different controller, it cannot be defined as a Ricoh PDF printer.

Printer model	Controller		Printer model	Controller
Gestetner DSm7110 Gestetner DSm7135 Gestetner DSm790	EB-135		Pro C550EX Pro C700EX	E-8100
Lanier LD1100 Lanier LD1135 Lanier LD190	EB-135		Pro C5300SL	E-27B
Lanier LD260c Lanier LD275c	E-7100 with Fiery V1.1 and higher		Savin C6055 Savin C7570	E-7100 with Fiery V1.1 and higher
Lanier LD365C Lanier LD375C	E-7200		Pro C651EX Pro C751 Pro C751EX	E-41A
MP 1100 MP 1350 MP 9000	EB-135		Pro C7100 Pro C7100S Pro C7100SX Pro C7100X Pro C7110 Pro C7110S	E-43A/E-83

Printer model	Controller		Printer model	Controller
			Pro C7110SX Pro C7110X	
MP C6000 MP C7500	E-7100 with Fiery V1.1 and higher E-8100 with Fiery V1.1 and higher		Pro C720 Pro C720S	E-40
MP C6501SP MP C7501SP	E-7200		Pro C7200 Pro C7200e Pro C7200S Pro C7200SX Pro C7200X Pro C7210 Pro C7210S Pro C7210SX Pro C7210X	E-45A/E-85A E-46A/E-86A
Pro 1106EX Pro 1356EX Pro 906EX	EB-135		Pro C7200SL	E-35A E-36A
Pro 1107EX Pro 1357EX Pro 907EX	EB-1357 with Fiery V1.1 and higher		Pro C900 Pro C900S	E-40/E-80 with Fiery V4.0 and higher
Pro 8100EX Pro 8100S Pro 8100Se Pro 8110 Pro 8110e Pro 8110S Pro 8110Se Pro 8120 Pro 8120e Pro 8120S Pro 8120Se	EB-32		Pro C901 Pro C901S	E-41/E-81 E-42/E82

Printer model	Controller		Printer model	Controller
Pro 8200S Pro 8210 Pro 8210S Pro 8220 Pro 8220S	EB-34		Pro C9100 Pro C9110	E-43/E-83
Pro 8300S Pro 8310 Pro 8310S Pro 8320 Pro 8320S	EB-35		Pro C9200 Pro C9210	E-45/E-85 E-46/E-86
Pro 8400S Pro 8410 Pro 8410S Pro 8420 Pro 8420S Pro 8420Y (Japan only)	EB-36		SAVIN 8135 SAVIN 8110 SAVIN 8090	EB-135
Pro C5100S Pro C5110S	E-22B/E-42B		Savin C9065 Savin C9075	E-7200
Pro C5200S Pro C5210S	E-24B/E-44B			
Pro C5300S Pro C5310S	E-27B/E-47B			

Planning for file systems

You can set up your file system as partitions or as a mounted file system from other storage units. However, if you plan to install the RICOH ProcessDirector base product on two computers (an active computer and a backup computer), you must create them on the mounted file system so both computers can access them.

- On Linux computers that the base product or a Secondary Server feature is installed on:
  - A single partition is the simplest file system setup. The RICOH ProcessDirector installer can create directories in a single partition automatically.

  - Multiple partitions let the system continue functioning when it runs out of space in one partition. If you want to set up file systems in multiple partitions, you need to create and mount the file systems on your computer before you install RICOH ProcessDirector.
  - When setting up partitions of the Linux system for RICOH ProcessDirector, you can use Logical Volume Manager (LVM), Hardware RAID, or separate partitions. Hardware RAID 0 provides the best performance.
  - If you want to use Logical Volume Manager (LVM), you need to set up and mount the file systems on your computer before you install RICOH ProcessDirector.
  - RICOH ProcessDirector does not support file systems created with the 64-bit inode setting.
- On Windows computers that have application servers installed, you do not have to set up file systems before installation.

When you determine the size and location of file systems, consider these factors:

- Storage and backup needs
- Failure recovery

File systems for the primary computer

You can let the RICOH ProcessDirector installer create the directories listed in File systems for the RICOH ProcessDirector primary computer, p. 45, or you can create them yourself. If you let RICOH ProcessDirector create them, they are created as directories, not file systems. If you want to use multiple partitions or LVM, you must create the file systems manually before you install RICOH ProcessDirector. Create and mount the `/aiw` file system before you create the other file systems.

File systems for the RICOH ProcessDirector primary computer

File system	Recommended size	Minimum size	Description
/aiw	80+ GB	40 GB	File system for RICOH ProcessDirector print jobs, resources, backup files, and trace files. This file system is shared by the secondary computers as a mounted file system. See note 1, p. 46.
/aiw/aiw1/db2	30 GB	20 GB	File system for DB2 tables when DB2 is used as the database and is installed on the same computer as the base product (either the RICOH ProcessDirector version of DB2 or a separate copy). See note 2, p. 46.
/aiw/aiw1/db2_logs	12 GB	12 GB	File system for DB2 logs when DB2 is used as the database and is configured to store its transaction logs in a separate file system and is installed on the same computer as the base product (either the RICOH ProcessDirector version of DB2 or a separate copy). See note 2, p. 46.

File system	Recommended size	Minimum size	Description
/var/aiw	5 GB	5 GB	File system for debug information from RICOH ProcessDirector.
/var/psf	5 GB	5 GB	File system for PSF configuration and temporary files.
/var/psf/segments	45 GB	10 GB	File system used to improve performance. This file system must be bigger than your biggest job. It requires enough space to store data for concurrent jobs on multiple printers. The recommended minimum size is 45 GB for five printers. Increase the size by 10 GB for each additional printer.

Note

1. If DB2 is installed on the primary computer and stores data under /aiw/aiw1, the /aiw file system must be large enough to hold the DB2 tables and logs. In that case, the minimum file system size for /aiw is 72 GB: the minimum sizes for all three file systems combined.
2. If you install a DB2 server on another computer and a DB2 client on the same computer as the base product, you do not have to create the /aiw/aiw1/db2 and /aiw/aiw1/db2_logs on the primary computer. However, you must make sure that the DB2 server meets minimum requirements. The file system for DB2 tables and logs server must be at least 22 GB, but 32 GB is recommended.

Existing file systems that RICOH ProcessDirector uses, p. 46 shows the file systems that you create when you install the operating system. You might need to increase the size of these file systems before you install RICOH ProcessDirector.

Existing file systems that RICOH ProcessDirector uses

File system	Recommended size	Minimum size	Description
/var	Varies	Set as an operating system default	File system that contains the `/var/spool/lpd` directory, used to spool jobs received by LPD protocol. This file system must be large enough to hold all of the print files that you receive at one time with the LPD protocol. If you install any Transform features, you must have an additional 1 GB free space in `/var`.
/var/lib	50 GB	24 GB	**If you use PostgreSQL installed in a Docker container by RICOH ProcessDirector as the database:** File system that contains required database tables for RICOH ProcessDirector.

File system	Recommended size	Minimum size	Description
/home/*system_user*	50 GB	24 GB	**If you use PostgreSQL installed in a Podman container by RICOH ProcessDirector as the database:** File system where the database volumes are stored. But default, the volumes are stored under the home directory of the RICOH ProcessDirector system user. The default system user is aiw1.
/home (default)	5 GB free space	5 GB free space	**If you use DB2 as the database and it is on the same computer as the base product:** File system that contains the home directory of the DB2 instance user. This DB2 is either the RICOH ProcessDirector version of DB2 or a separate copy. Note • If `/aiwinst` is in /home, it must have 2.5 GB free space. • If `/home/aiwinst` is a separate file system from `/home`, `/home/aiwinst` must have 2.5 GB free space. • The `/home` file system must not be mounted with the nosuid option. To verify that the nosuid option is not used, enter `mount` on the command line.
	2 GB free space	2 GB free space	**If you use DB2 as the database and it is on a different computer:** File system that contains the home directory of the RICOH ProcessDirector DB2 client user when you install the DB2 client on the same computer as the base product and configure it to work with a DB2 server on a different computer.
/opt	50 GB free space With Ricoh Postscript/PDF to AFP, PCL to AFP, SAP to AFP, or AFP to PDF installed, 1 GB **additional** free space With the Advanced Transform	45 GB free space With Ricoh Postscript/PDF to AFP, PCL to AFP, SAP to AFP, or AFP to PDF installed, 1 GB **additional** free space With the Advanced Transform feature	File system for RICOH ProcessDirector code. Note • The `/opt` file system must not be mounted with the nosuid option. To verify that the nosuid option is not used, enter `mount` on the command line.

File system	Recommended size	Minimum size	Description
	feature installed, 1 GB **additional** free space	installed, 1 GB **additional** free space	
/tmp	3 GB free space	750 MB free space	Temporary space used by the RICOH ProcessDirector installer. The RICOH Transform features listed require an additional 500 MB of free space in `/tmp`. **Note** • If you upgrade the DB2 database, you need 3 GB free space.
/usr	750 MB free space	750 MB free space	File system that contains the `/usr/lpp/psf` and `/usr/lib` directories used for printing AFP files.

For the file systems that RICOH ProcessDirector manages, ownership and permissions must be set as shown in Ownership and permissions for file systems, p. 48. If the RICOH ProcessDirector installer creates directories, it sets the correct ownership and permissions automatically.

Ownership and permissions for file systems

File system	Owner	Group	Permissions
/var/psf	root	root	2775 - drwxrwsr-x
/aiw/aiw1/db2 (See **Note.**)	root	root	775 - drwxrwxr-x
/aiw/aiw1/db2_logs (See **Note.**)	root	root	775 - drwxrwxr-x
/var/aiw	root	root	777 - drwxrwxrwx
/aiw	root	root	755 - drwxr-xr-x

Note

- The installation program changes the ownership to the RICOH ProcessDirector system user and group. You can use the default RICOH ProcessDirector system user (**aiw1**) and group (**aiwgrp1**), or you can specify a different user and group.

File systems for Linux Secondary Server features

You can let the RICOH ProcessDirector installer create the directories listed in File systems for Linux Secondary Server features, p. 49, or you can create them yourself before you install RICOH

ProcessDirector. If you let RICOH ProcessDirector create them, they are created as directories, not file systems. If you want to use multiple partitions, you must create the file systems manually.

File systems for Linux Secondary Server features

File system	Recommended size	Minimum size	Description
/aiwinstaller	2 GB	2 GB	File system that the installation program uses to store its files.
/var/psf	5 GB	5 GB	File system for PSF configuration and temporary files. Note • If `/var/psf/segments` is a subdirectory of `/var/psf`, `/var/psf` must meet the combined requirements of the two file systems.
/var/psf/segments	45 GB	10 GB	File system used to improve performance. This file system must be bigger than your biggest job. It requires enough space to store data for concurrent jobs on multiple printers. The recommended minimum size is 45 GB for five printers. Increase the size by 10 GB for each additional printer.
/var/aiw	5 GB	5 GB	File system for debug information from RICOH ProcessDirector.

Existing file systems that Linux Secondary Server features use, p. 49 shows the file systems that you create when you install the Linux operating system. You might need to increase the size of these file systems before you install RICOH ProcessDirector.

Existing file systems that Linux Secondary Server features use

File system	Recommended size	Minimum size	Description
/var/spool/lpd	Varies	Set as an operating system default	File system used to spool jobs received by LPD protocol. This file system must be large enough to hold all of the print files that you receive at one time with the LPD protocol.
/opt	15 GB free space	10 GB free space	File system for RICOH ProcessDirector code. Note • The `/opt` file system must not be mounted with the nosuid option. To verify that the nosuid option is not used, enter `mount` on the command line.

File system	Recommended size	Minimum size	Description
/tmp	750 MB free space	750 MB free space	Temporary space used by the RICOH ProcessDirector installer.
/usr	750 MB free space	750 MB free space	File system that contains the `/usr/lpp/psf` and `/usr/lib` directories used for printing AFP files.

For the file systems that RICOH ProcessDirector manages, ownership and permissions must be set as shown in Ownership and permissions for Linux Secondary Server feature file systems, p. 50. If the RICOH ProcessDirector installer creates directories, it sets the correct ownership and permissions automatically.

Ownership and permissions for Linux Secondary Server feature file systems

File system	Owner	Group	Permissions
/var/aiw	root	root	777 - drwxrwxrwx
/var/psf	root	root	2775 - drwxrwsr-x
/var/psf/segments	root	root	2777 - drwxrwsrwx

Creating system groups and users

RICOH ProcessDirector requires several user groups and IDs on the primary computer to operate correctly. The installation program can create the user groups and IDs or you can create them in advance.

It is easiest to let the installer create the user groups and IDs using the default values. If the default names do not comply with user and group naming rules in your environment, you can choose different names and enter them in the installer when requested. The groups and users are created using the specified names as local system users and groups.

If you prefer to create the groups and users in advance (using either the default names or names that you specify), the installation program can find and use them. Create those groups and users according to the descriptions below and enter their names in the installation program when asked.

Note

- If you plan to set up a manual failover environment, follow the instructions for setting up system groups and users in Installing a manual failover environment, p. 124.

If you plan to install any Secondary Server features on Linux computers, you must create some groups and users on both the primary computer and secondary computers. The groups and users on the secondary computers must be identical to those on the primary computer.

Note

- All Linux operating system user IDs and group names must be 1-8 characters because of a restriction in DB2. You cannot create a user ID that includes international characters (such as á, É, î, ñ, ô, ß) or double-byte characters. This limitation only applies if you use DB2 as your database.

Required groups

RICOH ProcessDirector requires these groups on the primary computer:

RICOH ProcessDirector group

The group that controls access to the RICOH ProcessDirector data directory. Members of this group can access the `/aiw/aiw1` file system. This is the default or primary group for the RICOH ProcessDirector system user.

The default name for the group is **aiwgrp1**.

Print queue group

The group used for all users and applications that send jobs to printers. On some platforms, this is a system group that is created when the operating system is installed, but not on others. For example, this group is created when you install SLES, but not when you install Red Hat Linux.

The name for this group must be printq. You cannot create a group with a different name and have RICOH ProcessDirector use it. If the installer does not find a group named **printq**, it creates one.

PostgreSQL database group

The group used to give access to the PostgreSQL database that RICOH ProcessDirector installs in a Docker container. This group is created when you install Docker Engine.

The default name for the group is **docker**.

When you install RICOH ProcessDirector, the RICOH ProcessDirector system user is added to this group.

This group is only required if you use PostgreSQL installed with RICOH ProcessDirector as your database and you are using Docker.

DB2 database group

The group used to give members DB2 **sysadm** authority for database operation. This is the default or primary group for the RICOH ProcessDirector instance user and for the Database client user (if needed).

The default name for the group is **aiwdbgrp**.

If you plan to use a DB2 server installed on a different computer with RICOH ProcessDirector, this group is created while running the script **setupRemoteDB2.sh** on the computer that DB2 is installed on and also on the computer that RICOH ProcessDirector is installed on.

This group is only required if you use IBM DB2 as the RICOH ProcessDirector database.

DB2 database fenced group

The internal group required by DB2; the default or primary group for the fenced user.

The default name for the group is **aiwdbfgp**.

If you plan to use a DB2 server installed on a different computer with RICOH ProcessDirector, this group is created during the installation on the computer that DB2 is installed on.

This group is only required if you use IBM DB2 as the RICOH ProcessDirector database.

RICOH ProcessDirector also requires the **RICOH ProcessDirector group** and **print queue group** on any secondary computers.

Required users

RICOH ProcessDirector requires these users on the primary computer:

RICOH ProcessDirector system user

The user ID that RICOH ProcessDirector runs under. This user must have the **RICOH ProcessDirector** group set as its default or primary group. It must also be a member of the **Print queue** group and the **DB2 database** or **PostgreSQL database** group (if you use the PostgreSQL database installed with RICOH ProcessDirector). You can use the default values for the other user properties.

The default system user ID is **aiw1**.

DB2 instance user

The user ID that the RICOH ProcessDirector DB2 database instance runs under. This user must have its default or primary group set to the **DB2 database** group. It must also be a member of the **RICOH ProcessDirector** group. You can use the default values for the other user properties.

The default DB2 instance user ID is **aiwinst**.

If you plan to use a DB2 server installed on a different computer, this user is created on the computer that DB2 is installed on.

DB2 fenced user

A second user ID that DB2 requires when you create an instance. This user must be a member of the **DB2 database fenced** group. You can use the default values for the other user properties.

The default DB2 fenced user ID is **aiwdbfid**.

If you plan to use a DB2 server installed on a different computer, this user is created on the computer that DB2 is installed on.

DB2 database client user

The user ID that the DB2 client uses. This user is only required if you install a DB2 server on a different computer and the DB2 client on the same computer as RICOH ProcessDirector. This user must have its primary or default group set to the **DB2 database** group. You can use the default values for the other user properties.

The default DB2 database client user ID is **aiwclnt**.

RICOH ProcessDirector also requires the **RICOH ProcessDirector system user** on any secondary computers.

Note

- If you set up passwords with expiration rules for these user IDs, you must administer those IDs as needed. If you do not change the passwords as needed and they expire, RICOH ProcessDirector stops working.

RICOH Transform features users and groups

One additional group and two additional users are required if you install any of these RICOH Transform features:

- Ricoh AFP to PDF
- Ricoh PCL to AFP

- Ricoh PostScript/PDF to AFP
- Ricoh SAP to AFP

The default users are **ipsitm** and **ipsejz**; the default group is **itm**. The Advanced Transform feature does not require these users and group.

Important

- Do not make either RICOH Transform features user ID the same as the RICOH ProcessDirector user ID. For example, if the RICOH ProcessDirector user ID is **aiw1**, do not enter **aiw1** for either Transform feature user ID.

Secure Sockets Layer and Transport Layer Security support

RICOH ProcessDirector provides support for the Secure Sockets Layer (SSL) and Transport Layer Security (TLS) protocols, so you can protect the print data in the system.

SSL and TLS are widely used to protect data on the Internet. The SSL and TLS protocols use digital certificates to establish a secure connection between a web server and any client systems that interact with it. After the connection is established, data transferred between the systems is encrypted using security keys. Only the intended recipient of the information can decrypt the data.

You can also use SSL or TLS to protect data on a smaller scale, such as within a print system like RICOH ProcessDirector. You can activate SSL or TLS to provide a greater level of security for the print data that is exchanged between the primary server and user interfaces, as well as the data that is exchanged with other applications using the web services that RICOH ProcessDirector supports.

To use SSL or TLS on a computer, you must obtain a digital certificate and install it on that computer. It is recommended that you get your certificate from a certificate authority (CA), because CAs are considered trusted third parties. You can use a self-signed certificate for testing, but using that certificate on production systems is not recommended.

When the certificate is issued, the CA sends it to you in an e-mail. You store the certificate in a keystore on the computer that the certificate is registered to.

Note

- RICOH ProcessDirector only supports Java Key Stores (JKS) files. To create a keystore, see the Java documentation about enabling SSL or TLS.
- Your private key password and keystore password must be the same. If they are not the same, you receive a `java.oi.IOException` error.

After the web server is configured to use it, SSL or TLS is automatically used for communications. The URL for the RICOH ProcessDirector user interface changes to use the **https://** prefix. You can still access the user interface using the **http://** address, but you can configure the web server to forward all requests to the secure address.

To use SSL or TLS with RICOH ProcessDirector, you can get a digital certificate and install it on the primary computer before you install the base product. After the base product is installed, you must activate SSL or TLS in the RICOH ProcessDirector web server component.

Considerations for virtual and cloud environments

RICOH ProcessDirector can be installed in virtual environments, such as those provided with VMware, or cloud platforms such as Amazon Web Services.

When configuring this type of system, the operating system prerequisites, memory and file system requirements still apply. Carefully consider security and network issues, especially if your RICOH ProcessDirector primary server runs outside of your physical network or you are sending jobs to continuous feed printers.

- The host name assigned to the RICOH ProcessDirector instance cannot change when the server is restarted. If this value changes over a restart, you will have a short grace period to update your license keys before the system stops running.
- If you are printing across an externally hosted or distributed network, you need substantial network bandwidth to keep high-speed printers running at rated speed over long distances.

  If you are printing to AFP, PCL, and IPDS printers, you can use a secondary server to receive and buffer print jobs so that data transmission to the printers can keep up with high print speeds. We recommend adding the secondary server to the same network that the printers are on and using this secondary server for the **Printer server** value when you create the printer objects. Also, take into consideration the location of the files that are being printed, as different printer types and methods might not get the required speed if the spool directory is not on the same network.

  After installing the secondary server, set these properties on the AFP printer:

  – **Copy to secondary server**: **Yes**

  – **Destination directory on secondary server**: The location on the secondary server file system where you want RICOH ProcessDirector to write print files.

  If you are printing to a Ricoh PDF or Custom PDF printer, there are some limitations to consider:

  – The PDF Printers do not have the **Copy to secondary server** option.

  – For PostScript printing, the quality of the PDF file can impact the time required for the printer to convert the PDF file to PostScript. The output PostScript file is created locally on the server where the Ricoh PDF Printer or Custom PDF Printer is defined. However, the file conversion occurs in the spool directory.

  – Optionally, jobs can be divided into smaller files. These smaller files are created on the primary server and then the smaller files are sent to the printer.

    Important

    ♦ We do not recommend dividing jobs into smaller files for Custom PDF printers, as the primary server does not receive status of all smaller files. Thus, it could result in a smaller file not printing.

  – When the printer is defined on the secondary server, the secondary server communicates with the printer for media information, printer status, and job status updates during printing.
- Securing data across your network and from cloud platforms to printers on the ground is your responsibility. Use of virtual private networks (VPNs) sometimes introduces performance degradation in file transfer. Involve your network and security administrators when planning to host RICOH ProcessDirector in these environments.

Security:

Securing data across your network and from cloud platforms to secondary servers or printers on the ground is your responsibility.

- Verify that the system where RICOH ProcessDirector is installed meets your security requirements.
- Enable secure HTTP (using the TLS protocol) in RICOH ProcessDirector to increase data security.
- Using a private VPN can help improve security, but it can also degrade network performance.

Network configuration:

- The host name assigned to the RICOH ProcessDirector instance cannot change when the server is restarted. If this value changes over a restart, you will have a short grace period to update your license keys before the system stops running.
- To enable communication between the remote secondary servers and primary server, make sure that the secondary server uses the primary server hostname over port *5555*. For more information about the server name, see Updating a primary computer host name or IP address, p. .

Network performance:

- If you print across an externally hosted or distributed network, you need substantial network bandwidth to keep high-speed printers running at rated speed over long distances. Contact your network administrator for help with configuring your network capacity.

Installing required software

RICOH ProcessDirector requires this software on the primary computer:

- A supported Linux operating system
  See Supported operating system and database configurations, p. 20 for more information.
- A supported platform container engine:
  This software is only required if you are using the PostgreSQL included with RICOH ProcessDirector as your database. Supported platform container engines are:
  - Docker Engine 24.0.6 or higher
  - Podman 4.0 or higher
- A supported database
  RICOH ProcessDirector uses a database to manage the flow of data. Two databases are supported:

  PostgreSQL

  The default database for RICOH ProcessDirector in version 3.12 and higher. You can choose to install the PostgreSQL version that comes with RICOH ProcessDirector or use you own version of PostgreSQL installed separately. The RICOH ProcessDirector installation program installs PostgreSQL in a Docker or Podman container. You must install Docker Engine 24.0.6 or higher or Podman 4.0 or higher before you install RICOH ProcessDirector to use the PostgreSQL configuration.

  If you choose to use a PostgreSQL database installed separately on the primary computer or on another computer, make sure to install it before running the installation for RICOH ProcessDirector. RICOH ProcessDirector supports PostgreSQL 15 and higher.

For download and installation instructions, refer to these links:

- https://www.postgresql.org/download/
- https://www.postgresql.org/docs/

IBM DB2

The default database for RICOH ProcessDirector in version 3.11.2 and lower and an alternate configuration for version 3.12 and higher.

You can use the version of DB2 provided with RICOH ProcessDirector or a DB2 version 11.5.8 or higher that you have installed outside of RICOH ProcessDirector. If you already have DB2 version 11.5.8 or higher installed on a computer in your network, you can configure RICOH ProcessDirector to work with that version instead. See Installing DB2, p. 73.

If you plan to install a Secondary Server feature, you must install a supported Linux operating system on the secondary computer.

If you plan to install an application server on a Windows computer, you must install a supported Windows operating system on the application server computer.

These features require additional software:

- Secondary Docker

  Docker Engine 24.0.6 or higher is required on Linux computers that will host Docker container secondary servers.
- PitStop Connect

  Enfocus PitStop Server 10 or higher on an application server that is configured to work with the primary server.
- FusionPro Connect

  FusionPro Server on an application server that is configured to work with the primary server.
- Ultimate Impostrip® Connect

  Ultimate Impostrip® Automation or Scalable on an application server that is configured to work with the primary server or on a separate Windows system.

  Note

  - If your Windows computer runs in a language other than English, do not install Ultimate Impostrip® in the default install directory. The program does not work properly with non-English default install paths. We recommend installing Ultimate Impostrip® in `C:\ImpostripOnDemand` on non-English Windows computers.
- Quadient Inspire Connect

  Quadient Inspire Designer V8 or higher.
- The AFP Support feature includes RICOH Visual Workbench, a separate user interface that you can install on any Linux or Windows system in your network.

  Java 1.8 or later must be installed on the system that is used for RICOH Visual Workbench.
- The PDF Document Support feature includes RICOH ProcessDirector Plug-in for Adobe Acrobat, a separate user interface that you can install on a Windows system in your network. Java 1.8 or later and Adobe Acrobat Pro 2020 or DC must be installed on the system that is used for RICOH ProcessDirector Plug-in for Adobe Acrobat.

- RICOH Transform features

  Java Runtime Environment 1.4 or higher.

  WorldType Fonts version 8.13 for RICOH SAP to AFP files to transform correctly when IS/3 support is enabled.

- Avanti Slingshot Connect

  Avanti Slingshot with the JDF Integration add-on installed on an application server that is configured to work with the primary server.

Other required software:

- A supported web browser

  A browser is required to open the RICOH ProcessDirector user interface, so it is required on any system that is used to access the user interface.

- A PDF viewer

  A PDF viewer is used inside the RICOH ProcessDirector user interface to display the contents of print jobs. It should be installed on any system that is used to access the user interface, but it is not required. If you open the user interface from a computer that does not have a PDF viewer installed, you see an error message if you try to view a job. Using Adobe Reader is recommended as it provides the most functionality.

Installing an operating system

RICOH ProcessDirector requires a 64-bit operating system that supports running 32-bit applications.

For primary or secondary computers:

One of these operating systems:

- Red Hat 8.1 through latest 8.X
- Red Hat 9.2 through latest 9.X
- Rocky Linux 8.4 through latest 8.X
- Rocky Linux 9.0 through latest 9.X
- SUSE Linux Enterprise Server (SLES) 12.0 with Service Pack 4 or above for x86_64
- SUSE Linux Enterprise Server (SLES) 15.0 with Service Pack 1 or above for x86_64

Note

- Rocky Linux is based on the Red Hat code base. References to Red Hat-derived operating systems in this documentation indicate that the statement or instruction is appropriate for Red Hat and Rocky Linux.
- Some operating system and database configurations are not supported; others require additional software. See Supported operating system and database configurations, p. 20 for more information.

For Windows application servers:

One of these operating systems:

- Windows 10 Pro or Enterprise 64-bit
- Windows 11 Pro
- Windows Server 2019 64-bit
- Windows Server 2022 64-bit

Important

- RICOH ProcessDirector verifies that the operating system meets these minimum requirements. The installation program does not install the software on earlier versions of the operating systems.

Installing the SLES operating system

1. See the SLES documentation to install SUSE Linux Enterprise Server (SLES) 12.0 with Service Pack 4 or above for x86_64 or SUSE Linux Enterprise Server (SLES) 15.0 with Service Pack 1 or above for x86_64.
    1. Make sure that these components are installed on both the primary and secondary computers:
        - Korn shell (**mksh**)
        - binutils
        - `insserv-compat` package
        - `libX11.so.6` and its dependent libraries
        - Perl interpreter (Perl.rte 5.8.8 or later)
        - Zip and unzip utilities
        - The `fontconfig` and `freetype` libraries
          We also strongly recommend installing DejaVu Fonts. OpenJDK requires these libraries to identify available fonts on the system.
        - On a SLES 12 primary computer only: The `net-tools` package.
        - On a SLES 15 primary computer only: The `net-tools-deprecated` package.
        - glibc 2.27 or higher
          This package is only required if you plan to install any RICOH Transform features.
    2. If you plan to install application servers, install the Network Information Service (NIS) server on the SLES primary computer. You can use YaST (Yet Another Setup Tool) to install NIS. In YaST, click **Software** → **Software Management** and search for `ypserv`.

       The `rpcbind` service is required on the primary computer.
    3. Security Enhanced Linux (SELinux) and Federal Information Processing Standard (FIPS) must be disabled during the install process for RICOH ProcessDirector. You can enable them again after the install is complete.
2. Create Linux partitions and file systems. See Planning for file systems, p. 44 for recommendations and considerations.
3. Run these commands and look for the expected results to verify that you installed SLES correctly:

SLES commands and expected results

Command	Expected result
To check the SLES release: `cat /etc/os-release`	Returns the operating system version and patch level.
To verify that the operating system is 64-bit: `uname -a`	A response that includes: `x86_64`
To check for Korn shell (mksh): `rpm -q mksh`	Response similar to: `mksh-50-2.13.x86_64`
To check for binutils: `rpm -q binutils`	Results resemble this example: `binutils-2.31-9.26.1.z86_64`

To check for insserv-compat:
`rpm -qa | grep insserv-compat`
	Results resemble this example:
	`insserv-compat-0.1-4.3.1.noarch`
	If no results are returned, you must install the missing package.
	To install the serving-compat package, type:
	`zypper install insserv-compat`

To check for libX11.so.6:
`rpm -qa |grep -i X11`
`ls -l /usr/lib*/libX11*`
	Results include a collection of libraries with the text `X11` in the name, such as:
	`libX11-6-1.6.2-12.5.1.x86_64`
	`libX11-data-1.6.5-1.41.noarch`
	`libxkbcommon-x11-0-0.8.0-1.17.x86_64`
	`ghostscript-x11-9.25-23.13.1.x86_64`
	`xorg-x11-essentials-7.6_1-1.22.noarch`
	If fewer than five results are returned, not all of the dependencies are installed. Install the libX11 libraries again, making sure to install all of the dependencies.

To check the version of Perl that is installed: `rpm -q perl`	A response that resembles: `perl-5.8.8-14.10`
To verify that the libraries for font support are installed: • `rpm -qa | grep fontconfig` • `rpm -qa | grep freetype` • `rpm -qa | grep -i dejavu`	Results resemble these examples: • `fontconfig-2.13.0-4.3.el7.x86_64` • `freetype-2.8-14.el7.x86_64` • `dejavu-fonts-common-2.35-7.el8.noarch` If no results are returned, you must install the missing library or fonts. To install all three, type: `zypper install libfreetype6 fontconfig dejavu-fonts`

Command	Expected result

To check for the net-tool packages:
On SLES 12:
`rpm -qa |grep net-tools`
On SLES 15:
`rpm -qa |grep net-tools-deprecated`
	Results resemble these examples:
	• `net-tools-1.60-765.5.4.x86_64`
	• `net-tools-deprecated-2.0+git20170221.47bb4a-3.11.x86_64`

To check the versions of zip and unzip that are installed:
`rpm -q zip`
`rpm -q unzip`
	`zip-3.0-1.el6.x86_64` (typical)
	`unzip-6.0-1.el6.x86_64` (typical)

`getconf GNU_LIBPTHREAD_VERSION`	`NPTL 2.19`
To verify that the rpcbind service is running: `rpcinfo`	A response that includes system information indicates that the rpcbind service is running. If the responses is an error message, the rpcbind service is not running. Type this command to start the rpcbind service: `/sbin/rpcbind`
If you are going to print with AFP printers whose parent server is a SLES Linux server, the portmap utility must be installed and running. `rpcinfo -p` This command only returns results if the rpcbind service is running.	A response that includes portmap, such as: `program vers proto port service 100000 4 tcp 111 portmapper`
To check the status for SELinux: `getenforce`	`Disabled`
To check the status for FIPS: `fips-mode-setup --check`	`Disabled`

Command	Expected result
To check the version number of glib library `rpm -q glibc`	Results resemble this example: `glibc-2.22-15.3.x86_64`

Note

- If you have installed a later version of a prerequisite, the version number returned varies.

If the command results are not as you expect, use YaST to make sure you have installed the required components (see step 1). In YaST, click **Software** → **Install/Remove Software**.

4. Verify date, time, and time zone settings through YaST, and correct if necessary:

   Click **System** → **Clock and Time Zone Configuration**. If you change the date, time, or zone, you might have to reboot the system for your changes to take effect.

5. Continue with Setting up networking configuration, p. 65.

Installing a Red Hat-derived operating system

RICOH ProcessDirector can be installed on a supported Red Hat or Rocky Linux operating system.

1. See the Red Hat or Rocky documentation to install the operating system.

   1. Make sure that these components are installed on both the primary and secondary computers:

      - Two versions of Korn shell: ksh and mksh
      - binutils
      - `/usr/lib64/libstdc++.so.6`

        The 64-bit version of a shared library that RICOH ProcessDirector uses. On supported Red Hat versions, the libraries are installed by: `.so.6: libstdc++-4.8.5-4.el7.x86_64`

        Note

        – The libraries are provided on the operating system installation media or can be downloaded from the Red Hat website.
      - `libX11.so.6` and its dependent libraries
      - Perl interpreter (Perl.rte 5.8.8 or later)
      - Zip and unzip utilities
      - The `fontconfig` and `freetype` libraries

        We also strongly recommend installing DejaVu Fonts. OpenJDK requires these libraries to identify available fonts on the system.
      - The `net-tools` package.
      - The `initscripts-service` package.

        This package is required only for Rocky Linux.

- glibc 2.27 or higher
  This package is only required if you plan to install any RICOH Transform features.

2. If you plan to install an application server on Windows, you must install a Network Information Service (NIS) server on the primary computer. These services are required on the primary server:
   - ypserv
   - ypbind
   - rpcbind
3. On servers that have a Common UNIX Printing System (CUPS) printer type defined:

   These RPMs are required:
   - `system-config-printer-libs`
   - `system-config-printer-udev`

   Note
   - CUPS printer types include Passthrough and PCLOut printers that use the **lpr** command.
4. Security Enhanced Linux (SELinux) and Federal Information Processing Standard (FIPS) must be disabled during the install process for RICOH ProcessDirector. You can enable them again after the install is complete.

2. Create Linux partitions and file systems. See Planning for file systems, p. 44 for recommendations and considerations.
3. Run these commands and look for the expected results to verify that you installed Red Hat correctly:

Red Hat/Rocky Linux commands and expected results

Command	Expected result

To check the Red Hat release:
`cat /etc/redhat-release`
To check the Rocky Linux release:
`cat /etc/os-release`
	`Red Hat Enterprise Linux Server release release_number`
	`NAME="Rocky Linux"`
	`VERSION=release_number`

To verify that the operating system is 64-bit: `uname -a`	Results that include `x86_64` as in this example: `Linux myserver 3.10.0-123.el7.x86_64 #1 SMP Mon May 5 11:16:57 EDT 2014 x86_64 x86_64 x86_64 GNU/Linux`
To check for the Korn shell packages: `rpm -q ksh`	Results resemble this example: `ksh-20120801-19.el7.x86_64` and

Command	Expected result
and `rpm -q mksh`	`mksh-56c-5.el8.x86_64`
To check for binutils: `rpm -q binutils`	Results resemble this example: `binutils-2.30-108.el8.x86_64`

To check for /usr/lib64/libstdc++.so.6:
Go to `/usr/lib64/` and type:
`ls`
	The list of files must include this exact entry:
	`/usr/lib64/libstdc++.so.6`
	The list might link that entry to this one:
	`/usr/lib64/libstdc++.so.6.0.13`

To check for libX11.so.6:
`rpm -qa |grep -i X11`
`ls -l /usr/lib*/libX11*`
	Results include a collection of libraries with the text `X11` in the name, such as:
	`libX11-1.6.5-2.el7.x86_64`
	`libX11-common-1.6.5-2.el7.noarch`
	`libxkbcommon-x11-0.7.1-1.el7.x86_64`
	`xorg-x11-font-utils-7.5-21.el7.x86_64`
	`xorg-x11-xinit-1.3.4-2.el7.x86_64`
	If fewer than five results are returned, not all of the dependencies are installed. Install the libX11 libraries again, making sure to install all of the dependencies.

