Red Hat Enterprise Linux 9

Configuring and using a CUPS printing server

Configure your system to operate as a CUPS server and manage printers, print queues and your printing environment

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Legal Notice

Abstract

The Common Unix Printing System (CUPS) manages printing on Red Hat Enterprise Linux. Users configure printers in CUPS on their host to print. Additionally, you can share printers in CUPS to use the host as a print server. CUPS supports printing to: AirPrint and IPP Everywhere printers Network and local USB printers with printer applications Network and local USB printers with legacy PostScript Printer Description (PPD)-based drivers

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CHAPTER 1. INSTALLING AND CONFIGURING CUPS

You can use CUPS to print from a local host. You can also use this host to share printers in the network and act as a print server.

Procedure

1. Install the **cups** package:

```
# dnf install cups
```

2. If you configure CUPS as a print server, edit the **/etc/cups/cupsd.conf** file, and make the following changes:

   a. If you want to remotely configure CUPS or use this host as a print server, configure on which IP addresses and ports the service listens:

```
Listen 192.0.2.1:631
Listen [2001:db8:1::1]:631
```

   By default, CUPS listens only on **localhost** interfaces (**127.0.0.1** and **::1**). Specify IPv6 addresses in square brackets.

IMPORTANT

Do not configure CUPS to listen on interfaces that allow access from untrustworthy networks, such as the internet.

   b. Configure which IP ranges can access the service by allowing the respective IP ranges in the **<Location />** directive:

```
<Location />
  Allow from 192.0.2.0/24
  Allow from [2001:db8:1::1]/32
  Order allow,deny
</Location>
```

   c. In the **<Location /admin>** directive, configure which IP addresses and ranges can access the CUPS administration services:

```
<Location /admin>
  Allow from 192.0.2.15/32
  Allow from [2001:db8:1::22]/128
  Order allow,deny
</Location>
```

   With these settings, only the hosts with the IP addresses **192.0.2.15** and **2001:db8:1::22** can access the administration services.

   d. Optional: Configure IP addresses and ranges that are allowed to access the configuration and log files in the web interface:

```
<Location /admin/conf>
```

```
  Allow from 192.0.2.15/32
  Allow from [2001:db8:1::22]/128
  ...
</Location>

<Location /admin/log>
  Allow from 192.0.2.15/32
  Allow from [2001:db8:1::22]/128
  ...
</Location>
```

3. If you run the **firewalld** service and want to configure remote access to CUPS, open the CUPS port in **firewalld**:

```
# firewall-cmd --permanent --add-port=631/tcp
# firewall-cmd --reload
```

   If you run CUPS on a host with multiple interfaces, consider limiting the access to the required networks.

4. Enable and start the **cups** service:

```
# systemctl enable --now cups
```

Verification

- Use a browser, and access **http://*<hostname>*:631**. If you can connect to the web interface, CUPS works.
  Note that certain features, such as the **Administration** tab, require authentication and an HTTPS connection. By default, CUPS uses a self-signed certificate for HTTPS access and, consequently, the connection is not secure when you authenticate.

CHAPTER 2. CONFIGURING TLS ENCRYPTION ON A CUPS SERVER

CUPS supports TLS-encrypted connections and, by default, the service enforces encrypted connections for all requests that require authentication. If no certificates are configured, CUPS creates a private key and a self-signed certificate. This is only sufficient if you access CUPS from the local host itself. For a secure connection over the network, use a server certificate that is signed by a certificate authority (CA).

WARNING

Without encryption or with a self-signed certificates, a man-in-the-middle (MITM) attack can disclose, for example:

- Credentials of administrators when configuring CUPS using the web interface
- Confidential data when sending print jobs over the network

Prerequisites

- CUPS is configured.
- You created a private key , and a CA issued a server certificate for it.
- If an intermediate certificate is required to validate the server certificate, attach the intermediate certificate to the server certificate.
- The private key is not protected by a password because CUPS provides no option to enter the password when the service reads the key.
- The Canonical Name (**CN**) or Subject Alternative Name (SAN) field in the certificate matches one of the following:
  - The fully-qualified domain name (FQDN) of the CUPS server
  - An alias that the DNS resolves to the server's IP address
- The private key and server certificate files use the Privacy Enhanced Mail (PEM) format.
- Clients trust the CA certificate.
- If the server runs RHEL 9.2 or later and the FIPS mode is enabled, clients must either support the Extended Master Secret (EMS) extension or use TLS 1.3. TLS 1.2 connections without EMS fail. For more information, see the Red Hat Knowledgebase solution TLS extension "Extended Master Secret" enforced.

Procedure

1. Edit the **/etc/cups/cups-files.conf** file, and add the following setting to disable the automatic creation of self-signed certificates:

```
CreateSelfSignedCerts no
```

2. Remove the self-signed certificate and private key:

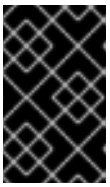
```
# rm /etc/cups/ssl/<hostname>.crt /etc/cups/ssl/<hostname>.key
```

3. Optional: Display the FQDN of the server:

```
# hostname -f
server.example.com
```

4. Store the private key and server certificate in the **/etc/cups/ssl/** directory, for example:

```
# mv /root/server.key /etc/cups/ssl/server.example.com.key
# mv /root/server.crt /etc/cups/ssl/server.example.com.crt
```



IMPORTANT

CUPS requires that you name the private key ***<fqdn>*.key** and the server certificate file ***<fqdn>*.crt**. If you use an alias, you must name the files ***<alias>*.key** and ***<alias>*.crt**.

