PaperCut MF

Professional Getting Started Guide - Windows

Notice

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Contents

1. Introduction

PaperCut NG/MF is a feature-packed application designed to meet the print management requirements of all types of organizations.

As with any software solution, there are many different installation and configuration variables that can affect how you deploy, license, and use PaperCut NG/MF.

This guide describes how to implement PaperCut NG/MF in a professional (client billing) organization on a Windows server with the following requirements:

- Staff can print directly from their computer without the need for a print server.
- Staff have no restrictions on their ability to print.
- All print jobs are charged to a customer/client account or internal office account.
- Staff can select the account to which a print job will be charged when they print.
- Reports on the charges against accounts are delivered to someone within the organization at regular intervals (e.g. monthly).

PaperCut NG/MF offers many other configuration options that can be tweaked to suit your needs. For more information, see the PaperCut NG/MF Manual.

2. Preparing for the implementation

Before you install PaperCut NG/MF, make sure your network environment is ready and you have all of the information you need. You should:

- Check system requirements
- Determine printing costs
- Confirm client / matter accounts
- Confirm internal office shared accounts
- Restrict Windows print queue security permissions

2.1. Check system requirements

PaperCut NG/MF requires a correctly configured network environment. Before you install PaperCut NG/MF, verify the following system requirements:

- **Operating system:**
  - The operating system version is supported and patches are up-to-date (see System Requirements).
- **User accounts:**
  - Each user has their own domain account and password. By default, PaperCut NG/MF does not maintain its own users and passwords, and instead uses the operating system log on accounts.
  - You have selected a domain user account to use as a test user.
  - You have the username and password for both network and local Administrator accounts.
- **Printers:**
  - Check that all printers are configured correctly and work *before* installing PaperCut NG/MF. PaperCut NG/MF works with the majority of printer hardware without any additional configuration. PaperCut NG/MF works with any postscript, PCL5, or PCL6 printer driver. For a list of all compatible printer drivers, see Supported Printers.
- **PaperCut NG/MF Application server**
  - Check the Sizing guide for details of the server requirements.
  - If your printers are currently hosted on a print server—install the Application Server on this server as well
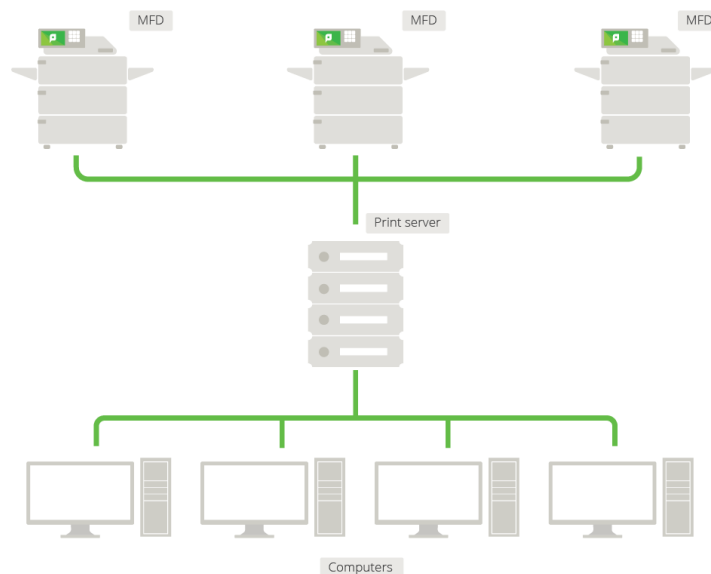
Figure 1: Network printing configuration

○ If you don't have a print server—install the Application Server on any server. You also need to install the Direct Print Monitor on each computer.
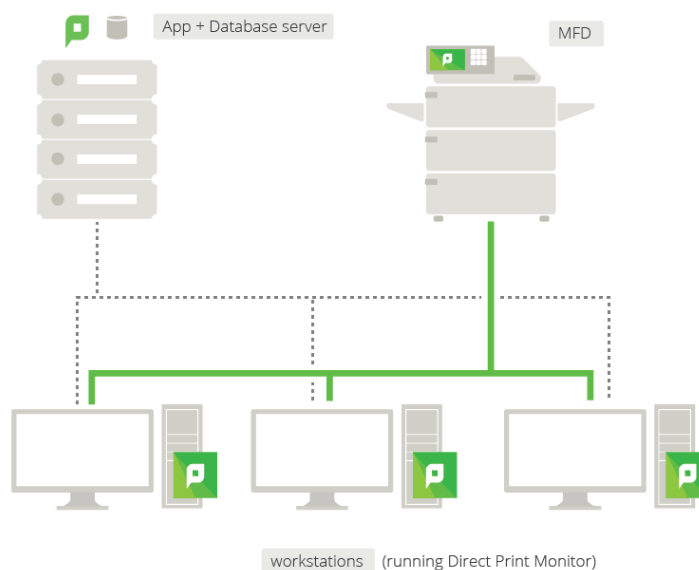

Figure 2: Direct Printing configuration

2.2. Determine printing costs

Before you install PaperCut NG/MF, you should determine the costs to apply to each print job. PaperCut NG/MF supports a number of different pricing models. The most popular pricing models are:

- **Simple**—a flat rate is applied to all pages (i.e. $0.50 per page)
- **Standard**—pricing is based on combinations of page sizes, color makeup, and discounts for duplex. A matrix, such as the following, will help capture the pricing model.

	Color	Grayscale	Color Duplex	Grayscale Duplex
A4	$0.50	$0.10	$1.00	$0.20
A3				

> **Note:**
> Organizations, such as Architects or Advertising should also consider the charges for using Large Format Printers.

2.3. Confirm client / matter accounts

Prepare some customer/client accounts to add into the system. Preparing a list of customer/client accounts in advance make the installation quicker. An export from a Finance Package is an excellent source.

> **Tip:**
> Automating this process where possible ensures new matters flow between systems. Ideally, an export would be scheduled to meet the chosen format so you do not have to repeat this process manually at given intervals. You can also see if an interface has been written by one of our ASCs.

- If you have only a small number of account codes, manually add them to the system.
- If you have a large number of customer/client accounts, you can use Excel to create a tab delimited file and import it into PaperCut NG/MF.

> **Important:**
> Your Excel spreadsheet must be saved in the following format:
> - Text (Tab delimited) (*. txt)

- PaperCut NG/MF allows for a hierarchy of customer/client accounts that closely matches the relationship between a client and a set of matters. For example, Mr Black might have a number of open matters with the organization including Conveyancing and a Family Law .

	A	B	C	D
1	Mr White	Conveyancing	Y	WHI0001
2	Mr White	Family Law	Y	WHI0002
3	Mr Blue	Family Law	Y	BLU0001
4	Mrs Red	Wills	Y	RED0001
5				

> **Note:**
> - Column 'D' is a short version of the code and is optional. You can use it in place of Column B if you prefer a short code instead of a description.
> - If all you want is a list of valid matter codes to choose from, a list in Column A is sufficient.
> - For a full list of shared account fields that can be imported, see Batch account import file format.
> - For more examples of import formats, see Account import formats.

> **Tip:**
> Consider adding a test user account that you can use for your testing so you do not affect any real accounts.