To check the version of Perl that is installed: `rpm -q perl`	Results resemble this example: `perl-5.16.3-283`
To verify that the libraries for font support are installed: • `rpm -qa | grep fontconfig` • `rpm -qa | grep freetype` • `rpm -qa | grep -i dejavu`	Results resemble these examples: • `fontconfig-2.13.0-4.3.el7.x86_64` • `freetype-2.8-14.el7.x86_64` • `dejavu-fonts-common-2.35-7.el8.noarch` If no results are returned, you must install the missing library or fonts. To install all three, type: `yum install freetype fontconfig dejavu-sans-fonts`
To check for the net-tools package: `rpm -q net-tools`	Results resemble this example: `net-tools-2.0-0.25.20131004git.el7.x86_64`

To check the versions of zip and unzip that are installed:
`rpm -q zip`
`rpm -q unzip`
	Results resemble these examples:
	`zip-3.0-1.el6.x86_64` (typical)
	`unzip-6.0-1.el6.x86_64` (typical)

Command	Expected result
`getconf GNU_LIBPTHREAD_VERSION`	Results indicate version 2.17 or higher: `NPTL 2.17`

To verify the RPM files that printer objects require:
`rpm -qa | grep system-config-printer`
	The list of results should include:
	`system-config-printer-libs`
	`system-config-printer-udev`

If you are going to print with AFP printers whose parent server is a Linux server, the portmap utility must be installed and running. `rpcinfo -p`	A response that includes portmap, such as: `program vers proto port 100000 4 tcp 111 portmapper`
To check the status for SELinux: `getenforce`	`Disabled`
To check the status for FIPS: `fips-mode-setup --check`	`Disabled`
To check the version number of glib library `rpm -q glibc`	Results resemble this example: `glibc-2.22-15.3.x86_64`
Note • If you have installed a later version of a prerequisite, the version number returned varies.	

If the command results are not as you expect, use the operating system tools to make sure that you have installed the required components (see step 1).

4. Verify date, time, and time zone settings, and correct if necessary. To display the settings, type:

   `timedatectl`

5. Continue with Setting up networking configuration, p. 65.

Installing a Windows Operating System

When you install an application server on a Windows operating system, choose the correct mode to run in.

RICOH ProcessDirector can be installed on these operating systems:

- Windows Server 2019 64-bit
- Windows Server 2022 64-bit
-
- Windows 10 Pro or Enterprise 64-bit
- Windows 11 Pro

To install a Windows operating system:

- See the Windows documentation to install the appropriate operating system. When you are asked to choose 32-bit or 64-bit mode, choose 64-bit mode for the Windows operating system. RICOH ProcessDirector is not compatible with 32-bit mode.

  Make sure that User Account Control (UAC) is set to **OFF**. You can turn it back on when the installation is complete.
- RICOH ProcessDirector supports both IPv4 and IPv6 protocols. If you use IPv4, IP addresses can be expressed using dotted-decimal addresses or the fully qualified host name. If you use IPv6, you must use the fully qualified host name of the server.

  Note

  – If you use an IPv6 address, you must complete additional configuration steps after you install RICOH ProcessDirector. See Configuring to use IPv6 addresses, p. 149.

Setting up networking configuration

To set up networking based on system networking information:

1. Make sure that RICOH ProcessDirector has access to a Domain Name System (DNS) server. The DNS server must have correct entries for the host name and IP address of each RICOH ProcessDirector primary computer and application/secondary computer on the network.

   Note

   - RICOH ProcessDirector supports both IPv4 and IPv6 protocols. If you use IPv4, IP addresses can be expressed using dotted-decimal addresses or the fully qualified host name. If you use IPv6, you must use the fully qualified host name of the server.
   - If you use an IPv6 address, you must complete additional configuration steps after you install RICOH ProcessDirector. See Configuring to use IPv6 addresses, p. 149.
2. Make sure that `/etc/hosts` on the primary computer has an entry for its IP address and the fully qualified host name.
3. In your firewall, open any ports that RICOH ProcessDirector uses. Depending on your configuration, you might need these ports:

Ports to open for the RICOH ProcessDirector primary server

Port	Used by (Client)	Used for (Purpose)
15080	User workstation	Access to the RICOH ProcessDirector user interface if not using TLS.
15090	Administrator workstation	Access to the RICOH ProcessDirector Feature Manager interface if not using TLS.
15443	User workstation	Access to the RICOH ProcessDirector user interface if using TLS.
15453	Administrator workstation	Access to the RICOH ProcessDirector Feature Manager user interface if using TLS.
515	Customer application	Required when sending jobs to RICOH ProcessDirector using LPR.
5001-65535	Customer mainframe	Sending jobs to RICOH ProcessDirector using Download for z/OS or AFP Download Plus. The port numbers defined in RICOH ProcessDirector must match the port numbers defined as printers on the mainframe.
55555	RICOH ProcessDirector secondary server	Using secondary servers that are not defined on the same system as the primary server. Allows communication between the secondary server and the primary server.
15080 or 15443	RICOH TotalFlow Print server	Sending printing status to RICOH ProcessDirector.

Ports to open for RICOH ProcessDirector primary, secondary, and application server

Port	Used by (Client)	Used for (Purpose)
15081	Administrator workstation	Importing the custom PDF printer definition to the RICOH ProcessDirector server that will be communicating with the printer Custom PDF printers. Most systems do not use custom PDF printers.
	Ricoh PDF printer	The job ticket containing reference to a PDF file that the printer retrieves.

Ports to open for the NFS server

Port	Used by (Client)	Used for (Purpose)
111	RICOH ProcessDirector primary and secondary server	The NFS server and User Name Mapping function when sharing data from the primary server to secondary servers or other systems using NFS.
2049	RICOH ProcessDirector primary and secondary server	The NFS server when sharing data from the primary server to secondary servers or other systems using NFS.

Ports to open for printers

Port	Used by (Client)	Used for (Purpose)
161	RICOH ProcessDirector primary and secondary server	Getting printer status and information using SNMP.
8010	RICOH ProcessDirector primary and secondary server	Getting printer status and information using SNMP.
9100-9103	RICOH ProcessDirector primary and secondary server	Sending jobs to a printer with a EFI Fiery controller using Postscript job tickets.

Ports to open for LDAP server

Port	Used by (Client)	Used for (Purpose)
389, 636, or other port as configured.	RICOH ProcessDirector primary server	Using LDAP to authenticate users.

Ports to open for printers that support JMF interfaces [1]

Port	Used by (Client)	Used for (Purpose)
80	RICOH ProcessDirector primary and secondary server	Sending IMSS queries using the HTTP protocol.
8010	RICOH ProcessDirector primary and secondary server	Sending JMF files to EFI Fiery controllers.
9100 (default) - 9103	RICOH ProcessDirector primary and secondary server	Sending jobs to a printer with a EFI Fiery controller using Postscript job tickets. 9100 is the default port. EFI printers use port 9102.

[1]These printers are defined in RICOH ProcessDirector as Ricoh PDF Printer objects.

Ports to open for Passthrough printers

Port	Used by (Client)	Used for (Purpose)
515	RICOH ProcessDirector primary server	Receiving jobs from RICOH ProcessDirector using LPR.

Ports to open for IPDS printers

Port	Used by (Client)	Used for (Purpose)
5001-65535	RICOH ProcessDirector primary server	Sending files to RICOH ProcessDirector using Download for z/OS or AFP Download Plus. These port numbers are configured when you create the input devices that receive these jobs. Open these ports after you define the input devices.

Ports to open for a transform server

Port	Used by (Client)	Used for (Purpose)
6984-6992	RICOH ProcessDirector primary server	Using any of the RICOH Transforms and that are not installed on the primary server. These transforms are not the same as the RICOH ProcessDirector Advanced Transform feature.
16080	Administrator workstation	Accessing the Transform Features user interface if using any of the RICOH Transforms.

Ports to open for the Reports feature

Port	Used by (Client)	Used for (Purpose)
5432	RICOH ProcessDirector primary server and any system accessing RICOH ProcessDirector reports data	Accessing the PostgreSQL database used to store data collected by the Reports feature. This database might be on the primary computer or on a different computer on your network. Using a PosgreSQL database installed separately as the primary database or when collecting data with the Reports feature. This port can be different depending on the port you specified when setting up the database.

Ports to open for a DB2 server

Port	Used by (Client)	Used for (Purpose)
DB2 prior to 11.5.8: 50000 DB2 11.5.8 and higher: 25000	RICOH ProcessDirector primary server	Using a DB2 database installed on a different server. These are the default ports used by DB2; the default value changed in Version 11.5.8. If your installation of DB2 uses a different port, open the port you use.

Ports to open for a primary PostgreSQL database

Port	Used by (Client)	Used for (Purpose)
5442	RICOH ProcessDirector primary server	Communication with the Docker or Podman container that holds the PostgreSQL database for RICOH ProcessDirector

4. Verify network connectivity:
   1. To verify that host name resolution is working, enter this command:
      `host localhost`

If you can access the DNS server, the response includes the host name `localhost` or `loopback` and the address `127.0.0.1`. For example:

```
localhost.mycompany.com is 127.0.0.1
```

2. From the computer where you will access the RICOH ProcessDirector user interface, use both the host name and the IP address to ping the primary computer.
3. From all application and secondary computers (if any), ping the primary computer.
4. From the primary computer, ping all secondary computers (if any).
5. Contact the network administrator if you are not successful with any of these verifications.

5. Verify that the speed, duplexing, and autonegotiation settings for the Ethernet card are those that your network administrator recommends for optimum performance. The optimum settings are different for each installation.

   To display and change these settings:

   1. Log in as the root user.
   2. To display the Ethernet settings, enter:

      ```
      ethtool eth0
      ```

   3. If necessary, use the ethtool command to change these settings. Check with the network administrator for the appropriate flags and values for your network. For example, this command sets full-duplex mode:

      ```
      ethtool -s eth0 duplex full
      ```

      This command sets autonegotiation on:

      ```
      ethtool -s eth0 autoneg on
      ```

6. Verify that the system listens on open ports. You can use the `netstat` command to verify the listening ports.

Installing PostgreSQL

You can use the version of PostgreSQL that is supplied with RICOH ProcessDirector or you can install your own copy of PostgreSQL. Your own copy can be installed on the same computer as the RICOH ProcessDirector base product or on a different computer.

If you are upgrading RICOH ProcessDirector and you want to transition from DB2 to PostgreSQL, you can migrate your existing data after you install the update. See Upgrading, p. 89.

Installing the RICOH ProcessDirector version of PostgreSQL

The RICOH ProcessDirector version of the PostgreSQL database is the easiest method to set up your PostgreSQL environment. RICOH ProcessDirector configures the PostgreSQL environment at installation time, allowing RICOH ProcessDirector to communicate with the PostgreSQL database. Also, RICOH ProcessDirector offers specialized maintenance scripts for the PostgreSQL database and the choice to migrate your database in case you need.

The RICOH ProcessDirector version of PostgreSQL is installed when you install the RICOH ProcessDirector base product.

The RICOH ProcessDirector installation program installs PostgreSQL in a Docker or Podman container. You must install Docker Engine 24.0.6 or higher or Podman 4.0 or higher before you install RICOH ProcessDirector to use the PostgreSQL configuration. If you cannot use Docker or Podman on your system, you can install your own version of PostgreSQL. See Configuring your own PostgreSQL database, p. 71 for more details.

Configuring your own PostgreSQL database

If you cannot use the RICOH ProcessDirector version of PostgreSQL, you can install PostgreSQL on your own and configure it to work with RICOH ProcessDirector.

RICOH ProcessDirector requires PostgreSQL version 15 or higher. You must install the PostgreSQL database before you install RICOH ProcessDirector. For download and installation instructions, refer to these links:

- https://www.postgresql.org/download/
- https://www.postgresql.org/docs/

Note

- If PostgreSQL is installed on a different computer on your network, install either the PostgreSQL server or the PostgreSQL client on the primary computer. RICOH ProcessDirector uses the command line tools included in those packages to access PostgreSQL commands and send requests to the other system. If you install the PostgreSQL server, you can still configure RICOH ProcessDirector to use a database on a different system. You do not need to create a database on this system.

RICOH ProcessDirector provides a script to configure a PostgreSQL database installed separately to work with RICOH ProcessDirector. The script is included in the `/scripts` directory on the RICOH ProcessDirector base product DVD or ISO image.

Make sure that the existing database cluster or the target database cluster directory can be accessed by the `postgres` user.

To configure your own PostgreSQL database:

1. Log in to the system where PostgreSQL is installed as the root user, or use sudo or the su command to become the root user.
2. Mount the DVD or ISO image on the system where PostgreSQL is installed.
3. Switch the current user to the `postgres` user, which is the default system user account created during the installation of PostgreSQL. Type this command:

   ```
   sudo su - postgres
   ```

4. Add the PostgreSQL bin directory path to your system environment variables.

   Enter this command:

   ```
   export PATH=/usr/pgsql-version/bin:$PATH
   ```

   where *version* is the PostgreSQL version. For example: `export PATH=/usr/pgsql-15/bin:$PATH`

Note

- You can add this path to the `.profile` configuration file for the `postgres` user. Thus, the path is always available for the `postgres` user.

5. Go to the `scripts` directory on the DVD or ISO image and type this command to run the script:

   `./setupExternalPostgresql.pl`

   Note

   - If the `postgres` user does not have permissions on the `scripts` directory, you can copy the script to a directory where the `postgres` user has permissions. For example, you can copy the script to `/var/lib/pgsql` where the postgres user has already permissions to execute commands.

6. Respond to the prompts as required:

   - When the script asks for a new or an existing database cluster, enter either the path to an existing database cluster or the path where you want to create a new database cluster.
   - When the script asks for a user name, enter the PostgreSQL user name to assign as the owner of the database. You can choose the default PostgreSQL user, a different PostgreSQL user, or specify a new PostgreSQL user to be created. The default user is `postgres`.

     Important

     – If you do not know the password for the default user, do not select the default user as the user name.
   - When the script asks for a password, enter the password for the user. A password is only required in these cases:
     – You create a new database cluster.
     – You already created a user for RICOH ProcessDirector to use.
     – You create a new user using this script.
   - When the script asks for an IP address, enter the IP address of the RICOH ProcessDirector primary server.
   - When the script asks for a port number, enter the port used to communicate with RICOH ProcessDirector. The default value is `5432`. We recommend using a different port number than the default value when creating a new database cluster. The port number is only required when you create a new database cluster.

   The script creates the AIWDB database in the database cluster. If you create a new cluster, the PostgreSQL database starts automatically.

7. **Optional:** To make sure that the database is installed and running, run a command specifying the port number, database name, and user name. For example, this command lets you connect to your PostgreSQL database with specific options:

   `psql -p 5444 -d AIWDB -U aiwdbpsql`

   where `5444` is the port number, `AIWDB` is the database name, and `aiwdbpsql` is the user name.

Note

- If the command fails or you cannot connect to the database, verify that the information you entered is correct.
- If the command executes correctly, the postgres command line opens.

8. To close the session and return to the command prompt, enter:

   ```
   \q
   ```


Installing DB2

You can use the version of DB2 that is supplied with RICOH ProcessDirector, or you can install your own copy of DB2. Your own copy can be installed on the same computer as the RICOH ProcessDirector base product or on a different Linux computer.

To install your own copy on the primary computer and use them together, your copy must be:

- DB2 11.5.8 or later

If you have a different release of DB2, you cannot use it with RICOH ProcessDirector.

Installing the RICOH ProcessDirector version of DB2

Use the RICOH ProcessDirector version of DB2 if you have no other applications that require DB2. Only RICOH ProcessDirector can use this version.

The RICOH ProcessDirector version of DB2 can be installed when you install the RICOH ProcessDirector base product on a computer where no other version of DB2 is installed. If another compatible version of DB2 is installed, you can choose whether to install and use the RICOH ProcessDirector version of DB2 or to use the other version of DB2.

The DB2 database can be installed from a separate disc or an ISO file. If you select to install RICOH ProcessDirector with the DB2 database, the RICOH ProcessDirector installation program requires that another disk with DB2 is inserted or the ISO is mounted.

To work together, DB2 and RICOH ProcessDirector require several system users and groups. You should never log in as these users, but you might need to recognize them for recordkeeping and security.

Choose one of these three ways to create and specify which users and groups the applications should use:

- Before you start the installation program, create the users and groups. Then, during the installation process, enter the names of the users and groups that you created. RICOH ProcessDirector finds and uses them.

  See Creating system groups and users, p. 50 for information about required users and groups.
- During the installation process, enter different names for the users and groups and let RICOH ProcessDirector create them.
- During the installation process, let RICOH ProcessDirector create the users and groups using the default values.

The default users and groups are:

DB2 instance user

aiwinst

DB2 instance group

aiwdbgrp

DB2 fenced user

aiwdbfid

DB2 fenced group

aiwdbfgp

Note

- If you set up passwords with expiration rules for these user IDs, you must administer those IDs as needed. If you do not change the passwords as needed and they expire, RICOH ProcessDirector stops working.

When you install RICOH ProcessDirector, the installation program creates a DB2 instance and user ID using the value you enter for the **DB2 instance user**. There must be no other DB2 instance or user ID with this name on the RICOH ProcessDirector system, even in a different version of DB2.

Installing your own copy of DB2 on the primary computer

Use your own copy of DB2 on the same computer as RICOH ProcessDirector if:

- You have other applications that require DB2 on that computer.
- You already have a DB2 license for the computer that you want to use with RICOH ProcessDirector.
- You want to manage DB2 outside RICOH ProcessDirector.

You must install DB2 11.5.8 or later before you install RICOH ProcessDirector.

When you install RICOH ProcessDirector, the installation program configures the existing version of DB2. It creates a DB2 instance for RICOH ProcessDirector to use. No other application should use this DB2 instance.

To work together, DB2 and RICOH ProcessDirector require several system users and groups. You should never log in as these users, but you might need to recognize them for recordkeeping and security.

Choose one of these three ways to create and specify which users and groups the applications should use:

- Before you start the installation program, create the users and groups. Then, during the installation process, enter the names of the users and groups that you created. RICOH ProcessDirector finds and uses them.

  See Creating system groups and users, p. 50 for information about required users and groups.
- During the installation process, enter different names for the users and groups and let RICOH ProcessDirector create them.

- During the installation process, let RICOH ProcessDirector create the users and groups using the default values.

  The default users and groups are:

  DB2 instance user

  aiwinst

  DB2 instance group

  aiwdbgrp

  DB2 fenced user

  aiwdbfid

  DB2 fenced group

  aiwdbfgp

Installing and configuring your own copy of DB2 on a different computer

Use your own DB2 server on a different computer and a DB2 client on the same computer as RICOH ProcessDirector if:

- You have other applications that already use DB2 on another computer.
- You already have a DB2 license for another computer that you want to use with RICOH ProcessDirector.
- You want to manage DB2 outside RICOH ProcessDirector.
- You want to use the same DB2 server with several RICOH ProcessDirector primary servers.

The DB2 client and server do not have to be on the same operating system, but they must be at the same level and fix pack. RICOH ProcessDirector only supports using DB2 11.5.8 or later in this configuration.

Important

- On Linux, the DB2 server requires a 64-bit operating system.

Before you install RICOH ProcessDirector, you must install and configure a DB2 server on the other computer and a DB2 client on the primary computer. If you are installing a manual failover configuration, you must install the DB2 client on both the active and the backup computers.

To install and configure the DB2 server and client:

1. Install DB2 11.5.8 or later using the installation instructions provided with DB2.

   In the **Set up a DB2 instance** window, choose the option to defer this task until later.
2. Verify that the computer that the DB2 server is installed on meets the memory and disk requirements to support RICOH ProcessDirector, keeping these issues in mind:

   - Each RICOH ProcessDirector primary server that connects to this DB2 server must use a separate directory on the DB2 server to store its databases. Each of those directories must have 22 GB of space available. By default, the primary servers use the home directory for

their instance user to store their databases. If you use the default setting, make sure that the home directory for the instance user is large enough.

However, in a manual failover configuration, the active and the backup computers share a DB2 instance. As a result, they both use the same directory and only require 22 GB of space, not 44 GB.

- If you change the directory that the instance uses to store its databases, make sure that the home directory for each instance user has at least 300 MB of space available.

2

3. Use the provided script to configure DB2 to work with each RICOH ProcessDirector primary server that connects to it.

   This configuration includes: creating a DB2 instance for RICOH ProcessDirector to communicate with; tuning the instance; creating the required groups and users (if needed); and starting the instance.

   The script is included in the `/scripts` directory on the RICOH ProcessDirector base product DVD.

   To configure the DB2 server:

   1. Insert the base product DVD in the drive and go to the `/scripts` directory.

      Note

      - If you are using a Red Hat or Rocky Linux system, the drive might mount automatically. However, drives that are mounted automatically on those systems are set up so that you cannot run programs from the media. You must unmount the drive and mount it again with the **exec** option before you can continue. You can use this command:
        `mount -t iso9660 -o remount,exec <mount_point>`

        You must remount the drive for every CD or DVD that you insert.

   2. Type this command to run the script and press Enter:
      `./setupRemoteDB2.sh`
   3. Respond to the prompts as required:

      - When the script asks for the DB2 instance name, type an instance name to use with one of your primary servers.

        Each primary server must have a unique DB2 instance. The default instance name is **aiwinst**; you can use this name with one of your primary servers. Record the instance name and password to use when you install RICOH ProcessDirector.
      - When the script asks for the **DB2 instance group** and the **DB2 fenced user group**, you can choose the default group or another existing group, or specify a new group to be created. The defaults are:

        DB2 instance group

        aiwdbgrp

        DB2 fenced group

        aiwdbfgp

        The instance user uses the DB2 instance group as its primary group; the DB2 fenced user uses the DB2 fenced user group as its primary group. If you are unsure which group to use, consult your DB2 administrator.

- When the script asks for the **DB2 fenced user name**, you can choose the default user or another existing user, or specify a new user to be created. The default is **aiwdbfid**. If you are unsure which user to use, consult your DB2 administrator. You should never log in as this user, but you might need to recognize it for recordkeeping and security.
- When the script asks for a DB2 instance port number, enter the port that you want DB2 to listen on for the primary server that uses this instance. The port number must be less than 65536. Record the port number to use when you install RICOH ProcessDirector.

4. On the DB2 server computer, run the script again for each primary server that will connect to DB2.

   Note

   - If you are configuring a manual failover environment, the backup computer shares the DB2 instance with the active computer. Do not run the script again for a backup computer.

5. Record the host name or IP address of the computer that DB2 is installed on.

4. Install the DB2 client on each of the computers that you plan to install RICOH ProcessDirector on, including any backup computers.

   Use the DB2 installation CD and choose the **IBM Data Server Runtime Client**.

   In the **Set up a DB2 instance** window of the installer, choose the option to defer this task until later.

   After the installation finishes, make sure the same DB2 Fix Pack that is installed on the client is also installed on the server.

5. Continue installing RICOH ProcessDirector using the instructions in Installing, p. 111.

Installing a web browser

RICOH ProcessDirector requires a web browser to access and display its user interface. You can access the user interface from the primary computer or from another computer. The workstation must have the most recent version of one of these browsers installed:

- Mozilla Firefox
- Google Chrome
- Microsoft Edge

The user interface has a web-based file viewer that requires a PDF viewer plug-in to display AFP or PDF files so you can select pages to reprint. To view print files, you can use an Acrobat plugin or the default PDF viewers that are included with Firefox, Chrome, and Edge.

We recommend installing Adobe Reader on any computers used to manage jobs. If you need to install Adobe Reader, you can download it from the Adobe website. The website tries to detect the operating system and language that your system is running. If you want to download the software in a different language, click **More download options**.

Note

- To view jobs that use double-byte fonts using an Acrobat plugin in RICOH ProcessDirector, be sure that the font package for the Adobe Reader is installed on your system. This package is available from the Adobe website (http://supportdownloads.adobe.com/product.jsp?platform=windows&product=10).
- Use the latest versions of the Firefox, Chrome and Edge browsers to get better functionality from their default PDF viewers.

Configuring Google Chrome

To access the RICOH ProcessDirector user interface from the Google Chrome browser, configure the browser with these settings:

1. In the Chrome address bar, enter: `chrome://settings/`
2. Under Privacy and security:
    1. Click Cookies and other site data and select Allow all cookies.
    2. Go back to Privacy and security and click Site settings. Scroll down to Content and click JavaScript. Make sure **Sites can use Javascript** is turned on.
3. If you want to use the viewer component of RICOH ProcessDirector, you must verify that Chrome is configured to open PDF files in its built-in PDF viewer:
    1. In the Chrome address bar, enter: `chrome://settings/content/pdfDocuments`
    2. Make sure that the **Open PDFs in Chrome** is selected.
    Some actions (such as highlighting search text or using small or large zoom values) do not function properly when you use the built-in viewer with RICOH ProcessDirector.
4. Close the settings tab.

Configuring Mozilla Firefox

To access the RICOH ProcessDirector user interface from a Windows computer with the Mozilla Firefox browser, you must configure the browser.

Important

The instructions to configure your version of Mozilla Firefox might differ from the instructions below. If any of the instructions do not work with your version of Firefox, click **Help** → **Help** and search the Firefox help system. For example, search for `enable javascript`. As an alternative, use a search engine. For example, search for `Firefox enable javascript`.

To configure Mozilla Firefox:

1. In the Firefox address bar, enter: `about:config`.
2. Click **I accept the risk!**.
3. To verify that Javascript is enabled:
    1. Find the **javascript.enabled** preference.
    2. Make sure the value is set to **True**.

If the value is set to **False**, double-click the **javascript.enabled** preference to change the value to **True**.

4. If you want to use the RICOH ProcessDirector right-click context menu, verify that the menu is enabled:
   1. Find the **dom.event.contextmenu.enabled** preference.
   2. Make sure the value is set to **True**.
      If the value is set to **False**, double-click the **dom.event.contextmenu.enabled** preference to change the value to **True**.
5. Close the **about:config** tab.
6. Click **Menu Button** → **Options**.
7. To make sure that Firefox can accept cookies:
   1. Click the **Privacy & Security** ( )tab.
   2. In **History**, select **Use custom settings for history** to tailor cookies. Ensure **Accept cookies from sites** is selected.
8. **Optional:** To change how files are downloaded:
   1. Click the **General** ( ) tab.
   2. In the Downloads area, select **Always ask you where to save files**.
9. **Optional:** If the Language feature is installed, you can change the language that RICOH ProcessDirector uses for the user interface text and most of the messages that it issues:
   1. In **Language,** click **Choose** and follow the instructions to add your language to the top of the list. Then click **OK**.

      Note

      RICOH ProcessDirector supports these languages and locales:

      - Brazilian Portuguese (pt_BR)
      - English (en_US)
      - French (fr_FR)
      - German (de_DE)
      - Italian (it_IT)
      - Japanese (ja_JP)
      - Spanish (es_ES)
10. **Optional:** When you install Firefox, it is configured to use a built-in PDF viewer. You can use the built-in PDF Viewer with RICOH ProcessDirector, but some actions (such as zoom and highlighting search text) might not function properly.

    In some cases, using a different plugin provides more functionality. Depending on the version of Firefox that you are running, you might need to try different options to find one that works with the RICOH ProcessDirector viewer.

    To set up the browser to use a different plugin for the viewer, do these steps:

1. In **Applications**, go to the **Content Type** list, find **Portable Document Format (PDF)**, and select it.
2. Next to **Portable Document Format (PDF)**, select the PDF plug-in you want to use.
3. Try to view a job in RICOH ProcessDirector to see if it meets your needs.
4. Repeat this process until you find the plugin that works best for you.

11. **Optional:** In general, we do not recommend logging in to RICOH ProcessDirector as more than one user from the same workstation. If you do, each user must log in to a different browser session. To make this possible, you must create a browser profile for each additional user ID and enable Firefox to use more than one profile at a time:

    1. Close Firefox.
    2. Click **Start** → **Run**.
    3. Enter this command:

```
firefox.exe -ProfileManager
```

    4. Follow the instructions in the Profile Manager to create a new profile.
    5. In the Windows Control Panel, click **System** → **Advanced system settings** → **Environment Variables**.
    6. In the System Variables area, click **New**.
    7. In the **Variable name** field, type `MOZ_NO_REMOTE`.
    8. In the **Variable value** field, type `1`.
    9. Click **OK** to close the New System Variable window.
    10. Click **OK** to close the Environment Variables window.
    11. Click **OK** to close the System Properties window.

    Whenever you start Firefox, you will be able to choose a profile that is not already in use.

Running the prerequisite checker

Use the prerequisite checker to verify that your system is ready to install RICOH ProcessDirector.

Note

- By default, the prerequisite checker log file is stored in this directory: `/opt/infoprint/ippd/logs/installer/prereq.out`

To run the prerequisite checker:

1. Log in to the primary computer as the root user.

   Important

   - You must log in as a user with UID 0. If you must log in as a different user, you can use `sudo su -` or `su -` to become the root user. However, do not use `sudo` or the `su` command in any other way to become the root user.

2. Open a command line and enter this command to make sure that you are in the root directory:

   ```
   cd /
   ```

3. If you are installing from a product DVD:

1. Insert the base product DVD in the drive.
2. To determine the name of the mount point, enter:

   ```
   ls /media
   ```

   On some systems, the name of the mount point is the same as the name of the CD or DVD.

   Note

   If you are using a Red Hat or Rocky Linux system, the drive might mount automatically. However, drives that are mounted automatically on those systems are set up so that you cannot run programs from the media. You must unmount the drive and mount it again with the **exec** option before you can continue. You can use this command:

   ```
   mount -t iso9660 -o remount,exec <mount_point>
   ```

   You must remount the drive for every CD or DVD that you insert.
3. Mount the drive, if necessary. Enter:

   ```
   mount /media/mount_point
   ```
4. Change directories so you can see the contents of the DVD. Enter these commands:

   ```
   cd /media/mount_point
   ls
   ```

   You see several scripts and directories, including a script called `setup`.

4. If you are installing from a mounted ISO file:
   1. Create the ISO mounting point. For example, `mkdir /isomount`.

      Note

      The mounting point for the ISO file does not need to be created off the root directory. It can be created anywhere on the system.
   2. Transfer the ISO file to the computer. For example, place the file in the directory `/tmp/RPD.iso`.
   3. Mount the ISO file using this command:`mount -o loop /<location of ISO>/<mounting point>`For example: `mount -o loop /tmp/RPD.iso /isomount`
5. If you are installing from a remote directory:
   1. Follow the instructions in Installing from a remote directory, p. 116. Return and complete this procedure after you go to the mounted directory.
6. To start the prerequisite checker, enter: `./setup -p PREREQ_ONLY=TRUE`

   Note

   Make sure that you enter the command for the prerequisite checker correctly. If you type the -p flag incorrectly, the installer ignores the flag and runs the full installation program instead of the prerequisite checker.

If your system has all the prerequisites installed, the prerequisite checker exits without a message. If your system does not have all the prerequisites installed, a message is displayed showing the missing prerequisites. Refer to the prerequisite checker logs for more information. By default, the log file is stored in this directory: `/opt/infoprint/ippd/logs/installer/prereq.out`

Planning for optional software

You can install optional software to be used with RICOH ProcessDirector. The categories of optional software are:

- Job submission
- Data transforms
- Fonts
- Formatting changes to PDF banner pages

Job submission

RICOH ProcessDirector can receive jobs from any system that can send jobs to hot folders or from any system that can use the LPD protocol or **pdpr** command. If you have the AFP Support feature, RICOH ProcessDirector can receive jobs from the Job Entry Subsystem (JES) spool on a z/OS host. Jobs are submitted to input devices that you define in RICOH ProcessDirector. Input devices receive the jobs and then initiate job processing.

The supported job submission methods are:

Hot folders

Receives print files through File Transfer Protocol (FTP) or your preferred file copying method. When you copy or move a print file to the hot folder directory, the input device that is associated with the hot folder automatically receives the job and initiates job processing.

Submit Jobs portlet

Lets you upload files and submit them for processing on the Main page of the RICOH ProcessDirector application. You can only submit jobs to a hot folder input device that is enabled and connected or to a workflow that is enabled. The input device or workflow must also be configured to accept jobs submitted using the portlet.

LPD

Receives jobs that are submitted using the line printer daemon (LPD) protocol. Users can use the **lpr** command or another command that uses the LPD protocol to submit jobs to a RICOH ProcessDirector LPD input device. The input device automatically receives the job and initiates job processing.

pdpr

If you are migrating from InfoPrint Manager and you use the **pdpr** command to submit jobs, you can configure RICOH ProcessDirector to accept jobs from the **pdpr** command. The RICOH ProcessDirector **pdpr** script creates an **lprafp** command to submit jobs, adding flags to send supported job property values to the primary server.

If you have the AFP Support feature, these job submission methods are also supported:

AFP Download Plus

Converts line data to AFP data and transmits the print job with all required resources across the TCP/IP network from the host system to RICOH ProcessDirector for printing.

Download for z/OS

Automatically transmits output across the TCP/IP network from the host system to RICOH ProcessDirector for printing or archiving.

Download for z/OS and AFP Download Plus are separately ordered features of PSF for z/OS. For information about PSF for z/OS and its features, see the IBM website (http://www.ibm.com).

In addition to deciding which job submission methods to use, you need to determine the naming convention for the job submission directories on the primary computer where you want the input files to be. You must specify these directories when you create an input device:

Folder location directory

The name of the directory that an input device monitors for incoming jobs. For example, `/aiw/aiw1/System/hf/LineData` for hot folder jobs, `/aiw/aiw1/System/lpd/LPDLineData` for LPD jobs, or `/aiw/aiw1/System/dl/AFP` for Download for z/OS or AFP Download Plus jobs.

Staging location directory

The name of the directory where the job submission method places the input file. Consider creating a subdirectory of the folder location directory. For example, `/aiw/aiw1/System/hf/LineData/Staged` for line data input files received from hot folders or `/aiw/aiw1/System/dl/AFP/Staged` for AFP input files received from Download for z/OS or AFP Download Plus.

Note

- Let RICOH ProcessDirector create these directories automatically with the correct ownership when it creates an input device. Do not create the directories yourself.

Each directory must provide read and write access to a group that the RICOH ProcessDirector system user (**aiw1** is the default) is a member of so that RICOH ProcessDirector can read and modify the input files. One option is to use the RICOH ProcessDirector group (**aiwgrp1** is the default). For more information about the RICOH ProcessDirector group, see Creating system groups and users, p. 50 and Completing post-installation tasks, p. 147.

Before you use Download for z/OS or AFP Download Plus with RICOH ProcessDirector, you must configure the software to communicate with RICOH ProcessDirector. Some of the configuration tasks include:

- Define a JES initialization statement for a functional subsystem application (FSA).
- Create a startup procedure to identify program name, region size, and printing defaults for the FSA.
- For Download for z/OS, create a routing control data set that points to the IP address of the primary computer and port number of the input device.
- For AFP Download Plus, define a Startup Procedure to point to the IP address of the primary computer and port number of the input device.
- Use installation exits, if necessary, for modifications to software functions. Both Download for z/OS and AFP Download Plus can use installation Exit 15, which transmits additional print parameters to RICOH ProcessDirector.

See the RICOH ProcessDirector information center for information about these topics:

- Copying files to hot folders or sending files using the LPD protocol.
- Installing and configuring the RICOH ProcessDirector **pdpr** script.

- Configuring Download for z/OS and AFP Download Plus with RICOH ProcessDirector.

For information about configuring Download for z/OS and AFP Download Plus, see *PSF for z/OS: Download for z/OS* and *PSF for z/OS: AFP Download Plus*.

Data transforms

Data transforms receive print jobs from RICOH ProcessDirector and transform the data from one data stream to another so that it can be printed.

You can purchase RICOH ProcessDirector features that are used to transform jobs from one datastream to another. You can also purchase external programs and connect them to RICOH ProcessDirector.