5. Set secure permissions on the private key that enable only the **root** user to read this file:

```
# chown root:root /etc/cups/ssl/server.example.com.key
# chmod 600 /etc/cups/ssl/server.example.com.key
```

Because certificates are part of the communication between a client and the server before they establish a secure connection, any client can retrieve the certificates without authentication. Therefore, you do not need to set strict permissions on the server certificate file.

6. Restore the SELinux context:

```
# restorecon -Rv /etc/cups/ssl/
```

7. Optional: Display the **CN** and SAN fields of the certificate:

```
# openssl x509 -text -in /etc/cups/ssl/server.example.com.crt
Certificate:
  Data:
    ...
    Subject: CN = server.example.com
    ...
    X509v3 extensions:
      ...
      X509v3 Subject Alternative Name:
        DNS:server.example.com
  ...
```

8. If the **CN** or SAN fields in the server certificate contains an alias that is different from the server's FQDN, add the **ServerAlias** parameter to the **/etc/cups/cupsd.conf** file:

```
ServerAlias alternative_name.example.com
```

In this case, use the alternative name instead of the FQDN in the rest of the procedure.

9. By default, CUPS enforces encrypted connections only if a task requires authentication, for example when performing administrative tasks on the **/admin** page in the web interface.
To enforce encryption for the entire CUPS server, add **Encryption Required** to all **<Location>** directives in the **/etc/cups/cupsd.conf** file, for example:

```
<Location />
  ...
  Encryption Required
</Location>
```

10. Restart CUPS:

```
# systemctl restart cups
```

Verification

1. Use a browser, and access **https://*<hostname>*:631/admin/**. This requires that your browser trusts the CA certificate. If the connection succeeds, you configured TLS encryption in CUPS correctly.

2. If you configured that encryption is required for the entire server, access **http://*<hostname>*:631/**. CUPS returns an **Upgrade Required** error in this case.

Troubleshooting

- Display the **systemd** journal entries of the **cups** service:

```
# journalctl -u cups
```

If the journal contains an **Unable to encrypt connection: Error while reading file** error after you failed to connect to the web interface by using the HTTPS protocol, verify the name of the private key and server certificate file.

Additional resources

- How to configure CUPS to use a CA-signed TLS certificate in RHEL (Red Hat Knowledgebase)

CHAPTER 3. GRANTING ADMINISTRATION PERMISSIONS TO MANAGE A CUPS SERVER IN THE WEB INTERFACE

By default, members of the **sys**, **root**, and **wheel** groups can perform administration tasks in the web interface. However, certain other services use these groups as well. For example, members of the **wheel** groups can, by default, execute commands with **root** permissions by using **sudo**. To avoid that CUPS administrators gain unexpected permissions in other services, use a dedicated group for CUPS administrators.

Prerequisites

- CUPS is configured.
- The IP address of the client you want to use has permissions to access the administration area in the web interface.

Procedure

1. Create a group for CUPS administrators:

```
# groupadd cups-admins
```

2. Add the users who should manage the service in the web interface to the **cups-admins** group:

```
# usermod -a -G cups-admins <username>
```

3. Update the value of the **SystemGroup** parameter in the **/etc/cups/cups-files.conf** file, and append the **cups-admin** group:

```
SystemGroup sys root wheel cups-admins
```

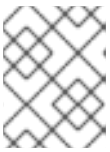
If only the **cups-admin** group should have administrative access, remove the other group names from the parameter.

4. Restart CUPS:

```
# systemctl restart cups
```

Verification

1. Use a browser, and access **https://*<hostname_or_ip_address>*:631/admin/**.



NOTE

You can access the administration area in the web UI only if you use the HTTPS protocol.

2. Start performing an administrative task. For example, click **Add printer**.

3. The web interface prompts for a username and password. To proceed, authenticate by using credentials of a user who is a member of the **cups-admins** group.
If authentication succeeds, this user can perform administrative tasks.

CHAPTER 4. OVERVIEW OF PACKAGES WITH PRINTER DRIVERS

Red Hat Enterprise Linux (RHEL) provides different packages with printer drivers for CUPS. The following is a general overview of these packages and for which vendors they contain drivers:

Table 4.1. Driver package list

Package name	Drivers for printers
cups	Zebra, Dymo
c2esp	Kodak
foomatic	Brother, Canon, Epson, Gestetner, HP, Infotec, Kyocera, Lanier, Lexmark, NRG, Ricoh, Samsung, Savin, Sharp, Toshiba, Xerox, and others
gutenprint-cups	Brother, Canon, Epson, Fujitsu, HP, Infotec, Kyocera, Lanier, NRG, Oki, Minolta, Ricoh, Samsung, Savin, Xerox, and others
hplip	HP
pnm2ppa	HP
splix	Samsung, Xerox, and others

Note that some packages can contain drivers for the same printer vendor or model but with different functionality.

After installing the required package, you can display the list of drivers in the CUPS web interface or by using the **lpinfo -m** command.

CHAPTER 5. DETERMINING WHETHER A PRINTER SUPPORTS DRIVERLESS PRINTING

CUPS supports driverless printing, which means that you can print without providing any hardware-specific software for the printer model. For this, the printer must inform the client about its capabilities and use one of the following standards:

- AirPrint™
- IPP Everywhere™
- Mopria®
- Wi-Fi Direct Print Services

You can use the **ipptool** utility to find out whether a printer supports driverless printing.

Prerequisites

- The printer or remote print server supports the Internet Printing Protocol (IPP).
- The host can connect to the IPP port of the printer or remote print server. The default IPP port is 631.

