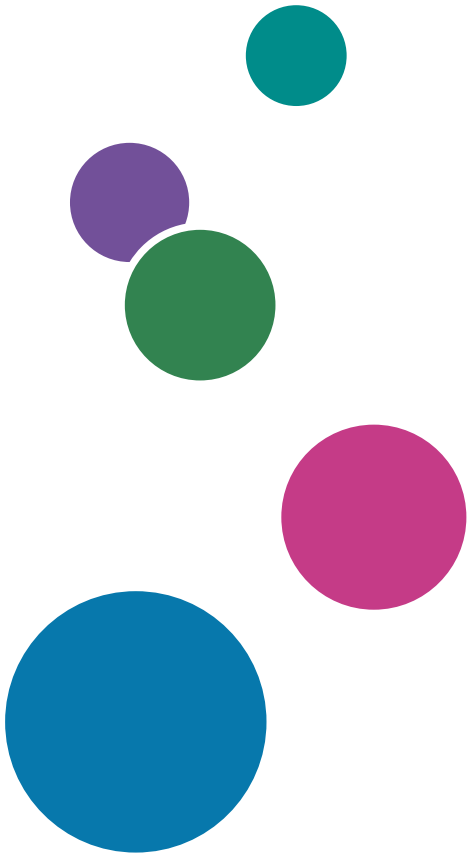
RICOH

RICOH ProcessDirector™ for Linux

Planning and Installing: Multiple Primary Servers Configuration

Version 3.14.1

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.

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Cautions regarding this guide

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- The contents of this document are subject to change without notice.
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- 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: Multiple Primary Servers Configuration* (this publication)

  This guide explains planning and installation procedures for RICOH ProcessDirector in a multiple primary servers configuration.
- *RICOH ProcessDirector for Linux: Planning and Installing*

  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 how to plan for, install, and start RICOH ProcessDirector in a multiple primary servers configuration:

See *RICOH ProcessDirector for Linux: Planning and Installing: Multiple Primary Servers Configuration*.

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.

Important

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

Note

- 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

AWS

Amazon Web Services

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 10:

  Microsoft Windows 10 Pro

  Microsoft Windows 10 Enterprise

- Windows 11:

  Microsoft Windows 11 Pro

- Windows Server 2019:

  Microsoft Windows Server 2019 Standard

- Windows Server 2022:

  Microsoft Windows Server 2022 Standard

- Windows Server 2025:

  Microsoft Windows Server 2025 Standard

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1. Overview

- **Supported operating systems and database compatibility**
- **System configurations**

In a multiple primary servers environment, two primary servers share the workload and monitor each other.

A multiple primary servers environment provides high availability for RICOH ProcessDirector by distributing system components across five dedicated servers.

Lead primary server

The lead primary server handles processing when the environment starts and it is the primary server that starts first.

Alternate primary server

The alternate primary server monitors the lead primary server and stands ready to take over if needed. When failover occurs, the transition completes within a few minutes, minimizing disruption to your printing operations.

UI server

Hosts the RICOH ProcessDirector interface. The UI server routes requests to whichever primary server is currently active, so users experience no interruption during failover. You can access the administration interface from a supported browser on workstations in your network without installing additional software.

File server

The file server provides shared storage that all servers access through NFS. Job data, configuration files, and system resources reside on the file server, ensuring that both primary servers can access the same information. This shared storage architecture eliminates synchronization delays during failover and ensures that no data is lost when the active primary changes.

Database server

The database server hosts the database using PostgreSQL or IBM DB2. All database requests originate from the active primary server, maintaining data consistency across the environment. Installing the database on a dedicated server isolates database operations from job processing and improves overall system performance.

You can expand a multiple primary servers environment with secondary servers to increase processing capacity. Secondary servers receive work assignments from the lead primary server and continue processing during failover. Application Servers can also participate in a multiple primary servers environment, extending RICOH ProcessDirector functionality to Windows-based applications.

A multiple primary servers environment supports all RICOH ProcessDirector features, including job submission through hot folders and LPD protocol, document tracking in PDF jobs, and AFP Support if purchased. The environment maintains the same web-based user interface and workflow capabilities as a standard installation while adding automatic failover protection.

Supported operating systems and database compatibility

A multiple primary servers environment requires a separately installed database on a dedicated database server. Verify that your operating system and database selections are supported before you begin installation.

The database included with RICOH ProcessDirector is not supported in a multiple primary servers configuration. You must install your own copy of PostgreSQL or IBM DB2 on a dedicated database server.

1. Verify that the operating system you plan to install on the lead primary server, alternate primary server, and secondary servers is listed in the following table.

   Supported operating system and database configurations

Operating system	Supported PostgreSQL configurations	Supported IBM DB2 configurations
Red Hat 9.2 through latest 9.x	Separately installed version	Separately installed IBM DB2
Red Hat 10.0 through latest 10.x	Separately installed version (requires PostgreSQL 16 or higher)	Not supported
Rocky Linux 9.0 through latest 9.x	Separately installed version	Not supported
Rocky Linux 10.0 through latest 10.x	Separately installed version (requires PostgreSQL 16 or higher)	Not supported
SUSE Linux Enterprise Server (SLES) 15.0 SP1 or above for x86_64	Separately installed version	Separately installed IBM DB2
SUSE Linux Enterprise Server (SLES) 16.0 or above for x86_64	Separately installed version (requires PostgreSQL 16 or higher)	Not supported

2. Verify that both the lead primary server and the alternate primary server run the same operating system family (for example, both Red Hat or both SLES).

   The operating system version, release, and service updates must be identical on both primary servers.

3. Select a database for your multiple primary servers environment.

   - **PostgreSQL** — Install your own copy of PostgreSQL on the dedicated database server.
   - **IBM DB2** — Install your own DB2 server on the dedicated database server, and install a DB2 client on the lead primary server, the alternate primary server, and the UI server.

The UI server and the file server do not require a specific operating system version from the table above. Consult your system administrator to select an appropriate Linux distribution for these servers.

System configurations

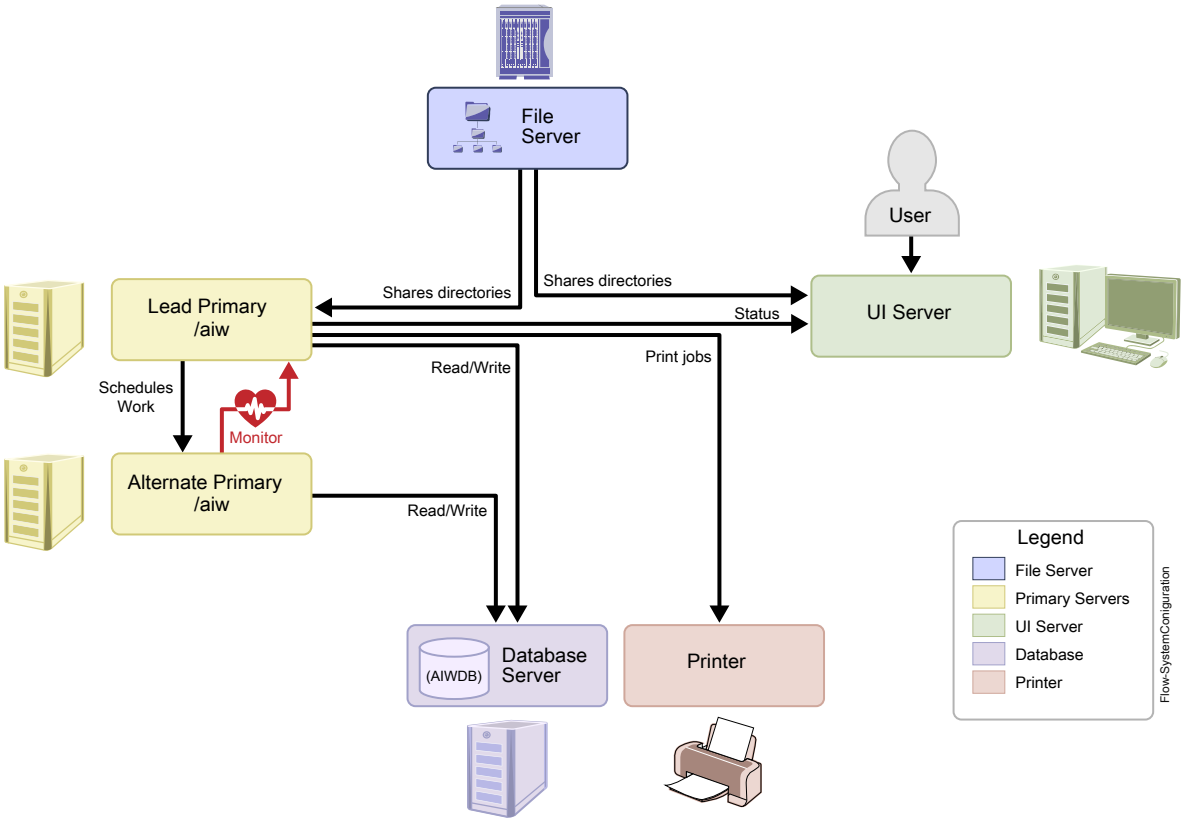
You can install RICOH ProcessDirector with various multiple primary servers configurations. The hardware configurations can include:

- Multiple primary computers with an NFS-mounted file system, a UI server, and a database server (PostgreSQL or DB2)

In this configuration, both primary servers, the lead primary, and the alternate primary server, can be running at the same time.