2.4. Confirm internal office shared accounts

Add some codes for the internal office accounts to your Excel spreadsheet of accounts. Not all jobs are chargeable to a client (for example, invoices, payslips, newsletters etc).

	A	B	C	D
1	Office	Newletter	Y	OFF0001
2	Office	Research	Y	OFF0002
3	Office	Marketing	Y	OFF0003
4	Office	Invites	Y	OFF0004

2.5. Restrict Windows print queue security permissions

When using Secure Print Release or account selection popups, PaperCut NG/MF pauses jobs on the Windows print queue prior to printing. It is important that the queue is secured to prevent users from resuming jobs themselves and bypassing PaperCut NG/MF.

There are two ways a Windows print queue can be secured:

- Restrict the print queue security permissions to prevent users from performing management functions.
- Configure the queue using the PaperCut TCP/IP Port.

For more information, see Print queue set up on Windows - forgotten task!

To restrict security permissions for a queue:

1. Log on as an Administrator to the server hosting the printers.
2. Open the printer configuration screen: **Start > Printers**

3. Right-click a printer; then select **Printer properties**.

4. Select the **Security** tab.

5. Select the **CREATOR OWNER** user.

6. In the **Permissions** area, clear both the **Allow** and **Deny** check boxes for **Manage Documents**.
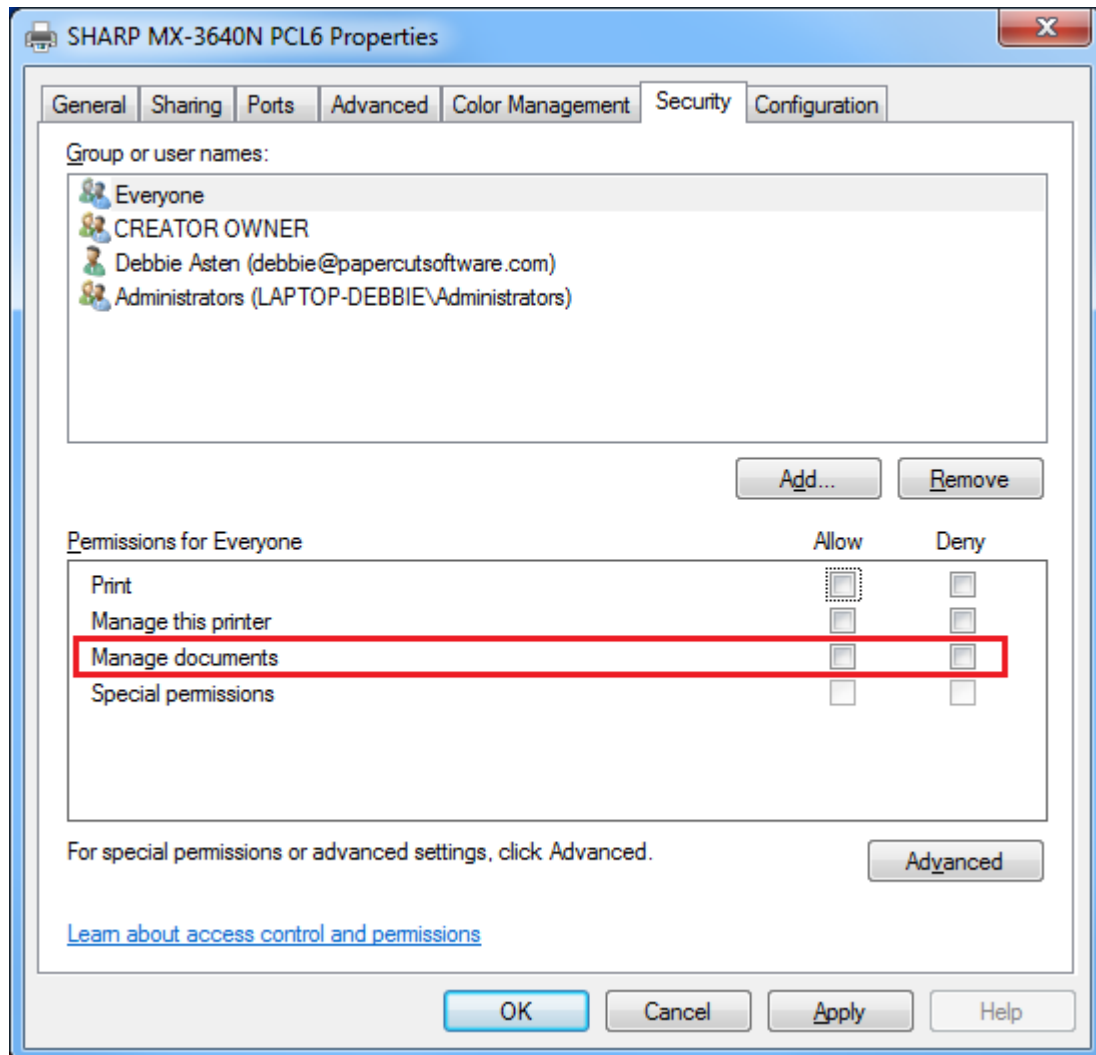
7. Click **OK**.

8. Perform these steps for each of the monitored printers.

> ⭐ **Tip:**
>
> When using Windows 2008 Server, use the Server Manager, navigate to the Print Management Console and globally set the security permissions by right-clicking the **Print Server(s) > Properties > Security** and editing the permissions there. This applies only to printers added *after* the global permissions are changed, not for pre-existing printers.

> ▶ **Important:**
>
> In order to use this method with Windows Server 2012 and 2012R2, Microsoft released a

patch for Windows Server 2012 and 2012R2. As always, please consult your Microsoft experts as to the suitability of this patch.

3. Installing PaperCut NG/MF

In a professional installation, you need to install the following components:

- Install the Application Server
- Install the Direct Print Monitor on a Windows computer
- Install the User Client
- Upsize to an external database (RDBMS) (optional)

These steps should not affect your business, but it's best to alert users there will be changes happening to the printing system for the duration of 30 minutes.

3.1. Install the Application Server

Installing the application server involves the following steps:

- Download and install PaperCut NG/MF
- Run the Configuration Wizard
- Check printer configuration

Step 1: Download and install PaperCut NG/MF

PaperCut NG/MF is supplied as a standard Windows `pcng-setup-<version>.exe` install program. You can download the latest version from https://www.papercut.com/products/ng/download/. After the download is complete, run the setup wizard as an administrator. A system restart is not usually required, but you should install on live production systems during periods of low activity, for example, not during backup operations or other administration activities.