Procedure

- Query the **ipp-versions-supported** and **document-format-supported** attributes, and ensure that the **get-printer-attributes** test passes:
  - For a remote printer, enter:

```
# ipptool -tv ipp://<ip_address_or_hostname>:631/ipp/print get-printer-attributes.test | grep -E "ipp-versions-supported|document-format-supported|get-printer-attributes"
Get printer attributes using get-printer-attributes      [PASS]
    ipp-versions-supported (1setOf keyword) = ...
    document-format-supported (1setOf mimeMediaType) = ...
```

  - For a queue on a remote print server, enter:

```
# ipptool -tv ipp://<ip_address_or_hostname>:631/printers/<queue_name> get-printer-attributes.test | grep -E "ipp-versions-supported|document-format-supported|get-printer-attributes"
Get printer attributes using get-printer-attributes      [PASS]
    ipp-versions-supported (1setOf keyword) = ...
    document-format-supported (1setOf mimeMediaType) = ...
```

  To ensure that driverless printing works, verify in the output:

  - The **get-printer-attributes** test returns **PASS**.
  - The IPP version that the printer supports is 2.0 or higher.
  - The list of formats contains one of the following:
    - **application/pdf**

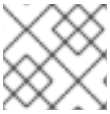
- **application/pdf**
- **image/urf**
- **image/pwg-raster**

- For color printers, the output contains one of the mentioned formats and, additionally, **image/jpeg**.

CHAPTER 6. ADDING A PRINTER TO CUPS BY USING THE WEB INTERFACE

Before users can print through CUPS, you must add printers. You can use both network printers and printers that are directly attached to the CUPS host, for example over USB.

You can add printers by using the CUPS driverless feature or by using a PostScript Printer Description (PPD) file.



NOTE

CUPS prefers driverless printing, and using drivers is deprecated.

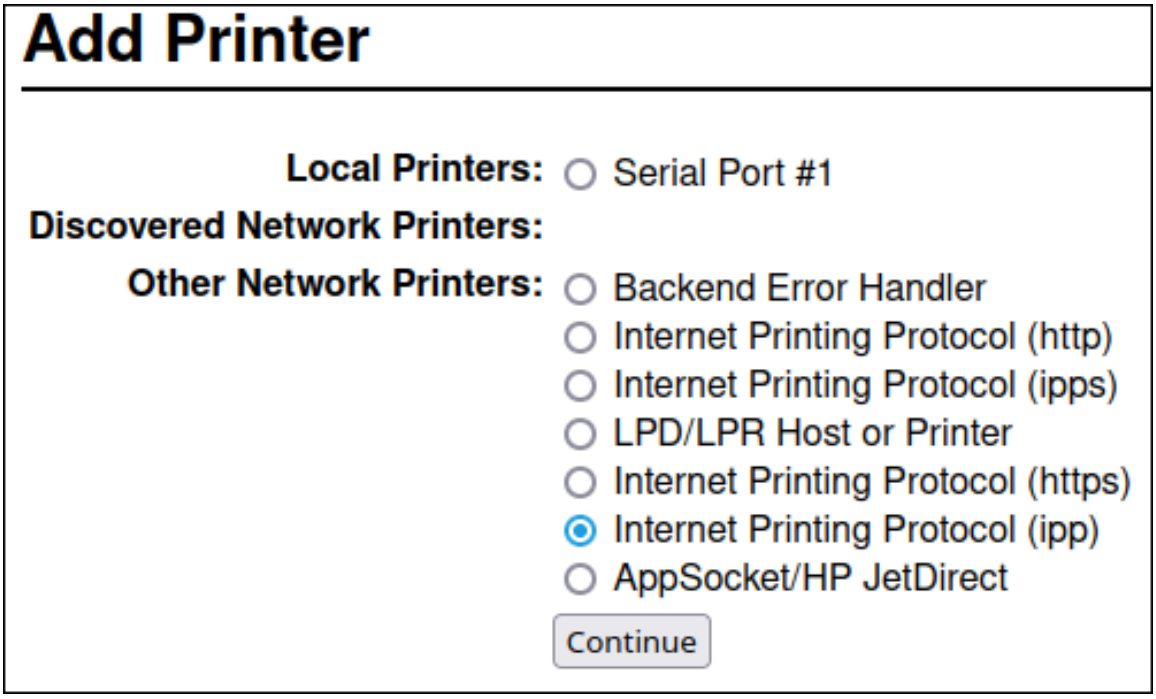
Red Hat Enterprise Linux (RHEL) does not provide the name service switch multicast DNS plug-in (**nss-mdns**), which resolves requests by querying an mDNS responder. Consequently, automatic discovery and installation for local driverless printers by using mDNS is not available in RHEL. To work around this problem, install single printers manually or use **cups-browsed** to automatically install a high amount of print queues that are available on a remote print server.

Prerequisites

- CUPS is configured.
- You have permissions in CUPS to manage printers .
- If you use CUPS as a print server, you configured TLS encryption to securely transmit data over the network.
- The printer supports driverless printing , if you want to use this feature.