- Multiple primary computers with an NAS file system, a UI server, and a database server (PostgreSQL or DB2)
  In this configuration, both primary servers, the lead primary, and the alternate primary server, can be running at the same time.

Example of a multiple primary servers configuration



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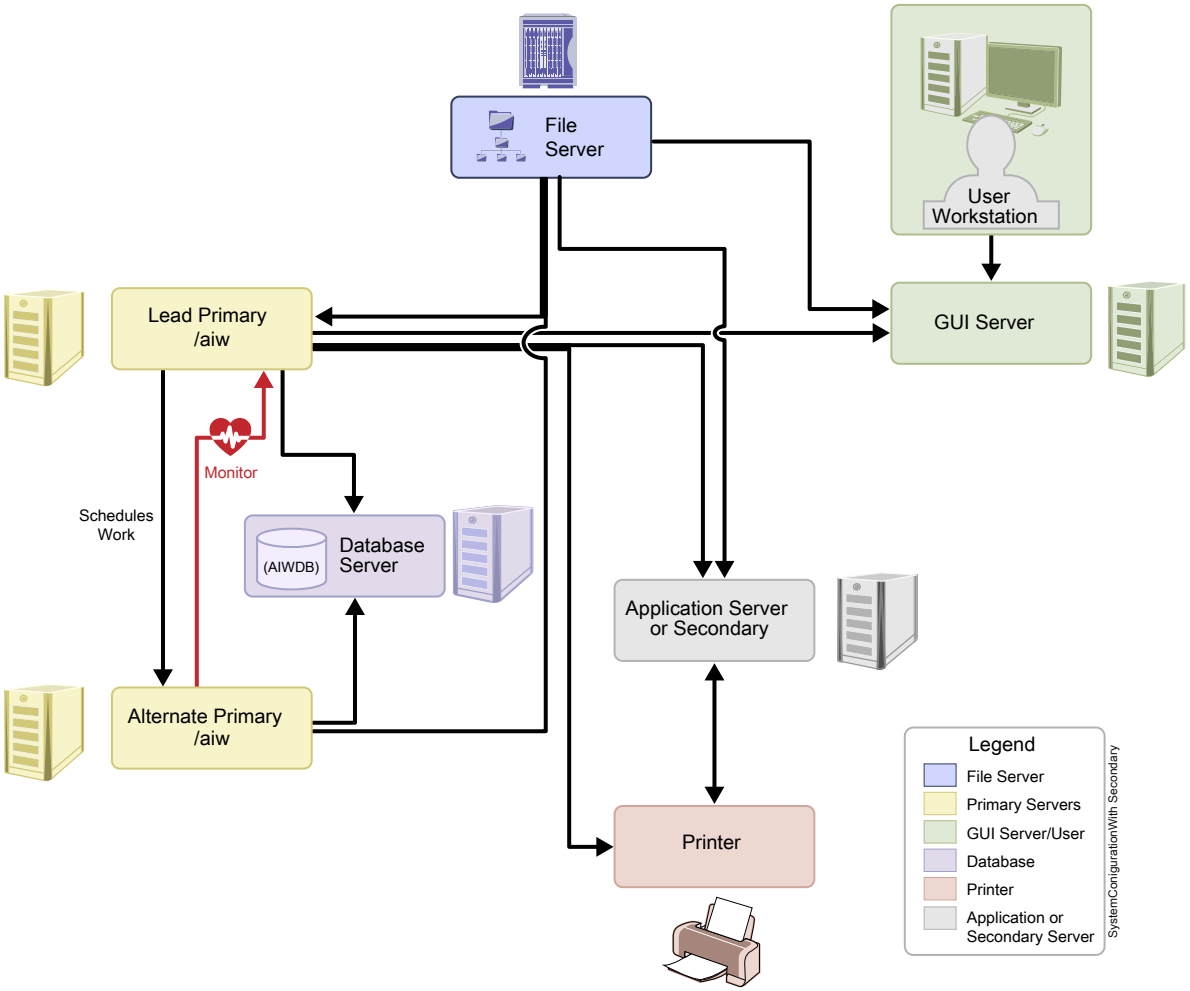
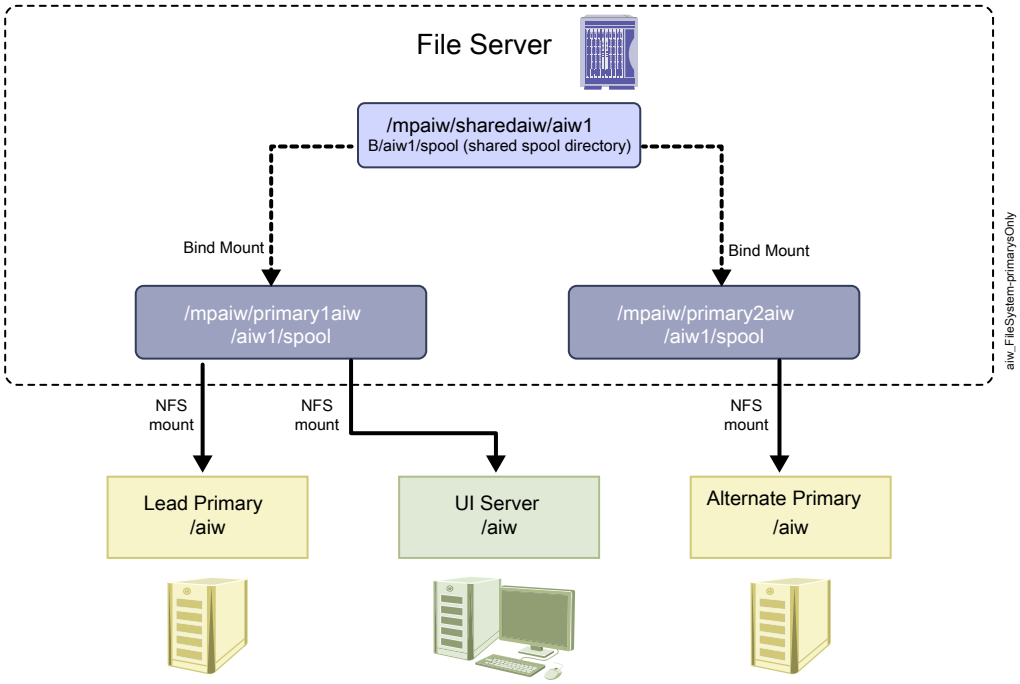
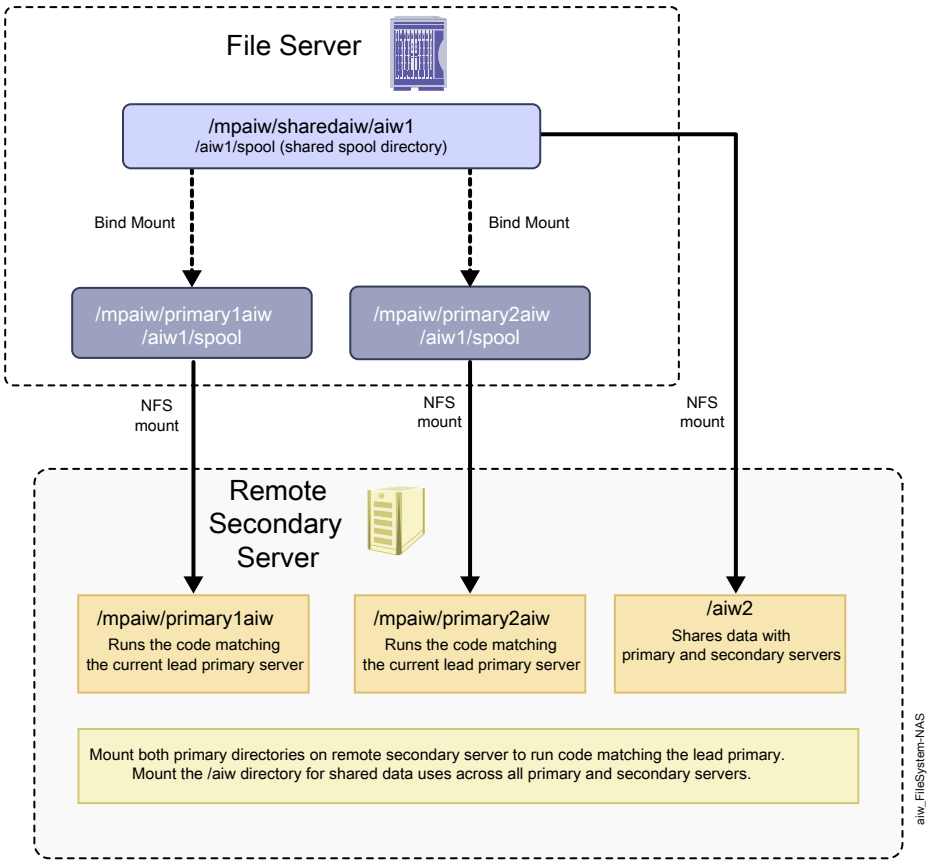
Example of a multiple primary servers configuration and an application server or secondary server



Example of a file system configuration



Example of a file system configuration with a secondary server



2. Planning for installation

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 Task checklist: Planning for a multiple primary servers environment, p. 19 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. 106.