Products and features that provide data transforms

Product	Data streams transformed to AFP	Data streams transformed from AFP	Other transforms	Information
RICOH Transform features	• GIF, JPEG, and TIFF • PCL • PDF and PostScript • SAP OTF and ABAP	• PDF		RICOH Transform feature information center
Advanced Transform feature	• PCL • PDF • PostScript	• PCL • PDF • PostScript	• Input-Image BMP, GIF, JPEG, PNG, and TIFF When you send jobs with image files included in AFP object containers, you must install an input data stream transform to process them correctly. For example, for AFP files containing	When you order the Advanced Transform feature, you choose the input data stream and output data stream transforms that you need. Then, you can combine them as needed. For example, if you choose the InputAFP, InputPS, the OutputPDF, and the OutputPCL transforms, you can convert: • AFP to PDF • AFP to PCL • PostScript to PDF • PostScript to PCL

Product	Data streams transformed to AFP	Data streams transformed from AFP	Other transforms	Information
			images, you must use the InputImage transform. When installed, the InputImage transform automatically handles images in these formats.	
RICOH InfoPrint XT for Linux (installed on the same computer as the base product or on a secondary computer)	Xerox metacode and LCDS			*RICOH InfoPrint XT for Linux: Installation and User's Guide*
RICOH InfoPrint XT for Windows (installed on an application server)	Xerox metacode and LCDS			*RICOH InfoPrint XT for Windows: Installation and User's Guide*

For information about using an external step in a workflow to use data transforms, see the RICOH ProcessDirector information center in the user interface.

Preparing to install RICOH Transform features

Before you install a RICOH Transform features, make sure your system meets the minimum requirements.

- Hardware requirements:
  - Minimum of an extra 10 GB free hard-drive space.
  - An extra 1 GB RAM for every CPU core, but no less than 4 GB.
    For example, if the computer has:
    - One dual-core processor, it must have an extra 4 GB RAM.
    - Two quad-core processors, it must have an extra 8 GB RAM.
    - Three quad-core processors, it must have an extra 12 GB RAM.
    - Four quad-core processors, it must have an extra 16 GB RAM.
- File systems for the primary computer:

  1 GB additional free space in the RICOH ProcessDirector `/opt` file system.

- Required software:

  WorldType Fonts version 8.13 for RICOH SAP to AFP files to transform correctly when IS/3 support is enabled.

  Java Runtime Environment 1.4 or higher.

  glibc 2.18 or higher

- System and network setup:

  1. Determine the number of nodes that the RICOH Transform features will use.

     This value is based on the number of processor cores in the computer where you want to install the Transform feature. The value is **2** or half of the cores in the computer, whichever is larger. For example, if the computer has:

     - One single-core processor, the number of nodes is **2**.
     - One dual-core processor, the number of nodes is **2**.
     - Two dual-core processors, the number of nodes is **2**.
     - Two quad-core processors, the number of nodes is **4**.
     - Four quad-core processors, the number of nodes is **8**.

  2. In your firewall, open the ports that the Ricoh Transform feature uses.

     These ports must have **LISTEN** permission for the listed application on the computer where you want to install the Transform feature:

     - Port 6980 for `/opt/infoprint/itm/clients/fdi/fdi`.
     - Ports 6984 and 6985 for `/opt/infoprint/itm/hn/feps`.
     - Port 6986 for `/opt/infoprint/itm/clients/coord/coord`.
     - Port 6989 through 6989 + *`(N-1)`* for `/opt/infoprint/itm/node1/node` through `/opt/infoprint/itm/node`*`N`*`/node`.

       Where *`N`* is the total number of nodes that the RICOH Transform features will use, as described above.

       For example, if the total number of nodes is 2, give **LISTEN** permission to:

       – Port 6989 for `/opt/infoprint/itm/node1/node`
       – Port 6990 for `/opt/infoprint/itm/node2/node`

     These applications must be able to make outgoing connections to the ports indicated on any computer:

     - `/opt/infoprint/itm/clients/fdi/fdi` to port 6984.
     - `/opt/infoprint/itm/hn/feps` to port 6986.
     - `/opt/infoprint/itm/clients/coord/coord` to ports 6984 and 6986.
     - `/opt/infoprint/itm/hn/pd/pdexec` to port 6984.
     - `/opt/infoprint/itm/node`*`[1 to N]`*`/node` to port 6985.
     - `/opt/infoprint/itm/node1/xforms/ctt_standalone/ctt_standalone` through `/opt/infoprint/itm/node`*`N`*`/xforms/ctt_standalone/ctt_standalone` to port 6989 through port 6989 + *`(N -1)`*.

Where *N* is the total number of nodes that the RICOH Transform features will use, as described above.

For example, if the total number of nodes is 2:

- `/opt/infoprint/itm/node1/xforms/ctt_standalone/ctt_standalone` to port 6989
- `/opt/infoprint/itm/node2/xforms/ctt_standalone/ctt_standalone` to port 6990

3. Installation errors occur on Linux systems with SELinux or FIPS enabled.
   - To see whether Security Enhanced Linux (SELinux) is enabled on your system, open a command prompt and type:
     `getenforce`
     If the command returns `Enforcing`, open `/etc/selinux/config` in a text editor and find the `SELINUX` line. To disable SELinux, change that line to: `SELINUX=disabled`
   - To see whether Federal Information Processing Standard (FIPS) is enabled on your system, open a command prompt and type:
     `fips-mode-setup --check`
     If the command returns `FIPS mode is enabled`, disable it by typing:
     `fips-mode-setup --disable`
4. Add additional system users and groups.
   One additional group and two additional users are required.
   The default users are **ipsitm** and **ipsejz**; the default group is **itm**.

Supplied fonts

Five sets of fonts are included with RICOH ProcessDirector. The fonts are available at https://dl.ricohsoftware.com/ when you download RICOH ProcessDirector. See Downloading installation files, p. 115 for more information.

The RICOH ProcessDirector package provides these fonts:

AFP Outline Fonts (LCD4-5683)

These fonts can be used on Linux and Windows. They include fonts for Japanese, Korean, Simplified Chinese, and Traditional Chinese.

AFP Classic OpenType Fonts (LCD2-20029)

These fonts have four styles: Regular, Bold, Italic, and Bold Italic.

AFP Asian Classic OpenType Fonts (LCD2-20055)

These fonts can be used to replace the older AFP Asian single byte character set (SBCS) fonts.

WorldType Fonts (LCD4-5684)

These are OpenType and TrueType fonts in Microsoft Unicode format.

AFP Raster Fonts (LCD4-5700)

These fonts are distinguished from AFP outline fonts because they have character set and coded font names that are eight characters rather than six characters.

To install these fonts for use with RICOH ProcessDirector, copy all the fonts from the supplied discs or ISO files to the `/usr/lpp/ipfonts` directory on your primary computer. Be sure to copy all font files from the subdirectories to `/usr/lpp/ipfonts`. Do not maintain the subdirectory structure from the source directory, but do make sure that the uppercase file names are preserved.

The AFP printer driver component and the **line2afp** data stream conversion component of RICOH ProcessDirector search that directory when they need a resource to process a job.

The AFP Support feature also provides a basic set of 240-pel and 300-pel fonts (compatibility fonts). These fonts include both uniformly spaced and mixed-pitch type families. These font families are included:

- APL
- Boldface
- Courier
- Document
- Essay
- Format
- Gothic
- Letter Gothic
- Orator
- Prestige
- Roman
- Script
- Serif
- Symbols
- Text

3. Upgrading

- **Upgrading on the same computer**
- **Upgrading on a different computer with Migration Assistant**
- **Completing the upgrade process**
- **Backing up data**
- **Exporting media with electronic forms**
- **Upgrading a manual failover environment**
- **Upgrading the PostgreSQL database version**
- **Upgrading the DB2 database**
- **Migrating data from DB2 to PostgreSQL**

If you have RICOH ProcessDirector installed, you can upgrade to the current version without uninstalling your existing software, or by installing on a new system and moving your objects to it.

For information about the new functions and updates included in this release, see New in this release, p. 12.

If you are upgrading RICOH ProcessDirector and have another computer, we recommend that you install on that computer. By installing on a different computer, you decrease the risk of problems and minimize downtime during this process. When the installation finishes, you can migrate your objects from your existing system to the new system. You can then verify the new installation while the old computer is still running.

In version 3.12, RICOH ProcessDirector introduced the **Migration Assistant**. Start this tool on your newly installed system (known as the target system) to access your existing system (known as the source system) and move objects over. The **Migration Assistant** simplifies the process, so you don't have to manually export objects from one system and import them to the new system.

Database evolution

For many years, RICOH ProcessDirector supported only IBM DB2 as its database. In version 3.12, support was expanded to include PostgreSQL. PostgreSQL replaced DB2 as the default configuration for RICOH ProcessDirector.

When you upgrade to version 3.12 or later, you have two choices:

- Continue to use your current database.
- Migrate from DB2 to PostgreSQL.

  Note

  If you plan to migrate from DB2 to PostgreSQL, you can either install the database included with RICOH ProcessDirector or you can install the database yourself. After you complete the RICOH ProcessDirector installation process, you can move your data into the PostgreSQL database.

Each option has different variables to consider, such as:

- The PostgreSQL configuration can be installed on Rocky Linux compared to DB2, which cannot be installed.
- You already have PostgreSQL installed and you want to configure RICOH ProcessDirector to use it.
- If you plan to install the upgrade on a different computer, the Migration Assistant can move your objects and settings into PostgreSQL just as easily as into DB2.

Choose which database configuration to use before you upgrade, based on these factors and specifications for your environment.

If you use the Reports feature, you can use the same PostgreSQL database or both running RICOH ProcessDirector and storing the collected data.

Upgrading on the same computer

If you are upgrading to a more recent version of RICOH ProcessDirector on the same computer, you need to meet certain requirements:

- You have Version 3.7 or higher of RICOH ProcessDirector installed.
- Your system meets all the prerequisites for this version.

  Important

  - The installer for newer versions of RICOH ProcessDirector enforces prerequisites more rigorously than earlier versions. If your operating system does not meet the minimum requirements, the installer cancels the installation. You do not need to uninstall RICOH ProcessDirector to install an operating system upgrade.
  - Before upgrading, determine the database to use for running RICOH ProcessDirector. Starting with version 3.12, PostgreSQL installed with RICOH ProcessDirector is the default database configuration. When upgrading to a more recent version you can continue to use DB2 with no interruptions or can choose to migrate your data to a PostgreSQL database.
- You have the installation DVDs or ISO files provided by Ricoh.
  Follow these instructions as needed:
  - Downloading installation files, p. 115
  - Installing from a remote directory, p. 116

The installation process upgrades the base product and almost all the features that are currently installed. RICOH Transform features and extended features (custom software components) are not updated automatically. You install them separately after you install the upgrade.

If you use more than one RICOH Transform features, upgrade all the transform features before you install your new license key.

- For information about installing RICOH Transform features, see Preparing to install RICOH Transform features, p. 85.
- For more information about installing extended features, contact your Ricoh support representative.

To upgrade to the current version of RICOH ProcessDirector on the same computer:

1. Verify that your system meets the prerequisites.

   See Hardware requirements, p. 36, Running the prerequisite checker , p. 80, and Installing required software, p. 55 for more information.
2. Before upgrading your system, back up your data.

   See Backing up data, p. 102 for more information.

   Note

   - If you are migrating from DB2 to the PostgreSQL database, take a backup of your DB2 database to avoid the risk of data loss.

3. If RICOH ProcessDirector is running with a DB2 database and you want to update your database, update it before or after you install RICOH ProcessDirector. See Upgrading the DB2 database, p. 106 for more information.
4. Follow the instructions in Preparing the primary computer for installation, p. 112.
5. Start the install process.
    1. Log in as the root user.

        Important

        - You must log in as a user with UID 0. If you must log in as a different user, you can use `sudo su -` or `su -` to become the root user. However, do not use `sudo` or the `su` command in any other way to become the root user.
    2. Open a command line and enter this command to make sure you are in the root directory:

        ```
        cd /
        ```
6. If you are installing from a DVD:
    1. Insert the base product DVD in the drive.
    2. To determine the name of the mount point, enter:

        ```
        ls /media
        ```

        On some systems, the name of the mount point is the same as the name of the CD or DVD.

        Note

        - If you are using a Red Hat or Rocky Linux system, the drive might mount automatically. However, drives that are mounted automatically on those systems are set up so that you cannot run programs from the media. You must unmount the drive and mount it again with the **exec** option before you can continue. You can use this command:
          `mount -t iso9660 -o remount,exec <mount_point>`

          You must remount the drive for every CD or DVD that you insert.
    3. Mount the drive, if necessary. Enter:

        ```
        mount /media/mount_point
        ```
    4. Change directories so you can see the contents of the DVD. Enter these commands:

        ```
        cd /media/mount_point
        ls
        ```

        You see several scripts and directories, including a script called `setup`.
7. If you are installing from an ISO file:
    1. Follow the instructions in Mounting an ISO file, p. 116.
    2. Change directories so you see the contents of the ISO file.
       You see several scripts and directories, including a script called `setup`.
8. To start the installer, enter: `./setup`

    The installer starts and displays the Introduction screen. Select the appropriate language for the installer to use and then click **OK**.

Note

- If the computer's operating system is a supported Red Hat-derived operating system and its language is Japanese, Simplified Chinese, or Traditional Chinese, choose **English** on the dropdown language menu. Japanese, Simplified Chinese, and Traditional Chinese characters do not display properly during a Red Hat installation of RICOH ProcessDirector.

9. Follow the instructions in the installer.

   The installer verifies many of the prerequisites for the system. If it finds any problems, it lists them for you. You cannot proceed until you correct them. After you fix the issues, verify the prerequisites again by returning to the **Prerequisite Verification** window. Click **Previous** in the installer or type `back` in console mode, then continue with the installer.

   Important

   - After you verify all the prerequisites, click **Cancel** to change a previous entry and begin the installation process again. Clicking the **Previous** button sometimes causes problems.

10. Review and accept the license and maintenance agreements.
11. Choose the database configuration that you want to use. If you currently use PostgreSQL as your main database, continue with step 12.

    If you choose to change databases, such as moving from DB2 to PostgreSQL, the installer installs the new database, but the contents are migrated later.

    Note

    - If you choose to change databases, the installer checks for prerequisites. If any prerequisites are missing, follow the instructions in the installation program.

12. Choose whether to upgrade your version of PostgreSQL if a newer version exists on the installation DVD or ISO file.

    Note

    - To upgrade your PostgreSQL database after you install RICOH ProcessDirector, you can run the upgrade script separately. To run the upgrade script after the installation, see Upgrading the PostgreSQL database version, p. 105.

13. Review the pre-installation summary and click **Install** to start installing.
14. Click **Done** to complete the installation.
15. On the command line, type this command to return to the root directory:

    ```
    cd /
    ```

16. If you installed from a DVD, eject the disc.
17. If you see error messages, view the installation logs in the `/opt/infoprint/ippd/logs/installer` directory and contact Software Support.
18. Reboot the system.
19. If you installed PostgreSQL and need to migrate your data to PostgreSQL, continue with: Migrating data from DB2 to PostgreSQL, p. 107
20. If you have not restarted the computer that RICOH ProcessDirector is installed on, restart it now.

21. When the computer restarts, RICOH ProcessDirector should start automatically. Use your browser to log in to the user interface. If an error occurs during the installation, contact Ricoh Software Support.

Note

- Use the **About** box to verify that the product version was updated.
- Use the **Feature Manager** to verify that all of your previously installed features were updated to new levels.
  Open Feature Manager by clicking **Administration** → **Utilities** → **Features**. If you see an error message, you must start Feature Manger manually:
  1. Log in to the primary computer as the RICOH ProcessDirector system user (aiw1 is the default).
  2. Open a command prompt and type: `startaiw -f`
  3. To complete the process, clear your browser cache.
     Information that is stored in the browser cache can cause errors when you try to use the newer level. Clearing the cache prevents those errors.
  4. Reload the Feature Manager webpage.

22. Continue with Completing the upgrade process, p. 100 to finalize the upgrading process.

Important

- RICOH ProcessDirector and all features install in trial mode. After you upgrade, download and install license keys. If the trial period expires before you install license keys, the software stops working. See Downloading and installing license keys, p. 161 for more information.

Upgrading on a different computer with Migration Assistant

To reduce the risk of problems, we recommend installing RICOH ProcessDirector on a different computer and then migrating your objects from the existing system to the new system.

Using the **Migration Assistant** when upgrading reduces downtime during migration by preventing problems such as missing features and ensuring that objects and all their dependencies are migrated together.

When using the Migration Assistant, the system you want to migrate from is referred to as the source system, while the destination system for migration is referred to as the target system.

Planning for Reports database migration

When you upgrade RICOH ProcessDirector on a different computer with the Reports feature installed, special consideration is required. You must make several decisions related to the Reports database to help the migration proceed smoothly.

Continue using the same Reports database?

The first decision to make is whether you want to continue using the same database to store your Reports data with the new installation or install a new database. There are several points to consider:

- If the Reports database runs on the source system with RICOH ProcessDirector, you likely want to move that database to the new system.
- If the Reports database runs on a different system in your network and you configured RICOH ProcessDirector to access it, you likely want to continue using that database.
- If you are upgrading to new server hardware to consolidate or decommission older servers, the option to move your Reports data onto the new server with RICOH ProcessDirector is worth considering.

If you choose to connect your new RICOH ProcessDirector system (your target system) to your existing Reports database, use this setting on the **Reports** page of the Migration Assistant:

- **Reports Database Configuration**: **Use existing Reports database**

Continue with Preparing to use the Migration Assistant, p. 95.

If you choose to create a new database, continue with the next question.

Where to create the new PostgreSQL database for Reports?

RICOH ProcessDirector can be configured to use either IBM DB2 or PostgreSQL to store data and manage jobs as they progress through their workflows. The Reports feature stores data in a PostgreSQL database, regardless of which database configuration RICOH ProcessDirector uses for the primary database.

Before you start the migration, determine whether to create your Reports database in a PostgreSQL instance installed by the RICOH ProcessDirector installer or in an instance that you install separately.

To use the PostgreSQL installed with RICOH ProcessDirector

No preparatory configuration is required. When you run the Migration Assistant, the Reports database is created in the same PostgreSQL instance that RICOH ProcessDirector uses, but in a separate database cluster.

Note

- This option is only supported if Docker Engine or Podman is installed on your primary computer.

When you run the Migration Assistant, choose: **Reports Database Configuration**: **Use new Reports database**

To use a PostgreSQL installed separately

Before you start the Migration Assistant, configure the Reports database settings for the target system on the **Administration** → **Reports** → **Database Settings** page. Enter values for the properties in the **General** section, then click the switch next to **Disabled: Do not capture data** to enable data capture.

Enabling data capture creates the Reports database cluster, but does not create any database tables. Do not create any Data Collectors, Data Transmitters, or collect data using the **WritePropsToReportsDatabase** step before you run the Migration Assistant.

When you run the Migration Assistant, choose: **Reports Database Configuration**: **Use new Reports database**

Migrate your existing data to the new database?

If you choose to create a new Reports database, you can also choose whether to move the data stored in the existing database to the new database. Choose the correct setting on the **Reports** page of the Migration Assistant:

- **Import existing Reports data**
- **Do not import existing Reports data**

Preparing to use the Migration Assistant

For a successful migration, we recommend taking some measures to prepare your systems to avoid difficult-to-solve problems that could lead to migration failure.

To prepare your systems for migration:

1. Install RICOH ProcessDirector on the target system.
    1. Verify that your system meets the prerequisites.

        See Hardware requirements, p. 36, Running the prerequisite checker , p. 80, and Installing required software, p. 55 for more information.
    2. Follow the installation instructions just as you would for a new installation.

        See Installing, p. 111 for more information.
    3. Return to this procedure after you complete the process to install the base product.
    4. Log in to the version of RICOH ProcessDirector that you just installed. Use the User Name `aiw` and the Password `aiw`.

        When you change the password for this user, remember the new password. We recommend logging in as this user until the migration process is complete and all users are imported to the target system.
    5. Install the same features that you had on your old system and any new features that you have purchased. If an error occurs during the installation, contact Ricoh Software Support.

        For more information, see Installing features, p. 152 and Installing RICOH Transform features, p. 158.
    6. **Optional:** Download and install license keys. RICOH ProcessDirector and all features install in trial mode. If the trial period expires before you install license keys, the software stops working.

        See Downloading and installing license keys, p. 161 for more information.

        Note

        You can install license keys after the migration process is complete if you prefer.
2. If you use the Reports feature, review Planning for Reports database migration, p. 93. Before you start the Migration Assistant, consider these items:
    - Whether you want to continue using the existing Reports database or create a new one for the target system.

- If you want to create a new database, what instance of PostgreSQL to use, an instance installed with RICOH ProcessDirector or one installed separately.
- If you are creating a new database for the target system, whether you want to migrate your existing data.

If you plan to create a new Reports database on the target system and migrate your existing data into it:

1. Log in to the source system and enable all the data collectors whose data you want to migrate.
2. **Optional:** Create the new database. Log in to the target system and open **Administration** → **Reports** → **Database settings**. Review and update the settings, then enable data capture. The database table is created automatically if everything is configured correctly.

   Note

   This step is required if you use a PostgreSQL instance installed outside of RICOH ProcessDirector.

3. If you are using the Preprinted Forms Replacement feature, export the `media.zip` file from your target system and copy it to the source system. Follow the instructions for Exporting media with electronic forms, p. 103.
4. When you import step resources, the files that they refer to are not included in the export package. Copy the files referenced in the step resources from the source system to the target system manually. You must copy the files to the target system before you start the **Migration Assistant**.

   1. To import all the step resources, copy the contents of `/aiw/aiw1/StepResources` from the source system into the same directory on the target system.
   2. To import specific step resources, open the XML file that you exported. Find the entry for each step resource that you exported and locate the **StepResource.File** property. In that value, find the name of the RSC file associated with that step resource. For example, in this value:

```
<property name="StepResource.File" value="{&quot;fileName&quot; :
&quot;/aiw/aiw1/StepResources/
1992052c6ef44a229b8b43d77232bf53.rsc1992052c6ef44a229b8b43d77232bf53.rsc
&quot; , &quot,&quot;displayName&quot; : &quot;
Ricoh_Export-2019-08-26_13-30-04.xml&quot;}"/>
```

      The file name is: `1992052c6ef44a229b8b43d77232bf53.rsc`

   3. Find the file on the source system and copy it into the same directory on the target system.

5. The **Migration Assistant** cannot migrate SSH Key credentials.

   Private Key credentials cannot be exported, because they must be created on the system where they are used. Objects that use private key credentials fail in the **Migration Assistant** and must be recreated manually afterwards.

6. Prevent common issues that can result in migration failure:

   1. Take a snapshot or backup of both the source and target systems to avoid the risk of data loss.

      See Backing up data, p. 102 for more information.

Note

- Using Migration Assistant to upgrade on a different computer does not affect the source system, preserving the data and configuration. We recommend backing up both systems as a safety measure.

2. Make sure that the **Product Update** features are installed on both systems at the same level. In the Feature Manager, find the **Product Update** feature for both systems and compare the values in the **Installed Version** column.

Note

- If the target system has a higher version, you have the opportunity to download the package during the migration. Then you can install the **Product Update** using **Import Package** on the source system **Feature Manager** page.
- If the source system has a higher version, find the most recent product update package in: `/opt/infoprint/ippd/available`. The name of the package is: `ProductUpdate-3.4.version_number.epk`. Download the package, then log in to the target system. Open Feature Manager, import the package, then install it.

  For more information, see Adding or upgrading a feature using Import Package, p. 155.

3. Check file system capacity. For a successful migration, the target system should have at least as much available capacity as the source system.
4. Verify that antivirus or other security software that locks and scans files is still disabled on the target system.

   Verify that exceptions for these paths are defined in your antivirus software:

   - `/aiw/aiw1`
   - `/opt/infoprint/ippd`
   - `/var/psf`
   - If you use DB2 installed with RICOH ProcessDirector as your database:
     - `/home/aiwinst/sqllib`
   - If you use PostgreSQL installed in a Docker or Podman container as your database:
     - /var/lib
   - If you use a custom feature that integrates BCC software running on a Windows application server with RICOH ProcessDirector, exclude this path on the Windows system that the BCC software runs on:
     - `C:\BCC`

Running the Migration Assistant

With the **Migration Assistant**, objects and files are transferred from one RICOH ProcessDirector system to the other. This process significantly minimizes the likelihood of human error associated with the import of a large number of objects and files.

Before you begin, make sure you know the URL for the login page of the system you want to migrate from (source system). To proceed with migration, you need Administrator access for both the source and target systems.

Note

- We recommend logging in to the target system using the `aiw` user, as your RICOH ProcessDirector user ID probably does not exist on the new system yet.
- You can create a new administrator user to log in to the target system, but, if it exists on the source system, it is overwritten during migration.

To use the **Migration Assistant**:

1. Log in to RICOH ProcessDirector on the target system as the `aiw` user.
2. Click the **Administration** tab.
3. In the left pane, click **Utilities** → **Migration Assistant**.
4. Select **IMPORT FROM ANOTHER SYSTEM**.
5. Log in to the source system with an administrator user name and password.

   Note

   - You must provide the full URL for the log in page of the source system.
6. On the **Verify** page, make sure all the information presented is correct and click **Continue**.
7. On the **Prepare** page, review the suggested actions to reduce the migration failure possibilities. For each step, you have the option to either complete or ignore it. Click **Save and Continue** to proceed with the migration.

   For example, in this step, you can make sure that the **Product Update** features are installed on both systems at the same level. In the Feature Manager, find the **Product Update** feature for both systems and compare the values in the **Installed Version** column.

   - If the target system has a higher version, click the download button in the **Migration Assistant** to save the package to your system. Then you can install the **Product Update** using **Import Package** on the source system.
   - If the source system has a higher version, find the most recent product update package in: `/opt/infoprint/ippd/available`. The name of the package is: `ProductUpdate-3.4.version_number.epk`. Download the package, then log in to the target system. Open Feature Manager, import the package, then install it.

     For more information, see Adding or upgrading a feature using Import Package, p. 155.
8. On the **Features** page, click **CHECK FEATURES** to compare the features installed on the systems. To proceed, make sure that both the source and target systems have the same features installed.

   If any features are missing, click **Save and Continue**. Review the features to install and click **OK**. Feature Manager opens so you can install the missing features. After the features are installed, log in to your RICOH ProcessDirector target system again and return to the **Migration Assistant**. When both systems contain the same features, click **Continue** to proceed with the migration.

Note

- If you purchased one or more features for the first time, they exist on the target system only.
- If you worked with Ricoh's Advanced Solutions Practice to install additional functions on your source system, you must transfer those feature packages to your target system. Contact your Ricoh representative for assistance.

9. On the **Objects** page, select to migrate all objects from your source system or specific objects.

   We recommend migrating all objects, but you can select which objects to migrate if you want to take this opportunity to remove some objects from your system. If you choose to selectively migrate objects, click the **Select objects** and choose the objects you want to migrate.

   The **Migrate options** let you overwrite any identically named objects on the target system with the corresponding objects from the source system.

10. On the **Settings** page, select which previously configured system settings to migrate. These settings are configured in the **Settings** section of the **Administration** page. Choose the settings to import and click **Save and Continue**.

    Note

    - **System Identification** properties cannot be exported with **General System** settings and must be created on the system where they are used.

11. On the **Files** page, select which eligible files from the `aiw/aiw1/` directory to migrate. Choose the files to import and click **Save and Continue**.

    Note

    - To easily identify all files that are eligible for migration on the target system, choose the **Selected files** option and then scroll through the list that appears.
    - Files eligible for migration include customized files that you have added to the directory, such as control files, scripts, and AFP resources. In addition, files used by sample workflows and other sample objects are also eligible to migrate from the source system.
    - Any files or folders with these special characters in their names: **\ / : * ? " < > |** are not visible in the list of eligible files to migrate and therefore cannot be selected for migration.
    - Non-UTF-8 characters cause errors in migration, including failure to migrate files entirely. The **Migration Assistant** reports success, but the files are not moved to the target system.
    - Not all files in the `/aiw/aiw1` directory are eligible for migration. For example, the spool files, hidden files, or symbolic link files cannot be migrated.

12. **Optional:** On the **Reports** page, select how to manage the migration of the Reports PostgreSQL database configuration and collected data.

    Choose the correct options for your installation based on your answers to the questions in Planning for Reports database migration, p. 93.

    Note

    - If you choose to continue using the existing database, Migration Assistant migrates only the settings for the Reports database. Migration Assistant adjusts the host name value as needed. For example, if the host name value on the source system is `localhost`, the value is converted to the full host name of the source system when it is imported to the target system.

If you are not ready to migrate your Reports settings or data, skip this migration.

13. Before proceeding with the migration process, review the configuration to import from the source system. If you need to change any choices, you can move to any step of setting up the migration elections by selecting **Edit**.
14. When everything is confirmed, click **START MIGRATION**.

    The **Migration Assistant** starts to import objects and settings while displaying the progress. You can download the migration log file to review the details when any migration errors occur or the final version when the migration is complete.

    During the migration, you can pause or cancel the import at any time.

    If you cancel a data migration, the process stops after the cancellation request is processed. Upon cancellation, objects or files that were already migrated are reverted to their original versions from the target system. If the reverting process is unsuccessful, objects or files that were not successfully restored remain in their migrated state.

    To manually return any objects or files on the target system to their original state, you can retrieve them from a snapshot or backup of the original system. Files on the target system are backed up before they are migrated. To restore files, you can find the backup versions in: `$AIWDATA/migrate/files-backup-<timestamp>.zip`
15. Download the ZIP file log if there are any errors that you need to review.
16. After you download the ZIP file, click **X** button at the top of the page to exit the **MIGRATION ASSISTANT**.

Note

- You can click X in the upper right corner of the window followed by **SAVE CHANGES** to save the progress at anytime during migration. In this way, you can return to complete the migration process from where you left off.
- See Completing the upgrade process, p. 100 to complete the migration process.

Completing the upgrade process

After you upgrade RICOH ProcessDirector, you must do a few more steps to make the transition easier.

If you upgraded on the same computer, the upgrade process converts your objects to versions that are compatible with the new RICOH ProcessDirector version. All your existing users and groups exist, so your users can log in using the same names and they have the same authority levels. When you log in, you see all of your printers, input devices, and other objects.

If you upgraded on a different computer, you should be able to log in and see all the objects that you imported. However, there are still some manual steps required to finish the migration process.

To complete the upgrade process:

1. If you upgraded to a different computer with Migration Assistant, take these actions:
    1. Re-enable any antivirus or security software that was disabled during the migration process.

       Note

       - Do not remove the paths you added to the exceptions list in the antivirus software.

2. The Migration Assistant cannot import TLS configuration information; you must configure it on the new system again.

   For more information, see Secure Sockets Layer and Transport Layer Security support, p. 53.

3. If you migrated your primary server from one operating system to another (especially from Windows to Linux or vice-versa), check and update all paths used in your workflow steps.

   Make sure all directory paths are updated to the directory structure of the new system. If you are migrating from RICOH ProcessDirector AIX to Linux or Windows, this step is essential.

4. Review the log for any errors, including objects that failed to import.

   Objects the use Private key credentials fail to import because the credentials do not exist. Recreate your private key credentials on the target system, then create those objects manually.

5. Restore any configuration or resource files that were not migrated by the Migration Assistant to the correct locations, so your jobs can find them.

   If you stored any of these files outside the `/aiw/aiw1` file system, you must move them manually.

6. Recreate the visual mechanisms used to help distinguish one RICOH ProcessDirector from another. Use the **System identification** settings on the **System Settings** page to set a background color or configure a tab in the banner.

7. If you created a custom portlet on a RICOH ProcessDirector system prior to version 3.10.2, you cannot import it to a system with RICOH ProcessDirector version 3.12 or later. Create the custom portlet again on the target system.

8. Update your secondary and application servers, then make sure the migrated objects can connect with the upgraded system.

   See Setting up application and secondary servers, p. 133 for more information.

   Note

   - Verify that all input devices and printers connected to the secondary and application servers are functioning properly.
   - Verify that all applications running on these systems, such as Avanti, PitStop, and Ultimate Impostrip®, are able to connect.

9. If you use the RICOH Predictive Insight Connect feature, the Migration Assistant copied some settings, but cannot complete the connection process.

   Refer to the procedure Setting up to send data to RICOH Predictive Insight, p. 181 to connect to RICOH Predictive Insight.

10. If you use custom document properties that were created in RICOH ProcessDirector prior to version 3.11.2, choose one of these options:

    - Copy `/aiw/aiw1/config/docCustomDefinitions.xml` to the target system and run the **docCustom** utility to activate the properties.
    - Manually migrate the document properties. On the target system, recreate your existing properties using the **Custom properties** page. See Creating and activating custom properties, p. 170 for details.

Note

- Custom document properties created in RICOH ProcessDirector 3.11.2 or later using the **Custom properties** page migrate just like other objects. No additional configuration is required.

11. If you use the Reports feature, verify that your Reports database is configured correctly and connected.

    If you migrated data from your old Reports database to a new one, only data for data collectors that were enabled on the source system was imported. To collect data on the target system after the migration process, enable data collectors on the target system.

12. Before putting the new system into production, set the value for **Smallest job number** in **Administration** → **Settings** → **System** to synchronize your job numbering.

2. Update any secondary and application servers to the new level.

   Follow the instructions in Installing the Secondary Server feature, p. 136 and Installing application servers on Windows computers, p. 143 as needed.

3. Before they log in for the first time, tell your users to clear their browser cache.

   Information that is stored in the browser cache can cause errors when users try to use the newer level. Clearing the cache prevents those errors.

Backing up data

You can use a backup script to archive a copy of your RICOH ProcessDirector system configuration.

To back up RICOH ProcessDirector data:

1. Stop all application and secondary servers. The backup procedure stops the primary server automatically. See Stopping the base product and secondary servers, p. 189 and Stopping an application server, p. 190.
2. Log in to the primary computer as the root user.
3. Enter `/opt/infoprint/ippd/bin/aiwbackup.pl` with any of these options:

   `-f` ***`file-name`*** — Back up data to a directory and file name other than the default, which is `/tmp/aiw_backup_data.[timestamp].tar.gz`.

   `-m` — Do not make a backup image of the database. Use this option if the database is on a different computer.

   `-r` — Input files and job files (the files in the spool directory that contain job information, including copies of input files) are saved by default. A backup with the -r option does not save input files or job files, but it does save jobs. System data and control files are always saved.

Important

- The -r option is slightly different on the **aiwbackup** and **aiwrestore** commands:
  - On aiwbackup, the -r option backs up the system without including input files or job files. It does *not* delete the jobs from the system.
  - On aiwrestore, the -r option restores the system without restoring jobs, input files, or job files.

  If you use the -r option when you back up RICOH ProcessDirector, you should also use it when you restore the system to avoid restoring jobs whose files have not been saved.

-h or -? Display help for the **aiwbackup** command.

For example, this command saves data, including jobs, but not including input files or job files, to a file called `mybackup.tar.gz`:

```
/opt/infoprint/ippd/bin/aiwbackup.pl -f mybackup.tar.gz -r
```

You see a message that all servers will be stopped, whether jobs and input files will be backed up, and the location of the backed up files.

4. Enter `Y` to proceed with the backup.
   When the backup is complete, you see a message that the backup was successful.

Exporting media with electronic forms

To reuse media objects with electronic forms on another RICOH ProcessDirector system, you can export them by copying the `media.zip` file to another system. The **Export Objects** function exports media objects but does not export the electronic forms defined for media objects.

RICOH ProcessDirector creates a `media.zip` file whenever you define, edit, rename, or delete a media object.

To export media with electronic forms:

1. Log in to the primary computer.
2. Go to this directory:
   - `/aiw/aiw1/share` on Linux
   - `C:\aiw\aiw1\share` on Windows
3. Copy the `media.zip` file to the system that you are exporting the media to.
4. Log in to the RICOH ProcessDirector primary computer on that system and put the `media.zip` file in this directory:
   - `/aiw/aiw1` on Linux
   - `C:\aiw\aiw1` on Windows
5. Extract the media objects from the `media.zip` file.