1. Double-click the `pcng-setup-<version>.exe` install program.
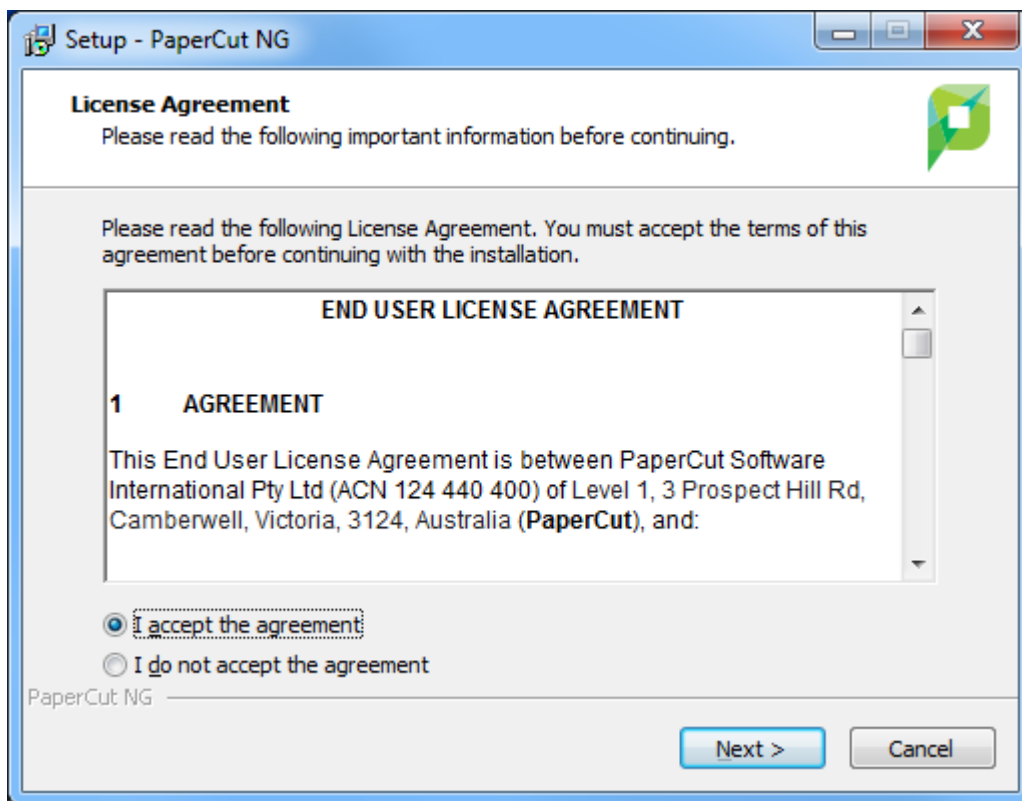
2. Read the End User License Agreement (EULA).

3. Select **I accept the agreement**; then click **Next**.

4. Read the installation information; then click **Next**.

5. Select the installation location; then click **Next**.

6. Select **Standard installation (primary server)**; then click **Next**.

7. Select whether or not you want to create a desktop shortcut; then click **Next**.

8. Click **Install**.

9. Click **Finish**.

Step 2: Run the Configuration Wizard

After you install PaperCut NG/MF, a web browser is displayed with the PaperCut NG/MF **Configuration Wizard Welcome** screen.

> ✏️ **Note:**
> If the **Configuration Wizard Welcome** screen is not displayed, you can access it by going to the following URL:
> - `http://localhost:9191/admin`

1. **Administrative password**

   a. Complete the following fields:

   - **Password**—enter the master password for the main in-built admin account. This password is independent of the operating system or domain passwords. The password must be at least six characters.

   > ⭐ **Tip:**
   > Keep this password secure. If you forget your password, you can reset it. For more information, see Resetting the Admin Password.

   - **Verify password**—re-enter the password.
   - **Location**—select the system's physical location and language.
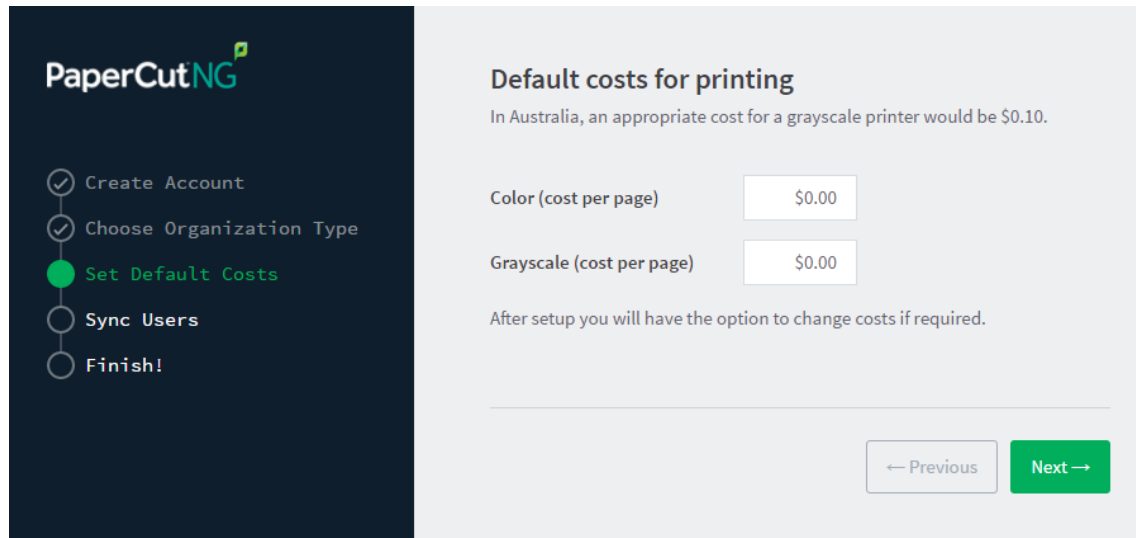
   b. Click **Next**.

2. **Organization type**

   The **Organization type** screen is displayed.

   This selection determines which system defaults are used.

a. Select **Professional (Client Billing)**.

b. Click **Next**.

3. ## Default cost for printing

The **Default costs for printing** screen is displayed.

If required, you can change this setting after installation.

a. Complete the following fields:

- **Color (cost per page)**—enter the default cost per page for color printing on all printers.

- **Grayscale (cost per page)**—enter the default cost per page for grayscale printing on all printers.

b. Click **Next**.

4. ## User/group synchronization

The **User/group synchronization** screen is displayed.

PaperCut NG/MF extracts user information out of your user directory. PaperCut NG/MF automatically tries to detect the available directory services, saving you hours of configuration time.

> **Note:**
>
> To speed up the installation, you can click **Skip this step** and synchronize the users/groups later.

a. In **User source**, select the source of user data:

- **Windows Standard**
- **Windows Active Directory**
- **LDAP**
- **Azure AD Secure LDAP**
- **Google Cloud Directory**

b. Select one of the following options:

- **Import all users**—import all domain user accounts. This includes all system accounts as well as user accounts. Importing all users is suitable for organizations that do not have user groups (user groups are not imported into PaperCut NG/MF with this options), and does not have a large number of system account.

- **Import users from selected groups**—import users from selected user groups. This is useful when:
    - only a subset of users will use the printers
    - you want to report on individual user groups or apply different policies or pricing to different groups
    - you have many system accounts

c. Click **Next**.

- For LDAP and Azure AD Secure LDAP, the Server Details page is displayed.
- For Google Cloud Directory, the Google Cloud Directory Details page is displayed.

d. Complete the following as required:

LDAP

i. Complete the following fields:

- **LDAP Server Type**—Determines which LDAP fields are used to get user and group information. PaperCut NG/MF supports the following server types:
    - Unix / Open Directory
    - Microsoft Active Directory
    - Novell eDirectory

However, it is easy to support other server types by adjusting the LDAP fields PaperCut NG/MF searches. For more information, see Advanced LDAP configuration.