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

- Installing, p. 57

Task checklist: Planning for a multiple primary servers environment

Complete these tasks before you install RICOH ProcessDirector in a multiple primary servers configuration. A multiple primary servers environment distributes components across five dedicated servers.

Prepare the servers in this order:

1. File server
2. Database server
3. Lead primary server
4. Alternate primary server
5. UI server

After you prepare the hardware and operating systems, complete these configuration steps in sequence:

1. Obtain required hardware for all five servers.
2. Install a supported operating system, including required libraries and tools.
3. Verify network connectivity and required ports between all servers.

4. Create system users and groups on all servers that require them.
5. Configure the file server and enable NFS.
6. Install PostgreSQL or IBM DB2 on the database server.
7. Install the PostgreSQL or IBM DB2 client on both primary servers.
8. Install optional software on both primary servers.
9. Configure HTTPS connection support on both primary servers.
10. Run the prerequisite checker on both primary servers and the UI server.
11. Configure SSH authentication between the lead primary, alternate primary, and UI servers.

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. 26 for hardware requirements.
- Secondary Server
  See Secondary computers, p. 25 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.

Lead and alternate primary servers

The lead primary server and the alternate primary server must both meet the minimum hardware requirements for the RICOH ProcessDirector base product and any features you plan to install.

Both the lead primary server and the alternate primary server must run the same operating system family. The operating system version, release, and service updates must be identical on both servers. See Supported operating systems and database compatibility, p. 13.

1. Verify that each primary server meets the minimum hardware requirements.

Minimum hardware requirements for primary servers

Resource	Requirement
Processor	x86 computer capable of running a supported 64-bit Linux operating system
CPU cores	Minimum 4 physical CPU cores
RAM	Minimum 8 GB available RAM
Hard-drive space	200 GB free
Network	Reliable, low-latency connection to the file server (NFS) and the database server

2. If you plan to use one or more document processing features, verify that each primary server has a minimum of 16 GB available RAM.

   Document processing features include:

   - 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.

3. If you plan to install the Advanced Transform feature or RICOH Transform features, verify that each primary server has the additional resources listed in the following table.

Additional hardware requirements for features

Feature	Additional requirement
Advanced Transform	Minimum 1 GB additional free hard-drive space in the `/opt` file system; minimum 2 GB additional free space in the `/aiw/aiw1` file system
RICOH Transform features	Minimum 10 GB additional free hard-drive space; 1 GB additional RAM per CPU core (minimum 4 GB additional)

4. If you run RICOH ProcessDirector on a virtual machine (VM), define the VM guest so that the number of dedicated CPUs exceeds the minimum hardware requirements.

   Do not overcommit physical CPU resources on the virtual host.

UI server

The UI server hosts the RICOH ProcessDirector user interface and routes requests to whichever primary server is currently active.

1. Verify that the UI server meets the minimum hardware requirements.

   Minimum hardware requirements for the UI server

Resource	Requirement
Processor	x86 computer capable of running a supported 64-bit Linux operating system
CPU cores	Minimum 4 physical CPU cores
RAM	Minimum 8 GB available RAM
Hard-drive space	200 GB free
Network	Reliable, low-latency connection to the file server (NFS) and the database server

2. Verify that the UI server is accessible from workstations in your network where users access the RICOH ProcessDirector user interface.

   Plan for sufficient network bandwidth to support concurrent user sessions.

3. Verify that the UI server has the following network connectivity:
   - SSH connectivity to both primary servers (for failover routing)
   - NFS access to the file server (read-only access to configuration and log data)

4. If you run the UI server on a virtual machine (VM), define the VM guest so that the number of dedicated CPUs meets or exceeds the minimum requirements.

   Do not overcommit physical CPU resources on the virtual host.

File server

The file server provides shared NFS storage that all servers in a multiple primary servers environment access. Job data, configuration files, and system resources reside on the file server.

1. Verify that the file server meets the minimum hardware requirements.

Resource	Requirement
Processor	x86 computer capable of running a supported 64-bit Linux operating system
CPU cores	Minimum 4 physical CPU cores
RAM	Minimum 8 GB available RAM

Resource	Requirement
Hard-drive space	200 GB free
Network	Reliable, low-latency connection to the file server (NFS) and the database server

2. Verify that the file server has sufficient storage for the shared directory structure.

File server storage allocation

Directory	Minimum size	Recommended size	Purpose
`/mpaiw/primary1aiw/`	40 GB	80+ GB	Shared directory for the lead primary server
`/mpaiw/primary2aiw/`	40 GB	80+ GB	Shared directory for the alternate primary server
`/mpaiw/sharedaiw/`	30 GB	50+ GB	Shared directory for common resources

3. Evaluate your storage requirements based on the following factors:
   - **Job volume** — Each job creates spool files that remain until the job completes and retention policies remove them.
   - **Retention periods** — Longer retention periods increase storage consumption because historical data accumulates.
   - **Control files and resources** — Transform resources, fonts, and forms occupy space that remains relatively constant.
   - **Log files** — Log files grow continuously. Regular log rotation prevents logs from consuming excessive storage.
4. Verify that the file server meets the following network requirements:
   - A dedicated network interface for NFS traffic, if possible.
   - Gigabit Ethernet (minimum) between the file server and all other servers.
   - Low-latency connectivity (place the file server on the same network segment as the primary servers).
5. Select a storage system that supports online expansion so you can increase storage capacity without taking the system offline.
6. When mounting the shared directory, include the `actimeo=0` option to disable attribute caching and prevent performance issues.
7. If you run the file server on a virtual machine (VM), define the VM guest with dedicated storage I/O resources.

   Do not overcommit storage or network I/O on the virtual host, because NFS performance degrades under resource contention.

Database server

The database server hosts the PostgreSQL or IBM DB2 database for RICOH ProcessDirector. All database requests originate from the active primary server.

1. Verify that the database server meets the minimum hardware requirements.

   Minimum hardware requirements for the database server

Resource	Requirement
Processor	x86 computer capable of running a supported 64-bit Linux operating system
CPU cores	Minimum 4 physical CPU cores
RAM	Minimum 8 GB available RAM
Hard-drive space	200 GB free
Network	Reliable, low-latency connection to the file server (NFS) and the database server

2. Evaluate your storage requirements based on the following factors:

   - **Job volume** — Each job creates database records. High-volume environments generate more database activity.
   - **Document tracking** — If you use document processing features, the database stores records for each document within a job, significantly increasing storage requirements.
   - **Retention periods** — Longer retention periods mean more historical data in the database.
   - **Reports** — If you use reporting features, report data accumulates over time.

   Plan for growth by using a storage system that supports online expansion.

3. Verify that the database server meets the following performance recommendations:

   - Use fast storage (SSD or equivalent) for the database data directory to minimize I/O latency.
   - Allocate sufficient RAM for the database to cache frequently accessed data.
   - Position the database server on the same network segment as the primary servers to minimize query latency.

4. If you run the database server on a virtual machine (VM), define the VM guest so that the number of dedicated CPUs meets or exceeds the minimum requirements.

   Do not overcommit physical CPU resources or memory on the virtual host.

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.
- 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 11 Pro
  - Windows Server 2022 64-bit
  - Windows Server 2025 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. 67.
  - The ISO **Downloads** page on the Ricoh website specifies how much space is required for each package. See Downloading installation files, p. 61 for more details.
- 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.

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.

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

Install prerequisite software on all servers.

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:

- 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 21 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 all Linux servers:

One of these operating systems:

- Red Hat 9.2 through latest 9.X
- Red Hat 10.0 through latest 10.X
- Rocky Linux 9.0 through latest 9.X
- Rocky Linux 10.0 through latest 10.X
- SUSE Linux Enterprise Server (SLES) 15.0 with Service Pack 1 or above for x86_64
- SUSE Linux Enterprise Server (SLES) 16.0 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.

For Windows application servers:

One of these operating systems:

- Windows 11 Pro
- Windows Server 2022 64-bit
- Windows Server 2025 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

Use these instructions to install a supported SLES operating system on all Linux servers.

1. See the SLES documentation to install SUSE Linux Enterprise Server (SLES) 15.0 with Service Pack 1 or above for x86_64 or SUSE Linux Enterprise Server (SLES) 16.0 or above for x86_64.
    1. Make sure that these components are installed:
        - 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 15 primary computer only: The `net-tools-deprecated` package.

- On a SLES 16 primary computer only: The `iproute2` 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 in a multiple primary servers environment, p. 45 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`

Command	Expected result
	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`
To check for the net-tool packages: On SLES 15: `rpm -qa |grep net-tools-deprecated`	Results resemble these examples: • `net-tools-deprecated-2.0+git20170221.47bb4a-3.11.x86_64`
To check for the net-tool packages: On SLES 16: `rpm -qa |grep net-tools-deprecated`	Results resemble these examples: • `iproute2-6.4.0-150600.1.3.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	A response that includes portmap, such as: `program vers proto port service 100000 4 tcp 111 portmapper`

Command	Expected result
utility must be installed and running. `rpcinfo -p` This command only returns results if the rpcbind service is running.	
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 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. 37.