   Extracting the media objects:
   - Puts a `media.xml` file in the same directory as the `media.zip` file.
   - Adds all electronic forms defined for the media to this directory:

- `/aiw/aiw1/constantforms` on Linux
- `C:\aiw\aiw1\constantforms` on Windows

If the `constantforms` directory has another version of an electronic form, the file extraction process asks if you want to replace the form. For example, the `constantforms` directory could have copies of the sample forms installed with the Preprinted Forms Replacement feature.

- To extract only forms that are not on the system where you are importing the media objects, choose the option to replace none of the files.
- To replace all the forms on the system with the version of the forms in the `media.zip` file, choose the option to replace all the files.

6. Make sure that the RICOH ProcessDirector system user and group (**aiw1** and **aiwgrp1** are the defaults) have permission to read and modify these files and directories:
   - The `constantforms` directory
   - All electronic forms in the `constantforms` directory
7. Import the media objects:
   1. Click the **Administration** tab on the user interface of the system where you are importing the media objects.
   2. In the left pane, click **Utilities** → **Import Objects**.
   3. Click **File to Import**.
   4. Go to this directory:
      - `/aiw/aiw1` on Linux
      - `C:\aiw\aiw1` on Windows
   5. Select the `media.xml` file.
   6. Select the media objects that you want to import.
   7. **Optional:** To make sure that you do not update media objects that exist, click **Deselect existing objects**.
   8. Click **Import**.

   For more information about importing objects, see the related task for copying objects from another system.

Upgrading a manual failover environment

If you have your primary computers installed in a manual failover environment, you must upgrade both systems.

The process for upgrading a manual failover configuration varies based on the database configuration that you used with the previous version and the one you want to use with the new version, and can be complicated by other factors.

Important

- Before proceeding to upgrade in a manual failover environment, you must make sure that the production and failover servers meet the prerequisites to install the update. Therefore, you must run the prerequisite checker first on the production server and then on the failover server. See Running the prerequisite checker , p. 80
- Make sure that the failover process is set up correctly and running succesfully before upgrading a manual failover environment, by switching from the production server to the failover server and back to the production server.

To start the upgrading process in a manual failover environment:

1. On the production server, do these steps:
    1. Upgrade the production server to the current version. See Upgrading on the same computer, p. 90 .
    2. Verify the installation to make sure that the installation completed successfully.
    3. Install the license keys for the production server. See Downloading and installing license keys, p. 161
    4. Log in to the production server as the system user (aiw1 is the default).
    5. Open a command line and type `stopaiw` to shut down RICOH ProcessDirector on the production server.
2. On the failover server, do these steps:
    1. Log in as the **root** user.
    2. Open a command line and go to the directory where the installation media is located and type `scripts/failover-setup-rpd-node.sh` and press **Enter** to run the script. The script adds entries to `/etc/services`, installs PSF if necessary, and updates the rpm database on the failover server.
    3. Switch the active node to the failover server by entering `/opt/infoprint/ippd/bin/changeHostname.pl server_hostname` where *`server_hostname`* is the name of the production server.
    4. Verify the installation on the failover server.
    5. Install the license keys for the failover server.
    6. Log in to the failover server as the system user (aiw1 is the default).
    7. Open a command line and type `stopaiw` to shut down RICOH ProcessDirector on the failover server.
3. On the production server, log in as the **root** user.
4. Switch the active node to the production server by entering `/opt/infoprint/ippd/bin/changeHostname.pl server_hostname` where *`server_hostname`* is the name of the failover server.

Upgrading the PostgreSQL database version

When you upgrade RICOH ProcessDirector, you have the option of upgrading the PostgreSQL version during the RICOH ProcessDirector install program or manually, after the install program completes or at a later date.

To manually upgrade the embedded PostgreSQL version:

1. Make sure that your current PostgreSQL database and RICOH ProcessDirector system are backed up.
2. Log in to the primary computer as the system user (**aiw1** is the default).
3. Type `su - root` and press **Enter**. When prompted, enter the password for the root user and press Enter.
4. Add the system user to the system environment variable.

   Enter this command: `export AIWUSER=`*`system_user`*, where *`system_user`* is the user used when you logged in.
5. Go to `/opt/infoprint/ippd/base` and locate the `updatePostgresql-`*`nnn`*`.zip` file, where *`nnn`* is the build number.

   Note

   - The RICOH ProcessDirector documentation assumes that the product is installed in the default directory. If you chose a different installation directory, you must change the first part of the directory to match the installation directory that you choose.
6. Unzip the `updatePostgresql-`*`nnn`*`.zip` file to a temporary location.
7. Go to the directory where you unzipped the file and find: `updatePostgresql.sh`
8. To run the script, type:

```
updatePostgresql.sh --update
```

   and press `Enter`.

   Note

   - When the script finishes, the command prompt returns: `PostgreSQL upgrade completed succesfully.`

Upgrading the DB2 database

When you upgrade RICOH ProcessDirector, the version of DB2 database that is embedded in RICOH ProcessDirector is left at the same level. You can upgrade the DB2 database before you start the RICOH ProcessDirector install program or after the install program completes.

If all these statements are true, you can upgrade the DB2 database using the DB2 installation DVD or ISO file provided with RICOH ProcessDirector:

- Your current DB2 database and RICOH ProcessDirector system is backed up.
- The current installed version of the DB2 database is 9.7, 10.1, or 10.5.
- The DB2 database being updated is the version installed by RICOH ProcessDirector and not supplied by an external source.
- You have the DB2 installation DVD or ISO file provided by Ricoh.

You can use scripts provided on the DB2 installation DVD or ISO file to upgrade the DB2 database before or after you install RICOH ProcessDirector.

Note

- You can only use the upgrade scripts with the version of DB2 that is installed with RICOH ProcessDirector. If you installed your own version of DB2 to work with RICOH ProcessDirector, use the standard upgrade process provided by IBM.

If you manually upgrade the DB2 database before upgrading RICOH ProcessDirector, do not start RICOH ProcessDirector until you upgrade to the new version. Some older versions of RICOH ProcessDirector do not work with newer versions of the DB2 database.

Whether you are installing using a DVD or an ISO image, make sure that you can access the DB2 installation DVD or ISO file from the primary server. Complete these procedures as needed:

- Preparing the primary computer for installation, p. 112
- Downloading installation files, p. 115
  Make sure that you download both the RICOH ProcessDirector and DB2 ISO files.
- Mounting an ISO file, p. 116
  For this procedure, mount the DB2 ISO file.

To upgrade the DB2 database manually:

1. Verify that your system meets the requirements listed above.
2. Log in to the primary computer as the system user (aiw1 is the default).
3. Open a command line and type: `stopaiw`
4. Type `su - root` and press **Enter**. When prompted, enter the password for the root user and press Enter.
5. Go to the directory where the DB2 installation DVD or ISO file is mounted and find: `scripts/upgradeDB2.sh`
6. To run the script, type `scripts/upgradeDB2.sh` and press **Enter**.

   Note

   - It can take several minutes for the script to complete.
     When the script finishes, the command prompt returns: `Successfully upgraded DB2.`
7. Check the installation log for any errors. Go to `/opt/infoprint/ippd/logs/installer/` and open `upgradeDB2.log`.
8. Verify the DB2 database level on the system. Type `/usr/local/bin/db2ls` and press **Enter**.

   The command displays the current DB2 database level along with the install path and install date. If the installation was successful, the DB2 database level is 11.5.9.0 Special Build 57034.
9. If you upgraded the DB2 database before upgrading RICOH ProcessDirector, continue with installing RICOH ProcessDirector.
10. If you upgraded the DB2 database after upgrading RICOH ProcessDirector, start RICOH ProcessDirector and log in to verify that the upgrade was successful.

Migrating data from DB2 to PostgreSQL

If you previously used RICOH ProcessDirector with DB2 and are migrating to the PostgreSQL database configuration, you must migrate your data from one database to the other after installing the update.

After the upgrade, RICOH ProcessDirector is still running on the DB2 database.

Note

- This procedure assumes that you installed RICOH ProcessDirector in the default location. If you installed in a different location, paths to files and scripts must be adjusted to your installation.
  The default paths are:
  - `$AIWPATH`: `/opt/infoprint/ippd`
  - `$AIWDATA`: `/aiw/aiw1`

To migrate your data from DB2 to PostgreSQL:

1. Log in to the primary computer as the RICOH ProcessDirector system user (aiw1 is the default).
2. Make sure that you can access both the DB2 and the PostgreSQL databases. Open a command line and enter these commands.
   - To check for DB2 enter: `db2 connect to aiwdb`
     If no connection info is returned, enter: `db2start` and check the status again.
   - To check for PostgreSQL, enter: `docker info` or `podman info`
3. Prepare a migration directory.
   1. Create a temporary directory for the migration. For example: `mkdir $AIWDATA/tmp/migrateDb2ToPostgresql`
   2. Open: `$AIWPATH/base`
   3. Copy the `migrateDb2toPostgresql-`*`version`*`.zip` to your temporary migration directory and unzip.
   4. In your temporary migration directory, update the permissions for `migrateDb2ToPostgresql.pl`
      Type: `chmod +x migrateDb2ToPostgresql.pl`
   5. Update the permissions for `rexact.pl`.
      Type: `chmod +x rexact.pl`
4. Run the migration tool.
   1. Stop RICOH ProcessDirector, except the database: `stopaiw -d`
   2. Log in as the root user.
   3. Run `. /opt/infoprint/ippd/base/config/ippdprofile`
   4. From the migration directory, run the migration script: `./migrateDb2ToPostgresql.pl`

   The migration starts by restarting the activation to create tables in PostgreSQL database. Activation status messages are displayed.

   When the activation is complete, the script runs the migration. As the migration script runs, you should see status messages such as: `Migrating table <tablename>`

Note

- Additional log messages are written to: `$AIWPATH/logs/installer/rexact-logs.log` and `$AIWPATH/logs/installer/migrateDb2ToPostgresql.log`
- If you see error messages during the migration, see Troubleshooting data migration errors, p. 109.

5. Stop and restart RICOH ProcessDirector:
   1. Log in as the RICOH ProcessDirector system user (aiw1 is the default).
   2. Run `stopaiw`
   3. Run `startaiw`
6. Log in to RICOH ProcessDirector. All objects and jobs should now appear on the **Main** page.

Note

- You can see extra jobs in the system if sample input devices are enabled while the `migratingDb2ToPostgresql.pl` script runs. The script reactivates and submits jobs to the sample input devices.

7. After you verify everything, proceed with uninstalling the DB2 database.
8. To uninstall DB2:
   1. Log in as the root user.
   2. Enter these commands to uninstall DB2 database.

```
cd $AIWPATH/db_version/instance
./db2idrop aiwinst
cd $AIWPATH/db_version/install
./db2_deinstall -a
```

   3. Remove the following directories if they exist:

```
$AIWDATA/db2
$AIWDATA/db2_logs
```

9. Continue with Completing the upgrade process, p. 100.

Troubleshooting data migration errors

If you see errors when migrating data from DB2 to PostgreSQL, check the following:

Unable to connect to the DB2 database.

Make sure that DB2 is running and that you can connect to it. To check for DB2 database enter: `db2 connect to aiwdb`

If no connection info is returned, enter: `db2start` and check the status again.

Unable to connect to the PostgreSQL database.

Make sure that PostgreSQL database is running.

To check for PostgreSQL database open a command line and type: `docker ps` or `podman ps`. If the Docker or Podman container is running, the container ID and status is displayed.

Table {0} was not found in the PostgreSQL database.

If you see this message and you find that there are missing objects or configurations on the server, contact Software Support. It is normal for some tables to be removed if they are no longer used.

Table {0} was not found in the DB2 database.

Tables might be missing be due to the installation of additional features.

Failed to migrate table {0} because of {1}

Try to migrate the table again by running `./migrateDb2ToPostgresql.pl -t <tablename>` script. If the table migration fails again, contact Software Support for assistance.

Unable to read the list of tables for migration.

Contact Software Support for further assistance.

Invalid configuration file: System.database.cfg

Check the file permissions for the `System.database.cfg` file. Type: `ls -l $AIWDATA/config/System.database.cfg` and compare the output to this: `-rwxrwxr-x`

If they do not match, update the permissions as needed. Otherwise, contact Software Support for further assistance.

Unable to remove the DB2 license because of {0}

The DB2 file could not be cleaned. This error can be ignored as uninstalling DB2 results in cleaning the file.

4. Installing

- **Task checklist**
- **Preparing the primary computer for installation**
- **Downloading installation files**
- **Mounting an ISO file**
- **Installing from a remote directory**
- **Installing the base product**
- **Troubleshooting installation errors**
- **Installing a manual failover environment**
- **Troubleshooting manual failover environment installation errors**

When you order RICOH ProcessDirector and request physical discs, you receive one or more installation discs.

If you do not request discs or if you want to install before the physical disc arrives, you can download ISO images from the Ricoh Production Print website: https://dl.ricohsoftware.com/. To download the software, follow the instructions in Downloading installation files, p. 115.

The discs or the ISO files include:

- One that holds the base product. This DVD or ISO file includes installers for trial versions of the features that can be installed using Feature Manager.
- DVDs and CDs that hold supplied fonts. See Supplied fonts, p. 87.
- If you purchased a Secondary Server feature, a CD or ISO file that holds the secondary server installer.
- If you purchased any of the Ricoh Transforms, DVDs or ISO files that hold the installers for each transform.

The RICOH ProcessDirector Secondary Server feature and application servers are the only components that are installed on different computers.

Important

1. RICOH ProcessDirector is installed in trial mode. After you install, you can download and install license keys for the features that you have purchased. See Downloading and installing license keys, p. 161 for more information.
2. The installation instructions for installing RICOH ProcessDirector on an active computer with a backup computer in a manual failover configuration are different than for installing on a primary computer alone. See Installing a manual failover environment, p. 124.
3. If the computer where you plan to install the base product already has a RICOH ProcessDirector Secondary Server feature installed, you must uninstall the Secondary Server feature before you install the base product. See Uninstalling Secondary Server features, p. 194 for details.
4. To migrate your objects from a primary server running on one operating system to a primary server running on a different operating system, follow the instructions in Running the Migration Assistant, p. 97 after installing RICOH ProcessDirector.
5. RICOH ProcessDirector is not guaranteed to work with third party products installed on the server, such as antivirus programs and network sniffers. Such programs may affect ports or files which are needed for RICOH ProcessDirector to function normally.

Task checklist

Here are the tasks you need to complete in this chapter. Check each item as you complete the task.

Checklist for completing installation tasks

	Task
	Preparing the primary computer for installation, p. 112 Use this procedure to make sure that you are ready to run the installation program.
	Optional: Downloading installation files, p. 115 If you do not have installation discs, use this procedure to download ISO images of them.
	Optional: Installing from a remote directory, p. 116 You can use a remote directory to install RICOH ProcessDirector or a Secondary Server feature without using a DVD. You can use a DVD drive on a different computer to copy the installation programs into the remote directory on your network. The remote directory holds the installers so you can access them from the computers that you want to install RICOH ProcessDirector on. The remote directory can be located on the computer that you plan to install RICOH ProcessDirector on.
	Installing the base product, p. 118 Use this procedure to install RICOH ProcessDirector.
	Optional: Installing a manual failover environment, p. 124 A manual failover environment consists of two primary servers, one production server and one failover server, that can both access file systems installed on a shared file server. If the production server becomes unavailable, you can move processing to the failover server until the production server is available again.
	Troubleshooting installation errors, p. 123 If you have trouble installing RICOH ProcessDirector, you can find information in the installation logs.

Preparing the primary computer for installation

When you are ready to install RICOH ProcessDirector, use this procedure to make final configuration updates and verify that the system configured correctly.

Note

- If you are using a copy of DB2 installed on a different computer instead of the version of DB2 that is included with RICOH ProcessDirector, make sure that you complete Installing and configuring your own copy of DB2 on a different computer, p. 75 before you start this procedure.
- If you are using a copy of PostgreSQL installed on the local computer or on a different computer instead of the PostgreSQL version included with RICOH ProcessDirector, make sure that you complete Configuring your own PostgreSQL database, p. 71 before you start this procedure.
- Setting the `umask` to use strict permissions might cause read or write issues on the installation folder. Therefore we recommend setting `umax` to `022`, the default set of permissions.

To prepare the primary computer:

1. Make sure that the planning checklist is complete and the required hardware and software are available and installed. See Planning for installation, p. 35.
2. Make sure that `/etc/hosts` on this computer has an entry for its IP address and the fully qualified host name.
3. Log in as the root user.

   Important

   - You must log in as a user with UID 0. If you must log in as a different user, you can use `sudo su -` or `su -` to become the root user. However, do not use `sudo` or the `su` command in any other way to become the root user.
4. We recommend that you set user resource limits for the maximum number of open files, number of processes, and stack size.

   All systems perform better with the new settings. Systems with areas of high volume require the settings.

   1. Edit the `/etc/security/limits.conf` file with a text editor to set these limits:

```
* soft nofile 32768
* hard nofile 32768
* soft nproc 65536
* hard nproc 65536
* soft stack 32768
* hard stack 32768
```

   2. Save the file and exit the editor.

      The new limits do not take effect until you log out and log back in.
5. **Optional:** If you plan to use IBM DB2 as the RICOH ProcessDirector database, check to see whether DB2 or a DB2 client is installed on this computer. Enter this command to see if a separate copy of DB2 or a DB2 client is installed:

   ```
   db2ls
   ```

   The results show whether DB2 is installed and the level of that installation. If there are no results, DB2 is not installed outside of RICOH ProcessDirector. If DB2 is installed, take one of the following actions to use either the installed copy or the RICOH ProcessDirector version.

   - If DB2 11.5.8 or higher is installed, continue installing RICOH ProcessDirector.
   - If there is a DB2 version lower than 11.5.8, update to DB2 version 11.5.8 or higher.

6. **Optional:** If you plan to use an instance of PostgreSQL installed on a different computer as the RICOH ProcessDirector database, verify that the PostgreSQL server or client is installed on the primary computer.

   The PostgreSQL server or client must be at the same level as the PostgreSQL database that you plan to use with RICOH ProcessDirector.

   - If neither the PostgreSQL server nor the client is installed, you must install one of them.
   - If a PostgreSQL server or client is already installed, check its version:

   1. Open a command line and change directories to where PostgreSQL is installed.
   2. Enter this command to view the client version:
      ```
      psql -v
      ```
   3. Enter this command to view the server version:
      ```
      postgres -V
      ```

   If both versions match, continue installing RICOH ProcessDirector. If the versions do not match, update PostgreSQL before you continue.

7. Disable your antivirus software.

   During the install process, various archive files (ZIP, JAR, and EPK files) are copied to your server. Then, the contents are extracted and moved to the correct directories on your system. Antivirus tools usually lock and scan files extracted from archives.

   While the lock and scan process is generally fast, the installation program runs faster. If the installer tries to unpack and move files before the scan is complete, installation errors occur and can be difficult to recover from. Disabling your antivirus software during the install process prevents these types of errors.

8. Set up exceptions within your antivirus software.

   If you cannot deactivate your antivirus software entirely, excluding some directories from scans can reduce the possibility of installation errors. In addition, most antivirus software affects the function of databases. The software sometimes quarantines files that databases use, causing operation errors. Setting up these exclusions now prevents those errors after RICOH ProcessDirector is installed.

   Set up exceptions for these paths:

   - `/aiw/aiw1`
   - `/opt/infoprint/ippd`
   - `/var/psf`
   - If you plan to use DB2 installed with RICOH ProcessDirector as your database:
     - `/home/aiwinst/sqllib`
   - If you plan to use PostgreSQL installed in a Docker or Podman container as your database:
     - `/var/lib`
   - If you use a custom feature that integrates BCC software running on a Windows application server with RICOH ProcessDirector, exclude this path on the Windows system that the BCC software runs on:

- `C:\BCC`

9. Disable Security Enhanced Linux (SELinux). Installation errors occur on Linux systems when you run the RICOH ProcessDirector installation program with SELinux enabled. To verify the SELinux mode and disable it:
   1. Open a command line and type this command to view the current SELinux mode:
      `getenforce`
   2. If the result of the command is `Enforcing`, disable SELinux. Open `/etc/selinux/config` in a text editor and find the SELINUX line. Change that line to:
      `SELINUX=disabled`
      Save and close the file.
   3. Run the `getenforce` command again to make sure SELinux is disabled.
10. Disable Federal Information Processing Standard (FIPS). Installation errors occur on Linux systems when you run the RICOH ProcessDirector installation program with FIPS enabled. To verify the FIPS mode and disable it:
    1. Open a command line and type this command to view the current FIPS mode:
       ```
       fips-mode-setup --check
       ```
    2. If the result of the command is `FIPS mode is enabled`, disable FIPS. Open a command line and type this command:
       ```
       fips-mode-setup --disable
       ```
    3. Reboot the system.
    4. Check the FIPS status again to verify that it is disabled.

Downloading installation files

If you do not have installation discs, use this procedure to download ISO images of them.

To download installation files:

1. In a web browser, open this page: https://dl.ricohsoftware.com/
2. Click **Software Downloads**, enter your Entitlement ID, and click **Submit**.
3. Under **Product Downloads in this EID**, click the title of each ISO file listed to download it.

   Note

   - For information about using ISO files to install software, click **Working with ISO files** on the right side of the webpage.
   - All RICOH ProcessDirector features are included in the base product except for the RICOH Transform features and the RICOH ProcessDirector: Secondary Server Feature.
4. If you need to install a Ricoh Transform feature, click the feature and save its ISO file to your computer.
5. If you need to install one of the supplied font sets:
   1. Click **View Related Files** on the right side of the page.
   2. Scroll to the bottom of the downloadable packages list to find the font collections.

3. Click the title of each font collection to download the ISO file.

6. After each file downloads, validate its MD5 checksum to the value shown on the webpage. Use this command, substituting the name of the file for *ProductUpdate.iso*:

   ```
   md5sum ProductUpdate.iso
   ```

   If the checksum does not match, download the file again.

7. **Optional:** Burn the base product ISO file onto a blank dual-layer DVD. Burn each other ISO file onto its own blank CD or DVD. If you have software that allows you to mount an ISO file, you do not have to burn the images to physical media.

   Note

   CD and DVD burning programs can burn files in a variety of formats, including data, video, and audio. If you decide to create a DVD, choose the option for burning an ISO image. The options for burning data do not create a DVD or CD that you can use to install the software.

4

You are now ready to use the installation program to install RICOH ProcessDirector.

- If you want to install from a DVD drive on the primary computer, continue with Installing the base product, p. 118.
- If you want to mount the ISO files, continue with Mounting an ISO file, p. 116
- If you want to copy the installers to a staging location on this computer or somewhere else on your network, continue with Installing from a remote directory, p. 116.

Important

- We recommend keeping your entitlement ID in a safe place for further use. It is useful when you need to download product updates or any other packages. To find more information about downloading product update packages, see Downloading and installing update packages, p. 184.

Mounting an ISO file

You can use a virtual drive to mount an ISO file to install RICOH ProcessDirector.

To mount an ISO file:

1. Create the ISO mounting point. For example, `mkdir /isomount`.

   Note

   - The mounting point for the ISO file does not need to be created off the root directory. It can be created anywhere on the system.

2. Transfer the ISO file to the computer. For example, place the file in the directory `/tmp/RPD.iso`.
3. Mount the ISO file using this command: `mount -o loop /<location of ISO>/<mounting point>`
   For example: `mount -o loop /tmp/RPD.iso /isomount`

Installing from a remote directory

You can use a remote directory to install RICOH ProcessDirector or a Secondary Server feature without using a DVD. You can use a DVD drive on a different computer to copy the installation programs into the remote directory on your network. The remote directory holds the installers so you can access them

from the computers that you want to install RICOH ProcessDirector on. The remote directory can be located on the computer that you plan to install RICOH ProcessDirector on.

The remote directory must have enough free space to hold the installers you want to store. We recommend having at least 7 GB of space in the remote directory for each installer. If you have installers for two operating systems in the same staging area, we recommend having at least 14 GB of space in the remote directory.

All the computers that you use in this procedure must be UNIX-based systems. In addition:

- You cannot store the installers in a remote directory on a Windows computer and then install RICOH ProcessDirector on a Linux computer.
- If the DVD drive is on a third computer that is mounted to the remote directory, that computer must also be a UNIX-based computer.

To install from a remote directory:

1. If you plan to copy the installation programs from a DVD drive on the same computer as the remote directory, continue with the next step. If you plan to copy the installation programs from a DVD drive that is not on the computer that holds the remote directory, mount the remote directory to the computer with the DVD drive .
2. Copy the installers to the remote directory:
    1. Log in to the computer that you want to create the remote directory on and open a command prompt.
    2. Create a directory that the files can be copied to, such as `/installers`. Configure the directory so other computers can mount it. This is the remote directory.
    3. Insert the base product DVD in the drive.

        Note

        - If you are using a Red Hat or Rocky Linux system, the drive might mount automatically. However, drives that are mounted automatically on those systems are set up so that you cannot run programs from the media. You must unmount the drive and mount it again with the **exec** option before you can continue. You can use this command:
          `mount -t iso9660 -o remount,exec <mount_point>`

          You must remount the drive for every CD or DVD that you insert.
    4. Go to the media mount point to view the contents.
       You should see a file named `mk_remote`.
    5. Type this command to run the script:
       `./mk_remote -d <directory>`
       Substitute the path to the remote directory that you created above for *<directory>*.
    6. When the script finishes, type `cd /` and eject the CD or DVD.
    7. When you finish moving all the installers, you can go to the remote directory to verify that the installers have been copied correctly.
3. Access the installers from the computer that you want to install RICOH ProcessDirector on:
    1. Log in to the computer that the software will be installed on.

Note

You must install the base product before you install any Secondary Server features. A Secondary Server feature cannot be installed on the same computer as the base product.

2. Create a directory to mount to the remote directory. We recommend that you give the directory the same name as the remote directory.
3. Mount the directory you just created to the remote directory.
4. Go to the mounted directory.
   You see several files and directories, including a script named `setup`.

4. Run the setup script in the mounted directory to start the installer.
   - To install the base product, type: `./setup`
   - To install a Secondary Server Feature, type: `./setup IPPDs`
     The base product must be installed on the primary computer already.
5. When the installer starts:
   - For the base product, continue by following the instructions that appear in the installer as described in section Installing the base product, p. 118.
   - For the Secondary Server feature, continue by following the instructions that appear in the installer as described in section Installing the Secondary Server feature, p. 136.

Note

- If the computer's operating system is a supported Red Hat-derived operating system and its language is Japanese, Simplified Chinese, or Traditional Chinese, choose **English** on the dropdown language menu. Japanese, Simplified Chinese, and Traditional Chinese characters do not display properly during a Red Hat installation of RICOH ProcessDirector.

Installing the base product

Before you begin, make sure that you have verified all the prerequisites for your configuration as listed in Planning for installation, p. 35 and Preparing the primary computer for installation, p. 112.

Note

- On Red Hat-derived operating systems, CD and DVD drives are configured to mount automatically. However, drives that are automatically mounted are often set up so you cannot run programs from the media, including installation programs. You must unmount the drive and mount it again before you can start the installation program. You must remount the drive for every CD or DVD that you insert.
- During the installation, the RICOH ProcessDirector license files are copied to the `/opt/infoprint/ippd/base/license` directory.
- The installation instructions describe how to install with a graphical display. If you cannot run the installation program in graphical mode, use console mode to install with a text-based installation program. To start the installer in console mode, insert `-console` in the command after the word setup. For example, to install the base product, type:
  `./setup -console`
  To use the installer in console mode:
  - Press Enter to move to the next screen.
  - Type `back` to return to the previous screen.
  - Type `quit` to exit the installer.

To install the base product:

1. Log in as the root user.

   Important

   - You must log in as a user with UID 0. If you must log in as a different user, you can use `sudo su -` or `su -` to become the root user. However, do not use `sudo` or the `su` command in any other way to become the root user.
2. Open a command line and enter this command to make sure you are in the root directory:
   ```
   cd /
   ```
3. If you are installing from a DVD:
   1. Insert the base product DVD in the drive.
   2. To determine the name of the mount point, enter:
      ```
      ls /media
      ```
      On some systems, the name of the mount point is the same as the name of the CD or DVD.

      Note

      - If you are using a Red Hat or Rocky Linux system, the drive might mount automatically. However, drives that are mounted automatically on those systems are set up so that you cannot run programs from the media. You must unmount the drive and mount it again with the **exec** option before you can continue. You can use this command:
        `mount -t iso9660 -o remount,exec <mount_point>`

        You must remount the drive for every CD or DVD that you insert.
   3. Mount the drive, if necessary. Enter:
      ```
      mount /media/mount_point
      ```
   4. Change directories so you can see the contents of the DVD. Enter these commands:

```
cd /media/mount_point
ls
```

You see several scripts and directories, including a script called `setup`.

Continue with step 5.

4. If you are installing from an ISO file:

   1. Follow the instructions in Mounting an ISO file, p. 116.
   2. Change directories so you see the contents of the ISO file.
      You see several scripts and directories, including a script called `setup`.

5. To start the installer, enter: `./setup`

   The installer starts and displays the Introduction screen. Select the appropriate language for the installer to use and then click **OK**.

   Note

   - If the computer's operating system is a supported Red Hat-derived operating system and its language is Japanese, Simplified Chinese, or Traditional Chinese, choose **English** on the dropdown language menu. Japanese, Simplified Chinese, and Traditional Chinese characters do not display properly during a Red Hat installation of RICOH ProcessDirector.

6. Follow the instructions in the installer.

   The installer verifies many of the prerequisites for the system. If it finds any problems, it lists them for you. You cannot proceed until you correct them. After you fix the issues, verify the prerequisites again by returning to the **Prerequisite Verification** window. Click **Previous** in the installer or type `back` in console mode, then continue with the installer.

   Important

   - After you verify all the prerequisites, click **Cancel** to change a previous entry and begin the installation process again. Clicking the **Previous** button sometimes causes problems.

7. Review and accept the license and maintenance agreements.
8. You can choose the name that you want to use for the RICOH ProcessDirector system user or you can use the default name. This is the user that RICOH ProcessDirector runs under. The default system user is **aiw1**.

   Note

   - All Linux operating system user IDs and group names must be 1-8 characters because of a restriction in DB2. You cannot create a user ID that includes international characters (such as á, É, î, ñ, ô, ß) or double-byte characters. This limitation only applies if you use DB2 as your database.

   Enter a name for the user. If the installer finds that the user already exists on the system, it asks if you want to use that user. If you did not create the user, choose **No** and enter a different name. If the installer does not find the user on the system, the installer creates it.

9. Enter the security group to use as the primary group for the system user, the UID and GID numbers for the user and group, and the home directory for the system user. The default values are shown in the installer, but you can change them.

   If you created the user and group before you started the installer, you are not asked for these values.

10. Choose a password for the system user and enter it twice. Remember this password; you need it later when you have to log in as the system user. If you created the user before you started the installer, you are not asked for the password.
11. Choose the language that you want the system user to use. This language determines the language used for some messages, even if you set the browser for the user interface to a different language.
12. Choose the database that you want to use with RICOH ProcessDirector.
    - PostgreSQL included with RICOH ProcessDirector. Continue with step 16.
    - PostgreSQL installed separately. Continue with step 13.
    - IBM DB2 included with RICOH ProcessDirector. Continue with step 14.
    - IBM DB2 installed on this server. Continue with step 15.
    - IBM DB2 installed on a different server. Continue with step 15.

    Note

    - If you are upgrading an existing system and plan to migrate your data from DB2 to PostgreSQL, you must migrate your data after the installation completes.
13. If you choose **PostgreSQL installed separately**, set up the remote PostgreSQL database server connection:
    1. If you have not completed the procedure in Configuring your own PostgreSQL database, p. 71 , exit the installer and do that procedure now.
    2. If you have completed that procedure, enter values for these fields:

       PostgreSQL server address or host name

       Specify the IP address or the host name of the server where PostgreSQL is installed.

       PostgreSQL binary path

       Specify the location of the PostgreSQL bin directory. On Windows, the default binary path is `C:\Program Files\<version_number>\bin` and on Linux, the default binary path is `/usr/<version_number>/bin`, where *<version_number>* is the PostgreSQL database version installed.

       PostgreSQL user name

       Specify the user name for the owner of the PostgreSQL database.

       PostgreSQL password

       Specify the password for the owner of the PostgreSQL database.

       PostgreSQL port number

       Specify the port number used to communicate with the PostgreSQL database. The default value is 5432.
    3. Click **Next** and continue with step 16.
14. If you choose **IBM DB2 included with RICOH ProcessDirector**:
    1. Click **Next**.
    2. In the next window, click **Choose** to select the installation media location.

3. In the **Select a folder** dialog, select the folder or mount point for the DB2 installation media and click **Select**.
4. Click **Next** to continue with the installation.

If the path was incorrect or the DB2 installer was not located, click **Previous** to go back or **Next** or **Cancel** to exit the installation.

15. If you choose **DB2 installed on a different server**, the next window shows any DB2 clients that are installed on the system. Choose the one that you want to use.

    1. Enter values for the users and groups that DB2 requires, along with any other instance information requested.

       The users and groups vary based on the DB2 configuration that you use:

       - The RICOH ProcessDirector version of DB2 requires an instance user, a fenced user, and their corresponding groups.
       - A separate copy of DB2 installed on the same computer as the base product requires an instance user, a fenced user, and their corresponding groups.
       - A separate copy of DB2 installed on a different computer requires an instance user and group for the DB2 client on the primary computer, and an instance user, a fenced user, and their corresponding groups for the DB2 server on the other computer.

         You created these users and groups when you installed and configured the DB2 client and server in Installing and configuring your own copy of DB2 on a different computer, p. 75.

       Note

       - All Linux operating system user IDs and group names must be 1-8 characters because of a restriction in DB2. You cannot create a user ID that includes international characters (such as á, É, î, ñ, ô, ß) or double-byte characters. This limitation only applies if you use DB2 as your database.

       If you created the users and groups before you started the installer, make sure you use the correct values.

16. Review the pre-installation summary and click **Install** to start installing.
17. Click **Done** to complete the installation.
18. On the command line, type this command to return to the root directory:

    ```
    cd /
    ```

19. If you installed from a DVD, eject the disc.
20. If you see error messages, view the installation logs in the `/opt/infoprint/ippd/logs/installer` directory and contact Software Support.
21. Reboot the system.
22. Continue with Logging in for the first time, p. 150.

Note

- Your software installs in trial mode. The trial license expires after 60 days. For more information about obtaining and installing license keys, see Downloading and installing license keys, p. 161.

Troubleshooting installation errors

If you have trouble installing RICOH ProcessDirector, you can find information in the installation logs.

The installer logs information in these directories:

- `opt/infoprint/ippd/logs`
- `opt/infoprint/ippd/logs/installer`
- `/tmp`

Installation errors occur on Linux systems when you run the RICOH ProcessDirector installation program with SELinux or FIPS enabled.

- To see whether Security Enhanced Linux (SELinux) is enabled on your system, open a command prompt and type:
  `getenforce`

  If the command returns `Enforcing`, open `/etc/selinux/config` in a text editor and find the `SELINUX` line. To disable SELinux, change that line to: `SELINUX=disabled`
- To see whether Federal Information Processing Standard (FIPS) is enabled on your system, open a command prompt and type:

  ```
  fips-mode-setup --check
  ```
  If the command returns `FIPS mode is enabled`, disable it by typing:

  ```
  fips-mode-setup --disable
  ```

Try to install again.
Here are some possible DB2 scenarios if you have to reinstall RICOH ProcessDirector:

- If you installed the RICOH ProcessDirector version of DB2:
  When you install RICOH ProcessDirector, the installation program creates a DB2 instance and user ID using the value you enter for the **DB2 instance user**. There must be no other DB2 instance or user ID with this name on the RICOH ProcessDirector system, even in a different version of DB2.

  If the installation program finds an instance using that name, it cannot create the instance. You can either delete the existing instance or choose another value for **DB2 instance user**. To delete an existing instance, enter this command, substituting the name you want to use for *DB2 instance user*:
  `/opt/IBM/db2/V11.1/instance/db2idrop` *`DB2 instance user`*

  Note

  – The path name might be different if you have installed a version of DB2 other than 11.1 or if DB2 is not installed in the default location.