- **LDAP Server Address**—The hostname or IP address of the LDAP server.

- **Use SSL**—Indicates if an encrypted SSL connection is used to connect to the LDAP server. The LDAP server requires SSL support to be enabled and should accept connections on the standard LDAPS port 636.

- **Base DN**—The Base DN of the LDAP server. This is the equivalent of the "suffix" config setting of the OpenLDAP server. For example, if the domain hosted by the LDAP server is "domain.com", then the Base DN might be `DC=domain,DC=com`. The format of the Base DN can differ significantly depending on configuration. Some older Novell eDirectory installations require a blank Base DN to operate. Some examples:

   `DC=myschool,DC=edu,DC=au,DC=myorganization,DC=com OU=OrgUnit,DC=domain,DC=com,DC=local`

- **Admin DN**—The DN of the user who has permission to connect to and query the LDAP server. This is typically an administrative user, although it can be a user that only has read-only access to the LDAP server. An example of the DN of the Administrator user on a Windows AD domain "domain.com", would be `CN=Administrator,CN=Users,DC=domain,DC=com`. The exact format of the DN depends on the LDAP server. Some examples:

  - Windows Active Directory: `CN=Administrator,CN=Users,DC=domain,DC=com`

  - Windows Active Directory (in organizational unit): `CN=administrator,OU=OrgUnit,DC=domain,DC=com`

  - Mac Open Directory: `uid=diradmin,CN=users,DC=domain,DC=com`

  - Unix Open LDAP: `uid=root,DC=domain,DC=com`, or `uid=ldapadmin,DC=domain,DC=com`

  - Novell eDirectory: `CN=root,DC=domain,DC=com`, or `CN=ldapadmin,OU=users,DC=domain,DC=com`.

The Admin DN and password is optional if your LDAP server allows anonymous binds for querying.

- **Admin password**—The password for the above user.

> ⭐ **Tip:**
> Some LDAP servers are configured to allow 'anonymous' LDAP query access. In these situations, you can leave **Admin DN** and **Admin password** blank.

    ii. Click **Test LDAP settings** to test and confirm your settings before continuing.

   iii. Click **Next**.

Azure AD Secure LDAP

    i. Complete the following fields as required:

- **Accept self-signed certificate**—Select this check box if you are using a self-signed certificate that does not need to be validated. If you are using a certificate signed by a trusted authority, clear this checkbox.

- **Azure LDAP External Address**—Your LDAP external address copied above from Azure AD Secure LDAP.

- **Base DN**—Your Azure DNS Domain Name. This is the equivalent of the "suffix" config setting of the OpenLDAP server. For example, if the domain hosted by the LDAP server is "domain.com", then the Base DN might be `DC=domain,DC=com`. The format of the Base DN can differ significantly depending on configuration. Some older Novell eDirectory installations require a blank Base DN to operate. Some examples:

  ```
  DC=myschool,DC=edu,DC=au,DC=myorganization,DC=com OU=OrgUnit,DC=domain,DC=com,DC=local
  ```

- **AAD DC Administrator username**—The Azure Active Directory DC administrator username. For example, admin@papercut.com.

- **Admin password**—The password for the above user.

    ii. Click **Test Settings** to test and confirm your settings before continuing.

   iii. Click **Next**.

Google Cloud Directory

> ✏️ **Note:**
> Remember, this functionality is available for organizations using G Suite Education, G Suite Enterprise for Education, G Suite Enterprise, and Cloud Identity Premium.

> ▶️ **Important:**
> Before you start, make sure you can log in to Google as a Super Admin.

1. Log in to admin.google.com using your Super Admin user login details. The **Google Admin console** is displayed.

2. Click the **Apps** tile. The **Apps** screen is displayed.

3. Click the **LDAP** tile. The LDAP screen is displayed.

4. Click **ADD CLIENT**.

5. Type a name for the LDAP client connection you'll be configuring to use for PaperCut NG/MF (for example, "PaperCut MF"), and optionally type a description; then click **CONTINUE**. The **Access permissions** screen is displayed.

   > **Note:**
   > This adds PaperCut NG/MF to the list of permitted LDAP clients. You can find more information about configuring access permissions from Google.

6. In the **Verify user credentials** section, select either:

   - **Entire domain <domain name>**
   - **Selected organizational units**; then click **Add** and select the units from the list. (Use this to limit syncing to users in a subset of groups.)

7. In the **Read user information** section, select either

   - **Entire domain <domain name>**
   - **Selected organizational units**; then either click **Copy from Verify user credentials** or click **Add** and select the units from the list. (Use this to limit syncing to users in a subset of groups.)

8. In the **Read group information** section, click the switch to set it to **On**; then click **ADD LDAP CLIENT**. Google displays a confirmation message and information about downloading the certificate.

9. On the same screen, click **Download certificate**; then save the downloaded certificate (which is a PDF file) in a secure location.

10. Click **CONTINUE TO CLIENT DETAILS**. The **Settings for <LDAP client name>** screen is displayed.

    > **Note:**
    > The service status, displayed at the top right of the screen, is initially set to **OFF**.

11. Click anywhere in the **Service Status** box. The **Service Status** screen is displayed.

12. Select **On for everyone**. The service status is updated for everyone.

13. Click **SAVE**.

> ✎ **Note:**
> Depending on the size of your organization, it can take up to 24 hours for Google Cloud Directory changes to apply.

5. **User Client options**
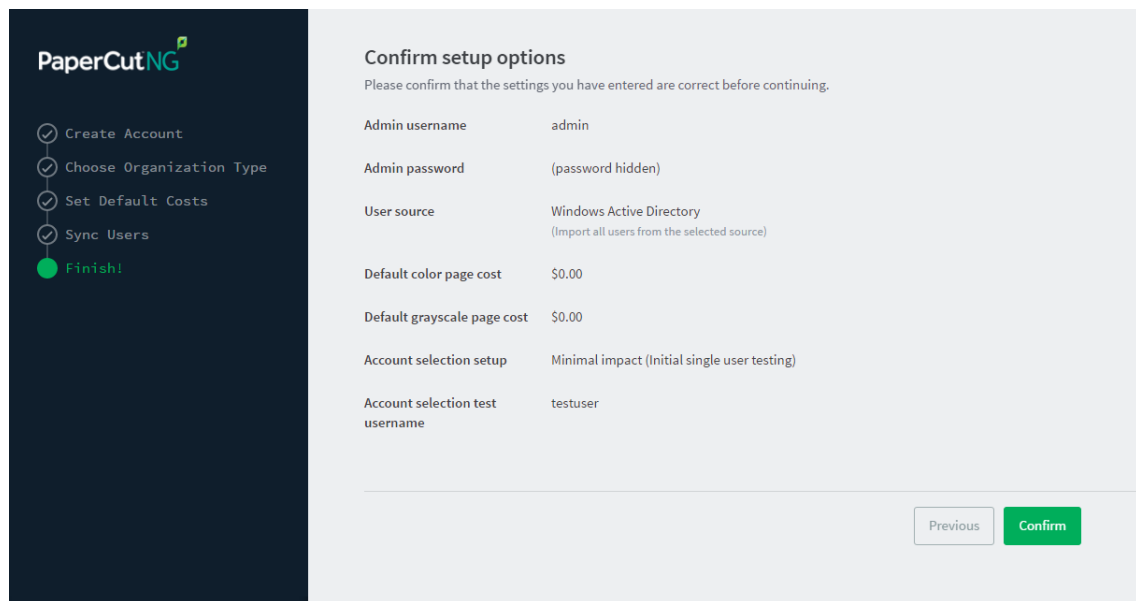
The **User client options** screen is displayed.

a. Select **Minimal impact (Initial single user testing)**. The account popup is enabled only for a single user for testing purposes. You need to nominate the testing account; this can be an existing system/domain account used for testing purposes or your own user account. The username should be in the format used to log in to the domain/system (usually the short form).