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`, `freetype` and `mkfontscale` libraries
  We also strongly recommend installing `dejavu-sans-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 in a multiple primary servers environment, p. 45 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`
and
`rpm -q mksh`
	Results resemble this example:
	`ksh-20120801-19.el7.x86_64`
	and
	`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-xinit-1.3.4-2.el7.x86_64`
	If fewer than four 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`

Command	Expected result
To verify that the libraries for font support are installed: • `rpm -qa | grep fontconfig` • `rpm -qa | grep freetype` • `rpm -qa | grep -i mkfontscale` • `rpm -qa | grep dejavu`	Results resemble these examples: • `fontconfig-2.13.0-4.3.el7.x86_64` • `freetype-2.8-14.el7.x86_64` • `mkfontscale-1.2.1-3.el9.x86_64` • `dejavu-sans-fonts-2.37-18.el9.noarch` If no results are returned, you must install the missing library or fonts. To install all three, type: `yum install freetype fontconfig mkfontscale 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)

`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`

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 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. 37.

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 2022 64-bit
- Windows Server 2025 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. 97.

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. 97.

2. Make sure that `/etc/exports` on all five servers list the IP addresses and fully qualified host names for all servers in the system.
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 servers

Port	Used by (Client)	Used for (Purpose)
15080	UI server	Access to the RICOH ProcessDirector user interface if not using TLS.
15443	RICOH ProcessDirector UI server	Access to the RICOH ProcessDirector user interface if using TLS.
515	RICOH ProcessDirector primary servers	Required when sending jobs to RICOH ProcessDirector using LPR.
5001-65535	RICOH ProcessDirector primary servers	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 primary 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 ProcessDirector UI 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 UI 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 UI 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 and secondary 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 and secondary server	• Printing to IPDS printers • 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 PostgreSQL database 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)
Your PostgreSQL port (5442 is the default port number)	RICOH ProcessDirector primary server	Communication with PostgreSQL database for RICOH ProcessDirector

4. Verify network connectivity:
   1. To verify that host name resolution is working, log in to all servers and 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 each server in the system.
   3. From all application and secondary computers (if any), ping the lead and alternate primary servers.
   4. From the primary computers, ping all the other servers in the system (secondary, application servers, database server, and UI server).
   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.

Creating system groups and users

RICOH ProcessDirector requires several user groups and IDs on each server in a multiple primary servers environment to operate correctly.

In a multiple primary servers environment, you must create all the required groups and users on each server before you begin installation.

Make sure that the UID and GID values are identical across all servers where a user or group is required. NFS uses numeric IDs for file ownership, so inconsistent values cause permission errors when servers access shared storage. If the default names do not comply with user and group naming rules in your environment, you can choose different names. Create those groups and users according to the descriptions below and enter their names in the installation program when asked.

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

Create these groups on all five servers and any secondary servers in the multiple primary servers environment:

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.

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.

Required users

Create these users on all five servers and any secondary servers in the multiple primary servers environment:

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**.

Create this user on the database server.

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**.

Create this user on the database server.

DB2 database client instance 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**.

This user is required on both primary servers.

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.

Planning for file systems in a multiple primary servers environment

A multiple primary servers environment uses shared NFS storage hosted on a dedicated file server. All servers access this shared storage to ensure data availability during normal operation and failover.

The file server requires sufficient storage capacity to handle the data generated by RICOH ProcessDirector.

Several factors influence storage requirements.

Job volume

Job volume determines how much spool space you need. Each job creates files in the spool directory that remain until the job completes and retention policies remove them. High-volume environments with large jobs require more storage than low-volume environments with small jobs.

Retention periods

Retention periods affect how long completed job data remains on the system. Longer retention periods require more storage because historical data accumulates over time.

Control files

Control files and resources consume storage space that remains relatively constant. Transform resources, fonts, and forms occupy space in the control directory. The size depends on how many resources your workflows require.

Log files

Log files grow continuously as the system operates. Regular log rotation and archival prevent logs from consuming excessive storage, but you should allocate sufficient space for operational logs. Plan for growth by selecting a storage system that supports online expansion. This capability allows you to increase storage capacity without taking the system offline.

File systems for the file server

The file server hosts the shared directory structure that all servers in a multiple primary servers environment access through NFS.

The file server provides centralized storage for spool files, configuration data, control files, and other resources. Each primary server mounts its designated directory from the file server, making sure that data remains accessible during failover.

File system	Recommended size	Minimum size	Description
/mpaiw/primary1aiw/	80+ GB	40 GB	Shared directory for lead primary server
/mpaiw/primary2aiw/	40 GB	40 GB	Shared directory for alternate primary server
/mpaiw/sharedaiw/	80+ GB	40 GB	Shared directory for common resources where the data files are stored.

Mount directories

Server	Remote path	Local mount directory
Lead primary server	/mpaiw/primary1aiw/	/aiw
Alternate primary server	/mpaiw/primary2aiw/	/aiw
UI server	/mpaiw/primary1aiw/	/aiw
Secondary server	/mpaiw/primary1aiw/	/mpaiw/primary1
Secondary server	/mpaiw/primary2aiw/	/mpaiw/primary2
Secondary server	/mpaiw/sharedaiw	/aiw

Configuring the file server

You must first configure the file server by enabling and starting the NFS server and setting up the shared directories. This configuration is required for sharing directories with lead primary server, alternate primary server, and the UI server.

To configure the file server:

1. Log in as the root user.
2. Enable and start the NFS server. Type:

   ```
   systemctl enable nfs-server.service
   systemctl start nfs-server.service
   ```

3. Copy the `create-mp-shares.sh` script to the file server.
   1. Mount the base product DVD or ISO file.
   2. Navigate to the `/scripts/mp` directory.
   3. Find `create-mp-shares.sh` and copy it to a directory on the file server.
   4. Change to the directory where you copied the file.
4. To set up the shared directories, type:

   ```
   create-mp-shares.sh primary1_hostname primary2_hostname gui_hostname
   ```

   The command creates the necessary shared directories and updates the `/etc/exports` file. Example of `/etc/exports` file:

```
/mpaiw/primary1aiw primary1_hostname(rw,no_root_squash,sync,no_subtree_check,crossmnt)
/mpaiw/primary2aiw primary2_hostname(rw,no_root_squash,sync,no_subtree_check,crossmnt)
/mpaiw/primary1aiw gui_hostname(rw,no_root_squash,sync,no_subtree_check,crossmnt)
```

Note

- The *primary1_hostname*, *primary2_hostname*, and *gui_hostname* are the host names for the lead primary, alternate primary, and UI servers.

Configuring the database server

The database server stores RICOH ProcessDirector system data. All database requests originate from the active primary server.

1. If you use PostgreSQL:
    1. Check and update the proxy server in the `/etc/dnf/dnf.conf` file.
    2. Download and install PostgreSQL. See Configuring your own PostgreSQL database, p. 47.
2. If you use DB2, see Installing and configuring your own copy of DB2 on a different computer, p. 49.

Installing PostgreSQL

For RICOH ProcessDirector running in a multiple servers environment, you must install your own copy of PostgreSQL. Install the PostgreSQL database on the database server.

Configuring your own PostgreSQL database

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 computers. 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. Download and install a supported version of PostgreSQL as indicated above.
2. Mount the RICOH ProcessDirector base product 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 one of the RICOH ProcessDirector primary servers.
   - 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. Open `/var/lib/pgsql/data/pg_hba.conf` and find this line (usually at the end): `host all all ipAddress/32 trust`

   where *`ipAddress`* is the IP address you specified in the script in the step above.

   Copy the line and change the IP address to the IP address of the other primary server. When you complete editing, there should be two lines, one with the IP address for each primary server.

8. To reload the file, run this command: `pg_ctl -D /var/lib/pgsql/data reload`
9. **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.

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

    ```
    \q
    ```

11. Install either the full PostgreSQL package or the PostgreSQL client on both primary servers.

Installing DB2

In a multiple primary servers environment, DB2 must be installed on a dedicated database server. You cannot install the database locally on a primary server. Install DB2 11.5.8 or later on the database server. Earlier versions of DB2 are not supported with RICOH ProcessDirector in a multiple primary servers environment.

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

Before you install RICOH ProcessDirector, you must install and configure a DB2 server on the database server and a DB2 client on each primary server.

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.
- Rocky Linux 9.0 through latest 9.X and Rocky Linux 10.0 through latest 10.X do not support the IBM DB2 database.

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:
   - 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.
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 or mount the ISO file and go to the `/scripts` directory.

      Note

      - If you are using Red Hat version 9.x or 10.x versions, 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 then script asks for the DB2 instance name, type an instance name for the system.
      - 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. Record the host name or IP address of the computer that DB2 is installed on.

4. Install the DB2 client on both primary servers.

   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.

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. 42 and Completing post-installation tasks, p. 95.

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*.

HTTPS Connection support

RICOH ProcessDirector provides support for HTTPS connection using Transport Layer Security (TLS) protocol, so you can protect the print data in the system.

TLS is widely used to protect data on the Internet. The TLS protocol uses 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 TLS to protect data on a smaller scale, such as within a print system like RICOH ProcessDirector. You can activate 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 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. On a production system, your certificate must use a strong encryption algorithm, such as SHA-256 and 2048-bit (or larger) RSA keys.

When the certificate is issued, the CA sends it to you in an e-mail. You store the certificate in a keystore on the UI server 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 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, 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 TLS with RICOH ProcessDirector, you can get a digital certificate and install it on the UI server before you install the base product. After the base product is installed, you must activate TLS in the RICOH ProcessDirector web server component.

Running the prerequisite checker

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

In a multiple primary servers environment, run the prerequisite checker on the lead primary server, the alternate primary server, and the UI server.