  – When you delete a DB2 instance, you delete all data in that instance.
- If you installed your own copy of DB2 on the primary computer:
  If you have to reinstall RICOH ProcessDirector, the DB2 instance that the first installation created might still exist. To check, log in as the root user and enter this command:
  `/opt/IBM/db2/V11.1/instance/db2ilist`

  Note

  – The path name might be different if DB2 is not installed in the default location.

- If you installed your own copy of DB2 on a computer other than the primary computer (a remote computer):

  If you have to reinstall RICOH ProcessDirector, the DB2 instance that the first installation created might still exist. To check, log in as the root user and enter this command:

  ```
  /opt/IBM/db2/V11.1/instance/db2ilist
  ```

  Note

  – The path name might be different if DB2 is not installed in the default location.

  If you find a DB2 instance with the name that you want to use, you cannot reuse it. You can either:

  – Enter a different name for the DB2 instance when you reinstall RICOH ProcessDirector.

  – Enter this command to delete the existing DB2 instance:
  `/opt/IBM/db2/V11.1/instance/db2idrop aiwinst`

  Important

  ♦ When you delete a DB2 instance, you delete all data in that instance.

Installing a manual failover environment

A manual failover environment consists of two primary servers, one production server and one failover server, that can both access file systems installed on a shared file server. If the production server becomes unavailable, you can move processing to the failover server until the production server is available again.

Installing a manual failover environment is a complex procedure. Before you start the configuration process, consult with your system administrator. Manual failover is primarily used in enterprise environments and might not be appropriate for your setting.

This procedure assumes that you use NFS for file sharing. Based on your system requirements and workflow, you might need a different setup, such as a SAN or NAS. Determine your system requirements and use the best technology for your company. Use the following steps as a guide to set up your system.

Before you start this procedure, open the required ports in your firewall to allow communication between your file server, production server, and failover server. Also, make sure you have completed these procedures as needed:

- Preparing the primary computer for installation, p. 112
- Downloading installation files, p. 115
- Mounting an ISO file, p. 116
- Installing from a remote directory, p. 116

Whether you are installing using a DVD or an ISO image, make sure that you can access the installation media from the production server, the failover server, and the file server.

To install a manual failover environment:

1. Determine the GID for each of these system groups. See Creating system groups and users, p. 50 for more information about system groups. You must use the same system group names and GID values on the production and failover systems. The defaults are listed below. If you choose to use different values, record them here for future reference.

Group Name	Default GID	Database configuration
printq	1002	• DB2 • PostgreSQL
aiwgrp1	32458	• DB2 • PostgreSQL
docker	977	PostgreSQL
aiwdbgrp	1000	DB2
aiwdbfgp	1001	DB2

2. Determine the UID values for each of these user names. You must use the same system user names and UIDs on the production and failover systems. See Creating system groups and users, p. 50 for more information about system users. The values are listed below.

User name	Default UID	Group Membership	Database configuration
aiw1	32457	aiwgrp1	• DB2 • PostgreSQL
		printq	• DB2 • PostgreSQL
		aiwdbgrp	DB2
		docker	PostgreSQL
aiwinst	1000	aiwdbgrp	DB2
aiwdbfid	1001	aiwdbfgp	DB2

3. Determine the host names for each of these servers.

Server	Description
Production server	The system that has the primary server installed and the system RICOH ProcessDirector runs on during normal operations.
Failover server	The system that RICOH ProcessDirector runs on as a backup, used when the normal server is unavailable.
File server	The system set up by a network administrator which hosts files such as installed code, configuration files, data files, and the database. Might be a SAN or NAS.

Note

- A DNS can be set to use a single host name alias to redirect to either the production or failover server, depending on which system is active. With this configuration, users can access the system from a single URL.

4. Log on to the file server as an administrator.
5. Open a command line. Go to the directory where the installation media is located and into the `scripts` directory. Find `failover-create-shares.sh`.

   If you have custom share paths or are using a technology other than NFS, copy `failover-create-shares.sh` to `/tmp`. Edit the script to match your system configuration.
6. Run the script.

   In a PostgreSQL configuration, type:

   ```
   ./failover-create-shares.sh postgresql
   ```

   In a DB2 configuration, type:

   ```
   ./failover-create-shares.sh db2
   ```
7. Verify that the script created these directories on the file server:

   - `/aiw/aiwdata`
   - `/aiw/aiwpath`
   - `/aiw/varaiw`
   - `/aiw/homeaiw1`
   - `/aiw/homeaiwinst` (this directory is created only when using a DB2 database)
   - `/aiw/homeaiwdbfid` (this directory is created only when using a DB2 database)
   - `/aiw/varpsf`
   - `/aiw/docker-volumes` (this directory is created only when using a PostgreSQL database with Docker)
   - `/aiw/podman-volumes` (this directory is created only when using a PostgreSQL database with Podman)
8. In the directory where the installation media is located, type: `scripts/failover-update_exports.sh` to add these shares to NFS.
9. Restart NFS. Type: `showmount -e` then `cat /etc/exports` to view and confirm the settings are correct on the file server.

   Make sure the added shares are correct and check the flags and permissions of each share.
10. Log in to the production server as the **root** user and mount the shared directories:

    1. Open a command line. Go to the directory where the installation media is located.
    2. Run the script.

       In a PostgreSQL configuration, type:

       ```
       scripts/failover-create-mountpoints.sh postgresql
       ```

       In a DB2 configuration, type:

       ```
       scripts/failover-create-mountpoints.sh db2
       ```

3. If the directory `/usr/local/bin` does not exist, type: `mkdir -p /usr/local/bin` and press **Enter**.
4. Copy `scripts/mountDrives.sh` from the installation media to `/usr/local/bin`
5. Using a text editor, edit `mountDrives.sh`. Make sure you change the file server value to the name of your file server.
6. If you are not using NFS to share and mount the filesystems, modify the script to run the appropriate commands to mount them.
7. To make the script executable, type: `chmod +x /usr/local/bin/mountDrives.sh` and press **Enter**.
8. To run the script, type: `/usr/local/bin/mountDrives.sh` and press **Enter**.
9. To confirm the shared directories are mounted, type: `df` and press **Enter** .

11. Create users on the production server:

    1. Copy `scripts/failover-user-configuration` from the installation media to `/tmp` on the production server.
    2. Using a text editor, open `failover-user-configuration`. Compare the system user and system group values to the system user and system group values from Step . If you are using the default values, these values do not need to be changed.
    3. To run the script, go to the directory where the installation media is located and type: `scripts/failover-create-users.sh /tmp/failover-user-configuration` and press **Enter**.
    4. Type: `id` *`username`* for each user name to verify it was created.
       For example, if you type: `id aiw1`, your output might look like:

       ```
       uid=3133(aiw1) gid=1038(ipserv) groups=10(wheel),1038(ipserv),111(staff1)
       ```

12. Install RICOH ProcessDirector on the production server. See Installing the base product, p. 118.

    When prompted for system users and system groups, use the same values you used in the scripts and select the system user (aiw1 is the default). Do not reboot the system after installing RICOH ProcessDirector. The mapped drives might need to be re-mapped if the system is rebooted.

13. Continue with Logging in for the first time, p. 150. Do not do the **Verifying the installation** procedure. Return to this section to complete the manual failover environment installation.

14. Completely shut down RICOH ProcessDirector on the production server:

    1. Log in to the production server as the system user (aiw1 is the default).
    2. If you run in a PostgreSQL configuration, go to the directory where the installation media is located. Type `scripts/failover-setup.sh` and press **Enter**.
    3. Open a command line and type: `stopaiw`
    4. Type: `su - root` and press **Enter**. When prompted, enter the password for the **root** user and press **Enter**.
    5. If you run in a DB2 configuration, type: `/opt/infoprint/ippd/db/bin/db2fmcu -d`
    6. If you run in a DB2 configuration, type: `ps -ef | grep db2` to display all db2 processes that are still running. To end each db2 process, type:

       `kill` followed by each of the process IDs listed in the results of the **grep** command. For example, your results might look similar to:

```
dasusr1  14729     1  0 Aug24 ?   00:00:01 /home/dasusr1/das/
                                             adm/db2dasrrm
root     18266     1  0 Aug24 ?   00:15:08 /opt/infoprint/ippd/db/
                                             bin/db2fmcd
dasusr1  18342     1  0 Aug24 ?   00:00:23 /opt/infoprint/ippd/db/das/
                                             bin/db2fmd -i dasusr1 -m /
                                             opt/infoprint/ippd/db/das/
                                             lib/libdb2dasgcf.so.1
root     21049     1  0 Sep01 ?   00:00:00 db2wdog 0 [aiwinst]
aiwinst  21051 21049  0 Sep01 ?   01:13:01 db2sysc 0
root     21059 21049  0 Sep01 ?   00:00:00 db2ckpwd 0
aiwinst  21061 21049  0 Sep01 ?   00:00:00 db2vend (PD Vendor
                                            Process - 1) 0
```

In these results, the process IDs are listed in the second column. To end the first process in the list, type: `kill 14729` and press **Enter**.

7. Type: `ps -ef | grep psfapid` to display all psfapid processes. To end each psfapid process, type:

   `kill` followed by each of the process IDs listed in the results of the **grep** command.

8. Type: `ps -ef | grep aiw1` to display all aiw1 processes. To end each aiw1 process, type:

   `kill` followed by each of the process IDs listed in the results of the **grep** command.

15. Log in to the failover server as the **root** user and mount the shared directories:

    1. Run the script.

       In a PostgreSQL configuration, type:

       `scripts/failover-create-mountpoints.sh postgresql`

       In a DB2 configuration, type:

       `scripts/failover-create-mountpoints.sh db2`

    2. If the directory `/usr/local/bin` does not exist, type: `mkdir -p /usr/local/bin` and press **Enter**.
    3. Copy `scripts/mountDrives.sh` from the installation media to `/usr/local/bin`.
    4. Using a text editor, edit `mountDrives.sh`. Make sure you change the file server value to the name of your file server. If you are not using NFS, update the script to use your sharing technology.
    5. If you are not using NFS to share and mount the filesystems, modify the script to run the appropriate commands to mount them.
    6. To make the script executable, type: `chmod +x /usr/local/bin/mountDrives.sh` and press **Enter**.
    7. To run the script, type: `/usr/local/bin/mountDrives.sh` and press **Enter**.
    8. To confirm the shared directories are mounted, type: `df` and press **Enter**.

16. Create users on the failover server:

    1. Copy `scripts/failover-user-configuration` from the installation media to `/tmp` on the failover server.
    2. Using a text editor, open `failover-user-configuration`. Compare the system user and system group values to the system user and system group values from Step . If you are using the default values, these values do not need to be changed.

3. To run the script, go to the directory where the installation media is located, type: `scripts/failover-create-users.sh /tmp/failover-user-configuration` then press **Enter**.
4. Type: `id` *`username`* for each user name to verify it was created.
   For example, if you type: `id aiw1`, your output might look like:

   ```
   uid=3133(aiw1) gid=1038(ipserv) groups=10(wheel),1038(ipserv),111(staff1)
   ```

17. On the failover server:
    1. Log in as the **root** user.
    2. Open a command line and go to the directory where the installation media is located. Type: `scripts/failover-setup-rpd-node.sh` and press **Enter** to run the script.
       The script adds entries to `/etc/services`, installs PSF if necessary, and updates the rpm database on the failover server.
    3. Type: `/opt/infoprint/ippd/bin/changeHostname.pl` *`production_server_hostname`* where *`production_server_hostname`* is the name of the production server.
    4. To verify the installation on the failover server, log in to the product again. This time, use the host name of the failover server in the web browser: `http://`*`failover hostname`*`:15080/pd` If you can log in, the installation is successful.
18. Switch processing back to the production server:
    1. Log in to the failover server as the system user (aiw1 is the default).
    2. Open a command line and type: `stopaiw`
    3. Log in to the production server as the **root** user.
    4. On the production server, type: `/opt/infoprint/ippd/bin/changeHostname.pl` *`failover_server_hostname`* where *`failover_server_hostname`* is the name of the failover server. The failover server is currently the primary server.
19. Install the license keys for the production and failover servers. You must purchase two license keys, one per server.
    1. On the production server, install the license key for the production server. See Downloading and installing license keys, p. 161.
    2. Open a command line and log in as the system user (aiw1 is the default) and type: `stopaiw`
    3. Switch processing to the failover server. On the failover server, open a command prompt as the **root** user and type: `/opt/infoprint/ippd/bin/changeHostname.pl` *`production_server_hostname`* where *`production_server_hostname`* is the name of the production server.
    4. On the failover server, install the license key for the failover server. See Downloading and installing license keys, p. 161.

       When you open the RICOH ProcessDirector user interface on the failover server, you might see the message **License key violation detected. Contact Software Support.** This message does not appear after the license key is installed.
    5. Open a command line and log in as the system user (aiw1 is the default) and type: `stopaiw`
    6. Switch processing to the production server. On the production server, open a command prompt as the **root** user and type: `/opt/infoprint/ippd/bin/changeHostname.pl` *`failover_server_hostname`* where *`failover_server_hostname`* is the name of the failover server.

Any features installed on the production server are automatically available when you switch processing to the failover server.

Troubleshooting manual failover environment installation errors

If you see errors when setting up a manual failover environment, check the following:

- If your production server, failover server, and file server cannot communicate with each other, make sure the correct ports on your firewall are open.
- If you notice a decrease in system or network performance after setting up a manual failover environment, your network infrastructure might not support the increase in bandwidth the manual failover environment requires. Contact your system administrator and make sure the correct file sharing technology is used. For example, instead of using NFS, it might be more efficient for your network to use a SAN. Make sure you have a dedicated network or your router or network switch is correctly configured for the increase in bandwidth.
- If you receive any licensing errors after the install, delete the RICOH ProcessDirector license file `/aiw/aiw1/config/license/license.key`. Copy `scripts/failover-setup-rpd-node.sh` from the installation media to `/tmp` and run the script. When prompted, if you accept the license agreement, make sure you type `yes` and press Enter. If your problem persists, contact Software Support.
- If you receive errors when trying to mount NFS, this problem might be caused by certain versions of Linux defaulting to NFS version 4. By default, NFS version 4 does not allow shared directory ownership. The system must be set up so that the production and failover servers can change the file and directory ownership of the files on the NFS shares. If you cannot modify NFS to fix this issue, modify the directory's ownership.

  Type `chown aiw1:aiwgrp1 /aiw/aiw1` to change the ownership.

  If this does not work, edit `/etc/sysconfig/autofs` using a text editor and change `MOUNT_NFS_DEFAULT_PROTOCOL=4` to `MOUNT_NFS_DEFAULT_PROTOCOL=3`. For example:

```
# MOUNT_NFS_DEFAULT_PROTOCOL - specify the default protocol used by
# mount.nfs(8). Since we can't identify
# the default automatically we need to
# set it in our configuration. This will
# only make a difference for replicated
# map entries as availability probing isn't
# used for single host map entries.
#
MOUNT_NFS_DEFAULT_PROTOCOL=3
```

  Then edit `/etc/nfsmount.conf` and change `Defaultvers=4` to `Defaultvers=3`. Then change `Nfsvers=4` to `Nfsvers=3`.

  Update the system by restarting NFS or rebooting the servers.

- If you switch between the production server and the failover server, and one of the servers cannot start up, then there might be locks on the file system. This is typically caused by one of the servers not being shut down correctly. To determine if this is the issue:

  1. In a command prompt, type `su - aiw1 -c "db2start;db2 connect to aiwdb"`

     Look in the results for a message like this: `SQL1391N The database is already in use by another instance of the database manager. SQLSTATE=51023`

     If you see a similar message, you must release the locks on the database.

2. Reboot the fileserver to release the locks.

5. Setting up application and secondary servers

- **Task checklist**
- **Preparing the primary computer**
- **Installing the Secondary Server feature**
- **Preparing a Windows application server**
- **Installing application servers on Windows computers**
- **Configuring an application server to run as a service**

After successfully installing the base product, you can set up application and secondary servers on other computers in your network.

Secondary servers run on Linux computers; application servers run on Windows computers. Those computers must meet the requirements listed in the section Secondary computers, p. 39.

Note

- If you only want to create local secondary servers on the primary computer, you do not have to complete these procedures.

Secondary servers created on other computers use the Network File System (NFS) protocol to access the `/aiw` file system on the primary server. Application servers can use NFS or a different protocol to access the `/aiw` file system. Some configuration is required on both the primary computer and the secondary computers to enable that access.

After you configure the communication protocol between the computers, you install the Secondary Server feature or the Application Server and define the server object in RICOH ProcessDirector.

Task checklist

Here are the tasks you need to complete in this chapter. Check each item as you complete the task.

Checklist for application server and secondary server tasks

	Task
	Preparing the primary computer, p. 134 Before you install any application or remote secondary servers you must export the `/aiw` file system and create an application or secondary server object in RICOH ProcessDirector. If you plan to use NFS on an application server, you must also verify that an NFS server is installed and started on the primary computer. If you plan to use Samba on an application server, you do not need to install NFS.
	Installing the Secondary Server feature, p. 136 Use this procedure to install a secondary server.
	Preparing a Windows application server, p. 139 When you install an application server on Windows, you are required to mount the `/aiw` file system from the primary computer so the Windows application server has write access to the `/aiw` file system as the system user (aiw1 is the default).

	Task
	Installing application servers on Windows computers, p. 143 After you have completed the prerequisite steps, you can install an application server on a Windows system in your network.
	Configuring an application server to run as a service, p. 145 Application servers can be configured to run as Windows services. Windows services can be set up to start automatically when a user logs in to the system.

Preparing the primary computer

Before you install any application or remote secondary servers you must export the `/aiw` file system and create an application or secondary server object in RICOH ProcessDirector. If you plan to use NFS on an application server, you must also verify that an NFS server is installed and started on the primary computer. If you plan to use Samba on an application server, you do not need to install NFS.

5

After you configure NFS, Samba, or your preferred protocol, use the RICOH ProcessDirector user interface to add and enable the application or secondary server.

Configuring the primary server to use NFS

To use NFS on an application server, you must verify that an NFS server is installed and started on the primary computer so the `/aiw` filesystem is accessible.

To configure the primary server to use NFS:

1. Verify that the NFS server on the primary computer is installed and started.

   On a SLES primary computer:

   1. In YaST, click **Network Services** → **NFS Server**.
   2. Verify that **Start** is set and then click **Next**. You see that `/aiw` is one of the available directories.
   3. Click **Finish**.

   On a Red Hat or Rocky Linux primary computer:

   1. Open a command prompt and type this command:
      ```
      systemctl list-unit-files | grep nfs
      ```
   2. In the results, verify that the **nfs-server.service** and **nfs-lock.service** services are listed. For supported Red Hat and Rocky Linux 8.x and 9.x versions, verify that **rpc-statd.service** is listed. If either one is not included in the list, use Yum to install it.
      Open a command prompt and type this command, replacing *service* with the name of the service or services to install:
      ```
      yum install service
      ```
   3. Start or restart the **nfs-server.service** and **nfs-lock.service** services.

   For supported Red Hat and Rocky Linux 8.x and 9.x versions, type these commands:

```
systemctl restart nfs-server.service
systemctl restart rpc-statd.service
systemctl enable rpc-statd.service
systemctl enable nfs-server.service
```

2. Update the `exports` file so the primary computer can connect to one or more secondary or application computers:
   1. Open `/etc/exports` in a file editor.
   2. Add lines to create exports for the secondary or application computers. Follow this format, replacing *`serverN`* with the host names of the secondary or application computers.
      - For a Linux secondary computer, use these parameters:
        `/aiw server1(rw,no_root_squash,sync)`
      - For an application server, use these parameters:
        `/aiw server1(crossmnt,rw,no_root_squash,sync,no_subtree_check)`
      - For multiple application or secondary servers, include each server as an entry on the same line.
        As an alternative, type a space and a backslash (****) to continue on another line:

```
/aiw server1 \
(crossmnt,rw,no_root_squash,sync,no_subtree_check) \
server2(crossmnt,rw,no_root_squash,sync,no_subtree_check) \
server3 (crossmnt,rw,no_root_squash,sync,no_subtree_check)
```

   3. Save the file and exit the editor.
3. Restart the NFS server so it uses the updated file.
   - On SLES, type:
     `systemctl restart nfsserver`
   - On supported Red Hat and Rocky Linux 8.x and 9.x versions, type:
     `systemctl restart nfs-server.service`
4. If your network does not have a Domain Name System (DNS) server, edit `/etc/hosts` on the primary computer to add the host name and IP address of the computer that is prepared for the application servers or Secondary Server feature.

Defining application and remote secondary servers

After you configure NFS, Samba, or your preferred protocol, you must create the application or secondary server in RICOH ProcessDirector.

To define the application or secondary server:

1. Open a web browser and enter `http://`*`hostname`*`:15080/pd` in the address bar replacing, *`hostname`* with the host name of the primary computer.
2. Log in to RICOH ProcessDirector.
3. Click the **Administration** tab.
4. In the left pane, click **Objects** → **Servers**.

5. On the Servers page, click **Add** and choose the type of server you are creating.
6. Specify a server name and the IP address or host name for the application/secondary computer. As an option, specify a description and values for the other properties of the server.
7. Choose an option for the **In general server pool** field.

   Servers in the general server pool can run any step defined in any workflow.

   For a secondary server, you can specify either **Yes** or **No**. If you want the secondary server to run only specific steps, specify **No** in this field and then tune each step template that you want to run on the secondary server.

   For an application server, specify **No** for **In general server pool**.

   Note

   - If any external steps send jobs to the application server, you must tune the step template appropriately. For information about how to tune the step template, click **Help** from the top task bar of the RICOH ProcessDirector user interface to see the information center.
8. Click **OK**.
9. In the left pane, click **Objects** → **Servers**.
10. Select the server and then click **Enable**.

Installing the Secondary Server feature

You can install the RICOH ProcessDirector Secondary Server feature on a Linux system in your network.

Important

- Secondary Server features are not required to have the same level of code as the base product. However, we recommend checking and upgrading the secondary server whenever the primary server is upgraded. To determine the level of code that is installed on either computer, enter this command:
  `echo $AIW_VERSION`
- Before you begin this procedure, make sure that you followed the steps in Preparing the primary computer, p. 134.

To install the Secondary Server feature on a Linux system:

1. Log in as the root user.

   Important

   - You must log in as a user with UID 0. If you must log in as a different user, you can use `sudo su -` or `su -` to become the root user. However, do not use `sudo` or the `su` command in any other way to become the root user.
2. Make sure that `/etc/hosts` on this computer has an entry for its IP address and the fully qualified host name.
3. Disable any antivirus software running on the system.

   During the install process, various archive files (ZIP, JAR, and EPK files) are copied to your server. Then, the contents are extracted and moved to the correct directories on your system. Antivirus tools usually lock and scan files extracted from archives.

While the lock and scan process is generally fast, the installation program runs faster. If the installer tries to unpack and move files before the scan is complete, installation errors occur and can be difficult to recover from. Disabling your antivirus software during the install process prevents these types of errors.

4. Set up exceptions within your antivirus software.

   If you cannot deactivate your antivirus software entirely, excluding some directories from scans can reduce the possibility of installation errors. In addition, most antivirus software affects the function of databases. The software sometimes quarantines files that databases use, causing operation errors. Setting up these exclusions now prevents those errors after RICOH ProcessDirector is installed.

   Set up exceptions for these paths:

   - `/aiw/aiw1`
   - `/opt/infoprint/ippd`
   - `/var/psf`

5. Open a command line and enter this command to make sure you are in the root directory:

   ```
   cd /
   ```

6. Insert the RICOH ProcessDirector Secondary Server feature DVD.
7. To determine the name of the mount point, enter:

   ```
   ls /media
   ```

   On some systems, the name of the mount point is the same as the name of the DVD.

   Note

   - If you are using a Red Hat Linux system, the drive might mount automatically. However, drives that are mounted automatically on those systems are set up so that you cannot run programs from the media. You must unmount the drive and mount it again with the **exec** option before you can continue. You can use this command:

     `mount -t iso9660 -o remount,exec <mount_point>`

   You must remount the drive for every DVD that you insert.

8. Mount the drive, if necessary. Enter:

   ```
   mount /media/mount_point
   ```

9. Change directories so you can see the contents of the DVD. Enter these commands:

   ```
   cd /media/mount_point
   ls
   ```

   You see several scripts and directories, including a script called `setup`.

10. To start the installer, enter: `./setup IPPDs`

    The installer starts and displays the Introduction screen. Select the appropriate language for the installer to use and then click **OK**.

    Note

    - If the computer's operating system is a supported Red Hat-derived operating system and its language is Japanese, Simplified Chinese, or Traditional Chinese, choose **English** on the dropdown language menu. Japanese, Simplified Chinese, and Traditional Chinese characters do not display properly during a Red Hat installation of RICOH ProcessDirector.

11. Follow the instructions in the installer.

    The installer verifies many of the prerequisites for the system. If it finds any problems, it lists them for you. You cannot proceed until you correct them. After you fix the issues, verify the prerequisites again by returning to the **Prerequisite Verification** window. Click **Previous** in the installer or type `back` in console mode, then continue with the installer.

    Important

    - After you verify all the prerequisites, click **Cancel** to change a previous entry and begin the installation process again. Clicking the **Previous** button sometimes causes problems.

12. Review and accept the license and maintenance agreements.
13. Type the host name or fully qualified IP address of the primary computer and verify it.
14. Enter the name of the RICOH ProcessDirector system user that you used on the primary computer. The default system user is **aiw1**.

    Note

    - All Linux operating system user IDs and group names must be 1-8 characters because of a restriction in DB2. You cannot create a user ID that includes international characters (such as á, É, î, ñ, ô, ß) or double-byte characters. This limitation only applies if you use DB2 as your database.

    If the installer finds that the user already exists on the system, it asks if you want to use that user. If you did not create the user, choose **No** and enter a different name. If the installer does not find the user on the system, the installer creates it.

    Do not select the check box for **Use system update file from another computer**.

15. Enter the values that you used on the primary computer for:

    - The security group to use as the primary group for the system user
    - The UID number for the user
    - The GID number for the group
    - The home directory for the system user

    The default values are shown in the installer.

    If you created the user and group before you started the installer, you are not asked for these values.

16. Enter the same password that you used for the system user on the primary computer twice. Remember this password; you need it later when you have to log in as the system user. If you created the user before you started the installer, you are not asked for the password.
17. Choose the language that you want the system user to use. This language determines the language used for some messages, even if you set the browser for the user interface to a different language.
18. Review the pre-installation summary and click **Install** to start installing.

    The final window displays the URL for accessing the user interface in this format, where *hostname* is the host name of the primary computer:

    `http://hostname:15080/pd`

19. Click **Done** to complete the installation.
    The secondary server starts automatically.
20. On the command line, type this command to return to the root directory:

    ```
    cd /
    ```

21. If you installed from a DVD, eject the disc.
22. Reboot the system.

    Note

    - If you have an automated recovery mechanism for system outages, disable it before rebooting.

23. To verify that the secondary server is running, enter this command on the command line:

    ```
    ps -ef | grep Instance
    ```

    You should see an instance statement such as:

    ```
    java com.ibm.aiw.instance.SecondaryInstance hostname
    ```

    If the software is not running, view the installation logs in the `/opt/infoprint/ippd/logs` directory. If this does not solve the problem, contact customer support.
24. To make sure that the secondary server is connected to the primary server, log in to the RICOH ProcessDirector user interface and click **Administration** → **Objects** → **Servers** to verify that the **Connection status** column contains **Connected**.

After your secondary server is running, you must determine how it is used and change the properties of some objects accordingly. For example:

- What printers and input devices do you want the secondary server to manage?
  Create or modify those devices so this secondary server is listed as their **Parent server**.
- What step templates can run on this secondary server?
  Tune those step templates so that they can run on this secondary server.
- What external programs on this secondary computer can be accessed using an external step?
  Set up the external program and configure a step based on the **RunExternalProgram** step template so it uses that program.

Preparing a Windows application server

When you install an application server on Windows, you are required to mount the `/aiw` file system from the primary computer so the Windows application server has write access to the `/aiw` file system as the system user (aiw1 is the default).

There are various ways to mount the `/aiw` file system on the primary computer from the application server. You can use any method to mount the file system. The procedures below use Samba and NFS file sharing as examples.

Connecting to the primary computer using Samba

To use Samba file sharing, you must configure Samba on the primary computer so the `/aiw` filesystem is accessible to the Windows application server. The share is then mounted on the Windows application server.

To connect to the primary computer using Samba:

1. Log on to the primary computer as `root`.
2. If Samba is not installed, install it.
3. Configure Samba using a setup tool such as Yast. While the configuration procedure is similar between operating systems, commands or tools used might differ. Configure as follows:
    1. Enter the workgroup or domain name.
    2. **Optional:** Set RICOH ProcessDirector as a domain controller. RICOH ProcessDirector does not need to be set as a domain controller. This setting does not affect RICOH ProcessDirector functionality.
    3. Set Samba to start on boot.
    4. Share the `/aiw` drive as a share named **aiw**.
4. Modify the `smb.conf` file located in `/etc/samba/` to include lines similar to these:

```
[global]
   workgroup = RPDWorkgroup
   passdb backend = tdbsam
   encrypt passwords = Yes
   restrict anonymous = 2
   domain logons = No
   domain master = No
   security = user
   wins support = No
   ntlm auth = Yes
   min protocol = SMB2
   max protocol = SMB3
   client min protocol = SMB2
   client max protocol = SMB3

[aiw]
    comment = RPD share
    inherit acls = Yes
    path = /aiw
    read only = No
    write list = root aiw1
    valid users = root aiw1
    force create mode = 0664
    force directory mode = 0775
    guest ok = No
```

Note

- These settings are suggestions for the contents of `smb.conf`; they are not necessarily the exact settings you should use. The global section likely contains additional lines. Leave the additional lines in the file. Additional sections can be commented out or deleted to prevent other parts of the system from being shared through Samba.

  This configuration file must have read and write privileges from the Windows machine as the system user (aiw1 is the default).
- You must enable the SMBv2 and SMBv3 protocols on the Samba server to avoid any connection errors.

5. **Optional:** Add the following lines to the `smb.conf` under the `[aiw]` section to increase security:

```
valid users = root aiw1
hosts allow = windowspc
```

Note

- Replace `windowspc` with the name of the application server and `aiw1` with the system user ID if you do not use the default.

6. Save the `smb.conf` file.
7. Restart the Samba daemon.
8. Run the command `smbpasswd -a root` and enter the password for **root**.
9. Run the command `smbpasswd -a system_user`, where *`system_user`* is the system user ID (aiw1 is the default), and enter the password for the system user.
10. On the application server, map the `/aiw` filesystem from the primary computer using the Map Network Drive dialog in Windows and this address for the server:

    `\\<primary_server_hostname>\aiw`

    To map the network drive from a command prompt, use this command:

    ```
    net use <drive_letter>: \\primary_server_hostname\aiw
    ```

    To give read and write permission on the mapped Samba folder, use this command:

    ```
    setsebool -P samba_export_all_rw 1
    ```

    Replace *`primary_server_hostname`* with the host name or IP address of the primary computer.
11. Test the configuration by creating a file in the *`drive_letter`*`:\aiw1` directory and then deleting it.
12. Note the name of the drive for use during the installation process.
13. Continue with Installing application servers on Windows computers, p. 143.

Connecting to the primary computer using NFS

To use NFS file sharing, you must configure NFS on the primary computer so the `/aiw` filesystem is accessible to the Windows application server. The share is then mounted on the Windows application server.

To connect to the primary computer using NFS:

1. On the application server, verify File Services are installed for the Network File System:
   1. Press **Windows Key+r** to open the Run dialog box and type:
      `appwiz.cpl`. This opens the Programs and Features window.
   2. In the Program and Features window, click **Turn Windows Features on or off**.
   3. Follow the instructions in the features wizard to make sure that NFS is installed.
      - For Windows Server 2019, install NFS by selecting **Features** → **Client for NFS**.
      - For Windows 10 Pro or Enterprise, install NFS by selecting **Services for NFS** → **Client for NFS**.

        Note

        – Client for NFS is only available on Windows 10 version 1703 or later.
2. Add registry entries to configure NFS with the UID and GID used to access files:
   1. Log in to the primary computer.
   2. In a command prompt type `id <system_user>` where `<system_user>` is your system user ID (default aiw1).
   3. Note the UID and GID numbers and convert them to hexadecimal format.

      Note

      The UID is the system user ID (default aiw1) and the GID is the system group ID (default aiwgrp1). They are specified in hexadecimal values in the registry, for example, the default UID of 32457 is 0x00007ec9, and the default GID of 32458 is 0x00007eca.
   4. On the application server, create a file named **nfs.reg**.

      Note

      You can create **nfs.reg**, anywhere on your system.
      Make sure you have file extensions showing. If you do not display file extensions, the file is created as a text file, not a registry file.
   5. Edit **nfs.reg** so it contains the following contents:

```
Windows Registry Editor Version 5.00

[HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\ClientForNFS\CurrentVersion\Default]
"AnonymousGID"=dword:<GID_hex>
"AnonymousUID"=dword:<UID_hex>
```

   6. Replace `<GID_hex>` with the GID hexadecimal number starting after the 0x. For example, if the GID hexadecimal number is `0x00007eca`, replace `<GID_hex>` with `00007eca`.
   7. Replace `<UID_hex>` with the UID hexadecimal number starting after the 0x. For example, if the UID hexadecimal number is `0x00007ec9`, replace `<UID_hex>` with `00007ec9`.
   8. Save **nfs.reg** and close the file.
   9. Double-click **nfs.reg** to run the registry file, which adds the UID and GID values to the registry.

Note

Make sure that the values in the registry file exactly match the instructions. Incorrect registry modification can damage your operating system.

10. Delete **nfs.reg** from your system.
11. Restart the NFS service by typing the following commands into a command prompt:

    ```
    nfsadmin client stop
    nfsadmin client start
    ```

    If you receive error messages when stopping or starting the NFS service, restart the application server computer.

3. On the application server, map the `/aiw` filesystem from the primary computer using the Map Network Drive dialog in Windows and this address for the server:

   ```
   \\<primary_server_hostname>\aiw
   ```

   Note

   - If the connection fails, map the filesystem manually. Open a Command Prompt, and type: `mount primary_server_hostname:/aiw drive_letter`.

4. Test the configuration by creating a file in the `<drive_letter>:\aiw1` directory and then deleting it.
5. Note the name of the drive for use during the installation process.
6. Continue with Installing application servers on Windows computers, p. 143.

Installing application servers on Windows computers

After you have completed the prerequisite steps, you can install an application server on a Windows system in your network.

Important

- The application server code level must match the base product code level on the primary computer.
- After you verify all the prerequisites, click **Cancel** to change a previous entry and begin the installation process again. Clicking the **Previous** button sometimes causes problems.

To install an application server on a Windows computer:

1. Log in as an administrator.
2. Disable any antivirus software running on the system.

   During the install process, various archive files (ZIP, JAR, and EPK files) are copied to your server. Then, the contents are extracted and moved to the correct directories on your system. Antivirus tools usually lock and scan files extracted from archives.

   While the lock and scan process is generally fast, the installation program runs faster. If the installer tries to unpack and move files before the scan is complete, installation errors occur and can be difficult to recover from. Disabling your antivirus software during the install process prevents these types of errors.

Note

- Microsoft Defender Firewall and Microsoft Defender Antivirus are separate programs. You must disable Microsoft Defender Antivirus. Turning off Microsoft Defender Firewall does not prevent the installation issues described.
- Microsoft Defender Antivirus must be disabled; passive mode is not sufficient to prevent install errors.

3. Set up exceptions within your antivirus software.

   If you cannot deactivate your antivirus software entirely, excluding some directories from scans can reduce the possibility of installation errors. In addition, most antivirus software affects the function of databases. The software sometimes quarantines files that databases use, causing operation errors. Setting up these exclusions now prevents those errors after RICOH ProcessDirector is installed.

   Set up exceptions for these paths:

   - `C:\aiw\aiw1`
   - `C:\Program Files\Ricoh\ProcessDirector`

4. Insert the RICOH ProcessDirector base product DVD in the drive.
5. Use Windows Explorer to view the contents of the DVD and find `appserver\setupIPPDs.exe`.
6. Double-click `setupIPPDs.exe` to start the installer.
7. In the installer, do these steps:

   1. Select the appropriate language and click **OK**. You see a welcome window for the installation program.
   2. Review the information presented in each window and click **Next** until you reach the Choose installation folder window. Choose a directory to install the application server in and click **Next**.