Procedure

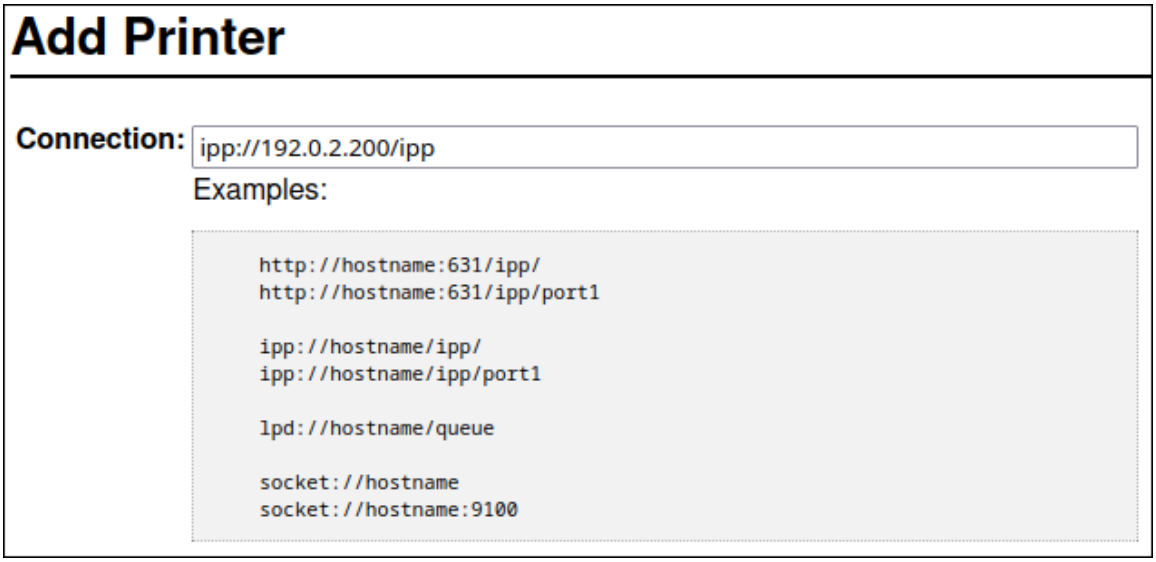
1. Use a browser, and access **https://*<hostname>*:631/admin/**.
   You must connect to the web interface by using the HTTPS protocol. Otherwise, CUPS prevents you from authenticating in a later step for security reasons.
2. Click **Add printer**.
3. If you are not already authenticated, CUPS prompts for credentials of an administrative user. Enter the username and password of an authorized user.
4. If you decide to not use driverless printing and the printer you want to add is detected automatically, select it, and click **Continue**.
5. If the printer was not detected:
   a. Select the protocol that the printer supports.



If your printer supports driverless printing and you want to use this feature, select the **ipp** or **ipps** protocol.

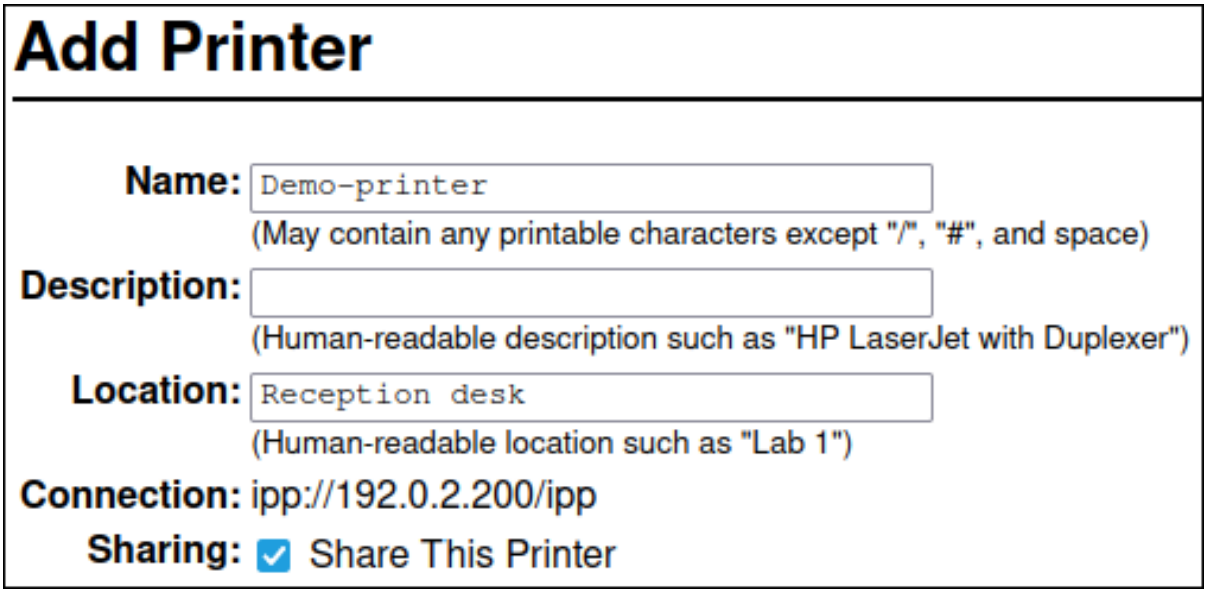
b. Click **Continue**.

c. Enter the URL to the printer or to the queue on a remote print server.



d. Click **Continue**.

6. Enter a name and, optionally, a description and location. If you use CUPS as a print server, and other clients should be able to print through CUPS on this printer, select also **Share this printer**.