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 server you want to evaluate 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 running 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 running 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. 67. 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.
7. Repeat this procedure for the other primary server and the UI server too.

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 SSH authentication

RICOH ProcessDirector requires SSH authentication between servers to transfer files during operation and failover.

In a multiple primary servers environment, the lead primary server, alternate primary server, and UI server must communicate using SSH to transfer files. The authentication without a password lets these transfers occur without manual intervention, which is essential for automatic failover.

SSH requirements

Configure SSH authentication between all three servers. Each server must be able to connect to the other two servers without prompting for a password.

Server	SSH keys
Lead primary server	Alternate primary server, UI server
Alternate primary server	Lead primary server, UI server
UI server	Lead primary server, alternate primary server

User account

Configure SSH keys using the `aiw1` user account. This is the RICOH ProcessDirector service account that runs the application processes. The aiw1 user must exist on all three servers with the same UID and GID.

Required connections

After configuration, verify that the following SSH connections work without password prompts:

- Lead primary server to alternate primary server
- Lead primary server to UI server
- Alternate primary server to lead primary server
- Alternate primary server to UI server
- UI server to lead primary server
- UI server to alternate primary server

Configuring SSH authentication between servers

Create SSH keys to allow RICOH ProcessDirector to move files between servers while it is running and configure the SSH authentication between servers.

1. On the lead primary server:
    1. Log in as the aiw1 user.
    2. Open a command prompt and type:

```
ssh-keygen -q -P "" -f ~/.ssh/id_rsa
ssh-copy-id -o "StrictHostKeyChecking=no" aiw1@alternateprimary_hostname
ssh-copy-id -o "StrictHostKeyChecking=no" aiw1@UIserver_hostname
```

2. On the alternate primary server:
    1. Log in as the aiw1 user.
    2. Open a command prompt and type:

```
ssh-keygen -q -P "" -f ~/.ssh/id_rsa
ssh-copy-id -o "StrictHostKeyChecking=no" aiw1@leadprimary_hostname
ssh-copy-id -o "StrictHostKeyChecking=no" aiw1@UIserver_hostname
```

3. On the UI server:
    1. Log in as the aiw1 user.
    2. Open a command prompt and type:

```
ssh-keygen -q -P "" -f ~/.ssh/id_rsa
ssh-copy-id -o "StrictHostKeyChecking=no" aiw1@leadprimary_hostname
ssh-copy-id -o "StrictHostKeyChecking=no" aiw1@alternateprimary_hostname
```

where *leadprimary_hostname* is the host name of the lead primary server, *alternateprimary_hostname* is the host name of the alternate primary server, and the *UIserver_hostname* is the host name of the UI server.

3. Installing

Installing RICOH ProcessDirector requires installation media obtained from Ricoh.

When you order RICOH ProcessDirector you can request physical discs and wait for them to arrive before installing. If you prefer to install from electronic media 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. 61.

The discs or the ISO files include:

- RICOH ProcessDirector base product installer
  Includes Feature Manager for adding features after the base product is installed.
- Secondary Server feature installer
  Included if you ordered a Secondary Server feature.
- Ricoh Transforms installers
  Included if you ordered one or more Ricoh Transform features.

The RICOH ProcessDirector Secondary Server feature and application servers are the only components that are installed on different computers.

Important

1. You can choose whether to install in interactive or automated mode.
   - In interactive mode, an installation program asks questions and walks you through some configuration settings before completing the installation.
   - In automated mode, you provide the configuration information in a response file before starting the installation program.

     With a response file, you can also install using a configuration management program, such as Ansible or Puppet. The configuration management program must have root access to complete the install, but the user conducting the install does not need to log in as the root user.
2. 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. 106 for more information.
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. for details.
4. 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.

Complete the installation in this order:

1. **Prepare the primary servers for installation.**

   Complete the procedure Preparing the primary computer for installation, p. 59 on the lead primary server and the alternate primary server.
2. **Optional: Download the installation files.**

   Complete the procedure Downloading installation files, p. 61. You only need to download the files once, then copy them to each server when you install.
3. **Optional: Install from a remote directory.**

   Complete the procedure Installing from a remote directory, p. 67.
4. **Optional: Prepare for automated installation.**

   If you plan to use the automated installation, complete the procedure Creating an installer response file, p. 62. Create a separate installer response file for each server or use the same response file if the configuration is identical.
5. **Install RICOH ProcessDirector on the lead primary server.**

   Complete one of these procedures on the lead primary server:
   - Installing the base product (interactive mode), p. 69
   - Installing the base product (automated mode), p. 73
6. **Configure the lead primary server.**

   Complete the procedure Configuring the lead primary server, p. 77.

7. **Install RICOH ProcessDirector on the alternate primary server.**

   Complete one of these procedures on the alternate primary server:

   - Installing the base product (interactive mode), p. 69
   - Installing the base product (automated mode), p. 73

8. **Configure the alternate primary server.**

   Complete the procedure Configuring the alternate primary server, p. 77.

9. **Configure the UI server.**

   Complete the procedure Configuring the UI server, p. 78.

If errors occur during installation, see Troubleshooting installation errors, p. 75.

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.

Do this procedure on both primary servers.

Note

- 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. 19.
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. If you use IBM DB2:
   1. Enter this command to verify the DB2 client is installed:
      ```
      db2ls
      ```
   2. Verify that the results show DB2 version 11.5.8 or higher.
   3. If the DB2 client is not installed, install it before you continue.
   4. If a version lower than 11.5.8 is installed, update to 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.

- If you plan to install in automated mode, continue with Creating an installer response file, p. 62.
- If you plan to install in interactive mode, choose your next step:
    - To install from a DVD drive on the primary computer, continue with Installing the base product (interactive mode), p. 69.
    - To mount the ISO files, continue with Mounting an ISO file, p. 67
    - 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. 67.

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. .

Creating an installer response file

To install RICOH ProcessDirector in automated mode, create an installer response file. This file includes the answers that you would provide in the installation wizard in the in interactive mode, so the installer can retrieve the answers autonomously.

The RICOH ProcessDirector installation media provides these sample installer response files. Choose the correct sample file to start with, based on the database you plan to use and whether you install it with RICOH ProcessDirector or install your own version.

The sample files are:

`Embedded_PostgreSQL.properties`

Use with the default database configuration: PostgreSQL installed at the same time as RICOH ProcessDirector.

`Embedded_DB2.properties`

Use with IBM DB2 provided with RICOH ProcessDirector.

`External_PostgreSQL.properties`

Use with a PostgreSQL database installed separately from RICOH ProcessDirector, either on the same server or a different server.

Note

- Use this sample file if you installed PostgreSQL on your database server.

`External_DB2.properties`

Use with IBM DB2 installed separately from RICOH ProcessDirector, but on the same server.

`Remote_DB2.properties`

Use with IBM DB2 installed on a different server.

Note

- Use this sample file if you installed DB2 on your database server.

If you are familiar with Red Hat® Ansible® Automation Platform, we also provide a sample Ansible playbook called `InstallRicohProcessDirector.yaml`. You can customize and use it with the appropriate response file.

Note

- When installing RICOH ProcessDirector in a multiple primary servers environment, use these installer response files: `External_PostgreSQL.properties`, `External_DB2.properties`, `Remote_DB2.properties`.

To create an installer response file:

1. Mount the RICOH ProcessDirector base product DVD or ISO file. Open `scripts/sample-response-files` and find the sample file that matches your database configuration. Save the file to your system.
2. Open the sample file in a text editor and review the contents.
3. Do not change the settings in the first section (`INSTALLER_UI` and `DB_TYPE`).

   These settings configure the installer to run in "silent" mode and specifies the database configuration to use.
4. Update the next two settings to accept the license and maintenance agreements.

   Review the agreements here:

   - Software License Agreement

- Software Maintenance Agreement

Remove the # sign at the beginning of these lines to indicate acceptance:

```
#LICENSE_AGREEMENT=ACCEPT
#MAINTENANCE_AGREEMENT=ACCEPT
```

5. For USER, enter the ID for the system user, the user ID that RICOH ProcessDirector runs under.

   You can choose the name that you want to use for the RICOH ProcessDirector system user or you can use the default name. 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.

   For additional information about the system user and groups, see Creating system groups and users, p. 42.

6. Enter additional information for the system user. Default values are shown in the file.

   GROUP

   The security group to use as the primary group for the system user.

   UID

   The UID for the system user.

   GID

   The GID for the primary group in GROUP.

   HOMEDIR

   The home directory for the system user.

   PW

   The password for the system user.

   Remember this password; you need it later when you have to log in as the system user.

7. For SYSTEM_LANGUAGE, choose the language that you want the system user to use.

   This setting determines the language used for some messages, even if you set the browser for the user interface to a different language. Copy and paste the appropriate language value. Values are case-sensitive.

8. Continue editing based on your database type:

   1. PostgreSQL installed with RICOH ProcessDirector: File is complete. Continue with step 12.
   2. PostgreSQL installed separately: Continue with step 9.
   3. DB2 installed with RICOH ProcessDirector: Continue with step 10.
   4. DB2 installed separately on the same server: Continue with step 10.
   5. DB2 installed on a different server: Continue with step 11

9. 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. 47, do that procedure now.
2. After you complete that procedure, enter values for these fields:

   PGSQL_TOOLS

   The location of the PostgreSQL bin directory. The default binary path is `/usr/<version_number>/bin`, where `<version_number>` is the PostgreSQL database version installed.