      Note

      - You cannot choose a directory with international characters (such as á, É, î, ñ, ô, ß) or double-byte characters anywhere in the directory path.

   3. Enter the drive letter that you used to mount the `/aiw` filesystem from the primary server.

      For example, to connect to the J drive type `J:`

   4. Click **Next**.
   5. In the Preinstallation summary window, review the information and click **Install**.
   6. Restart the computer to complete the installation.

8. When the system restarts, log in using the user ID that you want to run RICOH ProcessDirector under.
9. **Optional:** Make sure the connection between the application server and RICOH ProcessDirector is included in the local intranet zone. This step is important so that you can gather troubleshooting information in the future.

   1. Log in to the application server as the user that the service runs under.
   2. Select **Start** → **Internet Options** → **Security** → **Local Intranet**

3. Click **Sites**.
4. Under **Add this website to the zone** type the drive letter that you used to map the connection between the application server and the RICOH ProcessDirector primary server. Include a colon after the drive letter. For example, this application server has drive R: mapped to the primary server, type: `R:`
5. Click **Add**.
6. Click **Close**.
7. Click **OK** in the **Internet properties** dialog.

10. Start the application server. Use the **Start application server** link in the RICOH ProcessDirector start menu folder.
11. To make sure that the application server is connected to the primary server, log in to the RICOH ProcessDirector user interface and click **Administration** → **Objects** → **Servers** to verify that the **Connection status** column contains **Connected**.
12. If the application server is not connected to the primary server, see the *Application server does not connect* troubleshooting topic in the RICOH ProcessDirector information center. Click **Help** from the top task bar of the RICOH ProcessDirector user interface to see the information center.

Configuring an application server to run as a service

Application servers can be configured to run as Windows services. Windows services can be set up to start automatically when a user logs in to the system.

To configure an application server to run as a service:

1. Make sure the application server is installed and functions correctly.
2. Make sure the RICOH ProcessDirector is connected to the application server:
    1. Log in to RICOH ProcessDirector.
    2. Go to **Administration** → **Objects** → **Servers** and verify the application server is connected.
3. Log in to the Windows computer that the application server is installed on.
4. Stop the application server. Use the **Stop application server** link in the RICOH ProcessDirector start menu folder.
5. Windows services do not automatically have access to mapped network drives. The `mountaiwdata.bat` file grants access to these mapped network drives. Edit the provided `mountaiwdata.bat` file to automatically mount the shared drive for the service:
    1. Go to `C:\Program Files\Ricoh\ProcessDirector\bin`.
    2. Make a copy of the file `mountaiwdata_sample.bat` and rename it to `mountaiwdata.bat`. If you are upgrading or reinstalling the system, already have the `mountaiwdata.bat` file, and want to keep your previous settings, you do not have to do this step.
    3. Open `mountaiwdata.bat` and include commands to mount the drive and map it to the drive letter that you have previously set up.

       For example, if you use Samba and Windows file sharing to map your drive, your BAT file contents might include commands such as:

       `net use /delete <drive_letter>:`

```
net use <drive_letter>: \\<primary_host_name>\aiw /user:<primary_host_
name>\aiw1 <password> /persistent:yes
```

where *<drive_letter>* is your mapped application server drive, *<primary_host_name>* is the name of the server RICOH ProcessDirector is installed on, and *<password>* is your system password for the RICOH ProcessDirector system user (**aiw1** is the default system user).

If you use NFS and Windows file sharing to map your drive, your BAT file contents might include commands such as:

```
mount -o anon \\<primary_host_name>\aiw <drive_letter>
```

where *<primary_host_name>* is the name of the server RICOH ProcessDirector is installed on and *<drive_letter>* is your mapped application server drive.

4. Make sure that the drive is not currently mapped, then run **mountaiwdata.bat**. When it finishes, open Windows Explorer and make sure that the drive is mapped and connected.

6. Install the application server service:

   1. Start a command prompt as an administrator. Even if you are logged on to your system as an administrator, you must start the command prompt by selecting **Run as administrator** from the right-click menu.
   2. Go to `C:\Program Files\Ricoh \ProcessDirector\bin`.
   3. Type `aiwsvc install` and press Enter. This installs the application server service.
   4. Open the Windows Services window and look for the **Ricoh Process Director Application Server** service to make sure the application service installed.

7. **Optional:** Set the application server service to run as a local administrator user.

   Note

   - The application server service can run as a local administrator user service or a LocalSystem service (default). If it runs as a LocalSystem service, a password is not required. If it runs as a local administrator service, Windows requires a password for the user.

   1. In the Windows Services window, right-click the **Ricoh Process Director Application Server** service and select **Properties**.
   2. In the Log On tab, select **This Account** and specify the user and password.
   3. Click **OK**.

8. In the Windows Services control panel, right-click the **Ricoh Process Director Application Server** service and select **Start**.

9. Verify the application server service has started. In the Windows Services control panel, the status should read Started. In RICOH ProcessDirector, go to **Administration** → **Objects** → **Servers** and verify the application server is connected and that the startup type is set to **Automatic**.

6. Completing post-installation tasks

After you finish installing RICOH ProcessDirector, you complete post-installation tasks.

Note

- The installer creates files with the default group ownership set to the RICOH ProcessDirector group (**aiwgrp1** is the default). Any user who is in the RICOH ProcessDirector group can access files that RICOH ProcessDirector creates:
  - If you have users with Linux system user IDs who need to work directly with RICOH ProcessDirector files or submit files to hot folders, you must add their user IDs to the RICOH ProcessDirector group. Be sure to use that group as an additional group for your users, not as their default group.
  - If you create another group to own directories that RICOH ProcessDirector input devices use, you must add the RICOH ProcessDirector system user (**aiw1** is the default) to the new group.

Task checklist

Here are the tasks you need to complete in this chapter. Check each item as you complete the task.

Checklist for completing post-installation tasks

	Task
	Configuring to use IPv6 addresses, p. 149 You can use IPv6 addresses for the primary server and some of the other IP addresses in RICOH ProcessDirector.
	Logging in for the first time, p. 150

	Task
	After you install, reboot the primary computer and log in to RICOH ProcessDirector using a web browser.
	Verifying the installation, p. 151 If you have finished installing RICOH ProcessDirector and want to verify the installation, use this procedure to enable the Sample printer, submit a test job to the HotFolderPDF input device, and process the job.
	Optional: Deleting temporary installer files, p. 152 If a file system named `/aiwtmp` remains on your system after the RICOH ProcessDirector installer has finished an installation, you can delete that folder and all its contents.
	Installing features using Feature Manager, p. 153 After you install the base product, you can install features using the Feature Manager.
	Downloading and installing license keys, p. 161 If you have purchased RICOH ProcessDirector, RICOH ProcessDirector Subscription, or any feature, use this procedure to download license keys and install them.
	Configuring RICOH ProcessDirector, p. 164 You use the user interface to complete configuration tasks for RICOH ProcessDirector, such as setting up job processing, defining input devices for job submission, defining your printer hardware to RICOH ProcessDirector, and adding users. The RICOH ProcessDirector information center describes these configuration tasks.
	Scheduling automatic maintenance, p. 165 RICOH ProcessDirector provides maintenance scripts that must be run regularly on the primary computer to improve performance. By default, RICOH ProcessDirector runs these scripts every day at midnight. You can change the time or frequency, and you can run your own maintenance scripts at the same time.
	Optional: Replacing your control files with the sample files, p. 167 When you install a new version of RICOH ProcessDirector, the installer automatically adds new sample control files to the `/aiw/aiw1/samples` directory and copies them to your control files directory, `/aiw/aiw1/control_files`. It does not overwrite any of your customized control files in `/aiw/aiw1/control_files`. You can use the copyConfigurationFiles script to install the default control files or to overwrite your customized control files.
	Optional: Copying objects from another system, p. 168 To reuse objects from another RICOH ProcessDirector system, you can use the other system to export them. On this RICOH ProcessDirector system, you can import the objects rather than recreating them manually.

	Task
	Optional: **Installing and configuring the pdpr script, p. 172** If you are migrating from InfoPrint Manager and you use the **pdpr** command to submit jobs, you can install the RICOH ProcessDirector **pdpr** script on the computers that submit jobs and use the same command to send jobs to RICOH ProcessDirector.
	Optional: **Setting up to use LDAP authentication, p. 174** If you have an existing LDAP or Active Directory server, you can use LDAP or Active Directory user names and passwords to authenticate into RICOH ProcessDirector.

Creating directory lists and rules for fapolicyd

The File Access Policy Daemon (fapolicyd) helps you protect your system by applying special permissions.

You can configure fapolicyd to include a list of RICOH ProcessDirector directories in the trusted list or add a set of rules that allows RICOH ProcessDirector files to run. The files containing the directories list and the set of rules are generated by a RICOH ProcessDirector script. To use the files generated by the script, make sure that you have already installed the fapolicyd package on your Linux operating system.

To create directory lists and rules for fapolicyd:

1. Log in to the primary computer as the RICOH ProcessDirector system user (aiw1 is the default).
2. Open a command prompt and change directories to the `/aiw/aiw1/bin` directory.
3. To create a list of directories, run:

   `./fapolicyd-build-list.sh`

   The command creates a list of RICOH ProcessDirector directories and stores it in: `/aiw/aiw1/config/fapolicyd/fapolicyd-directories.txt`. The list contains all the standard RICOH ProcessDirector directories. You can add the directories listed to the fapolicyd trust database.
4. To create a list of rules, run:

   `./fapolicyd-build-list.sh -r`

   The command creates a file containing a list of rules and stores it in: `/aiw/aiw1/config/fapolicyd/fapolicyd-rules.rules`.
5. Copy the `fapolicyd-rules.rules` file to `/etc/fapolicyd/rules.d` directory.

Configuring to use IPv6 addresses

You can use IPv6 addresses for the primary server and some of the other IP addresses in RICOH ProcessDirector.

To configure to use IPv6 addresses:

1. Log in to the primary computer as the system user.
2. Open `/aiw/aiw1/config/jvmsettings.cfg` in a text editor.
3. Find all lines that contain `preferIPv4Stack=true`.
4. Change true to false:

   `preferIPv4Stack=false`

5. Save the file.
6. Run the command: `startaiw`

Logging in for the first time

After you install, reboot the primary computer and log in to RICOH ProcessDirector using a web browser.

When the installation process finishes:

1. Start a web browser.
2. Enter this URL replacing *hostname* with the host name of the primary computer: `http://hostname:15080/pd`
3. On the login page, type the default administrator user ID `aiw` and the default password `aiw` and then click **Log in**. You are prompted to change the password before you can log in to the user interface. Make note of your new password on the Installation planning checklist, p. 197.
4. If the browser page is blank after a full minute, so you do not see the RICOH ProcessDirector login page, first try to refresh the browser. If you still do not see the login page, you might need to stop and restart the base product.
    1. Log in to the primary computer as the RICOH ProcessDirector system user, using the user and password you entered in the installer (**aiw1** is the default).

        Note

        - The installer sets up the RICOH ProcessDirector system user with environment variables and paths that permit all of the administrative functions for RICOH ProcessDirector. If you use the su command to switch from another login to the system user, use the - (minus) flag (`su - username`) to make sure that you inherit the environment that was set up for the system user.
    2. Enter `stopaiw` at the command prompt and wait for all the components to stop.
    3. Enter `startaiw` at the command prompt.
    4. To verify that RICOH ProcessDirector is running, enter this command on the command line:

        ```
        ps -ef | grep Instance
        ```

        You should see a statement that includes `PrimaryInstance`, such as:

        ```
        aiw1 6593 1 0 Mar23 pts/3 00:00:05 java -Xmx2048m
        -Djava.net.preferIPv4Stack=true
        -Djava.awt.headless=true com.ricoh.aiw.primary.PrimaryInstance
        ```

        If there is a secondary server, you should also see a process that includes `SecondaryInstance`.
    5. Enter this URL in the web browser, replacing *hostname* with the host name of the primary computer:

        ```
        http://hostname:15080/pd
        ```
    6. If you still see a blank page, view the installation logs in the `/opt/infoprint/ippd/logs` directory.
5. If you see a message that the browser cannot connect to the primary server:

1. Log in to the primary computer as the RICOH ProcessDirector system user, using the user and password you entered in the installer (**aiw1** is the default).

   Note

   - The installer sets up the RICOH ProcessDirector system user with environment variables and paths that permit all of the administrative functions for RICOH ProcessDirector. If you use the su command to switch from another login to the system user, use the - (minus) flag (`su - username`) to make sure that you inherit the environment that was set up for the system user.

2. Enter `startaiw` at the command prompt.
3. To verify that RICOH ProcessDirector is running, enter this command on the command line:

   ```
   ps -ef | grep Instance
   ```

   You should see a statement that includes `PrimaryInstance`, such as:

   ```
   aiw1 6593 1 0 Mar23 pts/3 00:00:05 java -Xmx2048m
   -Djava.net.preferIPv4Stack=true
   -Djava.awt.headless=true com.ricoh.aiw.primary.PrimaryInstance
   ```

   If there is a secondary server, you should also see a process that includes `SecondaryInstance`.
4. Enter this URL in the web browser, replacing *`hostname`* with the host name of the primary computer:

   ```
   http://hostname:15080/pd
   ```

5. If you still see the message, view the installation logs in the `/opt/infoprint/ippd/logs` directory.

RICOH ProcessDirector is now open and the base product is running. See Verifying the installation, p. 151 to verify the installation by printing a test job.

Verifying the installation

If you have finished installing RICOH ProcessDirector and want to verify the installation, use this procedure to enable the Sample printer, submit a test job to the HotFolderPDF input device, and process the job.

This verification procedure only applies to new installations. When you upgrade an existing installation, RICOH ProcessDirector does not create a Sample printer.

To verify the installation:

1. If you are not logged in to the RICOH ProcessDirector user interface, log in.
2. In the Printers portlet, right-click the **Sample** printer and select **Enable**.
3. On the command line, enter this command to copy a test file into the hot folder that the HotFolderPDF input device monitors:

   ```
   cp /aiw/aiw1/testfiles/Demo.pdf /aiw/aiw1/System/hf/defaultPDF
   ```

4. Wait a few seconds for the RICOH ProcessDirector user interface to refresh. If it does not refresh automatically, refresh your browser. You should see a job in the Jobs table on the Main page. The job's Phase should be **Complete**, and its State should be **Retained**.

If you do not see a job, see the "Job not appearing in Jobs table" troubleshooting topic in the RICOH ProcessDirector information center. Click **Help** () from the top banner of the RICOH ProcessDirector user interface to see the information center.

5. Right-click the job and select **View Log**. The log should show that the job printed. For example, if the job ID is 10000000, the log should show message `AIWI0016I: 10000000 printed`. The job does not print on a real printer.

   This verifies that RICOH ProcessDirector is installed correctly.

The PDF workflow processes jobs that are submitted to the HotFolderPDF input device. During the Prepare phase, the workflow runs a RunExternalProgram step. This step is an example of how you can integrate other programs into your workflow. The step produces a CSV file with information about the job. To see the type of information that you can access with a step in a workflow, look at the output in the CSV file. The file is in the `/aiw/aiw1/samples` directory. The file name is the job ID followed by info.csv. For example, `10000000.info.csv`.

Note

- Your software installs in trial mode. The trial license expires after 60 days. For more information about obtaining and installing license keys, see Downloading and installing license keys, p. 161.

Deleting temporary installer files

If a file system named `/aiwtmp` remains on your system after the RICOH ProcessDirector installer has finished an installation, you can delete that folder and all its contents.

If the installer creates the `/aiwtmp` directory, it also deletes it. However, if you create `/aiwtmp` before starting the installer, the installer does not remove this file system. If any errors occur during the installation, files might be left in this file system, which can now be removed.

To delete the temporary installer files:

1. Log in to the primary computer as **root**.
2. Open a command line and enter these commands to find the root directory and see its contents:

   ```
   cd /
   ls
   ```

3. If you see the `/aiwtmp` file system, delete it and all its contents.

Installing features

After you install RICOH ProcessDirector or RICOH ProcessDirector Subscription, you can add features at any time.

You install most features using the Feature Manager, available on the **Administration** tab.

The RICOH Transform features cannot be installed using the Feature Manager. See Installing RICOH Transform features, p. 158 for instructions.

Important

- All features are installed in trial mode. To continue using a feature after the trial period, you purchase the feature and install a license key for it. See Downloading and installing license keys, p. 161 for more information.

  To see whether a feature is running in trial mode and how many days remain for each feature in trial mode, go to the Licenses page of the Administration tab and look at the **License state** column.
- The maintenance license for RICOH ProcessDirector includes maintenance for features. They do not have separate maintenance licenses.
- Licenses for the RICOH ProcessDirector Subscription base product and its features expire when the base product subscription period is over.
- If you intend to install the AFP Support feature, we recommend that you install it before or at the same time as your other features. If you install features that process documents (such as Archive) before you install AFP Support, RICOH ProcessDirector does not install the AFP versions of sample workflows supplied with those features.
- The PDF Document Support feature has a two-part installation process. You install the RICOH ProcessDirector components on the primary computer using the Feature Manager. You install RICOH ProcessDirector Plug-in for Adobe Acrobat on a computer with Adobe Acrobat Pro installed.
- When you install RICOH ProcessDirector, some configuration files in `/aiw/aiw1/control_files/external programs` are used by both the RICOH Transform and the Advanced Transform features. However, the Advanced Transform features supply a different sample version of the `xform.cfg`. That sample file includes parameters that are only used by the Advanced Transform features.

  After you install the Advanced Transforms, you must make those parameters available. Find the `xform.cfg` installed by the Advanced Transform features in `/aiw/aiw1/samples/control_files/external programs`. Compare it to the one installed by the base product in `/aiw/aiw1/control_files/external programs`. Manually merge any changes from the sample file into the base product file.

  If you are upgrading to a newer version, update the `xform.cfg` file as well as the profiles installed in `/aiw/aiw1/cpt/profiles`, such as `mffafp.pro`.

Installing features using Feature Manager

After you install the base product, you can install features using the Feature Manager.

To install one or more features using Feature Manager:

1. If one or more secondary servers are defined and started, stop all of the secondary servers. See Stopping the base product and secondary servers, p. 189.
2. On the primary computer, temporarily disable any antivirus software that is running.
3. Verify that exceptions are still set in your antivirus software to exclude the directories listed from antivirus scans.
   - `/aiw/aiw1`
   - `/opt/infoprint/ippd`
   - `/var/psf`

- If you use DB2 installed with RICOH ProcessDirector as your database:
  - `/home/aiwinst/sqllib`
- If you use PostgreSQL installed in a Docker or Podman container as your database:
  - /var/lib
- If you use a custom feature that integrates BCC software running on a Windows application server with RICOH ProcessDirector, exclude this path on the Windows system that the BCC software runs on:
  - `C:\BCC`

4. If you have any RICOH Transform features installed, shut down the Transform Features application.
5. Log in to RICOH ProcessDirector as a user authorized to use Feature Manager.
6. Click the **Administration** tab.
7. In the left pane, choose **Utilities** → **Features**.

   Some browsers might prevent opening the Feature Manager in a new tab due to the pop-up blockers. Verify your settings and allow Feature Manager to open in a new browser tab.

   If you see an error message, you must start Feature Manager manually:

   1. Log in to the primary server as the RICOH ProcessDirector system user (aiw1 is the default).
   2. Open a command prompt and type: `startaiw -f`
   3. Refresh the Feature Manager webpage.
8. If the feature that you want to install is not listed, you must import it. See Adding or upgrading a feature using Import Package, p. 155 for details about importing the feature package.
9. If the feature that you want to install is in the list, select the check box next to it.
10. In the **Available versions** column for each feature, select the version of the feature you want to install.
11. Click **Install**.
12. Review the information in the confirmation window, specify a name for the **Installation display name**, then click **OK** to continue.
    The features are installed, then RICOH ProcessDirector restarts to finish the install process.

    Note

    If one or more features fail to install, choose one of these options:

    - Click **Try again** to retry the installation. If the install fails a second time, click **Restore this Installation** to return to a stable state.
    - Click **Restore this Installation** to revert the system to the state it was in before this installation.

    If you cannot install a particular feature or restore an installation, contact Ricoh Software Support.
13. Click **DISMISS**. The dialog closes and you see the login page.

Note

You might find that RICOH ProcessDirector is running in two browser tabs. If it is, close one of the tabs.

14. To complete the installation process, clear your browser cache.

    Information that is stored in the browser cache can cause errors when you try to use the newer level. Clearing the cache prevents those errors.

15. Log in again.
16. Restart any secondary servers that you stopped in step 1. See Starting the base product and secondary servers, p. 187.
17. If you shut down the Transform Features application, restart it.
18. Enable any antivirus software that you disabled.

Adding or upgrading a feature using Import Package

You can use Feature Manager to add a new feature or upgrade an existing feature by downloading a feature package file, either from the Ricoh website or from a feature DVD, and then using the **Import Package** action.

You must save the feature package file to a location that can be accessed from the primary computer.

If you download the feature package file from the Ricoh website, save it to a location that is accessible from RICOH ProcessDirector. This location can be on the primary computer, a workstation, or a network drive. Remember where you save the file so that you can browse to it from RICOH ProcessDirector. Additionally, you must extract the file in that location so the EPK file within the downloaded file can be seen.

If you receive the feature package file from a DVD, you need to locate the file on the DVD, copy it from the DVD onto the primary computer, and remember where you put it so you can browse to it.

To import a feature package using Import Package:

1. If one or more secondary servers are defined and started, stop all of the secondary servers. See Stopping the base product and secondary servers, p. 189.
2. On the primary computer, temporarily disable any antivirus software that is running.
3. Verify that exceptions are still set in your antivirus software to exclude the directories listed from antivirus scans.
   - `/aiw/aiw1`
   - `/opt/infoprint/ippd`
   - `/var/psf`
   - If you use DB2 installed with RICOH ProcessDirector as your database:
     - `/home/aiwinst/sqllib`
   - If you use PostgreSQL installed in a Docker or Podman container as your database:
     - /var/lib

- If you use a custom feature that integrates BCC software running on a Windows application server with RICOH ProcessDirector, exclude this path on the Windows system that the BCC software runs on:
  - `C:\BCC`

4. If you have any RICOH Transform features installed, shut down the Transform Features application.
5. Log in to RICOH ProcessDirector as an administrator or other user with authority to import packages.
6. In the left pane, choose **Utilities** → **Features**.

   If you see an error message, you must start Feature Manger manually:

   1. Log in to the primary computer as the RICOH ProcessDirector system user (aiw1 is the default).
   2. Open a command prompt and type: `startaiw -f`
   3. To complete the process, clear your browser cache.

      Information that is stored in the browser cache can cause errors when you try to use the newer level. Clearing the cache prevents those errors.
   4. Reload the Feature Manager webpage.

   The Feature Manager page opens in a new browser tab.
7. Click **Import Package**.
8. In the **Package to import** field click  .
9. Select the feature package EPK file for the feature you want to install and click **Open**.
   The import automatically begins.
10. When the import finishes, the feature you installed or upgraded appears in the main Feature Manager window.
    The feature appears in the Feature Manager table selected.
11. In the **Available Versions** column, use the list to select the version of the feature you want to install.
12. Click **Install**.
13. Review the information in the confirmation window, then click **OK** to continue.
    The feature is installed, then RICOH ProcessDirector is restarted to finish the install process.
14. Click **DISMISS** to close the Feature Manager browser tab.

    Note

    You might find that RICOH ProcessDirector is running in two browser tabs. If it is, close one of the tabs.
15. To complete the process, clear your browser cache.

    Information that is stored in the browser cache can cause errors when you try to use the newer level. Clearing the cache prevents those errors.
16. Log in again.

17. Restart any secondary servers that you stopped in step 1. See Starting the base product and secondary servers, p. 187.
18. If you shut down the Transform Features application, restart it.
19. Enable any antivirus software that you disabled.

Running RICOH ProcessDirector in a different language

RICOH ProcessDirector supports multiple languages which allow you to see the user interface and messages in your preferred language.

Supported languages:

- English
- French
- German
- Italian
- Japanese
- Spanish
- Portuguese

Note

You are not limited to one language pack. You can install as many languages as you need.

To download and specify the language for RICOH ProcessDirector:

1. Download the language pack that you need:
    1. In a web browser, open this page: https://dl.ricohsoftware.com/
    2. Click **Software Downloads**, enter your Entitlement ID, and click **Submit**.
    3. Click **View Related Files** on the right side of the page.
    4. To download a package, click the title of the language pack feature that you need.
       Example: RICOH ProcessDirector: French LanguagePack Feature
2. Install the downloaded language pack:
    1. Log in to the primary server as the system user.
    2. Click the **Administration** tab.
    3. In the left pane, choose **Utilities** → **Features**.
    4. Click **Import Package**.
    5. In the **Package to import** field click  .
    6. Select the language pack EPK file you downloaded and click **Open**.
       The import automatically begins.

7. When the import finishes, the language pack or packs you imported appear in the main Feature Manager window.
   The language pack appears in the Feature Manager table selected.

   Note

   You can install multiple language packs at the same time.
8. Click **Install**.
9. Review the information in the confirmation window, enter an installation display name and then click **OK** to continue.
10. After the language pack is installed, click **DISMISS**. The dialog closes and you see the login page.
    RICOH ProcessDirector is restarted to finish the install process.

Note

You might find that RICOH ProcessDirector is running in two browser tabs. If it is, close one of the tabs.

3. Go to the browser settings and change the preferred language for displaying pages to the language pack you downloaded.

   Example: If you downloaded the French LanguagePack Feature, select French as the webpage language.
4. To display the RICOH ProcessDirector user interface in the selected language, click the browser refresh button.

Note

- RICOH Visual Workbench and RICOH ProcessDirector Plug-in for Adobe Acrobat are always installed with other languages available. They display in the language that your operating system runs in.
- Some properties require you to select your preferred language for the messages that are returned to RICOH ProcessDirector. These properties are:

  Device language

  You can find this property in the property notebook of Download input devices.

  External program language

  You can find this property in the property notebook for the **RunExternalProgram** step template or a step template based on it, such as **CopyToFolder**.

  Printer language

  You can find this property in some of the printer property notebooks.

Installing RICOH Transform features

Before you install any RICOH Transform features:

- Make sure that your computer meets the additional hardware and software requirements specified. See Primary computer, p. 37 and Data transforms, p. 84 for those requirements. You can install one or more RICOH Transform features on the primary server or on another computer on your network.
- Make sure that Security Enabled Linux (SELinux) or Federal Information Processing Standard (FIPS) are not enabled.

  Note

  – To see whether Security Enhanced Linux (SELinux) is enabled on your system, open a command prompt and type:
    `getenforce`

    If the command returns `Enforcing`, open `/etc/selinux/config` in a text editor and find the `SELINUX` line. To disable SELinux, change that line to: `SELINUX=disabled`

  – To see whether Federal Information Processing Standard (FIPS) is enabled on your system, open a command prompt and type:

    ```
    fips-mode-setup --check
    ```
    If the command returns `FIPS mode is enabled`, disable it by typing:

    ```
    fips-mode-setup --disable
    ```

- The AFP Support feature must be installed on the primary server even if the Transform feature is installed on a computer other than the primary server.
- The RICOH Transform features are installed in trial mode. To continue using the RICOH Transform features after the trial period, you must purchase each transform that you want to use and a license key for it.

You can either:

- Do the steps in this section to install RICOH Transform features using their DVDs.
- Use Installing from a remote directory, p. 116 to copy the RICOH Transform features installers to a staging location on your network, then mount the computer that you want to install features on to that location and run the installers.

Note

- This task does not apply to the Advanced Transform feature. If you are installing the Advanced Transform feature, use the instructions for installing features using Feature Manager.

To install a RICOH Transform features:

1. Stop the base product. See Stopping the base product and secondary servers, p. 189.
2. Log in as the root user.

   Important

   - You must log in as a user with UID 0. Do not use **sudo** or the **su** command to become the root user.
3. Insert the appropriate RICOH Transform features DVD.

Note

- If you are using a Red Hat or Rocky Linux system, the drive might mount automatically. However, drives that are mounted automatically on those systems are set up so that you cannot run programs from the media. You must unmount the drive and mount it again with the **exec** option before you can continue. You can use this command:
  `mount -t iso9660 -o remount,exec <mount_point>`

  You must remount the drive for every CD or DVD that you insert.

The media mount point is **/media/cdrom**.

4. To determine the name of the media mount point, enter:

   ```
   ls /media
   ```

   On some systems where the media is mounted automatically, the name of the mount point is the same as the name of the CD or DVD.

5. On a SLES system, enter this command to mount the DVD drive:

   ```
   mount /media/cdrom
   ```

6. Enter this command to start the installation program:

   ```
   /media/cdrom/setup
   ```

7. Select the appropriate language for the installer to use and click **OK**.
8. Reply to any prompts in the installer.

   When the installer asks you to choose a directory to install the transform in, you can choose a directory on any drive. However, you cannot choose a directory with international characters (such as á, É, î, ñ, ô, ß) or double-byte characters anywhere in the directory path.

   The installation program analyzes the system. If it reports any errors, follow the instructions to correct them.

   If the installation program finds an older version of the RICOH Transform features, you must uninstall it. All custom configurations or resources associated with the older version are also deleted.

   If this is the first RICOH Transform features installed, the program detects that the Transform Feature Base is not installed. Click **Next** to install it.

   The installation program checks for missing dependencies.After you install all of the

9. Review the information in the Pre-Installation Summary window and click **Install**.
   When the installation program completes, it shows a summary, including information about accessing the user interface with a web browser. The default password is `nopassword`.
10. When the installer completes, click **Done**.
11. Unmount and eject the DVD.
12. If you have another RICOH Transform features to install, repeat this procedure beginning with the step to insert the appropriate RICOH Transform features DVD, described above. Make sure you install all the Transform features before you install the license key.

Note

- When upgrading a transform feature, make sure that all transform features are at the same version. If the transform features are not at the same version, the transform feature you did not upgrade stops working.
- When installing a new version of Transform Features over a previous version, make sure to uninstall first the previous version of Transform Features. Uninstalling Transform Features deletes the files stored in your installation folders.

Important

- To install a language pack, enter this command: `/media/cdrom/linux/features/install_tf_rpd_language_pack.sh`

Logging into the Transform Features user interface

This section describes how to log into the Transform Features user interface.

To log in:

1. Open a web browser and enter this address:

   `http://target server host name or ip address:port determined at install/itm`

   The default port number is 16080.

   For example, if a Transform Feature is installed on a host with TCP/IP address **127.0.0.1** with the default port, the address is: **http://127.0.0.1:16080/itm**.

2. In the browser window, you see the **Log in to the Transform Feature user interface** page. Type the Transform Features password.

   The default password is `nopassword`.

3. Click **Log in**.
   You see the Transform Features user interface main page.

   Note

   - If you do not use the Transform Features user interface for 30 minutes or more, you must log in again.

   When you first log in to the Transform Features user interface, you see one transform server that has been added by default during the installation.

Downloading and installing license keys

If you have purchased RICOH ProcessDirector, RICOH ProcessDirector Subscription, or any feature, use this procedure to download license keys and install them.

Before you begin this procedure:

- Install the product or feature in trial mode.
- If you have not already purchased the software, contact your local Ricoh support representative or sales representative.

After you purchase the software, Ricoh sends an email to the email address provided when the order was placed with the Entitlement Management System (EMS) - Entitlement Certificate in the subject line. This email contains an Entitlement ID (EID).

- Follow all the steps in this procedure each time that you receive an email with an Entitlement ID for RICOH ProcessDirector components that you have purchased.

  You will receive a new Entitlement ID when you renew the subscription for RICOH ProcessDirector Subscription.
- License keys are specific to the release of RICOH ProcessDirector or RICOH ProcessDirector Subscription that you have installed. Be sure that the version on the **About** dialog matches the information in the email.
- This procedure for downloading and installing license keys does not apply to the Transform Features. See Installing the Transform Feature license keys, p. 163 for more information.

To download and install license keys:

1. Open RICOH ProcessDirector.
2. Click the  button at the right of the banner and select **About**.
3. Click **INSTALL LICENSES**.
4. Click the link to open the license activation website.
5. On the **Software Activation** page, enter your **EID** and system fingerprnt.
   - Find the EID in the **Ricoh-Entitlements** email and type or paste it into the **EID** field.
   - Copy the system fingerprint from the **Install Licenses** dialog.
6. Click **Confirm Content**.
7. Select the license you want to activate and click **Activate**.
8. After the license is activated, click **Download License Key**.
   The license key file is downloaded to your computer.
9. Return to the **Install Licenses** dialog.
10. In the **Install licenses** dialog, click  and select the license file you want to install.
11. Click **Done**.
12. Restart RICOH ProcessDirector to complete the installation. See Starting the base product and secondary servers, p. 187.

    Important

    - If the trial period or subscription expires before you restart RICOH ProcessDirector, RICOH ProcessDirector shuts down.

The license keys for all purchased features are now installed on the primary computer. Any feature without a license key remains in trial mode until its trial period ends. If you purchase an additional feature, renew your subscription, or renew your maintenance on the product, repeat this process to install the new key.

When the trial period ends, the steps and objects that are supplied with the feature stop working, but remain on the system. Installing a license key after you purchase the feature activates the steps and objects without requiring a reinstall.

When a subscription expires, all of your objects remain in the system, but you cannot log in. Contact Ricoh software support for assistance with installing a new license on a system with an expired subscription.

Installing the Transform Feature license keys

You can install a Transform Feature license key on a computer other than the primary computer using an installation program from the Transform Features directory.

To install a Transform Feature license key:

1. Log in as an administrator or root user to the computer that the Transform Feature is installed on.
2. Get the fingerprint for the computer.
    1. Open a command prompt.
    2. For Linux, browse to the `/opt/infoprint/itm/license_installer` directory, and type:
        - `./GetFingerprint.sh`
    3. For Windows, browse to the **drive:**`\Program Files\InfoPrint\InfoPrint Transform Features\license_installer` directory, and type:
        - `GetFingerprint.cmd`

    The output of the command looks like this:

    ```
    *1AW QLQ7 BQDZ RLRZ
    ```

    Note

    - This fingerprint is required to generate the license key. Save the fingerprint for later.
3. Get the license file.
    1. When you purchased the Transform Feature, Ricoh Production Print sent an email to the email address provided when the order was placed with the Entitlement Management System (EMS) - Entitlement Certificate in the subject line. This email contains an Entitlement ID (EID) and a link to the Entitlement Management System website.
    2. Open the Entitlement Management System website in your browser.
    3. In the **Login Using** list, select **EID**.
    4. Find the EID in the email and type or paste it into the **EID** field.
    5. Click **Login**.
    6. Select the license you want to activate and click **Activate**.
    7. In the **Activate Product(s)** window, enter the system fingerprint and click **Generate**.

        Note

        - If you see an error message that the license could not be generated because checksum validation failed, you entered an incorrect system fingerprint.
    8. Select what you want to do with the license file:

- Select **Save to File** to save the license file to your computer.

  Note

  – Note the **hostname** and the **fingerprint** (without the *) when saving the license file. This is valuable information to have when recovering from a hard drive failure.
- To add the license keys to an existing license file, select **Append To File**.
- To email yourself a copy of the license file, select E-mail.

  Note

  – Check the email address in the Contact field. If a copy of the email (including the license key file) should be sent to a different email address, click **E-mail**. Type the email address and click **Send**.

9. Log out from the EMS website.
10. If you received the license key file in an email, transfer it to the computer that the Transform Feature is installed on or a network location that is accessible to that computer.

4. Install the license key.
   - For Linux:
     1. Open a command prompt.
     2. Browse to the `/opt/infoprint/itm/license_installer` directory, and type `./install_license_keys.sh`.
   - For Windows:
     1. In Windows Explorer, browse to the **drive:**`\Program Files\InfoPrint\InfoPrint Transform Features\license_installer` directory.
     2. Double-click `license_keys_installer.exe` to run the license key installation program.

Configuring RICOH ProcessDirector

You use the user interface to complete configuration tasks for RICOH ProcessDirector, such as setting up job processing, defining input devices for job submission, defining your printer hardware to RICOH ProcessDirector, and adding users. The RICOH ProcessDirector information center describes these configuration tasks.