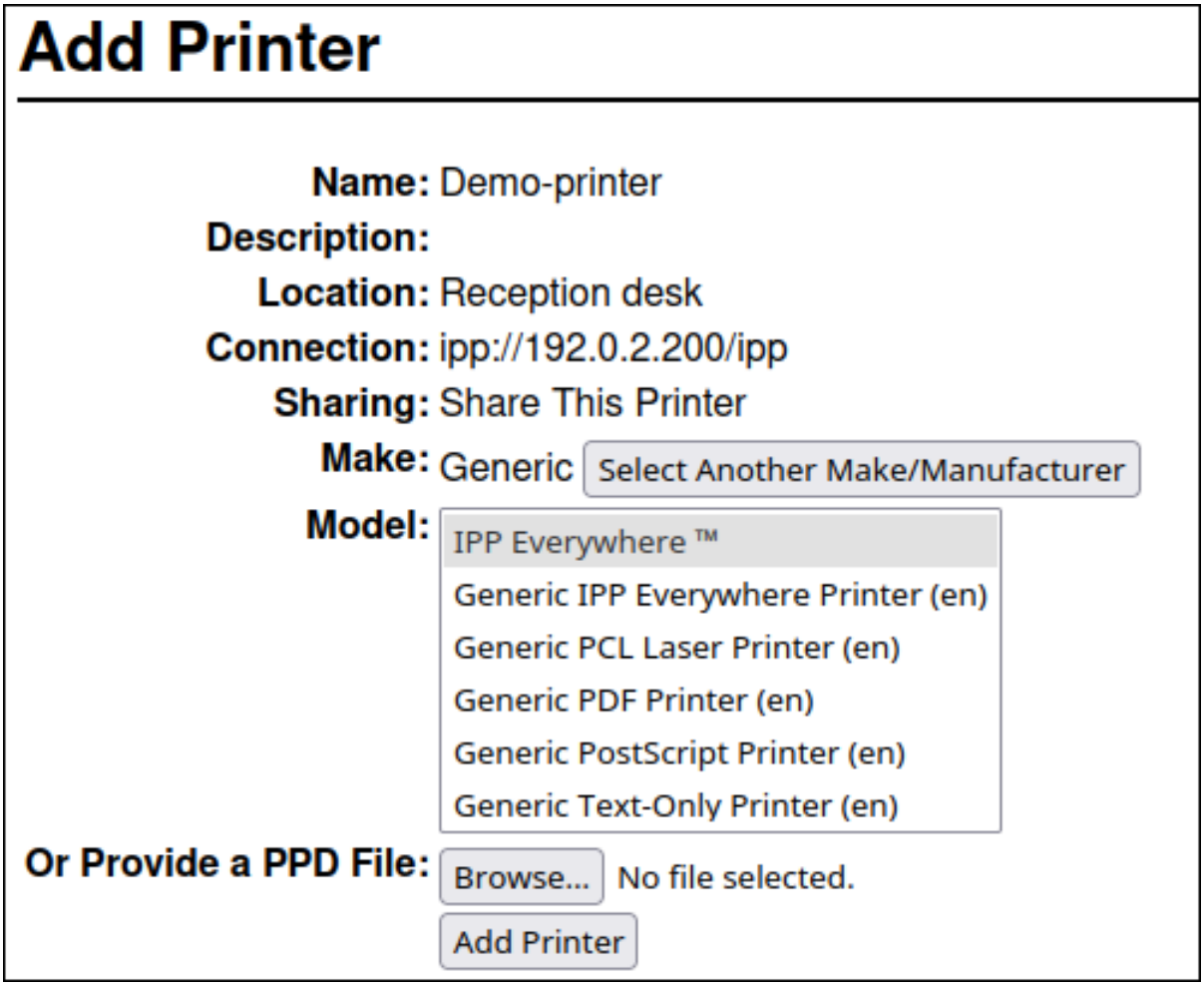
7. Select the printer manufacturer in the **Make** list. If the printer manufacturer is not on the list, select **Generic** or upload a PPD file for the printer.

8. Click **Continue**.

9. Select the printer model:

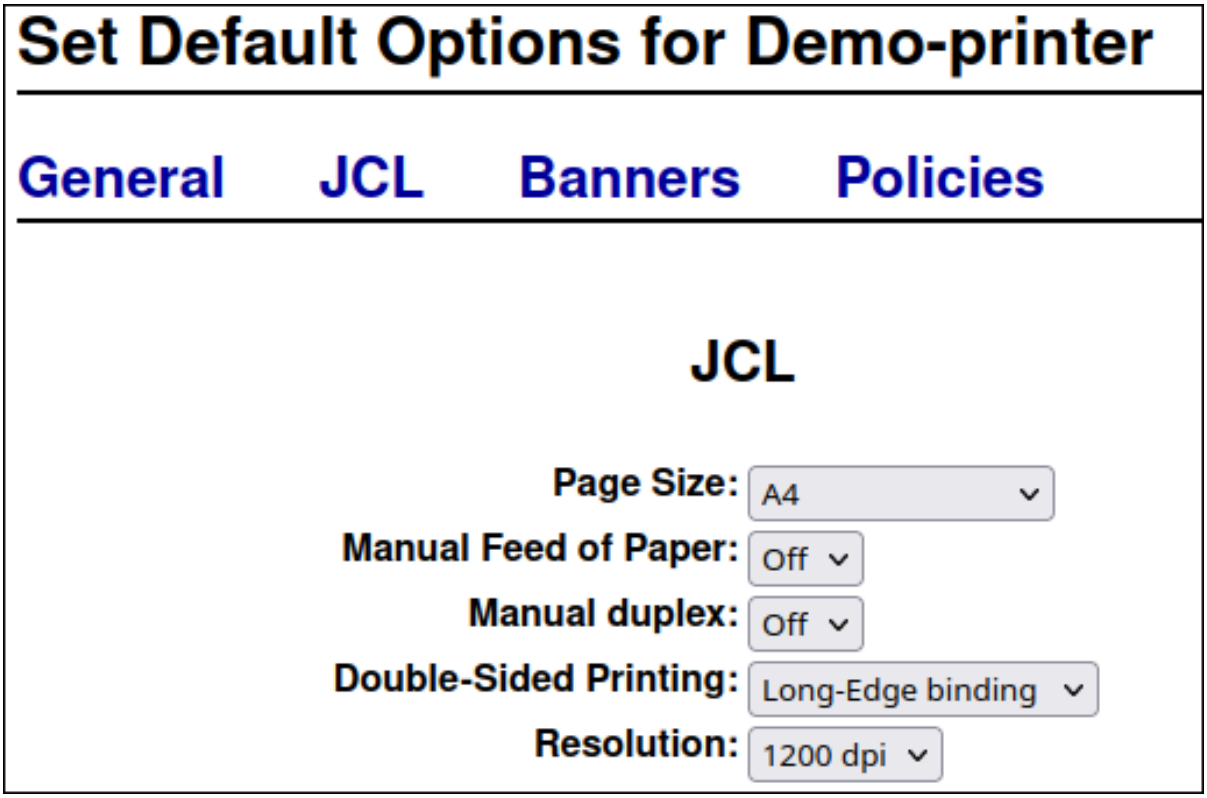
   - If the printer supports driverless printing, select **IPP Everywhere**. Note that, if you previously installed printer-specific drivers locally, it is possible that the list also contains entries such as ***<printer_name>*** **- IPP Everywhere**.