   PGSQL_SERVER

   The IP address or host name of the server where PostgreSQL is installed.

   PGSQL_PORT

   The port number used to communicate with the PostgreSQL database.

   PGSQL_USER

   The user name for the owner of the PostgreSQL database.

   PGSQL_PASSWORD

   The password for the owner of the PostgreSQL database.
3. Continue with step 12.

10. If you use IBM DB2 included with RICOH ProcessDirector or a separate DB2 on the same server, both configurations require an instance user, a fenced user, and their corresponding groups. Information about these values is available in Creating system groups and users, p. 42.
    1. Set these values:

       DB2_INSTANCE_USER

       The user ID that the RICOH ProcessDirector DB2 database instance runs under.

       DB_INSTANCE_DIR

       The home directory for the DB2 instance user on the primary server.

       DB_INSTANCE_GROUP

       The group used to give members DB2 **sysadm** authority for database operation.

       DB_FENCED_USER

       A second user ID that DB2 requires when you create an instance.

       DB_FENCED_DIR

       The home directory for the DB2 fenced user on the primary server.

       DB_FENCED_GROUP

       The internal group required by DB2; the default or primary group for the fenced user.
    2. For the RICOH ProcessDirector version of DB2, set `DB2_INSTALLER_FOLDER` to the installation media location (mount point) for the DB2 install ISO or DVD.
    3. For a separate DB2 on the same server, set `DB2_INSTALL_PATH` to the base directory where DB2 is installed.
    4. Continue with step 12.

11. If you use DB2 installed on a different computer, the configuration requires an instance user and group for the DB2 client on the primary computer. It also requires 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. 49. If you have not completed that procedure, do it now.

    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.

    1. For `DB2_INSTALL_PATH`, enter the full path to the install location for the DB2 client on the primary server.
    2. Enter values for the users and groups that you created in the previous procedure.

       `DB2_INSTANCE_USER`

       The instance user for the DB2 client on the primary server.

       `DB_INSTANCE_DIR`

       The home directory for the DB2 instance user on the primary server.

       `DB_INSTANCE_GROUP`

       The DB2 instance group on the primary server.

       `DB_REMOTE_HOST`

       The host name or IP address of the server that DB2 is installed on.

       `DB_REMOTE_PORT`

       The port that you want DB2 to listen on to communicate with the primary server.

       `DB_REMOTE_USERID`

       The DB2 user on the remote server.

       `DB_REMOTE_DIR`

       The home directory for the DB2 user on the remote server.

       `DB_REMOTE_PASSWD`

       The password for the DB2 user on the remote server.
    3. Continue with step 12.

12. Save the file and copy it to a location on the primary computer. When you run the installer, you provide the path to this file. The file must be stored in a location that is accessible to the installer.

    Note

    - In a multiple primary configuration, you use the same file on both primary servers. Copy the file to both primary servers.

Now you're ready to run the installation program in automated mode. Choose your next step based on how you plan to run the install media:

- To install from a DVD drive on the primary computer, continue with Installing the base product (automated mode), p. 73.
- To mount the ISO files, continue with Mounting an ISO file, p. 67
- 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. 67.

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`
4. Continue with the appropriate procedure.
   - Installing the base product (interactive mode), p. 69
   - Installing the base product (automated mode), p. 73
   - Installing the Secondary Server feature, p. 82

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. Continue with the appropriate procedure:
    - Installing the base product (interactive mode), p. 69
    - Installing the base product (automated mode), p. 73
    - Installing the Secondary Server feature, p. 82
      The base product must be installed on the primary computer before you start this install.

Installing the base product (interactive mode)

Before you begin, make sure that you have verified all the prerequisites for your configuration as listed in Planning for installation, p. 19 and Preparing the primary computer for installation, p. 59.

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 in interactive mode:

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. Mount the primary server to the file server.

   - On the lead primary server, use these commands:

   ```
   mkdir /aiw
   mount -t nfs fileserver-hostname:/mpaiw/primary1aiw /aiw
   ```

   - On the alternate primary server, use these commands:

   ```
   mkdir /aiw
   mount -t nfs fileserver-hostname:/mpaiw/primary2aiw /aiw
   ```

   where *fileserver-hostname* is the IP address or host name of the file server.

4. 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 6.

5. If you are installing from an ISO file:

   1. Follow the instructions in Mounting an ISO file, p. 67.
   2. Change directories so you see the contents of the ISO file.
      You see several scripts and directories, including a script called `setup`.

6. Start the installer.

   - If you are installing the lead primary, enter: `./setup`
   - If you are installing the alternate primary or the UI server, use this command to skip activation. Enter: `./linux/setupIPPD.bin -DONT_ACTIVATE=true`

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

7. 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.

8. Review and accept the license and maintenance agreements.
9. 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.

10. 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.

11. 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.

12. 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.

13. Choose the database that you want to use with RICOH ProcessDirector.

    - PostgreSQL installed separately. Continue with step 14.
    - IBM DB2 installed on a different server. Continue with step 15.

14. 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. 47, 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.

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:

       - 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. 49.

       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 just installed the lead primary server, copy the Multiple Primary feature to the primary server. Type this command:

    ```
    cp mountpoint/mpfeature/MultiplePrimary-*.epk /opt/infoprint/ippd/available/
    ```

    where *mountpoint* is the mount point for the DVD or ISO file.

20. On both primary servers, copy the synchronization script to the primary server. Type this command:

    ```
    cp mountpoint/scripts/mp/rpd-sync.sh ~
    ```

    where *mountpoint* is the mount point for the DVD or ISO file.

21. If you installed from a DVD, eject the disc.
22. If you see error messages, view the installation logs in the `/opt/infoprint/ippd/logs/installer` directory and contact Software Support.
23. Reboot the system.
24. If you just installed on the lead primary, continue with Configuring the lead primary server, p. 77.
25. If you just installed on the alternate primary, continue with Configuring the alternate primary server, p. 77.

Installing the base product (automated mode)

Before you begin, make sure that you have verified all the prerequisites for your configuration as listed in Planning for installation, p. 19 and Preparing the primary computer for installation, p. 59. Also make sure that you have created an installer response file as described in Creating an installer response file, p. 62.

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.
- To start the installation program in automated mode, you must log in as the root user.

  However, if you use a configuration management program such as Ansible, you can log in as a different user. The configuration management program must have root access, but the user who logs in does not.

To install the base product in automated mode:

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. Mount the primary server to the file server.

   - On the lead primary server, use these commands:

```
mkdir /aiw
mount -t nfs fileserver-hostname:/mpaiw/primary1aiw /aiw
```

   - On the alternate primary server, use these commands:

```
mkdir /aiw
mount -t nfs fileserver-hostname:/mpaiw/primary2aiw /aiw
```

   where *`fileserver-hostname`* is the IP address or host name of the file server.
4. 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`
   `cd linux`

5. Continue with step 6.

5. If you are installing from an ISO file:

   1. Follow the instructions in Mounting an ISO file, p. 67.
   2. Change directories so you see the contents of the ISO file, then open the `linux` directory.

6. Start the installer.

   - If you are installing the lead primary, enter: `./setupIPPD.bin -f path_to_response_file`
   - If you are installing the alternate primary, use this command to skip activation. Enter: `./setupIPPD.bin -f path_to_response_file -DONT_ACTIVATE=true`

   The installer runs without intervention. No messages appear in the command window to provide status. The command line returns either when the install completes successfully or when it encounters an error.

   A successful installation on the lead primary server requires at least 15 minutes and could last much longer. Installing on the alternate primary server completes faster because the product is not activated.

7. When the command line returns, determine whether the install was successful or an error occurred.

   1. **On the lead primary:** Open the install summary file, located here: `/opt/infoprint/ippd/logs/installer/summary.log` and look at the last line of the file.

      Note

      - If the file doesn't exist, the install process likely failed in prerequisite checking. Continue with step 3..

      If the installation completed successfully, the last line includes this text:

```
RICOH ProcessDirector system activation complete. Return code: 0.
```

      - If the installation was successful, continue with step 10.
      - If the last line is different, review the summary for information about errors. If you see an activation error, contact Software Support.

2. **On the alternate primary:** Type this command to see the last 20 lines of the install log:

```
tail -20 /opt/infoprint/ippd/logs/installer/ippd.dump.log
```

In the output, look for these lines:

```
INSTALL_SUCCESS=SUCCESS
Congratulations! Ricoh ProcessDirector has been successfully installed to:

/opt/infoprint/ippd
```

If those lines are present, the installation succeeded. Continue with step 10. If you do not see those lines, continue with step 3.

3. Open the prerequisite report, located here: `/opt/infoprint/ippd/logs/installer/prereq.out`

   This file shows the results of the prerequisite checker, which runs as part of the installation. If the file reports prerequisite issues, fix them and run the installer again.

4. Check the entries in the response file.

   Make sure all the values use correct spelling and upper/lower case letters. Try to run the installer again (step 6).

5. If the install fails for a second time, contact Software Support.

8. If you just installed the lead primary server, copy the Multiple Primary feature to the primary server. Type this command:

   `cp` *`mountpoint`*`/mpfeature/MultiplePrimary-*.epk /opt/infoprint/ippd/available/`

   where *`mountpoint`* is the mount point for the DVD or ISO file.