The minimal impact strategy allows you to test the popup with the nominated test system/domain user account, after which you can enable the popup for other users as appropriate.

b. Click **Next**.

6. **Confirm setup options**

The **Confirm setup options** screen is displayed.

16 of 49

a. Check the settings you have entered. If you want to change anything, you can return to any of the configuration screens to alter the options.

b. Click **Confirm**.

   The **Initial user import** screen is displayed.

c. Click **Close**.

7. **Setup complete**

   After completing the configuration wizard you are presented with a user synchronization status screen, showing the progress and results of the setup.

a. Click **Login** to access the Admin web interface and begin familiarizing yourself with the options and features available.

Step 3: Check printer configuration

PaperCut NG/MF automatically detects the print queues on the print server on which PaperCut NG/MF is installed. To view the printer list:

1. Click the **Printers** tab.
2. If the printers are not displayed, print a document. The first job triggers registration of the printer with PaperCut NG/MF.

3.2. Install the Direct Print Monitor on a Windows computer

If your organization does not have a dedicated print server at one or more sites, you should consider setting up Direct Printing. Direct Printing allows you to track and report on local printing that is sent directly from a computer to a printer, without a print server. The following steps show how to install Direct Print on Windows machines. For more information about installing Direct Print on other operating systems, see:

- Install the Direct Print Monitor on a Linux computer
- Install the Direct Print Monitor on a Mac computer

Step 1: Ensure the primary server is set up correctly

Before installing the Direct Print Monitor, you should ensure that the primary server (Application Server) is set up and running correctly.

Verify that:

- PaperCut NG/MF release 16.0 or above is installed.
- Users can log in to user pages from their computers.
- Administrators can access the system.
- The Application Server is accessible from each computer requiring Direct Printing, that is, you can ping the Application Server.

Step 2: Ensure firewall software is set to allow access to the port used by the Application Server

A computer with the Direct Print Monitor installed needs to communicate (initiate a TCP connection) on the port used by the Application Server (by default this is port 9191). Ensure that any firewall software on the primary Application Server is not set to block any incoming local network traffic on this port.

Step 3: Change the default configuration (optional)

The Direct Print Monitor installation configuration file is installed in the following location on the Application Server:

```
[app-path]/providers/direct-print-monitor/win/direct-print-
monitor.conf
```

> **Note:**
> If you need to change the configuration after deploying Direct Printing, you must change the configuration on every computer using Direct Printing.

The Direct Print Monitor configuration file is automatically generated with the hostname of the Application Server when the Application Server is installed. If required, you can change the default configuration, however, the default configuration suits most implementations. For example, you can change the IP address of the Application Server to a Fully Qualified Domain Name (FQDN).

Step 4: Install the Direct Print Monitor on each computer

Install the Direct Print Monitor on each Windows computer. You can either:

Manually install the Direct Print Monitor

If you do not have many computers on which you want to install the software, manual installation might be easier.

> **Note:**
> If the computer has a PaperCut NG/MF Print Provider installed, uninstall it.

1. Ensure the following files are in a shared folder that is accessible to the target computers (i.e. a network share or mapped drive):

   ```
   [app-path]\providers\direct-print-monitor\win\
   ```

   This folder contains the following files:

   - `pc-direct-print-monitor.exe`
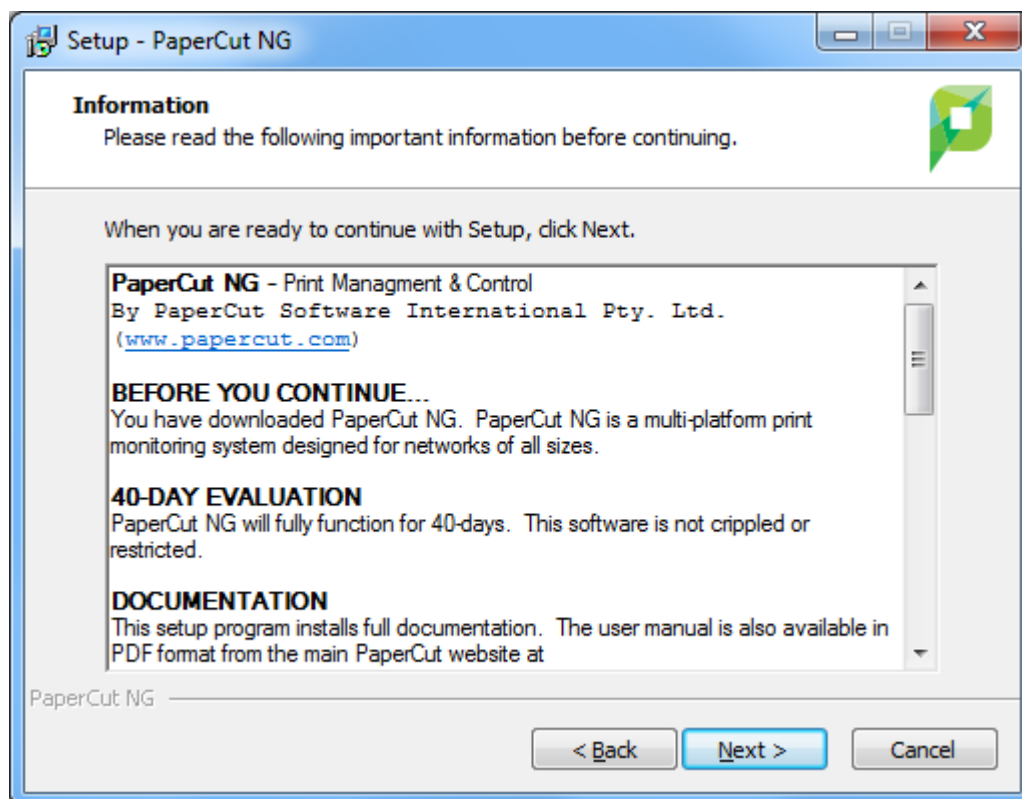   - `direct-print-monitor.conf`