   - If the printer does not support driverless printing, select the model or upload the PPD file for the printer.



10. Click **Add Printer**

11. The settings and tabs on the **Set printer options** page depend on the driver and the features the printer supports. Use this page to set default options, such as for the paper size.



12. Click **Set default options**.

Verification

1. Open the **Printers** tab in the web interface.
2. Click on the printer's name.
3. In the **Maintenance** list, select **Print test page**.

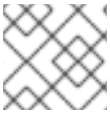
Troubleshooting

- If you use driverless printing, and printing does not work, use the **lpadmin** utility to add the printer on the command line. For details, see Adding a printer to CUPS by using the lpadmin utility.

CHAPTER 7. ADDING A PRINTER TO CUPS BY USING THE LPADMIN UTILITY

Before users can print through CUPS, you must add printers. You can use both network printers and printers that are directly attached to the CUPS host, for example over USB.

You can add printers by using the CUPS driverless feature or by using a PostScript Printer Description (PPD) file.



NOTE

CUPS prefers driverless printing, and using drivers is deprecated.

Red Hat Enterprise Linux (RHEL) does not provide the name service switch multicast DNS plug-in (**nss-mdns**), which resolves requests by querying an mDNS responder. Consequently, automatic discovery and installation for local driverless printers by using mDNS is not available in RHEL. To work around this problem, install single printers manually or use **cups-browsed** to automatically install a high amount of print queues that are available on a remote print server.

Prerequisites

- CUPS is configured.
- The printer supports driverless printing , if you want to use this feature.
- The printer accepts data on port 631 (IPP), 9100 (socket), or 515 (LPD). The port depends on the method you use to connect to the printer.

Procedure

- Add the printer to CUPS:
  - To add a printer with driverless support, enter:

    ```
    # lpadmin -p Demo-printer -E -v ipp://192.0.2.200/ipp/print -m everywhere
    ```

    If the **-m everywhere** option does not work for your printer, try **-m driverless:*<uri>***, for example: **-m driverless:*ipp://192.0.2.200/ipp/print***.
  - To add a queue from a remote print server with driverless support, enter:

    ```
    # lpadmin -p Demo-printer -E -v ipp://192.0.2.201/printers/example-queue -m everywhere
    ```

    If the **-m everywhere** option does not work for your printer, try **-m driverless:*<uri>***, for example: **-m driverless:*ipp://192.0.2.200/printers/example-queue***.
  - To add a printer with a driver in file, enter:

    ```
    # lpadmin -p Demo-printer -E -v socket://192.0.2.200/ -P /root/example.ppd
    ```
  - To add a queue from a remote print server with a driver in a file, enter:

```
# lpadmin -p Demo-printer -E -v ipp://192.0.2.201/printers/example-queue -P
/root/example.ppd
```

- To add a printer with a driver in the local driver database:

  i. List the drivers in the database:

  ```
  # lpinfo -m
  ...
  drv:///sample.drv/generpcl.ppd Generic PCL Laser Printer
  ...
  ```

  ii. Add the printer with the URI to the driver in the database:

  ```
  # lpadmin -p Demo-printer -E -v socket://192.0.2.200/ -m
  drv:///sample.drv/generpcl.ppd
  ```

These commands uses the following options:

- **-p *<printer_name>***: Sets the name of the printer in CUPS.
- **-E**: Enables the printer and CUPS accepts jobs for it. Note that you must specify this option after **-p**. See the option's description in the man page for further details.
- **-v *<uri>***: Sets the URI to the printer or remote print server queue.
- **-m *<driver_uri>***: Sets the PPD file based on the provided driver URI obtained from the local driver database.
- **-P *<PPD_file>***: Sets the path to the PPD file.

Verification

1. Display the available printers:

```
# lpstat -p
printer Demo-printer is idle. enabled since Fri 23 Jun 2023 09:36:40 AM CEST
```

2. Print a test page:

```
# lp -d Demo-printer /usr/share/cups/data/default-testpage.pdf
```

CHAPTER 8. PERFORMING MAINTENANCE AND ADMINISTRATION TASKS ON CUPS PRINTERS BY USING THE WEB INTERFACE

Printer administrators sometimes need to perform different tasks on a print server. For example:

- Maintenance tasks, such as temporary pausing a printer while a technician repairs a printer
- Administrative tasks, such as changing a printer's default settings

You can perform these tasks by using the CUPS web interface.