9. On both primary servers, copy the synchronization script to the primary server. Type this command:

   `cp` *`mountpoint`*`/scripts/mp/rpd-sync.sh ~`

   where *`mountpoint`* is the mount point for the DVD or ISO file.

10. If you installed from a DVD, eject the disc.
11. Reboot the system.
12. If you just installed on the lead primary, continue with Configuring the lead primary server, p. 77.
13. If you just installed on the alternate primary, continue with Configuring the alternate primary server, p. 77.

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 DB2 version for *`version`* and the name you want to use for *DB2 instance user*:
  `/opt/IBM/db2/`*`version`*`/instance/db2idrop` *`DB2 instance user`*

  Note

  – The path might be different for some versions of DB2 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, substituting the DB2 version for *`version`*:
  `/opt/IBM/db2/`*`version`*`/instance/db2ilist`

  Note

  – The path might be different for some versions of DB2 or 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, substituting the DB2 version for *`version`*:
  `/opt/IBM/db2/`*`version`*`/instance/db2ilist`

Note

– The path might be different for some versions of DB2 or 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, substituting the DB2 version for *version*:
`/opt/IBM/db2/version/instance/db2idrop aiwinst`

Important

♦ When you delete a DB2 instance, you delete all data in that instance.

Configuring the lead primary server

The lead primary server is the first primary server installed and becomes the initial active primary. Configuration includes mounting shared storage and running the configuration script.

To configure the lead primary server:

1. Log in as the system user (aiw1 is the default).
2. Stop RICOH ProcessDirector. Open a command prompt and type:

```
stopaiw
```

3. To update the permissions for `configureMP.pl`, type:

```
chmod +x /aiw/aiw1/bin/configureMP.pl
```

4. Run the script for setting up the alternate primary server and the UI server. Type:

```
/aiw/aiw1/bin/configureMP.pl primary2_hostname ui_server_hostname
```

where *primary2_hostname* and *ui_server_hostname* are the IP addresses or host names of the alternate primary server and the UI server.

5. After running the script, to make sure the configuration is correct:
   - Open the `/aiw/aiw1/config/servers.cfg` file and verify that the `primary1` and `primary2` entries were created.
6. Install the Multiple Primary feature. Type this command:
   `xact -d /opt/infoprint/ippd/available/MultiplePrimary-*.epk`
7. Continue with installing the alternate primary server. Repeat the install procedure that you used for the lead primary server:
   - Installing the base product (interactive mode), p. 69
   - Installing the base product (automated mode), p. 73

Configuring the alternate primary server

The alternate primary server monitors the lead primary server and assumes the lead role during failover. Under typical operation, the alternate primary server functions as a secondary server. Configuration includes synchronizing files and initializing the license key.

To configure the alternate primary server:

1. As the root user, synchronize the alternate primary server with the lead primary server. Type:

```
~/rpd-sync.sh primary1_hostname
```

2. To initialize the license key on the alternate primary server, type these commands:

    1. `source /opt/infoprint/ippd/base/config/ippdprofile`
    2. `/opt/infoprint/ippd/bin/collectKeyInfo.pl -l /aiw/aiw1/config/license/IPPD-Base-Trial-60-days.key`

3. Switch to the aiw1 user. Type:

```
su - aiw1
```

4. Run this command:

```
db2 catalog db AIWDB as AIWDB at node AIWNODE authentication server
```

5. Continue with Configuring the UI server, p. 78

Configuring the UI server

The UI server hosts the administration interface and connects to the active primary server. Configuration includes mounting to the lead primary, copying directories and files to the UI server, synchronizing files, and initializing license keys.

To configure the UI server:

1. Log in to the UI server as the root user.
2. Create the `/aiw`, then mount it to the `/mpaiw/primary1aiw` directory on the file server. Type:

```
mkdir /aiw
mount -t nfs fileserver-hostname:/mpaiw/primary1aiw /aiw
```

    where *fileserver-hostname* is the IP address or host name of the file server.

3. Create the `/opt/infoprint/ippd` directory and change its ownership to the system user (default: aiw1) and system group (default:aiwgrp1) . Type:

```
mkdir -p /opt/infoprint/ippd
chown system_user:system_group  /opt/infoprint/ippd
```

    where *system_user*:*system_group* are the user and group you created previously and used when you installed the primary servers.

4. Copy the synchronization script from the lead primary to the UI server.

    Find this file on the lead primary: `/root/rpd-sync.sh`. Copy it to the same location on the UI server.

5. Synchronize the UI server with the lead primary server. Type:

```
~/rpd-sync.sh primary1_hostname
```

6. To initialize the license key, type these commands:

    1. `source /opt/infoprint/ippd/base/config/ippdprofile`
    2. `/opt/infoprint/ippd/bin/collectKeyInfo.pl -l /aiw/aiw1/config/license/IPPD-Base-Trial-60-days.key`

7. Change to the system user (default is aiw1). Type:

```
su - system_user
```

8. Copy two files from the lead primary server to the UI server. Be sure to create the files in the same location on the UI server as where you found them on the primary server.
   1. On the lead primary server, find these files:
      - `/home/aiw1/.bash_profile`
      - `/home/aiw1/.profile`
   2. Copy the files to the UI server in the same locations.
      - `/home/aiw1/.bash_profile`
        This file replaces a file that already exists.
      - `/home/aiw1/.profile`
        This file is new.

All the servers are now installed.

Next, do these procedures to start the system and make sure you can log in:

1. Starting the entire multiple primary servers environment, p. 123
2. Logging in for the first time, p. 98

After you start the system and log in successfully, continue with additional tasks, such as adding secondary and application servers and installing features.

4. 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. 25.

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.

To add a secondary server:

1. Preparing the primary computer, p. 81
2. Installing the Secondary Server feature, p. 82
3. Adding a secondary server to the multiple primary servers configuration, p. 86

To add an application server:

1. Preparing the primary computer, p. 81
2. Preparing a Windows application server, p. 87
3. Installing application servers on Windows computers, p. 90
4. Configuring an application server to run as a service, p. 92

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.

After you configure NFS, Samba, or your preferred protocol, use the RICOH ProcessDirector user interface to add and enable the application or secondary server.

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. 81.

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. If you are installing from a DVD:

   1. Insert the RICOH ProcessDirector Secondary Server feature DVD.
   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 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 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. 67.
   2. Change directories so you can 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 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** in the list. 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. Type the host name or fully qualified IP address of the primary computer and verify it.
12. 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**.

13. 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, make sure you use the correct values.
14. 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.
15. 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.
16. 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
    ```
17. Click **Done** to complete the installation.
    The secondary server starts automatically.
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. Reboot the system.

    Note

    - If you have an automated recovery mechanism for system outages, disable it before rebooting.
21. 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.
22. 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.

Adding a secondary server to the multiple primary servers configuration

Install and configure a remote secondary server to work with the primary servers in your RICOH ProcessDirector environment.

1. Install a Secondary Server feature on a Linux computer that is separate from your primary server. To install a secondary server see Installing remote secondary servers. During the installation process, when prompted enter the active primary server hostname.
2. After the installation is complete, go to the shared file server system and list both `primary1aiw` and `primary2aiw` `directories` directories in the `/etc/exports` file.
   1. Open `/etc/exports` in a file editor and add these lines:

```
/mpaiw/primary1aiw secondary-hostname(rw,no_root_squash,sync,no_subtree_check,crossmnt)
/mpaiw/primary2aiw secondary-hostname(rw,no_root_squash,sync,no_subtree_check,crossmnt)
/mpaiw/sharedaiw/ secondary-hostname(rw,no_root_squash,sync,no_subtree_check,crossmnt)
```

      where *secondary-hostname* is the hostname of the secondary server.
   2. Save and close the file.
   3. To apply the new export configuration, type:

```
exportfs -ra
```

3. On the secondary server, create both `/mpaiw/primary1aiw/` and `/mpaiw/primary2aiw` directories. Type:
   1. Run: `mkdir -p /mpaiw/primary1aiw/`
   2. Run: `mkdir -p /mpaiw/primary2aiw/`
4. Mount the `/mpaiw/primary1aiw/` and `/mpaiw/primary2aiw` directories:
   1. Enable and start the NFS server:

```
systemctl enable nfs-server.service
systemctl start nfs-server.service
```

   2. Type these commands:

```
mount -t nfs fileserver-hostname:/mpaiw/primary1aiw /mpaiw/primary1aiw
mount -t nfs fileserver-hostname:/mpaiw/primary2aiw /mpaiw/primary2aiw
mount -t nfs fileserver-hostname:/mpaiw/sharedaiw /aiw
```

5. Start the active primary server using `startaiw`.

6. Log in to the RICOH ProcessDirector lead primary server and add the new secondary sever. See Defining application and remote secondary servers.
7. Go to the remote secondary system and log in as root.
8. Open the `/opt/infoprint/ippd/base/config/ippdprofile` file using a text editor and find and replace export `export AIWDATA=/aiw/aiw1` with `export AIWDATA=${AIWDATA}`.
9. Start the secondary server using `startaiw`. The secondary should be connected after several seconds. If it fails to connect, make sure you have followed both steps 6(a) and 6(b) above. The secondary server should be connected after several seconds. If it fails to connect, make sure the information from step 9 is correct.

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 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. 90.

Adding an application server

Install and configure an application server to connect to the primary servers in your RICOH ProcessDirector environment using NFS-mapped drives.