To access the RICOH ProcessDirector information center to learn about configuration tasks:

1. Enter `http://`*`hostname`*`:15080/pd` in the address bar of a web browser. Replace *hostname* with the host name of the primary computer.
2. Click ?- → **Help** from the top task bar. You see the RICOH ProcessDirector information center.
3. From Contents in the left pane, click **Configuring**. You see a list of configuration tasks in the right pane.
4. Select the configuration tasks that apply to your installation.

Scheduling automatic maintenance

RICOH ProcessDirector provides maintenance scripts that must be run regularly on the primary computer to improve performance. By default, RICOH ProcessDirector runs these scripts every day at midnight. You can change the time or frequency, and you can run your own maintenance scripts at the same time.

While these scripts are running, they might slow RICOH ProcessDirector down for a few minutes. Therefore, you should avoid running them at peak production times.

These entries in the `crontab` file run the maintenance scripts:

```
00 00 * * 0-6 /aiw/aiw1/maintenance/maintenance.pl daily
00 00 * * 0 /aiw/aiw1/maintenance/maintenance.pl weekly
```

`crontab` entries are in this format:

```
mm hh dd month weekday command
```

The first entry runs all scripts in the `/aiw/aiw1/maintenance/daily` directory at 00:00 (midnight) every day from Sunday (0) through Saturday (6). The second entry runs all scripts in the `/aiw/aiw1/maintenance/weekly` directory at 00:00 (midnight) every Sunday. (By default, there are no scripts in `/aiw/aiw1/maintenance/weekly`.)

- To run the maintenance scripts weekly instead of daily, move them to the `/aiw/aiw1/maintenance/weekly` directory.
- To change the time, day, or frequency for running maintenance scripts, edit the `crontab` file.

  1. Log in to the primary computer as the RICOH ProcessDirector system user (**aiw1** is the default).
  2. Enter this command:

     ```
     crontab -e
     ```

  3. Make any necessary changes.

     For example, this entry runs all scripts in the `/aiw/aiw1/maintenance/daily` directory at 10:30 PM every Monday, Wednesday, and Friday:

```
30 22 * * 1,3,5  /aiw/aiw1/maintenance/maintenance.pl daily
```

- To run your own scripts at the same time as the RICOH ProcessDirector maintenance scripts, copy them into the `/aiw/aiw1/maintenance/daily` or `/aiw/aiw1/maintenance/weekly` directory.

  Make sure that the RICOH ProcessDirector system user ID has execute permission for your scripts.

Tuning Java memory allocation

Allocating more memory to Java often improves the performance of RICOH ProcessDirector. However, it is imperative that you take several factors into consideration before you change this configuration.

Run with the default setting for a while before you consider changing the Java memory allocation. If you repeatedly experience Java out of memory errors, consider increasing the allocation.

Important

- We recommend allocating no more than 50% of the available system memory on your system to RICOH ProcessDirector Java processes. This recommendation takes into consideration the memory needs of other parts of RICOH ProcessDirector, such as the database, transforms, custom code, and other components. The recommendation also ensures that the operating system and other tools and utilities have the resources they require to operate.
- If you intend to define local secondary servers to use with resource-intensive steps, you must take those requirements into consideration as well. The amount of memory allocated to all RICOH ProcessDirector servers on the primary computer combined should not exceed 50% of the available system memory.
- If you intend to install remote secondary servers, you specify the memory allocation in the `jvmsettings.cfg` file on the primary server as well. Evaluate the secondary computer in the same way that you evaluate the primary computer to determine how much of the available memory the secondary server can use.

To tune Java memory allocation:

1. Check the amount of RAM installed on your system. Divide that number by 2 and write it down.
2. Check how much memory is allocated to other applications that run on this system.

   Reduce the number you wrote down by the amount of memory each application uses. The resulting value is the total amount of heap memory that is available for you to allocate to Java for all running RICOH ProcessDirector primary and secondary processes.

   Note

   - If your RICOH ProcessDirector solution requires more memory than the amount determined in this step, we recommend upgrading the system memory to meet the stated guidelines. Allocating more than 50% of available memory to the RICOH ProcessDirector Java heap negatively impacts performance.
3. Log in to the primary computer as the system user (aiw1 is the default).
4. Open `$AIWDATA/config/jvmsettings.cfg` in a text editor.

   By default, `$AIWDATA` is `/aiw/aiw1`.
5. Find the line that looks like this:

```
primary=-Xmx2048m -Djava.net.preferIPv4Stack=true -Djava.awt.headless=true
```

   The value after `primary=-Xmx` is the maximum amount of heap memory the RICOH ProcessDirector Java run time environment is allowed to use for the RICOH ProcessDirector primary process. In this example, the primary server can use 2048MB (2GB) of RAM for its heap.
6. Update the -Xmx value to the number you determined in step 2.
   For example, to allow the primary server use 8GB of heap space, you can specify `-Xmx8192m` or `-Xmx8g`
7. If the line does not include this setting: `-XX:+UseG1GC`, add it.
8. If you have secondary servers defined, add a line for each secondary server to allocate a specific amount of memory for them.

Note

For remote secondary servers, repeat steps 1 and 2 to determine the heap memory available on the secondary computer.

1. Copy the line that begins with `primary` and paste it on a new line at the bottom of the file.
2. Update the line that you copied to change `primary` to the value of the **Server name** property for the secondary server.
3. Update the value after *`secondary_server_name`*`=-Xmx` to the amount of memory that you have available for it.

9. Save and close the file.
10. Restart RICOH ProcessDirector to apply the changes.

Note

- You change the RICOH ProcessDirector Plug-in for Adobe Acrobat JVM memory allocation by clicking **Ricoh** → **Preferences** from the Adobe Acrobat menu bar.

Replacing your control files with the sample files

When you install a new version of RICOH ProcessDirector, the installer automatically adds new sample control files to the `/aiw/aiw1/samples` directory and copies them to your control files directory, `/aiw/aiw1/control_files`. It does not overwrite any of your customized control files in `/aiw/aiw1/control_files`. You can use the copyConfigurationFiles script to install the default control files or to overwrite your customized control files.

Replacing your control files requires Perl to run. Before replacing your control files, make sure a Perl interpreter is installed.

To replace your control files with the sample files:

1. Log in to the primary computer as the RICOH ProcessDirector system user (**aiw1** is the default).
2. On the command line, enter this command:

   ```
   /opt/infoprint/ippd/bin/copyConfigurationFiles.pl
   ```

   You can add these optional parameters to the copyConfigurationFiles command:

   [-r [-b]] [-w *`forceReplaceFile`*] [*`samplesDirectory configurationFilesDirectory`*] [[-o *`differencesOutputFile`*] [-c]] [-v] [-help]

   -r

   The script overwrites existing files in the `/aiw/aiw1/control_files` directory.

   -b

   The script backs up each file it replaces. The backup files are called *`replaced_file`*.bak. It does not back up files unless they are being replaced by a different version of that file.

   -w *`forceReplaceFile`*

   The script overwrites a specific set of files. List the file paths to overwrite in the *`forceReplaceFile`* file.

   `samplesDirectory`

The directory where the sample files are located. The default is `/aiw/aiw1/samples`.

configurationFilesDirectory

The directory where the control files are located. The default is `/aiw/aiw1/control_files`.

-o *differencesOutputFile*

The script writes any file names where there are different versions of a file in the samples and control_files directories. The different version file names are written to the *differencesOutputFile* file.

-c

The script compares the files in the `/aiw/aiw1/samples` and `/aiw/aiw1/control_files` directories and prints a list of which files are in both directories but have different content. Running the script with this parameter does not do the normal copying and replacing.

-v

The script displays additional file information while copying files.

-help

The script displays help and syntax information.

New versions of RICOH ProcessDirector might add new functions that require updated control files. To move your customized content from the old control files to the new control files:

1. Generate a list of which files have new versions. Enter this command:
   `copyConfigurationFiles.pl -o /tmp/differencesOutputFile`
2. Copy the new control files. Enter this command:
   `copyConfigurationFiles.pl -r -b -w /tmp/differencesOutputFile`

   Specifying the `-b` causes the script to back up files before overwriting them.
3. Copy your customized content from the *replaced_file.bak* backup files to the corresponding control file.

Important

- We recommend using the **Migration Assistant** when upgrading to a different computer to copy objects from one system to another. For additional information see Upgrading on a different computer with Migration Assistant, p. 93.

Copying objects from another system

To reuse objects from another RICOH ProcessDirector system, you can use the other system to export them. On this RICOH ProcessDirector system, you can import the objects rather than recreating them manually.

You can export and import objects such as input devices, workflows, printers, media objects, notifications, servers, step templates, user names, groups, and locations. You can also export and import some objects added by features or extensions.

Important

- We recommend using the **Migration Assistant** when upgrading to a different computer to copy objects from one system to another. For additional information see Upgrading on a different computer with Migration Assistant, p. 93.
- Do not import objects added by a feature or extension that is not installed on this system.
- Before you import an object that has the same name as an existing object of the same type, make sure that the existing object is disabled. If the object is an input device, also make sure that it is disconnected. When you import the new object, the existing object is updated to match the new one.
- Before you import an input device or printer whose **Parent server** property has any value other than **System**, make sure that the parent server has been added as a secondary server. Make sure that the secondary server has been enabled and connected to the primary server.
- If you are using the Preprinted Forms Replacement feature, export the `media.zip` file before you import media objects with electronic forms. Follow the instructions in the help system for exporting media objects with electronic forms.
- When you import order property mapping objects, the file specified in the **Sample order XML file** property is not included in the export package. You must copy the file to the new system manually after you import the object.

  Sample XML files are stored in: `/aiw/aiw1/mapping/proprty_mapping_object`
- When you import step resources, the files that they refer to are not included in the export package. Copy the files referenced in the step resources from the export system to the import system manually. You must copy the files to the import system before you import the step resource objects.
  - To import all the step resources, copy the contents of `/aiw/aiw1/StepResources` from the export system into the same directory on the import system.
  - To import specific step resources, open the XML file that you exported. Find the entry for each step resource that you exported and locate the **StepResource.File** property. In that value, find the name of the RSC file associated with that step resource. For example, in this value:

    ```
    <property name="StepResource.File" value="{&quot;fileName&quot; : &quot;/
    aiw/aiw1/StepResources/1992052c6ef44a229b8b43d77232bf53.
    rsc1992052c6ef44a229b8b43d77232bf53.rsc&quot; , &quot,&quot;
    displayName&quot; : &quot;Ricoh_Export-2019-08-26_13-30-04.xml&quot;}"/>
    ```

    The file name is: `1992052c6ef44a229b8b43d77232bf53.rsc`

    Find the file on the export system and copy it into the same directory on the import system.
- You can export objects from a primary server running on one operating system and import them on a primary server running on a different operating system.

  If you export objects from Windows and import them on Linux, you need to manually update the paths for the paths or the configuration files.

To copy objects from another system:

1. Click the **Administration** tab.
2. In the left pane, click **Utilities** → **Import Objects**.
3. In the **File to import** field, click  to select the XML file that contains the properties of exported objects.

The default name of this file is `Ricoh_Export_timestamp.xml`. The administrator who exported the objects might have given the file a different name.

Note

- If you exported media objects with electronic forms, the name of the file is `media.xml`. It is in this directory:
  - `/aiw/aiw1`

The file is automatically examined, and the objects are evaluated. If there are issues with any objects in the file, you see a dialog that lists the import errors and warnings. Close the dialog and all the objects appear in the **Objects to import** table. Objects with errors or warnings are marked with an icon.

Repeat this step for all the files you want to import. Objects from additional files are added to the table, so they can all be added at the same time.

4. Review the objects in the list. Select any object marked with a warning or error symbol and click **Details** to see additional information about the warning or error. Follow the instructions in the description to resolve problems. You cannot import objects that are marked as errors.
5. Select the objects that you want to import.
6. **Optional:** To make sure that you do not update objects that exist, click **Deselect existing objects**.
7. Click **Import**.

   If the **Import** button is disabled, one or more selected objects are marked with the error icon. Click **Deselect error objects** to clear the selection for those objects and click **Import** again. The objects without errors are imported.

   Return to the error objects to resolve the issues and try to import them again.

Note

- Credential objects might be contained in the file you import if they were included as references in workflows, step templates, input devices, or transmitter objects. The imported credential objects cannot be used until you re-enter values for the **User name** and **Password** properties on the imported system.
- If an imported workflow refers to a step that does not exist on this system, RICOH ProcessDirector replaces the step with a placeholder step named ReplacedStep. The original step name and step template name are available in the Step properties. The ReplacedStep acts like the ContinueToNextStep step template, so it simply passes the job to the next processing step without changing it.
- Contact your local Ricoh support representative if you receive an error message for step templates not containing a reference to an extension when importing objects.

Creating and activating custom properties

If none of the existing job, document, or order properties meet your specific needs, you can define custom properties that are tailored to your specifications. After these properties are activated, you can use them just as you would any other property.

Important

We recommend to not recreate any document properties that have been defined in the **docCustomDefinitions.xml** file.

To create and activate a custom property:

1. Click the **Administration** tab.
2. In the left pane, click **Objects** → **Custom properties**.
3. Click **Add**.
4. Select either **Document Property**, **Job Property**, or **Order Property**.
5. Configure the custom property by setting all the values.

   To find more information about the custom properties values, click the **?** button next to a field.

   Important

   - The third section of the database name must be different for each custom property. For example, you cannot use both `Doc.Custom.Test` and `Job.Custom.Test`. You must change one of the database names to use something unique, such as `Doc.Custom.Test1`.
6. To activate the custom property, click the switch at the top of the dialog.

   Note

   - All custom properties must be activated before they can be used in steps, workflows, input devices, jobs, and so on.
7. To save the changes and close the dialog, click **OK**.

   Important

   When activating or deactivating a custom property, we recommend doing these actions:

   - Log out of RICOH ProcessDirector.
   - Refresh the browser window and clear your browser cache.
   - Log in to RICOH ProcessDirector.
8. Test the property using different scenarios in a testing environment.

   We recommend trying the new property in a small number of places that represent your intended usage, to ensure that the property functions as you intend it to.

   While you can deactivate a custom property to change its configuration, that process affects existing uses of the property. When a custom property is deactivated, all connections to any objects where the custom property was added are lost. The custom property is removed from any objects it was previously connected to. Any commands or processes based on the custom property might not function properly. For example, connector rules that use the property fail to evaluate correctly.

   After you make your changes, you reactivate the custom property. You need to add the custom property to the objects it was removed from.

Note

When the custom property is reactivated:

- The property is not added back to jobs that it was removed from.
- Processes and commands that include the property should start to function correctly again.

Installing and configuring the pdpr script

If you are migrating from InfoPrint Manager and you use the **pdpr** command to submit jobs, you can install the RICOH ProcessDirector **pdpr** script on the computers that submit jobs and use the same command to send jobs to RICOH ProcessDirector.

The installation package for the **pdpr** script is copied to the primary computer when you install the base product. You can copy the installation package and install it on computers that submit jobs running these operating systems:

- Red Hat 8.1 through latest 8.X
- Red Hat 9.2 through latest 9.X
- Rocky Linux 8.4 through latest 8.X
- Rocky Linux 9.0 through latest 9.X
- SUSE Linux Enterprise Server (SLES) 12.0 with Service Pack 4 or above for x86_64
- SUSE Linux Enterprise Server (SLES) 15.0 with Service Pack 1 or above for x86_64
- Windows 11
- Windows Server 2022 64-bit

  Note

  – To install the **pdpr** script on a different operating system, contact your Ricoh support representative.

The **pdpr** script requires Perl to run. Before you install the **pdpr** script, make sure that a Perl interpreter is installed on the client systems.

The **pdpr** script uses a control file named `pdpr.cfg` to determine whether jobs are sent to InfoPrint Manager or to RICOH ProcessDirector. You can either store the control file on the same computer that you install the **pdpr** script on, or you can store it in a central location and let the **pdpr** script access it using FTP. The **pdpr** script uses an anonymous login to the FTP server, so the anonymous user must have read permission for the control file.

To get the most recent pdpr script, contact your Ricoh support representative.

To install and configure the **pdpr** script:

1. Log in to the primary computer as the RICOH ProcessDirector system user (**aiw1** is the default), or with a user ID that is a member of the RICOH ProcessDirector group (**aiwgrp1** is the default).
2. Find the pdpr installer file: `/aiw/aiw1/samples/pdpr/pdpr_installer`.
3. Copy the file to a temporary directory on the computer that runs the **pdpr** command.
4. Log in to a client computer:
   - On a Linux-based client, log in as the root user and open a command prompt.

- On a Windows client, log in as a user with administrator permission and open a command prompt.

5. Change directories to the directory that contains `pdpr_installer`.
6. Type: `perl pdpr_installer`
   The installer interface runs in the command prompt window.
7. When the installer asks where you want to install the program, choose a different directory than the temporary directory that `the pdpr_installer` was copied in to.

   Important

   - If you install into the temporary directory, the installation fails. You get an incomplete installation that has a pdpr directory instead of the pdpr script.

8. Respond to the questions in the installer according to these definitions:

   Host name or IP address of RICOH ProcessDirector server

   Fully qualified host name or IP address of the computer that the primary server is installed on.

   Full FTP path for pdpr.cfg file

   If you want to store the `pdpr.cfg` file in a central location, the full path to the `pdpr.cfg` file. The value must end with the file name `pdpr.cfg`.

   If you plan to store the `pdpr.cfg` file on the same system as the **pdpr** script, do not type anything; press **Enter** and continue with the installer.

9. Finalize the installation process:

   - If you are installing on a Linux client, log out and log back in so the changes can take effect.
   - If you are installing on a Windows client, restart the computer so the changes can take effect.

10. To define rules for parsing the pdpr command and submitting jobs to RICOH ProcessDirector, edit the `pdpr.cfg` file.

    The file must contain one line for each rule that you define. Jobs are sent to an input device based on the last rule that they match. If the job does not meet the conditions of any of the rules, it is sent to InfoPrint Manager.

    Each line of the file follows this syntax:

    `FileName | LDName,`*regular_expression, input_device_name,* [BOTH]

    Use **FileName** if you want to parse the file name of the input file to determine where to send the job. Use **LDName** to parse the value of the **-d** (InfoPrint Manager logical destination) option on the **pdpr** command to determine where to send the job.

    For example, the file might contain these lines:

```
LDName, .*\.[Pp][Ss], InputPS
FileName, .*\.[Aa][Ff][Pp], InputAFP
```

    The first line instructs the script to look at the **-d** option on the **pdpr** command. If the value specified for that option ends with **.ps** or **.PS**, the job is sent to the input device named **InputPS**. The second line instructs the script to look at the file name of the input file. If the file name ends with **.afp** or **.AFP**, the job is sent to the input device named **InputAFP**.

If neither condition is met, the job is sent to InfoPrint Manager using the value stored in the PDHOST environment variable on the system.

Add the **BOTH** parameter to the end of an entry to indicate that if the condition is satisfied, the job should be sent to both InfoPrint Manager and RICOH ProcessDirector. This is useful when you are initially configuring RICOH ProcessDirector to receive jobs from **pdpr** because you can test the RICOH ProcessDirector configuration while continuing to use InfoPrint Manager in your production environment.

Now you can configure RICOH ProcessDirector to receive jobs submitted with the **pdpr** script from all the client systems. For more information, see the RICOH ProcessDirector information center in the user interface.

Setting up to use LDAP authentication

If you have an existing LDAP or Active Directory server, you can use LDAP or Active Directory user names and passwords to authenticate into RICOH ProcessDirector.

You must install the Security feature before you can set up to use LDAP authentication.

Consult your LDAP administrator for the values of the **LDAP server** and other properties you set in this procedure. Before you turn on LDAP authentication, you map RICOH ProcessDirector security groups to existing LDAP groups.

After you turn on LDAP authentication, the first time that a user logs in:

- RICOH ProcessDirector authenticates the user name and password with the LDAP server.
- RICOH ProcessDirector creates a RICOH ProcessDirector user name that is identical to the LDAP user name.

  Note

  – No LDAP password information is stored on the RICOH ProcessDirector server.
  – When you use an LDAP user ID to access your production environment, RICOH ProcessDirector cannot track the number of failed login or password change attempts. Therefore, RICOH ProcessDirector cannot lock the user out after repeated failed login attempts with an incorrect LDAP password. You must configure the maximum number of failed login or password change attempts on your LDAP server in addition to configuring RICOH ProcessDirector security.
- RICOH ProcessDirector assigns the user RICOH ProcessDirector group memberships based on the values for the **Product to LDAP group mapping** property and the LDAP group memberships of the user.

Each time that a user logs in:

- RICOH ProcessDirector authenticates the user name and password with the LDAP server.
- If you synchronize product groups with LDAP groups, RICOH ProcessDirector updates the product group memberships of the user based on:
  – The values for the **Product to LDAP group mapping** property.
  – The LDAP group memberships of the user.
- If you do not synchronize product groups with LDAP groups, RICOH ProcessDirector does not update the product group memberships of the user. You can assign group memberships to users

manually in RICOH ProcessDirector. See the RICOH ProcessDirector information center for information about managing users and groups.

To set up to use LDAP authentication:

1. Log in as a user who is a member of the **Administrator** security group.
2. Click the **Administration** tab.
3. In the left pane, click **Settings** → **LDAP**.
4. Set the **LDAP server** property to either of these values:
   - The network IP address.
   - The fully qualified host name of the LDAP server and the port that the system uses for authentication.

     To include more than one LDAP server, use a semicolon (;) to separate the entries.
5. Specify values for the **Root distinguished name**, **User search base**, and **User search filter** properties.

   The value you enter for the **User search filter** property determines the format of your RICOH ProcessDirector user names, for example, an email address format or a UID format.
6. **Optional:** Specify a value for the **Email attribute** property.

   If you enter a value for this property, RICOH ProcessDirector sets a value for the **Email address** property when it creates a user.
7. Specify values for the **Manager distinguished name** and **Manager password** properties.
8. Specify values for the **Group search base**, **Group search filter**, and **Group search member** properties.

   RICOH ProcessDirector uses the name of the LDAP group specified in the **Product to LDAP group mapping** property in the **Group search filter** property when it authenticates an LDAP user to RICOH ProcessDirector.
9. If you want to manage RICOH ProcessDirector security groups using LDAP, set the **Synchronize with LDAP** property to **Yes**. If you want to manage security groups using RICOH ProcessDirector, set the property to **No**.
10. Specify the connections between product groups and LDAP groups:
    1. Select a product security group from the list.
    2. Type the name of the corresponding LDAP group next to it.
    3. Click **+** to the right of the LDAP group and map another product group to an LDAP group.
    4. Repeat the previous step until you have mapped all product groups to LDAP groups.
11. Check to see whether your browser has automatically filled the **Manager distinguished name** and **Manager password** properties. If they are filled, clear the properties and leave them blank.
12. To secure the connection to the LDAP server and establish Transport Layer Security (TLS), specify a value for the **LDAP security** property:
    - To use the StartTLS operation, set the property to **StartTLS**.

      StartTLS works with most default implementations of LDAP.
    - To use the Secure LDAP (LDAPS) protocol, set the property to **ldaps**.

Do not specify LDAPS unless your LDAP administrator already has set up your LDAP implementation to use LDAPS.

13. To verify that you can log in with your LDAP credentials:
    1. In the **Test LDAP Settings** section, enter an LDAP user name and password. Make sure that the user name is a member of an LDAP group that is mapped to the RICOH ProcessDirector **Administrator** group.
    2. Click **Test LDAP Settings**.
       If the test is successful, you receive a message that says `LDAP settings test succeeded.`

       If you receive an error message, click **Close**, update your LDAP settings, and click **Test LDAP Settings** again.
14. When the test completes successfully, set the **Authenticate with LDAP** property to **Yes**.

    If you cannot get a successful test, leave the **Authenticate with LDAP** property set to **No** and have your LDAP specialist look at other possible issues.
15. Click **SAVE**.

    If you have not used the test function before you click **SAVE** with the **Authenticate with LDAP** property set to **Yes**, the system runs the test with the user ID and password specified.

    - If the test succeeds, the settings are saved and LDAP authentication is activated.
    - If the test fails, you see an error message and none of the settings are saved.
      Fix the **LDAP settings** and run the test until it passes. If the test continues to fail, set the **Authenticate with LDAP** property to **No** and click **SAVE**. Work with your LDAP specialist to resolve the problems and retest the settings.

After you turn on LDAP authentication:

- Local RICOH ProcessDirector users cannot log in to RICOH ProcessDirector.
- The first time that an LDAP user logs in to RICOH ProcessDirector, the system creates a user name that is identical to the LDAP user name.
- If the **Synchronize with LDAP** property is set to **Yes**, RICOH ProcessDirector does not use any product groups that are not associated with LDAP groups.

RICOH ProcessDirector does not delete existing user names when you turn on LDAP authentication. You must manually delete those user names from the system.

Note

- When LDAP authentication is turned on and RICOH ProcessDirector has a user with the same user name as an LDAP user:
  - RICOH ProcessDirector keeps the password of the existing user.
  - RICOH ProcessDirector lets the user authenticate with LDAP.
- If LDAP authentication is turned off, the user can authenticate with the RICOH ProcessDirector password.

Communicating between RICOH ProcessDirector and the LDAP server

When you set up communications between RICOH ProcessDirector and your LDAP server, you might have to modify your LDAP server settings for these binds and search requests.

This table maps the Database property names to the corresponding names in the user interface. Use this table as a reference to help understand what properties are passed and returned by the searches and binds performed by RICOH ProcessDirector.

Database and User Interface property names

Database Property Name	User Interface Property Name
WorkflowSystem.AdLdap.GroupMap	Product to LDAP group mapping
WorkflowSystem.AdLdap.GroupSearchBase	Group search base
WorkflowSystem.AdLdap.GroupSearchFilter	Group search filter
WorkflowSystem.AdLdap.GroupSearchMember	Group search member
WorkflowSystem.AdLdap.ManagerDN	Manager distinguished name
WorkflowSystem.AdLdap.ManagerPassword	Manager distinguished name password
WorkflowSystem.AdLdap.rootDN	Root distinguished name
WorkflowSystem.AdLdap.Server	LDAP server
WorkflowSystem.AdLdap.UserSearchBase	User search base
WorkflowSystem.AdLdap.UserSearchFilter	User search filter
User.ID	User name
User.Password	User password

RICOH ProcessDirector creates these binds whenever a user logs in:

- `bind ${WorkflowSystem.AdLdap.Server} using ${WorkflowSystem.AdLdap.ManagerDN} and ${WorkflowSystem.AdLdap.ManagerPassword}`

  When the **Manager distinguished name** system property (`WorkflowSystem.AdLdap.ManagerDN`) does not have a value, an Anonymous bind is created.

- `bind to ${WorkflowSystem.AdLdap.Server} using ${User.ID} and ${User.Password}`

  Note

  – The password for `User.Password` must be set when making changes for LDAP. If the password is not set, the bind fails.

RICOH ProcessDirector does these search requests whenever a user logs in:

- For all RICOH ProcessDirector LDAP groups:`searchRequest "${WorkflowSystem.AdLdap.GroupSearchBase},${WorkflowSystem.AdLdap.rootDN}" wholeSubtree Filter: (${WorkflowSystem.AdLdap.GroupSearchFilter}${WorkflowSystem.AdLdap.GroupMap})`

  The results must include the **Group search member**. The value of the Group search member is used as the RICOH ProcessDirector user name.

- When a user name is set to the value returned on the **Group search member** argument: `searchRequest "${WorkflowSystem.AdLdap.UserSearchBase},${WorkflowSystem.AdLdap.rootDN}" wholeSubtree Filter: (${WorkflowSystem.AdLdap.UserSearchFilter}=${User.ID})`

Verify communications between RICOH ProcessDirector and your LDAP server are working correctly by testing the **Group search base** and **User search base**:

- Test the **Group search base** by entering this command at a command prompt:

  ```
  ldapsearch -D "WorkflowSystem.AdLdap.ManagerDN" -x -W -b "WorkflowSystem.AdLdap.GroupSearchBase,WorkflowSystem.AdLdap.rootDN" -h "WorkflowSystem.AdLdap.Server" -s sub "(WorkflowSystem.AdLdap.GroupSearchFilter=GroupMap)"
  ```

  If communications between RICOH ProcessDirector and your LDAP server are working correctly, data containing the group search is returned. The response contains information stored in your LDAP server:

  ```
  UID=UserName, ou=GroupName, ou=OrganizationName, dc=ComputerName, dc=CompanyName
  ```

  `GroupName` is returned by **WorkflowSystem.AdLdap.GroupSearchBase**. `OrganizationName`, `ComputerName`, and `CompanyName` are returned by **WorkflowSystem.AdLdap.rootDN**.

- Test the User search base by entering this command at a command prompt:

  ```
  ldapsearch -D "WorkflowSystem.AdLdap.ManagerDN" -x -W -b "WorkflowSystem.AdLdap.UserSearchBase,WorkflowSystem.AdLdap.rootDN" -h "WorkflowSystem.AdLdap.Server" -s sub "(WorkflowSystem.AdLdap.UserSearchFilter=User.ID)"
  ```

  Data containing the user search is returned if communications between RICOH ProcessDirector and your LDAP server are working correctly. The response contains information stored in your LDAP server:

  ```
  UID=UserName, ou=OrganizationUsers, ou=OrganizationName, dc=ComputerName, dc=CompanyName
  ```

  `OrganizationUsers` is returned by **WorkflowSystem.AdLdap.UserSearchBase**. `OrganizationName`, `ComputerName`, and `CompanyName` are returned by **WorkflowSystem.AdLdap.rootDN**.

Creating a Docker container secondary server

Use this procedure to create a Docker container secondary server on a Linux system and connect it to your primary computer.

Before you begin this procedure, install Docker Engine 24.0.6 or above on the Linux computer that will host the container secondary server.

Note

- On RICOH ProcessDirector for Linux, you can create Docker container secondary servers on the primary computer or on a separate Linux computer.

To create a Docker container secondary server:

1. Contact Ricoh Software Support for assistance with this process.

   The Software Support team can help evaluate your system and determine whether this procedure needs to be modified to fit your needs.

2. Download and install the Secondary Docker feature.

Follow these procedures:

- Downloading and installing update packages, p. 184
- Adding or upgrading a feature using Import Package, p. 155

3. If directed by Software Support, install the Secondary Server feature on the remote Linux computer that will host the Docker container secondary server.

   Follow the procedures outlined in Setting up application and secondary servers, p. 133. If you are installing a Docker container secondary server only on the primary computer, you do not have to install the Secondary Server feature nor configure NFS. Skip to step 7.

4. If you did not install the Secondary Server feature:

   1. Configure NFS to communicate between the primary computer and the computer that will host the Docker container secondary server.

      Follow the procedure in Configuring the primary server to use NFS, p. 134 to set up NFS on the primary computer.

   2. On the computer that will host the Docker container secondary server, create this directory: `/aiw`, then mount it to the `/aiw` directory on the primary computer.

      Use this command: `mount -t nfs` *`primary computer IP address or hostname`*`:/aiw /aiw`

5. On the computer that will host the Docker container secondary server:

   1. Create a Linux user ID with the same name as the RICOH ProcessDirector system user (**aiw1** is the default). Add that user ID to the **docker** group.
   2. Change the ownership of the `/aiw` directory to the user you created.

6. Log in to RICOH ProcessDirector.
7. Create the server object to represent the Docker container secondary server.

   1. Click the Administration tab.
   2. In the left pane, click **Objects** → **Servers**.
   3. On the **Servers** page, click **Add** → **Container secondary server**
   4. Fill in the properties as appropriate.
   5. Click **OK**.

   RICOH ProcessDirector creates the server object and installs the container secondary server on the target system.

8. When the installation process completes, start the container secondary servers. Log in to the computer that hosts the secondary container servers and run the command below.

Note

- If you created the container secondary server on the primary computer, run the command on the primary computer.

  Replace *directory* with: `/aiw`

  The *path_to_script* is not required on the primary server.
- If you created the container secondary server on a different computer, run the command from the secondary computer.

  On a secondary computer, you must provide the full path to the script on the primary computer, including the directory that is mounted to the `/aiw` directory on the primary server. In the command below, replace these values:

  – *path_to_script*
  The full path to the script on the primary server, including the mounted directory. If the mounted directory is `/aiw` (as in the procedure above), the value is: `/aiw/aiw1/bin/`

  – *directory*
  The full path to the directory that is mounted to the `/aiw` directory on the primary server. In the procedure above, this directory is also `/aiw`.
- To start a specific container secondary server, replace *[secondary_name]* with the name of that server. Omit this value to start all of the container secondary servers present on the Linux computer.

[path_to_script]`containers.pl start` *directory [secondary_name]*
For example:

- To start all the container secondary servers on the primary server:
  `containers.pl start /aiw`
- To start one of four container secondary servers on a different computer:
  `/aiw/aiw1/bin/containers.pl start /aiw secServContainer3`

To stop the Docker container secondary servers, run this command on the computer that hosts them:

[path_to_script]`containers.pl stop` *directory [secondary_name]*

Follow the replacement instructions above for *[path_to_script]*, *directory* and *[secondary_name]*.

Moving processing to and from a failover server

Failover servers are designed to take over processing in the event that your RICOH ProcessDirector production server suffers a catastrophic event. Use this procedure to move processing between the RICOH ProcessDirector production server and the failover server.

To switch RICOH ProcessDirector processing to and from a failover server:

1. Log in as the system user (aiw1 is the default) to the server you are moving processing from. If the system is not available (for example hardware failure or if the system is powered down), continue with step 3. If you are moving processing from the production server to the failover server, log in to the production server.If you are moving processing from the failover server to the production server, log in to the failover server.
2. Open a command line and enter: `stopaiw`

3. Log in as the root user to the server you are moving the processing to.
4. Enter `/opt/infoprint/ippd/bin/changeHostname.pl` *`server_hostname`* where *`server_hostname`* is the name of the server you are moving processing from and press **Enter**. If you are moving processing from the production server to the failover server, *`server_hostname`* is the production server. If you are moving processing from the failover server to the production server, *`server_hostname`* is the failover server.

Setting up to send data to RICOH Predictive Insight

The RICOH Predictive Insight settings let you configure the system to send data to RICOH Predictive Insight.

The data that you send to RICOH Predictive Insight must be stored in the Reports database by the RICOH ProcessDirector data collectors. Before you do this procedure, you need to configure the Reports feature, including setting up data collectors and workflow steps to gather the data that you want to send to RICOH Predictive Insight. The data collected by the data collectors before setting up a RICOH Predictive Insight data transmitter can be used in RICOH Predictive Insight after the transmission is enabled.

Note

- Make sure that you have enabled data capturing in **Reports** → **Database Settings** and for each data collector you want to collect data.

To create a connection to RICOH Predictive Insight and to transmit data, you must complete a series of steps. The data connection requires you to create a credential and a data transmitter. The credential uses an authentication code to create a certificate that authenticates with RICOH Account Administration for access to Ricoh cloud applications. To get access to RICOH Account Administration, contact the system administrator for RICOH Predictive Insight.

After you create a certificate that authenticates RICOH ProcessDirector to Ricoh cloud, you must create a RICOH Predictive Insight data transmitter that enables the data transmission.

Important

- Only one Ricoh cloud credential and one RICOH Predictive Insight data transmitter can be created for sending data to RICOH Predictive Insight.

To set up to send data to RICOH Predictive Insight:

1. Click the **Administration** tab.
2. In the left pane, click **Settings** → **RICOH Predictive Insight**.
3. Go to **Settings** and set the values for these properties:
    1. Select the time zone for the RICOH ProcessDirector primary computer from the **Primary computer time zone** list.
    2. Enter the name of the RICOH ProcessDirector system in the **System display name** field. The name identifies your RICOH ProcessDirector system in RICOH Predictive Insight.
    3. If you choose to use a proxy server, make sure that the proxy server is configured on the **System Settings** page.
    4. Click **Save settings**.