   > **Note:**
   > These two files must be in the same folder for the Direct Print Monitor installation to work.
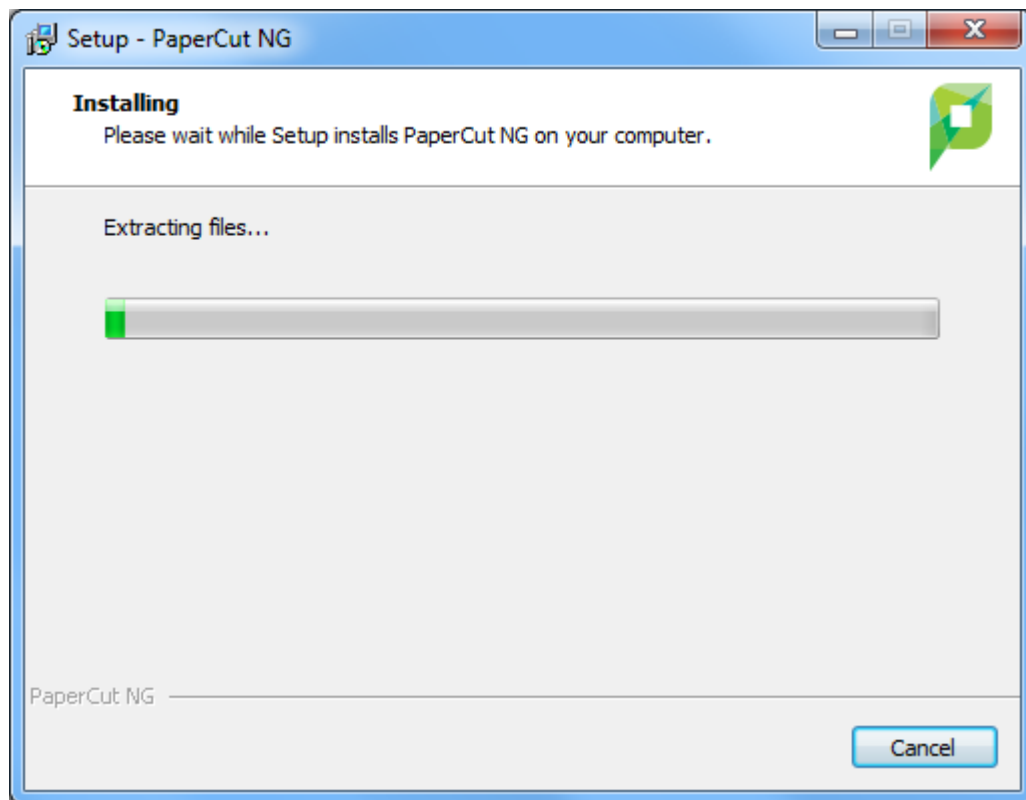
2. On each computer, navigate to the shared folder on the Application Server.
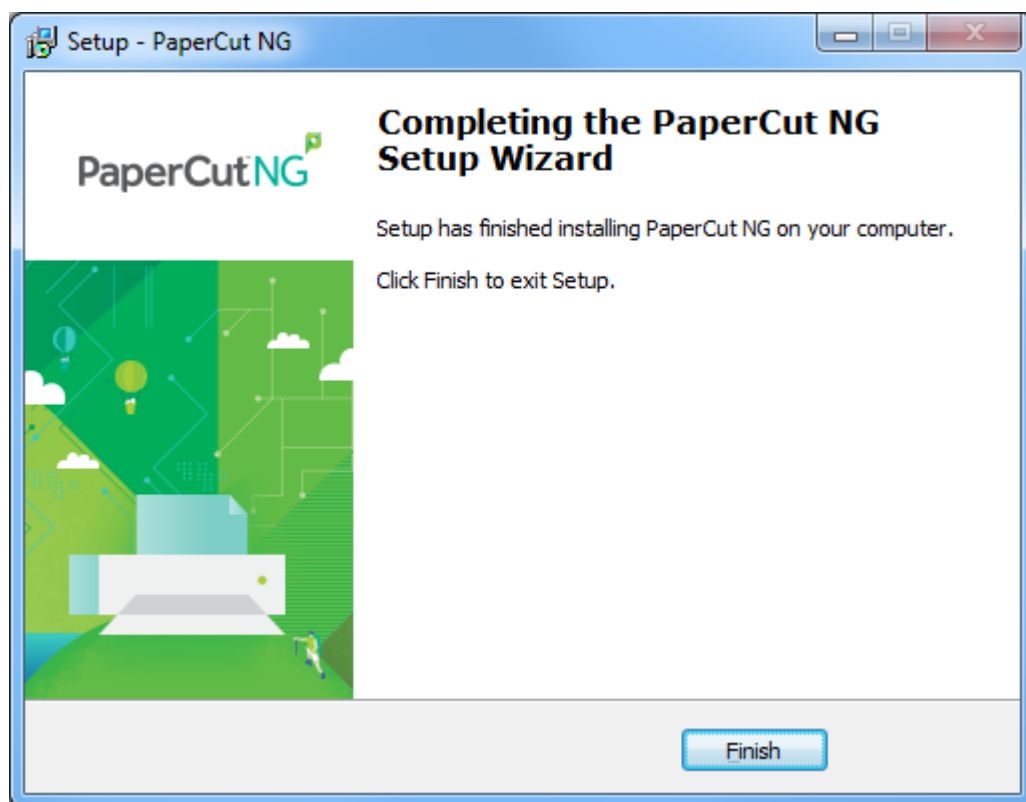3. Double-click `pc-direct-print-monitor.exe`.
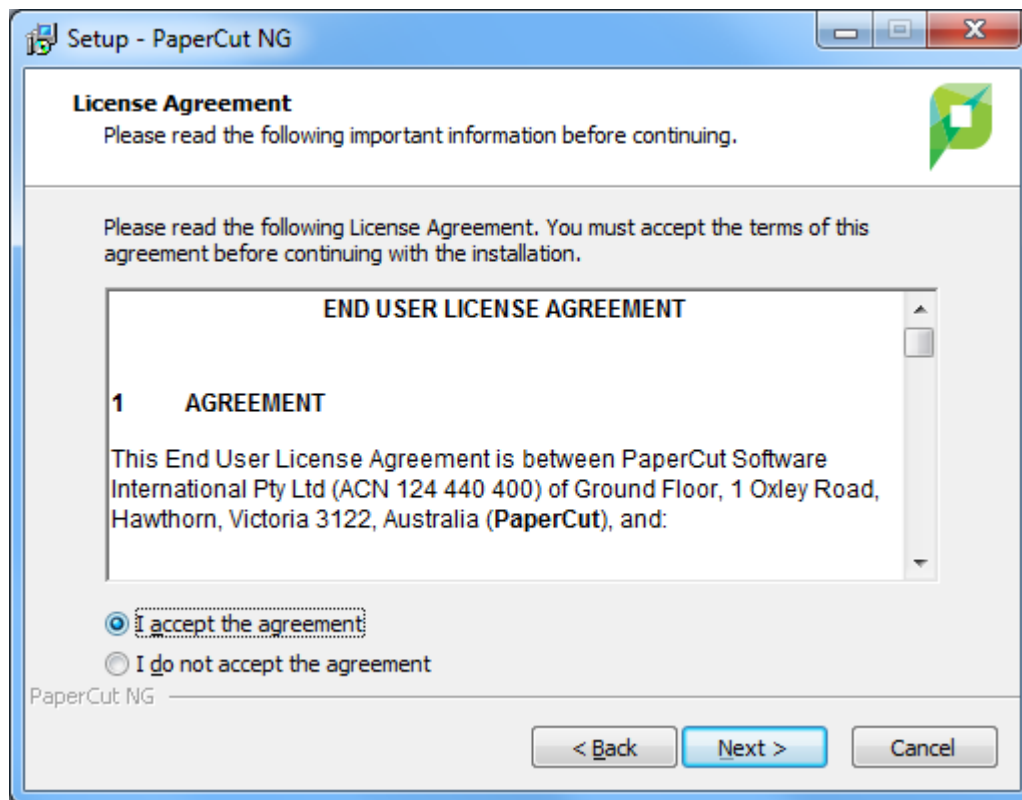
4. Read the End User License Agreement.