Prerequisites

- CUPS is configured.
- You have permissions in CUPS to manage printers .
- If you use CUPS as a print server, you configured TLS encryption to not send credentials in plain text over the network.
- The printer already exists in CUPS .

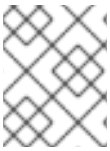
Procedure

1. Use a browser, and access **https://*<hostname>*:631/printers/**.
   You must connect to the web interface by using the HTTPS protocol. Otherwise, CUPS prevents you from authenticating in a later step for security reasons.
2. Click on the name of the printer that you want to configure.
3. Depending on whether you want to perform a maintenance or administration task, select the required action from the list.
4. If you are not already authenticated, CUPS prompts for credentials of an administrative user. Enter the username and password of an authorized user.
5. Perform the task.

CHAPTER 9. USING SAMBA TO PRINT TO A WINDOWS PRINT SERVER WITH KERBEROS AUTHENTICATION

With the **samba-krb5-printing** wrapper, Active Directory (AD) users who are logged in to Red Hat Enterprise Linux (RHEL) can authenticate to Active Directory (AD) by using Kerberos and then print to a local CUPS print server that forwards the print job to a Windows print server.

The benefit of this configuration is that the administrator of CUPS on RHEL does not need to store a fixed user name and password in the configuration. CUPS authenticates to AD with the Kerberos ticket of the user that sends the print job.



NOTE

Red Hat supports only submitting print jobs to CUPS from your local system, and not to re-share a printer on a Samba print server.

Prerequisites

- The printer that you want to add to the local CUPS instance is shared on an AD print server.
- You joined the RHEL host as a member to the AD.
- CUPS is installed on RHEL, and the **cups** service is running.
- The PostScript Printer Description (PPD) file for the printer is stored in the **/usr/share/cups/model/** directory.

Procedure

1. Install the **samba-krb5-printing**, **samba-client**, and **krb5-workstation** packages:

```
# dnf install samba-krb5-printing samba-client krb5-workstation
```

2. Optional: Authenticate as a domain administrator and display the list of printers that are shared on the Windows print server:

```
# smbclient -L win_print_srv.ad.example.com -U
administrator@AD_KERBEROS_REALM --use-kerberos=required

 Sharename       Type      Comment
 ---------       ----      -------
 ...
 Example         Printer   Example
 ...
```

3. Optional: Display the list of CUPS models to identify the PPD name of your printer:

```
lpinfo -m
...
samsung.ppd Samsung M267x 287x Series PXL
...
```

   You require the name of the PPD file when you add the printer in the next step.

4. Add the printer to CUPS:

```
# lpadmin -p "example_printer" -v smb://win_print_srv.ad.example.com/Example -m
samsung.ppd -o auth-info-required=negotiate -E
```

The command uses the following options:

- **-p *printer_name*** sets the name of the printer in CUPS.
- **-v *URI_to_Windows_printer*** sets the URI to the Windows printer. Use the following format: **smb://*host_name*/*printer_share_name***.
- **-m *PPD_file*** sets the PPD file the printer uses.
- **-o auth-info-required=negotiate** configures CUPS to use Kerberos authentication when it forwards print jobs to the remote server.
- **-E** enables the printer and CUPS accepts jobs for the printer.

Verification

1. Log into the RHEL host as an AD domain user.
2. Authenticate as an AD domain user:

```
# kinit domain_user_name@AD_KERBEROS_REALM
```

3. Print a file to the printer you added to the local CUPS print server:

```
# lp -d example_printer file
```

CHAPTER 10. USING CUPS-BROWSED TO LOCALLY INTEGRATE PRINTERS FROM A REMOTE PRINT SERVER

The **cups-browsed** service uses DNS service discovery (DNS-SD) and CUPS browsing to make all or a filtered subset of shared remote printers automatically available in a local CUPS service.

For example, administrators can use this feature on workstations to make only printers from a trusted print server available in a print dialog of applications. It is also possible to configure **cups-browsed** to filter the browsed printers by certain criteria to reduce the number of listed printers if a print server shares a large number of printers.

NOTE

If the print dialog in an application uses other mechanisms than, for example DNS-SD, to list remote printers, **cups-browsed** has no influence. The **cups-browsed** service also does not prevent users from manually accessing non-listed printers.

Prerequisites

- The CUPS service is configured on the local host .
- A remote CUPS print server exists, and the following conditions apply to this server:
  - The server listens on an interface that is accessible from the client.
  - The **Allow from** parameter in the server's **<Location />** directive in the **/etc/cups/cups.conf** file allows access from the client's IP address.
  - The server shares printers.
  - Firewall rules allow access from the client to the CUPS port on the server.

Procedure

1. Edit the **/etc/cups/cups-browsed.conf** file, and make the following changes:
   a. Add **BrowsePoll** parameters for each remote CUPS server you want to poll:

   ```
   BrowsePoll remote_cups_server.example.com
   BrowsePoll 192.0.2.100:1631
   ```

   Append **:<port>** to the hostname or IP address if the remote CUPS server listens on a port different from 631.

   b. Optional: Configure a filter to limit which printers are shown in the local CUPS service. For example, to filter for queues whose name contain **sales_**, add:

   ```
   BrowseFilter name sales_
   ```

   You can filter by different field names, negate the filter, and match the exact values. For further details, see the parameter description and examples in the **cups-browsed.conf(5)** man page on your system.

   c. Optional: Change the polling interval and timeout to limit the number of browsing cycles:

```
BrowseInterval 1200
BrowseTimeout 6000
```

Increase both **BrowseInterval** and **BrowseTimeout** in the same ratio to avoid situations in which printers disappear from the browsing list. This mean, multiply the value of **BrowseInterval** by 5 or a higher integer, and use this result value for **BrowseTimeout**.