1. Install an application server on a Windows system in your network. See Installing application servers on Windows computers
2. After RICOH ProcessDirector, in Windows Server install Client for NFS and restart the system. For more information see Add roles and features to Windows Server.
3. Create a file in a text editor and paste these lines:

```
Windows Registry Editor Version 5.00
[HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\ClientForNFS\CurrentVersion\Default]
"AnonymousGID"=dword:00007eca
"AnonymousUID"=dword:00007ec9
```

4. Close the file and save it as `nfs.reg`.
5. Double-click the file to install the keys in the registry.
6. After the installation is complete, go to the shared file server system and export both `primary1aiw` and `primary2aiw` directories.
    1. Open `/etc/exports` in a file editor and add these lines:

```
/mpaiw/primary1aiw application-server-hostname(rw,no_root_squash,
sync,no_subtree_check,crossmnt)
/
/mpaiw/primary2aiw application-server-hostname(rw,
no_root_squash,sync,no_subtree_check,crossmnt)
```

    where *application-server-hostname* is the host name of the application server.
7. Go to the application server and map both `\mpaiw\primary1aiw` and `\mpaiw\primary2aiw` folder as network drives.
8. Log in to RICOH ProcessDirector on the UI server
9. Go to **Administration** → **Objects** → **Servers** and add the application server.
10. Set two environment variables with the letters selected for both lead and alternate primary servers. Open a command line as administrator and type:

```
setx PRIMARY1AIWDATA "drive-letter:\aiw1" /M
setx PRIMARY2AIWDATA "drive-letter:\aiw1" /M
```

    where *drive-letter* is the letter you assigned for the mapped drive.
11. Set the `AIWDATA` environment variable to the same drive letter and directory as you set for the active primary server. Open a command line as administrator and type:

```
setx AIWDATA "drive-letter:\aiw1" /M
```

12. Verify if the `AIWDATA` environment variable was correctly set. Type:

```
echo %AIWDATA%
```

13. **Optional:** Verify if the `%PRIMARY1AIWDATA%` and `%PRIMARY2AIWDATA%` environment variables are correctly set. Type:

```
echo %PRIMARY1AIWDATA%
echo %PRIMARY2AIWDATA%
```

14. Start the application server. Use the **Start application server** link in the RICOH ProcessDirector start menu folder.
15. Verify if the application server is connected:
    1. Log in to RICOH ProcessDirector.
    2. Go to **Administration** → **Objects** → **Servers** and verify the application server is connected.

    If it is not connected, reboot the RICOH ProcessDirector system and retry step 14.

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`
- The drive letter that you used to mount the `/aiw` filesystem from the primary server

4. Insert the RICOH ProcessDirector base product DVD in the drive or double-click the ISO file.
5. Use Windows Explorer to view the contents of the DVD or ISO file 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**.

5. Completing post-installation tasks

- **Task checklist**
- **Creating directory lists and rules for fapolicyd**
- **Configuring to use IPv6 addresses**
- **Logging in for the first time**
- **Verifying the installation**
- **Deleting temporary installer files**
- **Activating a feature on a multiple primary servers configuration**
- **Downloading and installing license keys**
- **Installing the Transform Feature license keys**
- **Configuring RICOH ProcessDirector**
- **Tuning Java memory allocation**
- **Replacing your control files with the sample files**
- **Copying objects from another system**
- **Creating and activating custom properties**
- **Setting up to use LDAP authentication**
- **Communicating between RICOH ProcessDirector and the LDAP server**
- **Setting up to send data to RICOH Predictive Insight**

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. 97 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. 98 After you install, reboot the primary computer and log in to RICOH ProcessDirector using a web browser.
	Verifying the installation, p. 99

	Task
	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. 100** 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. After you install the base product, you can install features using the Feature Manager.
	Downloading and installing license keys, p. 106 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. 109 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. 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. 110** 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. 112** 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. 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. 116 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. .
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. 99 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. 106.

5

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.

Activating a feature on a multiple primary servers configuration

1. Stop the lead primary server.
   The alternate primary server detects that the lead primary server is not available and becomes the active primary server. This transition can take up to two minutes.
2. Wait for the alternate primary server to become the active primary server.
   Before you continue, verify that the alternate server is functioning as the active primary and that the UI server is connected to it.
3. On the server that you stopped at step 1, activate a specific feature.

   For example, type:

```
/aiw/aiw1/bin/xact -d PDFDocumentSupport-1.0.1740394835.epk
```

   1. If activation succeeded, proceed to the next step.

2. If activation fails, verify that the alternate primary server and the UI Server are still working correctly before you retry.

4. Start the server that you just installed the feature on.
5. Stop the active primary server.
   The lead primary server becomes the active primary.
6. Wait for the processing to switch back to the other primary server.
   The server that you installed the feature on must be the active primary server before you synchronize other servers to make sure the updated UI configuration files are built before synchronization.
7. Synchronize the UI server with the lead primary server:
   1. As root user, on the UI server, type: `~/rpd-sync.sh leadprimary_hostname`
   2. Restart the UI server.
8. Verify that the lead primary server and the UI server are working correctly with the updated feature.
9. Synchronize the alternate primary server with the lead primary server:
   1. As root user, on the alternate primary server, type: `~/rpd-sync.sh leadprimary_hostname`
10. Start the alternate primary server.
11. Stop the lead primary server.
    The alternate primary server becomes the active primary.
12. Verify that the alternate primary server and the UI server are working correctly with the updated feature.

The feature is now activated on both primary servers. Either server can operate as the active primary with the new feature available.

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, either click  **Browse or drag file** and find the license key file that you downloaded, or drag and drop the file into the field.
    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.

5

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. and Data transforms, p. 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. 67 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 .
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.

5

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 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. 107 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 **License key file** field, either click  **Browse or drag file** and find the license key file that you downloaded, or drag and drop the file into the field.
11. Click **Done**.
12. Restart RICOH ProcessDirector to complete the installation. See .

    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 your local Ricoh sales team or third-party reseller for assistance with ordering and obtaining a new EID to extend the subscription for your system. After you receive a new EID, follow the steps above for installing a new license on a system. Though you cannot log in, you can open the **About box** and install the new license from the login page.

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.

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 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.
8. Save and close the file.
9. 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 .

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 .
- 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 **Browse or drag file** and find the file on the system, or drag and drop 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 not recreating 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 a 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.

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:

5

- 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**.

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.

6. Starting and stopping a multiple primary system

- **Starting the entire multiple primary servers environment**
- **Stopping the entire multiple primary servers environment**
- **Stopping and starting one primary server**
- **Starting an application server**
- **Stopping an application server**

You can start and stop RICOH ProcessDirector servers.

Starting the entire multiple primary servers environment

After you install all servers and configure the shared directory permissions, you must start each server in the correct sequence.

1. Log in to the lead primary server and start RICOH ProcessDirector. Type: `startaiw -p`

   The lead primary server becomes the initial active primary server.
2. Log in to the alternate primary server and start RICOH ProcessDirector. Type: `startaiw -p`

   The alternate primary server becomes the initial worker primary server.
3. Log in to the UI server and start RICOH ProcessDirector. Type : `startaiw -w`
4. Verify that the `.multiplePrimaries.properties` file was created under `/aiw/aiw1/mp/`.

   Verify if the correct information is set in the file. Example:

```
#Wed Jul 30 15:06:43 MDT 2025
uiServer=ui_server_hostname
activePrimary=primary_server_1_hostname
workerPrimary=primary_server_2_hostname
```

   where *primary_server_1_hostname* is the host name of the lead primary server and *primary_server_2_hostname* is the host name of the alternate 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.

Stopping the entire multiple primary servers environment

Use this procedure to stop all servers for planned maintenance, such as a scheduled power outage.

1. Stop all secondary servers. On each secondary server, enter this command:

```
stopaiw
```

2. To stop the UI server enter this command:

```
stopaiw
```

3. To stop RICOH ProcessDirector on the alternate primary server, enter this command:

```
stopaiw
```

4. To stop RICOH ProcessDirector on the lead primary server, enter this command:

```
stopaiw
```

5. To stop the database on the database server:

   - For PostgreSQL:

```
systemctl stop postgresql
```

   - For DB2:

```
su - aiwinst -c "db2stop force"
```

6. **Optional:** To stop the NFS service on the file server, enter this command:

```
systemctl stop nfs-server.service
```

   Stop NFS only if you plan to power off or perform maintenance on the file server.

Stopping and starting one primary server

Use this procedure to take one primary server offline for maintenance while the other primary server continues processing.

In a multiple primary servers environment, you can stop one primary server without disrupting the system. The behavior depends on which server you stop:

- If you stop the lead primary server, the alternate primary server detects the failure and takes over processing. This transition completes within two minutes.
- If you stop the alternate primary server, the lead primary continues processing without interruption.

1. To stop one of the primary servers in the system:

   1. Log in to the server as the system user (aiw1 is the default).
   2. Type this command: `stopaiw`

   When the command finishes processing:

   - If you stopped the lead primary server, processing transfers to the other server. This server is now the lead primary.
   - If you stopped the alternate primary server, processing continues on the lead primary as usual.

2. To start the primary server again:

1. Log in to the server as the system user (aiw1 is the default).
2. Type this command: `startaiw`

The server starts and assumes the role of alternate primary server.

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 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.

7. 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.

RICOH ProcessDirector™ for Linux Planning and Installing: Multiple Primary Servers Configuration

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