5. Select **I accept the agreement**; then click **Next**.

6. Click **Next**.

When the installation is complete, the **Completing the PaperCut Setup Wizard** screen is displayed.

7. Click **Finish**.

The Direct Print Monitor is installed.

> ▶ **Important:**
> You cannot install the Direct Print Monitor on a computer that has a Print Provider installed. This includes computers that are acting as Application Servers, Site Servers, and secondary servers.

Step 5: Test

The Direct Print Monitor should now be configured.

1. Log in to the Application Server as "admin" and verify that the printer queues are linked to the printer:

    a. Click the **Printers** tab.

    b. Select a printer.

    c. Verify that the printer queues are linked to the printer.

2. Perform a multi-page test print on each printer and verify that print jobs are tracked correctly.

3.3. Install the User Client
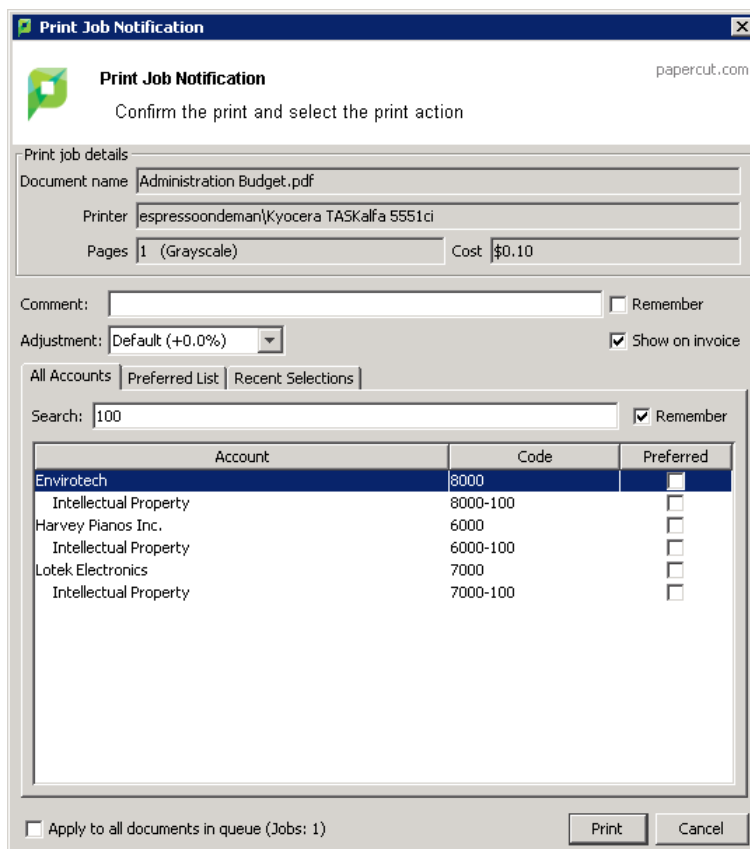
The User Client facilitates the following tasks:

● Display system messages, such as print policy popups.
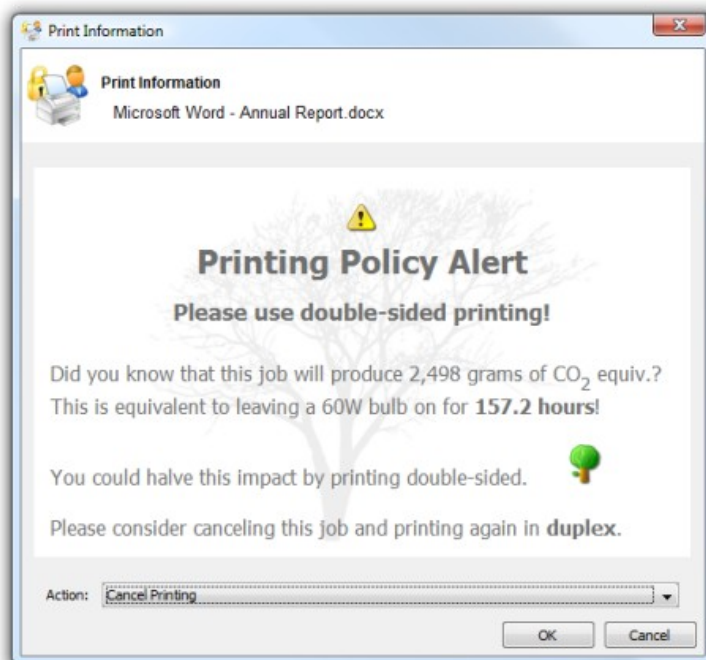
● Provide users with a "last chance" before printing, confirming what they are about to print.
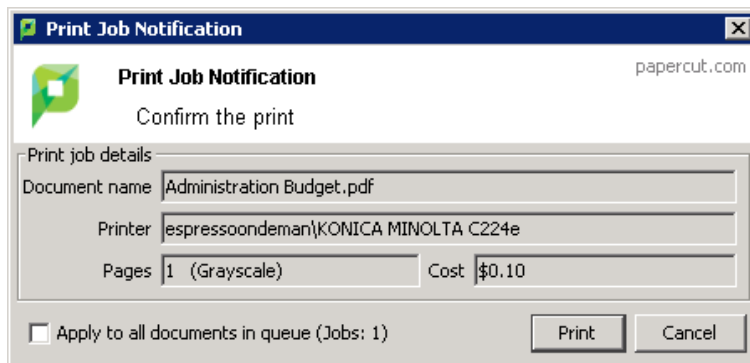
- Allow users to select shared accounts via a popup.

Step 1: Confirm that the User Client software is shared

The PaperCut NG/MF User Client install package is located in the following directory:

```
\\[app-path]\client\win\
```

The directory is automatically shared in read-only form as `PCClient` as part of the install process.

1. Confirm that you can access the User Client software via the network.

Step 2: Deploy the User Client

You can deploy the PaperCut NG/MF User Client to workstations using a variety of deployment methods. The deployment options are covered in detail in the `[app-path]\client\README.txt` file.

For a small professional implementation, we recommend the local install method (`client-local-install.exe`). This method provides users with a standard "setup wizard" install process to install the client directly on their local hard drive. You can also streamline / automate this installer by using command-line options.

1. Copy the `client-local-install.exe` to a computer that needs the User Client.

2. Double-click the exe file; then follow the prompts.

For more information about deploying the User Client on other operating systems:

- Mac
- Linux

3.4. Upsize to an external database (RDBMS)

By default, PaperCut NG/MF uses an internal database product known as Apache Derby. You might, however, consider running PaperCut NG/MF on an external RDBMS if your organization:

- has existing database infrastructure and wants to consolidate all applications on the same database platform.

- has an existing database maintenance and backup procedure and wants PaperCut NG/MF to take advantage of this

- uses 3rd party reporting and analysis tools (like Crystal Reports or Microsoft Access) to view and analyze the PaperCut NG/MF database

- is very large and requires the performance benefits of a dedicated RDBMS. This also allows the database to reside on a separate server to PaperCut NG/MF, which improves the system scalability.