By default, **cups-browsed** polls remote servers every 60 seconds and the timeout is 300 seconds. However, on print servers with many queues, these default values can cost many resources.

2. Enable and start the **cups-browsed** service:

```
# systemctl enable --now cups-browsed
```

Verification

- List the available printers:

```
# lpstat -v
device for Demo-printer: implicitclass://Demo-printer/
...
```

If the output for a printer contains **implicitclass**, the **cups-browsed** service manages the printer in CUPS.

Additional resources

- **cups-browsed.conf(5)** man page on your system

CHAPTER 11. ACCESSING THE CUPS LOGS IN THE SYSTEMD JOURNAL

By default, CUPS stores log messages in the **systemd** journal. This includes:

- Error messages
- Access log entries
- Page log entries

Prerequisites

- CUPS is installed.

Procedure

- Display the log entries:
  - To display all log entries, enter:

    ```
    # journalctl -u cups
    ```

  - To display the log entries for a specific print job, enter:

    ```
    # journalctl -u cups JID=<print_job_id>
    ```

  - To display log entries within a specific time frame, enter:

    ```
    # journalectl -u cups --since=<YYYY-MM-DD> --until=<YYYY-MM-DD>
    ```

    Replace **YYYY** with the year, **MM** with the month, and **DD** with the day.

Additional resources

- **journalctl(1)** man page on your system

CHAPTER 12. CONFIGURING CUPS TO STORE LOGS IN FILES INSTEAD OF THE SYSTEMD JOURNAL

By default, CUPS stores log messages in the **systemd** journal. Alternatively, you can configure CUPS to store log messages in files.

Prerequisites

- CUPS is installed.

Procedure

1. Edit the **/etc/cups/cups-files.conf** file, and set the **AccessLog**, **ErrorLog**, and **PageLog** parameters to the paths where you want to store these log files:

```
AccessLog /var/log/cups/access_log
ErrorLog /var/log/cups/error_log
PageLog /var/log/cups/page_log
```

2. If you configure CUPS to store the logs in a directory other than **/var/log/cups/**, set the **cupsd_log_t** SELinux context on this directory, for example:

```
# semanage fcontext -a -t cupsd_log_t "/var/log/printing(/.*)?"
# restorecon -Rv /var/log/printing/
```

3. Restart the **cups** service:

```
# systemctl restart cups
```

Verification

1. Display the log files:

```
# cat /var/log/cups/access_log
# cat /var/log/cups/error_log
# cat /var/log/cups/page_log
```

2. If you configured CUPS to store the logs in a directory other than **/var/log/cups/**, verify that the SELinux context on the log directory is **cupsd_log_t**:

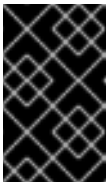
```
# ls -ldZ /var/log/printing/
drwxr-xr-x. 2 lp sys unconfined_u:object_r:cupsd_log_t:s0 6 Jun 20 15:55 /var/log/printing/
```

CHAPTER 13. SETTING UP A HIGH-AVAILABILITY CUPS PRINT SERVER ENVIRONMENT

If your clients require access to printers without interruption, you can set up CUPS on multiple hosts and use the print queue browsing feature to provide high availability. Print clients then automatically configure print queues shared by the different print servers. If a client sends a print job to its local print queue, CUPS on the client routes the job to one of the print servers which processes the job and sends it to the printer.

Procedure

1. Set up CUPS on two or more servers:
   a. Install and configure CUPS.
   b. Enable TLS encryption.
   c. Add print queues to all CUPS instances by using the lpadmin utility or the web interface. If you use the web interface, ensure that you select the **Share this printer** option while you add the printer. The **lpadmin** utility enables this setting by default.



IMPORTANT

For the high-availability scenario, each queue on one print server requires a queue with exactly the same queue name on the other servers. You can display the queue names on each server by using the **lpstat -e** command.

   Optional: You can configure the queues on each server to refer to different printers.

2. On print clients:
   a. Edit the **/etc/cups/cups-browsed.conf** file, and add **BrowsePoll** directives for each CUPS print server:

```
BrowsePoll print_server_1.example.com:631
BrowsePoll print_server_2.example.com:631
```

   b. Enable and start both the **cups** and **cups-browsed** service:

```
# systemctl enable --now cups cups-browsed
```

Verification

- Display the available printers on a client:

```
# lpstat -t
...
device for Demo-printer: implicitclass://Demo-printer/
Demo-printer accepting requests since Fri 22 Nov 2024 11:54:59 AM CET
printer Demo-printer is idle.  enabled since Fri 22 Nov 2024 11:54:59 AM CET
...
```

The example output shows that the **Demo-printer** queue uses the **implicitclass** back end. As a result, **cups-browsed** routes print jobs for this queue to the hosts specified in the **BrowsePoll** directives on this client.

Additional resources

- High-availability printing in Red Hat Enterprise Linux (Red Hat Knowledgebase)

CHAPTER 14. ACCESSING THE CUPS DOCUMENTATION

CUPS provides browser-based access to the service's documentation that is installed on the CUPS server. This documentation includes:

- Administration documentation, such as for command-line printer administration and accounting
- Man pages
- Programming documentation, such as the administration API
- References
- Specifications

Prerequisites

- CUPS is installed and running.
- The IP address of the client you want to use has permissions to access the web interface.

Procedure

1. Use a browser, and access **http://*<hostname_or_ip_address>*:631/help/**.
2. Expand the entries in **Online Help Documents**, and select the documentation you want to read.