4. In the **Credential** section, click the Add icon to create a Ricoh cloud credential. A new dialog opens to set up the credential:
    1. Fill in the fields in the **General** section.
    2. In the **Certificate** section, click **Generate code**. **RICOH Account Administration** opens in a new tab.
    3. Log in to **RICOH Account Administration** and copy the code.
    4. Return to RICOH ProcessDirector and paste the generated code into the **One-time code** field.
    5. Click **OK** to generate the certificate and save the credential.
5. In the **Data Transmitter** section, click the Add icon to create a new RICOH Predictive Insight data transmitter. A new dialog opens to set up the data transmitter:
    1. Review the current values for the properties and make any required updates on all the tabs. To see information about any of the properties, click the question mark button next to the property name.
    2. When all the settings are configured correctly, click the switch at the top of the **General** tab to enable the data transmitter.
    3. Click **OK**.

If all settings are configured correctly, you should see a green check mark in front of every section. The first data transmission occurs on the schedule you set. The first transmission could take a while to complete, even if only a small amount of data is sent. The upper right corner of the RICOH Predictive Insight Settings page shows the status of the connection and the date and time of the last successful transmission.

Installing a RICOH ProcessDirector product update

Preparing for the update

When you prepare your system for an update, you must determine how you want to update your system and what components you have installed, and then back up your system.

To prepare for an update:

1. Decide how to update your system. You have two choices:
    - Download the full product ISO file for the most recent version of RICOH ProcessDirector.
      The ISO file includes a full update of the base product and all the features. You install the update the same way that you initially installed the product.

      This option is the most efficient, because there is only one package to download and installed features are updated automatically.

      Note

      – RICOH Transform features must be downloaded and installed separately.
    - Download the update packages for the base product and each of the features you have installed.

Downloading individual update packages can be faster than downloading the full ISO file, as each package is significantly smaller than the ISO file. However, each package must be downloaded individually. If you have a large number of features to update, the process can take a long time.

You can only install a product update on RICOH ProcessDirector systems at Version 3.6 or higher. If your software is below Version 3.6, use the full product ISO file or contact Software Support.

2. If you have RICOH Transform features installed, log in to the Transform Feature user interface and open the About dialog. Note the transforms that you have installed.
3. If you chose to use the full product ISO file, follow the instructions in chapters 3 and 4 of *Ricoh ProcessDirector: Planning and Installing* for downloading and installing the update.
4. If you chose to install update packages, you must update the base product and all features that are currently installed.
    1. Log in as a user authorized to use Feature Manager.
    2. Click **Administration**.
    3. In the left pane, choose **Utilities** → **Features**

        If you see an error message, you must start Feature Manger manually:

        - Log in to the primary computer as the default user and open a command prompt. Type: `startaiw -f`

        To complete the process, clear your browser cache and reload the Feature Manager webpage.
    4. Make a list of all the features that have a version number In the **Installed Version** column.

        The Product Update feature contains the base product, so it must be updated.
5. Back up the system. Type these commands.

    ```
    zip -r aiwlib.zip /aiw/aiw1/lib/*
    zip -r ext-xml.zip /opt/infoprint/ippd/extensions/**/extension.xml
    ```

    Note

    - This procedure stops and starts your RICOH ProcessDirector server. Do this procedure at a scheduled maintenance time.
6. Make sure that Security Enabled Linux (SELinux) or Federal Information Processing Standard (FIPS) are not enabled.
    - To see whether Security Enhanced Linux (SELinux) is enabled on your system, open a command prompt and type:
      `getenforce`

      If the command returns `Enforcing`, open `/etc/selinux/config` in a text editor and find the `SELINUX` line. To disable SELinux, change that line to: `SELINUX=disabled`
    - To see whether Federal Information Processing Standard (FIPS) is enabled on your system, open a command prompt and type:

      ```
      fips-mode-setup --check
      ```

      If the command returns `FIPS mode is enabled`, disable it by typing:

```
fips-mode-setup --disable
```

7. Disable your antivirus software.

   During the install process, various archive files (ZIP, JAR, and EPK files) are copied to your server. Then, the contents are extracted and moved to the correct directories on your system. Antivirus tools usually lock and scan files extracted from archives.

   While the lock and scan process is generally fast, the installation program runs faster. If the installer tries to unpack and move files before the scan is complete, installation errors occur and can be difficult to recover from. Disabling your antivirus software during the install process prevents these types of errors.

8. Verify that these exceptions are configured in your antivirus software.

   If you cannot deactivate your antivirus software entirely, excluding some directories from scans can reduce the possibility of installation errors. In addition, most antivirus software affects the function of databases. The software sometimes quarantines files that databases use, causing operation errors. Setting up these exclusions now prevents those errors after RICOH ProcessDirector is installed.

   Verify the exceptions for these paths:

   - `/aiw/aiw1`
   - `/opt/infoprint/ippd`
   - `/var/psf`
   - If you plan to use DB2 installed with RICOH ProcessDirector as your database:
     - `/home/aiwinst/sqllib`
   - If you plan to use PostgreSQL installed in a Docker or Podman container as your database:
     - /var/lib
   - If you use a custom feature that integrates BCC software running on a Windows application server with RICOH ProcessDirector, exclude this path on the Windows system that the BCC software runs on:
     - `C:\BCC`

Downloading and installing update packages

Product updates for RICOH ProcessDirector can be downloaded from the Ricoh Software webpage.

Note

- This procedure assumes that you are not using the primary computer to access an external webpage and download the update files.
  If you download the files directly to the primary computer, download the files to this directory:

  ```
  /opt/infoprint/ippd/available
  ```

To download and install the update packages:

1. In a web browser, open this page: https://dl.ricohsoftware.com/.

2. Click **Software Downloads**, enter your Entitlement ID, and click **Submit**.
3. **Optional:** If you have RICOH Transform features to update, find and click the names of those transforms to download them.
4. Click **View Related Files** on the right side of the page.
5. Click the title of each package that you want to download, starting with **Ricoh ProcessDirector: Product Update Feature**.

   Use the list of installed features that you made to determine which other packages to download.
6. After each package downloads, validate its MD5 checksums to the value shown on the webpage. Use this command, substituting the name of the file for *ProductUpdate.epk*:

   ```
   md5sum ProductUpdate.epk
   ```

   If the checksum does not match, download the file again.
7. Log in to the primary server as the aiw1 user.
8. Copy the EPK files into this directory on the primary computer:

   ```
   /opt/infoprint/ippd/available
   ```
9. Install the Product Update feature using Import Package.

   For more information, see: Adding or upgrading a feature using Import Package, p. 155
10. When the installation completes, RICOH ProcessDirector restarts. Use your browser to log in to the user interface. If an error occurs during the installation, contact Ricoh Software Support.
11. If you downloaded other feature packages, use Feature Manager to install them.

Important

- There are packages that contain features updates that are installed only if instructed by Ricoh Software Support. Check with the Ricoh Software Support team before downloading and installing any other packages outside the base product, language packs, and font collections.

7. Starting, stopping, and uninstalling

- **Starting the base product and secondary servers**
- **Starting an application server**
- **Stopping the base product and secondary servers**
- **Stopping an application server**
- **Uninstalling RICOH ProcessDirector**

You can start and stop RICOH ProcessDirector servers. You can also uninstall RICOH ProcessDirector.

Starting the base product and secondary servers

RICOH ProcessDirector base product and secondary servers start automatically when the systems on which they are installed start. However, you might need to start the base product or a secondary server without restarting the entire operating system.

After a system shutdown and restart, all the printers are disabled. If you want all the printers that were enabled before the shutdown to be enabled after the system is restarted, you can change the **Remember enabled status of printers** system property to **Yes**.

To start the base product or remote secondary servers:

1. Log in to the system as the RICOH ProcessDirector system user (**aiw1** is the default).
2. Access the command line.
3. Enter this command:

   ```
   startaiw
   ```

4. If the **startaiw** command fails, enter these commands:

   ```
   stopaiw
   startaiw
   ```

On the primary computer, the command starts the primary server, local secondary servers, the user interface program, and the information center. On a secondary computer, the secondary server starts and connects to the primary server.

Deactivating the autostart script on Linux

If you do not want the RICOH ProcessDirector base product or secondary servers to start automatically when you restart the system on which they are installed, you can deactivate the autostart script. You remove two symbolic links from the script to deactivate it. RICOH ProcessDirector can be running when you deactivate the script.

To deactivate the autostart script:

1. Log in as the root user.
2. Access the command line.
3. Enter this command:

   ```
   systemctl disable aiwserv.service
   ```

Activating the autostart script on Linux

If you previously deactivated the autostart script on your system, you can reactivate it. Reactivating the autostart script causes the RICOH ProcessDirector base product or secondary server to start automatically when the system starts. You add two symbolic links from the script to activate it.

Note

- When you install RICOH ProcessDirector, the default is that it activates the autostart script. If you have not deactivated it, you do not have to do this procedure.

To activate the autostart script:

1. Log in as the root user.
2. Access the command line.
3. Enter this command:

```
systemctl enable aiwserv.service
```

Starting and stopping the base product when the database is on a different computer

The RICOH ProcessDirector primary server and its database client must always be able to connect to the database server. If the database server is installed on a different computer and you reboot that computer, you must stop and restart RICOH ProcessDirector.

Stop and restart RICOH ProcessDirector and the database server in this order:

1. Log in to the Linux system as the RICOH ProcessDirector system user (**aiw1** is the default).
2. Enter this command to stop RICOH ProcessDirector:

```
stopaiw
```

3. Reboot the computer where the database server is installed.

   The database server stops automatically.
4. Log in to the database server computer as the RICOH ProcessDirector database instance user.

   The default user ID is aiwinst.
5. Start the database server:
6. On the RICOH ProcessDirector primary computer, log in as the RICOH ProcessDirector system user again and enter this command to restart RICOH ProcessDirector:

```
startaiw
```

If the database server stops unexpectedly, stop RICOH ProcessDirector, then continue with the step after stopping RICOH ProcessDirector, described above.

Starting an application server

To run processing steps on an application server, the application server must be running. If the application server is not configured as a service, you must start the application server manually.

To manually start an application server:

1. Log in to the Windows system as the user that the application server runs under.
2. Start the application server. Use the **Start application server** link in the RICOH ProcessDirector start menu folder.

Stopping the base product and secondary servers

When you stop the RICOH ProcessDirector base product or a remote secondary server, you can stop the system with or without waiting for job-processing steps to complete. If you have the AFP Support feature installed, you can also choose whether to stop processes that were started by the RICOH ProcessDirector printer driver component, by Download for z/OS, or by AFP Download Plus.

After a system shutdown and restart, all the printers are disabled. If you want all the printers that were enabled before the shutdown to be enabled after the system is restarted, you can change the **Remember enabled status of printers** system property to **Yes**.

To stop the base product or a remote secondary server:

1. Log in to the system as the RICOH ProcessDirector system user (**aiw1** is the default).
2. Access the command line.
3. **Optional:** To minimize the impact of shutting down the system on processes that are currently running, disable the input devices associated with the server.
4. Enter one of these commands:

   - To stop the system immediately without waiting for steps to complete:
     ```
     stopaiw
     ```
     Any steps that were in a processing state will move to an error state when you restart the system.
   - To stop the system after the currently processing steps are complete:
     ```
     stopaiw -q
     ```
   - To stop the system and all processes that were started by the printer driver component, by Download for z/OS, or by AFP Download Plus:
     ```
     stopaiw -t
     ```
     This option is only available on a primary computer with the AFP Support feature installed.

   On the primary computer, the command shuts down the primary server, local secondary servers, the user interface program, and the information center. If a remote secondary server is connected to the primary server when the primary server stops, the secondary server tries to reestablish the connection every 30 seconds, until it can connect or until the remote secondary server stops.

   On a secondary computer, the command disconnects the remote secondary server from the primary server and stops the secondary server.
5. **Optional:** While the stopaiw command does shut down RICOH ProcessDirector, in some situations, additional steps are required to ensure that all processing ends. These situations include:

- Applying updates to the operating system.
- Reworking the file system that contains /aiw. For example, moving the file system to a new storage unit.
- Running a full storage backup. For example, shutting everything down so that data transfers do not occur during the backup.

To stop all other processing related to RICOH ProcessDirector:

1. If you run in a PostgreSQL configuration, run the following command: `systemctl stop postgresql`
2. The steps that follow require root authority. Type: `su - root` and press **Enter**. When prompted, enter the password for the **root** user and press **Enter**.
3. If you run in a DB2 configuration, type: `/opt/infoprint/ippd/db/bin/db2fmcu -d`
4. If you run in a DB2 configuration, type: `ps -ef | grep db2` to display all db2 processes that are still running. To end each db2 process, type:

   `kill` followed by each of the process IDs listed in the results of the **grep** command. For example, your results might look similar to:

```
dasusr1  14729     1  0 Aug24 ?   00:00:01 /home/dasusr1/das/
                                             adm/db2dasrrm
root     18266     1  0 Aug24 ?   00:15:08 /opt/infoprint/ippd/db/
                                             bin/db2fmcd
dasusr1  18342     1  0 Aug24 ?   00:00:23 /opt/infoprint/ippd/db/das/
                                             bin/db2fmd -i dasusr1 -m /
                                             opt/infoprint/ippd/db/das/
                                             lib/libdb2dasgcf.so.1
root     21049     1  0 Sep01 ?   00:00:00 db2wdog 0 [aiwinst]
aiwinst  21051 21049  0 Sep01 ?   01:13:01 db2sysc 0
root     21059 21049  0 Sep01 ?   00:00:00 db2ckpwd 0
aiwinst  21061 21049  0 Sep01 ?   00:00:00 db2vend (PD Vendor
                                             Process - 1) 0
```

   In these results, the process IDs are listed in the second column. To end the first process in the list, type: `kill 14729` and press **Enter**.
5. Type: `ps -ef | grep psfapid` to display all psfapid processes. To end each psfapid process, type:

   `kill` followed by each of the process IDs listed in the results of the **grep** command.
6. Type: `ps -ef | grep aiw1` to display all aiw1 processes. To end each aiw1 process, type:

   `kill` followed by each of the process IDs listed in the results of the **grep** command.

Stopping an application server

You can stop an application server through the Windows Start menu. Stopping the server prevents RICOH ProcessDirector from accessing any external programs on the Windows system.

To stop an application server:

1. Log in to the Windows system as the user that the application server runs under.
2. Stop the application server. Use the **Stop application server** link in the RICOH ProcessDirector start menu folder.

Uninstalling RICOH ProcessDirector

You might need to uninstall RICOH ProcessDirector (for example, if you need to restore to a previous level).

Uninstalling the base product, features, and extensions

You can use one command to uninstall the base product and all features and extensions (except Secondary Server features) at the same time. You cannot uninstall features or extensions individually.

To uninstall the base product and all features and extensions:

1. Log in to the primary computer as the root user.
2. Enter one of these commands:

   - If you are running the primary computer from a graphical user interface such as X Windows:
     `/opt/infoprint/ippd/_uninstall/ippd/removeIPPD -i gui`
   - If you are running the primary computer from a terminal window:
     `/opt/infoprint/ippd/_uninstall/ippd/removeIPPD -i console`

   Note

   - If you see an error that the Java virtual machine cannot be found, enter this command, then try to run the command again:
     `. ~aiw1/.profile`

   RICOH ProcessDirector starts the program that guides you through the uninstallation process. Follow the instructions in the program.
3. Click **Uninstall** to start the uninstallation process.

   You can choose to remove the system user (aiw1), the system group (aiwgrp1), and the DB2 database user (aiwclnt) and group (aiwdbgrp).
   When the uninstallation is complete, you either see a message that the uninstallation was successful or a message that there were errors and the location of the error log file.
4. Click **Done**.
5. The uninstallation program leaves behind part of the directory structure. To completely remove all files that the RICOH ProcessDirector installation program installed, remove any file systems that were created as part of the installation.

   File systems to remove include:

   - `/aiw/aiw1/db2`
   - `/aiw/aiw1/db2_logs`
   - `/aiw`
   - `/opt/infoprint/ippd`
   - `/var/psf/segments`
   - `/var/psf`
   - `/var/aiw`

Important

- Do not remove the `/opt/infoprint` directory if RICOH InfoPrint XT or RICOH Transform Feature are installed on the server you are using.

6. To remove the RICOH ProcessDirector databases and DB2 instance from a DB2 server on a different computer:
   1. Log in to that computer as the DB2 instance owner of the RICOH ProcessDirector database.
   2. Insert the RICOH ProcessDirector base product DVD in the drive.
   3. Go to the `/scripts` directory on the RICOH ProcessDirector base product DVD.
   4. Enter this command to run the uninstall script:

      ```
      ./remoteDB2uninstall.sh
      ```

Note

- `remoteDB2uninstall.sh` lets you choose whether to remove the RICOH ProcessDirector user IDs or user groups created by `setupRemoteDB2.sh`. It does not remove RICOH ProcessDirector user IDs or user groups that you created manually.

7. To remove the RICOH ProcessDirector databases from a PostgreSQL database installed on a separate server,
   1. Switch to postgres user from the root user: `su - postgres_user`

      Replace *postgres_user* with the user ID that RICOH ProcessDirector uses to log in to PostgreSQL. The default is **postgres**.
   2. Enter this command to terminate connections and drop the database:

      `/usr/pgsql-version/bin/dropdb -force -p <port> -U postgres_user AIWDB`

      Replace *version* with the installed version of PostgreSQL.
   3. Enter this command to stop PostgreSQL:

      `/usr/pgsql-version/bin/pg_ctl stop -o "-p <port>" -U postgres_user -D cluster_directory`

      Replace *cluster_directory* with the path where the database was initialized.
   4. Enter this command to remove the cluster directory:

      `rm -rf cluster_directory`

8. To remove the Docker or Podman container when you are using a PostgreSQL database installed with RICOH ProcessDirector, you must first stop the Docker or Podman container and then remove it.
   1. Enter this command to stop the container:

      `docker stop container-name`

      `podman stop container-name`
   2. Enter this command to remove the container:

      `docker rm container-name`

      `podman rm container-name`
   3. Enter this command if you also want to remove the associated volumes:

      `docker volume prune`

`podman volume prune`

This command deletes all persistent data previously associated with containers that have now been removed.

The *container-name* is `rpd-aiwdb-postgres` for the primary database and `rpd-reports-postgres` for the Reports database.

9. Restart the primary computer.

Uninstalling Transform Features

If you want to uninstall Transform Features, you need to uninstall it from the server and the BladeCenter, as appropriate.

Uninstalling Transform Features from a server

This section describes the procedure for uninstalling Transform Features from a server.

To uninstall Transform Features from a server:

1. For Linux, run this command from this path: `/opt/infoprint/itm/_uninst/uninstall_itm.sh`, and for Windows, specify the uninstall command from this path: *`install_path`*`\_uninst\uninstall.exe`
2. To uninstall only a specific transform, for Linux, run this this command:
   `/opt/infoprint/itm/_inst/feature/<transform_id>/_uninst/uninstall_tf_<transform_id>.sh` where *<transform_id>* is the transform name.
3. You see the **Welcome to the uninstall program** page.
4. Click **Next**.
   You see the summary page stating that the installer will uninstall Transform Features.
5. Click **Uninstall**.
   You see the page stating that Transform Features has successfully uninstalled.
6. Click **Finish** to exit the wizard.

On Windows operating systems, Transform Features can also be uninstalled from the Control Panel.

Uninstalling Transform Features from a Linux server from the command line

This section describes how to uninstall Transform Features from the command line.

To uninstall Transform Features from a Linux server:

1. Log in as a root (administrator) user.
2. For a console uninstall, enter this command:
   `/opt/infoprint/itm/_uninst/uninstall_itm.sh`
3. To uninstall only a specific transform, enter this command:
   `/opt/infoprint/itm/_inst/feature/<transform_id>/_uninst/uninstall_tf_<transform_id>.sh` where *<transform_id>* is the transform name.

Uninstalling Transform Features from a Windows server from the command line

This section describes how to uninstall Transform Features from the command line.

To uninstall Transform Features from a Windows server:

1. Log in as an administrator user.
2. For a console uninstall, enter this command:
   *install_path*_uninst\uninstall.exe -i console
3. For a silent uninstall (does not produce any output and does not require user input), enter this command:
   *install_path*_uninst\uninstall.exe -i silent

Uninstalling Secondary Server features

To uninstall Linux secondary servers:

1. Log in as the root user.
2. Enter this command:

```
/opt/infoprint/ippd/_uninstall/ippds/removeIPPDs
```

   RICOH ProcessDirector starts the installation program that guides you through the uninstallation process. Follow the instructions in the installer.
3. Choose whether to remove any RICOH ProcessDirector users and groups.
4. Click **Uninstall** to start the uninstallation process.
5. When the uninstallation is complete, you see either a message that the uninstallation was successful or a message that there were errors and the location of the error log file.
6. Click **Done**.
7. To completely remove all files installed by RICOH ProcessDirector, delete these file systems and directories:

   ```
   /aiw
   /var/psf/segments
   /var/psf
   /var/aiw
   ```

Removing the application server as a service

To remove the application server as a service without uninstalling the application server:

1. Log in to the Windows computer that the application server is installed on.
2. In a Windows command prompt, go to `C:\Program Files\Ricoh\ProcessDirector\bin`.
3. Type: `aiwsvc uninstall` and press Enter.
4. Open the Windows Services window, and look for the **Ricoh Process Director Application Server** service. If the **Ricoh Process Director Application Server** is no longer there, the application service has been removed.

5. Turn off the automatic drive mounting function that the application service used:
    1. In Windows Explorer, go to `C:\Program Files\Ricoh\ProcessDirector\logs`.
    2. Remove or disable the `mountaiwdata.bat` file. If you plan to reactivate the application server service in the future, disabling the file is a good option. You can disable the file by commenting out the file contents or by renaming it to something similar to mountaiwdata.bat.bak.
6. **Optional:** Start the application server. Use the **Start application server** link in the RICOH ProcessDirector start menu folder.

Uninstalling an application server

To uninstall an application server from a Windows computer:

1. Log in to the application server as an administrator.
2. If the application server is installed on a Windows 11 Pro computer, before uninstalling the application server, you must add an environment variable to run the uninstall script. To add the environment variable:
    1. Click the Windows Start button and type **Control Panel**.
    2. Click **Control Panel**.
    3. Go to **System** and click **Advanced system settings**.
    4. Click **Environment Variables** in the **System Properties** dialog.
    5. Click **New** in the System variables section.
    6. Enter `JAVA_TOOL_OPTIONS` in the **Variable name** field.
    7. Enter `"-Dos.name=Windows Server 2019"` in the **Variable value** field.
    8. Click **OK**.
3. Go to the directory where you installed RICOH ProcessDirector. If you accepted the default directory during installation, go to `C:\Program Files\Ricoh\ProcessDirector`.
4. Go to `_uninstall\ippds` and run `removeIPPDs.exe`.
5. Click **Uninstall** to start the uninstallation process.
   When the uninstallation is complete, you either see a message that the uninstallation was successful or a message that there were errors and the location of the error log file.
6. Click **Done**.

8. Installation planning checklist

This checklist contains tasks that can help you plan for your RICOH ProcessDirector installation.

Installation planning checklist

Check each item as you complete the task.

	Task	Notes
	Determine your system configuration (see System configurations, p. 33 for an example of a configuration). Keep in mind your requirements for file sharing (such as Shark, FAST, RAID, or NFS) and failure recovery.	
	Estimate your current and future storage and backup needs. Consider production volumes, print resource management, and failure recovery.	
	Make sure that you have adequate network capacity.	
	Determine which printers you want to use with RICOH ProcessDirector. When you define printers to RICOH ProcessDirector, you need this information: • Printer name • TCP/IP port number • TCP/IP address or host name • SNMP community name, if you want to use SNMP to monitor the printer You should also decide on the language for the printer driver component to use when it returns messages to RICOH ProcessDirector.	
	Obtain the required hardware for your configuration that meets your storage and backup requirements See Hardware requirements, p. 36.	
	Decide whether to set up your file system as partitions or as mounted file systems from other storage units. See Planning for file systems, p. 44.	
	Decide which database configuration to use with RICOH ProcessDirector: • PostgreSQL supplied with RICOH ProcessDirector • PostgreSQL installed locally or remotely. • IBM DB2 supplied with RICOH ProcessDirector	

	Task	Notes
	• Your own copy of DB2	
	If you use your own copy of DB2: • Decide whether to install DB2 on the primary computer or on a different computer. • If you install DB2 on a different computer, determine the directory for RICOH ProcessDirector information.	
	If you use your own copy of PostgreSQL: • Decide whether to install the PostgreSQL database on the primary computer or on a different computer. • If you have already installed a PostgreSQL database on a different computer, determine the directory for the database cluster and the PostgreSQL user name and password used by RICOH ProcessDirector. • If you are using PostgreSQL on a different server, you must install either PostgreSQL or PostgreSQL command line tools on the primary server.	
	Determine what values to use for the RICOH ProcessDirector group on this computer. The default name for the group is **aiwgrp1** and the default GID is **32458**. You can change either value. Keep in mind that the GID must be the same across all primary and secondary computers; therefore, if you choose your own, make sure the value is large enough to avoid conflicts. All operating system user and group names must have 1-8 characters because of a database restriction. You cannot create a user ID that includes international characters (such as á, É, î, ñ, ô, ß) or double-byte characters. This restriction is only applicable when you use DB2 as your database. See Creating system groups and users, p. 50 for additional information about creating this group and other required groups.	
	Determine what values to use for the RICOH ProcessDirector system user. The default name for the system user is **aiw1** and the default UID is **32457**. You can change either value. Keep in mind that the UID must be the same across the primary and all secondary computers that connect to it; therefore, if you choose your own, make sure the value is large enough to avoid conflicts. All operating system user and group names must have	

	Task	Notes
	1-8 characters because of a database restriction. You cannot create a user ID that includes international characters (such as á, É, î, ñ, ô, ß) or double-byte characters. This restriction is only applicable when you use DB2 as your database. If you create directories for RICOH ProcessDirector input devices to use, this UID must be a member of the group that owns these directories. See Creating system groups and users, p. 50 for additional information about creating this user and other required users.	
	If you choose to use DB2, determine the user IDs and groups for DB2 to use. Default names are provided, but you can change them to meet your requirements. All operating system user and group names must have 1-8 characters because of a database restriction. You cannot create a user ID that includes international characters (such as á, É, î, ñ, ô, ß) or double-byte characters. This restriction is only applicable when you use DB2 as your database. • In any DB2 configuration, you need an Instance group and a Database fenced group. The default names for those groups are **aiwdbgrp** and **aiwdbfgp**. • In any DB2 configuration, you need an Instance user and a Fenced user. The default names for the users are **aiwinst** and **aiwdbfid**. • If you install a DB2 client on the same computer as the base product and a DB2 server on a different computer, you need a Database client user. The default name for this user is **aiwclnt**. You should never log in as any of these users, but you might need to recognize them for recordkeeping and security.	
	Establish a host name and IP address for each server, including the DB2 or PostgreSQL server on a different computer if you use one. RICOH ProcessDirector supports IPv4 addresses.	
	Determine the password to use when you log in to the RICOH ProcessDirector user interface with the `aiw` user name. The first time you log in to RICOH ProcessDirector with the default user name of `aiw` and the default password of `aiw`, you are	

	Task	Notes
	prompted to change the password. The password must be 8 to 32 alphanumeric characters.	
	If you use a DB2 server on a different computer, determine the password for the RICOH ProcessDirector instance user.	
	Determine how many RICOH ProcessDirector user IDs you want to create and which authority you want each ID to have, such as monitor, operator, supervisor, or administrator. Determine what other authority groups you want to create and what actions they can do.	
	If you want to use LDAP or Active Directory user IDs and passwords to authenticate RICOH ProcessDirector users, ask your LDAP administrator to create LDAP groups for each level of access you want to set up as a RICOH ProcessDirector security group.	
	Consider which job submission methods you are going to use to send jobs to RICOH ProcessDirector: • You can copy or FTP files into hot folders, send files using the LPD protocol, or use the **pdpr** command. • If you have the AFP Support feature, you can use Download for z/OS or AFP Download Plus. • You can upload files manually using the **Submit Jobs** portlet on the **Main** page. The job submission method you use depends on the system you are sending the jobs from. For more information, see Job submission, p. 82.	
	Determine which resources must be available for RICOH ProcessDirector to use (such as standard and non-standard AFP fonts). Then, consider how you want to share your resources so they are available to RICOH ProcessDirector (for example, NFS or Samba). If you store your resources in the `/aiw/aiw1/resources` directory on your primary computer, all the RICOH ProcessDirector components, including any secondary servers, can find them with no additional configuration. RICOH ProcessDirector does not make any changes to that directory during updates, so you do not have to reload the resources when you install an update.	

	Task	Notes
	Install the required software for your configuration (see Installing required software, p. 55).	
	Install any optional software, such as Download for z/OS, AFP Download Plus, or InfoPrint Transform Manager (see Planning for optional software, p. 82).	
	Change the language for the computer, if required: **SLES** In YaST: • Click **System** → **Choose Language**. • Click **System** → **Select Keyboard Layout**. In the KDE Control Center, click **Regional & Accessibility** → **Country/Region & Language**. **Red Hat or Rocky Linux** To check which locale is currently in use, type: `cat /etc/locale.conf` To check which locales are installed on the system, type: `localectl list-locales` To change the locale that is in use, type: `localectl set-locale LANG=`*`locale name`* Replace *`locale name`* with the name of one of the locales that is installed on the system. **Windows** Click **Control Panel** → **Regional and Language Options**.	RICOH ProcessDirector supports these languages and locales: • Brazilian Portuguese (pt_BR) • English (en_US) • French (fr_FR) • German (de_DE) • Italian (it_IT) • Japanese (ja_JP) • Spanish (es_ES)
	Security Enhanced Linux (SELinux) must be disabled during the install process for RICOH ProcessDirector. To check the status of SELinux, type: `getenforce`	You can enable it again after the install is complete.
	Federal Information Processing Standard (FIPS) must be disabled during the install process for RICOH ProcessDirector. To check the status of FIPS, type: `fips-mode-setup --check`	You can enable it again after the install is complete.

9. Accessibility

Ricoh strives to provide products with usable access for everyone, regardless of age or ability.

For more information about the commitment that we have made to accessibility, refer to the Accessibility page on the Ricoh website.

Accessibility features

Accessibility features help users who have disabilities, such as restricted mobility or limited vision, use information technology products successfully.

The major accessibility features in this product let you:

- Use screen readers, screen magnifiers, and other assistive technologies.
- Use a keyboard instead of a mouse.
- Change attributes such as volume, color, contrast, and font size.

In addition, the information center and the publications for the product are in an accessible format.

To enable assistive technology support in the installer, specify the console option at the end of the setup command. For example, to enable assistive technology on Linux computers, enter:

```
./setup -console
```

Keyboard navigation

This product uses standard Microsoft Windows navigation keys.

Important

- You cannot use the Workflow tab, the AFP Indexer mode of RICOH Visual Workbench (which is part of the AFP Support feature), the AFP Editor feature, or the Whitespace Manager feature with the keyboard alone. They require a mouse.

RICOH ProcessDirector user interface shortcut keys

When the Jobs table on the Main page or a table on the Administration page has focus, you can use these shortcut keys:

User interface shortcut keys

Description	Ctrl + key
Select all objects in the table.	a
Open the field help for the currently selected property.	F1

When viewing a job in a workflow, you can use these shortcut keys:

View job in workflow shortcut keys

Description	Ctrl + key
Zoom in.	+
Zoom out.	-
Return to the default zoom level.	0

RICOH ProcessDirector workflow shortcut keys

On the Workflow Editor, you can use these shortcut keys:

Workflow shortcut keys

Description	Ctrl + key
Save the workflow.	Ctrl + s
Undo a previous action, including changes made on a step or connector property notebook.	Ctrl + z
Reverse an Undo action, including changes made on a step or connector property notebook.	Ctrl + y or Ctrl + Shift + z
Show or hide the side panel.	Ctrl + e
Show or hide the **Map**.	Ctrl + m
Zoom in.	Ctrl + +
Zoom out.	Ctrl + -
Reset the zoom to the default value.	Ctrl + 0
Reset the default size and location of the Map window.	Ctrl + d
Copy one or more steps. Steps must be selected first.	Ctrl + c
Delete one or more steps. Steps must be selected first.	Delete

GLOSSARY

This glossary defines technical terms and abbreviations used in RICOH ProcessDirector.

access control

In computer security, the methods and facilities used to ensure that a computer system and the data, system software, and application programs stored in it can be accessed only by authorized users in authorized ways.

Advanced Function Presentation (AFP)

A set of licensed programs, together with user applications, that use the all-points-addressable concept to print data on a wide variety of printers or display data on a variety of display devices. AFP also includes creating, formatting, archiving, retrieving, viewing, and distributing information.

AFP

See Advanced Function Presentation, .

client

In a distributed file system environment, a system that is dependent on a server to provide it with programs or access to programs.

client/server

In communications, the model of interaction in distributed data processing in which a program at one site sends a request to a program at another site and awaits a response. The requesting program is called a client; the answering program is called a server.

command

A request from a terminal or a specification in a batch-processing print file for the performance of an operation or the running of a particular program.

compatibility fonts

A group of AFP fonts that emulate the uniformly spaced and fixed-pitch fonts used with line printers. Compatibility fonts include 240-pel and 300-pel fonts.

File Transfer Protocol (FTP)

In the Internet suite of protocols, an application layer protocol that uses TCP and Telnet services to transfer bulk-data files between machines or hosts.

GIF

Graphics interchange format for images.

hostname

The network name for a print server or transform server. The host name is the fully qualified domain name or a specific subname of a fully qualified domain name. For example, if printserver1.boulder.ibm.com is the fully qualified domain name, either printserver1.boulder.ibm.com or printserver1 can be the host name. See also IP address, .

hot folder

A directory that receives input files that are submitted to RICOH ProcessDirector.

InfoPrint Manager for AIX

A print server that handles the scheduling, archiving, retrieving, and assembly of a print job and its related resource files.

IP address

In the Internet suite of protocols, the 32-bit address of a print server or transform server, expressed in dotted decimal notation. For example: 9.99.9.143. See also host name, .

ISO image

An image of an optical disc based on an International Organization for Standardization file system standard. A file containing an ISO image can be burned to a CD or DVD or mounted in an operating system as a virtual disc.

JPEG

Joint Photographic Experts Group image format.

Linux

An open source implementation of the UNIX system.

line printer daemon (LPD)

The receiving portion, or target, of a file transfer that receives the spooled file that was sent and places the file on a local output queue.

mount

To make a file system accessible.

OpenType font

An extension of the TrueType font format that adds support for PostScript outlines and more support for international character sets and advanced typographic control.

outline font

A font whose graphic character shapes are defined by mathematical equations rather than by raster patterns.

PDF

See Portable Document Format, .

Portable Document Format (PDF)

A universal file format that preserves the fonts, images, graphics, and layout of any source document so it can be viewed and printed on a variety of platforms.

PostScript (PS)

A page description language with graphics capabilities that was developed by Adobe Systems, Incorporated.

primary computer

A computer on which the RICOH ProcessDirector base product is installed and on which the primary server runs.

primary server

The component of the RICOH ProcessDirector base product that contains the PSF print driver and the RICOH ProcessDirector version of DB2. It manages all aspects of job processing; controls system settings; maintains a file system shared between all primary and application/secondary

servers; and processes each job through a series of steps, some of which can call other programs to do special processing.

print server

A computer to which one or more printers are connected or the process that manages those printers.

PS

See PostScript, .

raster font

A font in which the characters are defined directly by the raster bitmap.

root

The user name for the system user with the most authority.

secondary computer

A computer on which a RICOH ProcessDirector Secondary Server feature is installed and on which a secondary server runs.

secondary server

A RICOH ProcessDirector server that provides additional processing power and can run on the primary computer or on separate computers (secondary computers).

server

On a network, the computer that contains the data or provides the facilities to be accessed by other computers on the network.

spool

The system function of putting files or jobs into disk storage for later processing or printing.

transform server

The process that manages data and image transforms.

TIFF

Tagged image file format.

TrueType font

A font format based on scalable outline technology in which the graphic character shapes are based on quadratic curves. The font is described with a set of tables contained in a TrueType font file.

Web browser

A client program that initiates requests to a Web server and displays the information that the server returns.

Web server

The program that is capable of servicing Hypertext Transfer Protocol (HTTP) requests for display in a Web browser.

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EN US EN GB EN AU 6/2025 G550-1042-46