The high-level steps to upsize the database are:

1. Stop the PaperCut NG/MF Application Server.

2. Perform a backup of the existing data.

3. Create a new database in the external RDBMS.

4. Configure the database.

5. Change the PaperCut NG/MF connection details.

6. Initialize the new database.

7. Load the data into the new database.

8. Restart the application.

This section provides detailed instructions for SQL Server. For more information about SQL Server Express, My SQL, PostgreSQL, and Oracle databases, see Upsize to an external RDBMS.

> ▶ **Important:**
> Each Application Server requires exclusive access to an external database. i.e. A single

> ▶ database cannot be shared between more than one Application Server. If you are running multiple Application Servers (e.g. a test and production instance), then each must have a separate database.

Step 1: Stop the PaperCut NG/MF Application Server

Stop the Application Server. This allows you to back up the data, guaranteeing that all data is saved and ready to load into the new database.

1. Open the services control panel. (**Start > Control Panel > Administrative Tools > Services**)
2. Find the service named **PaperCut Application Server**.
3. Right-click the service.
4. Select the option you want to perform (e.g. Stop/Start/Restart).

Step 2: Perform a backup of the existing data

Perform a backup of the database. This data is loaded into the application in a later step.

To back up the database:

1. On the Application Server, open a command prompt. (If you see 'Access Denied' errors, run the command prompt as an Administrator).
2. Change (`cd`) to the server binaries directory. e.g.

   ```
   Windows: cd "C:\Program Files\PaperCut NG/MF\server\bin\win"
   ```
3. Run the following command:

   ```
   db-tools export-db
   ```

   The output of the above command shows the name of the backup file.
4. Take note of the backup file name because it is required in a later step.

Step 3: Create a new database in the external RDBMS

This step differs depending on the external database you are using. It is assumed that the administrator knows how to create a new database. The following steps must be performed regardless of the chosen database:

1. Create a new empty database for dedicated use by PaperCut NG/MF. When creating the database, make sure you select the correct character encoding for your language.

   > ▶ **Important:**
   > Create the database with a character encoding suitable for your language. For SQL

> ▶ Server, the character encoding is set in **Collation** on the new database screen. For other databases, such as PostgreSQL or MySQL, select a unicode character set (UNICODE or UTF8) that allows all possible characters to be stored.

2. Create a new database user (and password) for PaperCut NG/MF to use to connect to the database.

3. Assign the appropriate permissions to the new user to give them full access to the new database (for example, permission to create/drop tables, and select/insert/update/delete in all tables).

> ▶ **Important:**
>
> Make sure you have enough disk space for the growth of your PaperCut NG/MF database. A full disk can corrupt the PaperCut NG/MF database. For more information, see Database sizing and growth.
>
> We also recommend you set up notifications for low disk space as described here: Alert Email Notification through SCOM 2012 R2.

Step 4: Configure the database

Microsoft SQL Server provides enterprise class database performance. With this type of database, you should put in place a database re-index every month. This database optimization helps with general performance, and more specifically, large queries performed on the SQL database. These queries include Reporting, as well as Bulk Actions performed on multiple data points.

> ▶ **Important:**
>
> Ensure that SQL Server has the TCP protocol, and the server authentication option is set to **SQL Server and Windows Authentication**.
>
> The database user created for PaperCut NG/MF should have only the minimum set of permissions required for the PaperCut application. The user should have full permissions to create/drop tables and have full access to any created tables. However, the user should not have permission to access other databases installed on the database server.

To configure Microsoft SQL Server, perform the following tasks on the machine with SQL Server installed:

Step 5: Get the driver for the SQL Server

> ✏️ **Note:**
>
> If you have the latest version of PaperCut NG/MF it already includes the latest version of Microsoft's JDBC driver for SQL Server. Skip to Step 2.

1. Go to Download the latest version of Microsoft's JDBC driver for SQL Server from this link: https://docs.microsoft.com/en-us/sql/connect/jdbc/download-microsoft-jdbc-driver-for-sql-

server?view=sql-server-2017

2. Run the downloaded file to extract the files.

3. Copy the file `mssql-jdbc-<version number>.jre11.jar` from the location the files were extracted to, to `<PaperCut MF or NG install directory>\server\lib-ext\`

Step 6: Enable SQL Server authentication

PaperCut NG/MF requires SQL Server authentication to be enabled on the instance of SQL Server. To do this:

1. In **SQL Server Management Studio**, right-click the instance of SQL Server to configure; then select **Properties**.

2. Select the **Security** section on the left.

3. Change the **Server Authentication** to **SQL Server and Windows Authentication mode**.

4. Restart the Microsoft SQL Server service using either the standard service control panel or the SQL Server tools.

Step 7: Create a database user

PaperCut NG/MF requires a user to connect to the database. To create this user:

1. In **SQL Server Management Studio**, right-click **Security > Logins**; then select **New Login**.

2. Enter the username (for example, papercut).

3. Change the **Server Authentication** to **SQL Server and Windows Authentication mode**.

4. Enter the user's password.

5. Disable password expiration.

6. Click **OK**.

7. After creating the PaperCut NG/MF database, assign this user `db_owner` permissions on the database, so that it can create the required database tables.

8. Initialize the database.

Step 8: Set statistics to auto update

1. In **SQL Server Management Studio**, right-click the database; then select **Properties**.

   The **Database Properties** dialog is displayed.

2. Scroll to the top of the **Other options** list.

3. In **Auto Update Statistics**, select **True**.

4. Click **OK**.

Step 9: Change the PaperCut NG/MF connection details

1. On the Application Server, open the server config file in a text editor (e.g. Notepad):

   ```
   [app-path]/server/server.properties
   ```

2. (New installations only) Comment out the line:

   ```
   database.type=Internal
   ```

   by adding a # (hash) character to the beginning of the line.

3. (New installations only) Find the database connection details for SQL Server), and uncomment the lines by removing the # (hash) character.

4. (New installations only) Set the username and password to connect to the database:

   ```
   database.username=[your-db-user]
   database.password=[your-db-password]
   ```

5. Set the database connection URL, which describes the location and connection details of the external database.

   SQL Server database connection URL format

   The SQL Server URL format is:

   ```
   jdbc:sqlserver://[server][:port];databaseName=
   [database];socketTimeout=600000
   ```

   The default port is 1433.

   When using SQL Server instances, specify the instance name in the connection URL as follows:

   ```
   jdbc:sqlserver://[server][\instanceName]
   [:port];databaseName=[database];socketTimeout=600000
   ```

   Where:

   - `[server]` is the name of the server running the SQL Server database, and must be resolvable from the PaperCut NG/MF server. If the SQL Server instance is running on the same machine, then you can use `localhost`.

   - `[port]` is the port the SQL Server Express edition is configured to listen on. .

   - `[database]` is the name of the SQL Server database you created in the external RDBMS.

   For more information see building the Connection URL.

   If you want to enable Windows authentication, add `;integratedSecurity=true` to the connection string:

   ```
   jdbc:sqlserver://[server][:port];databaseName=
   [database];socketTimeout=600000;integratedSecurity=true
   ```

Step 10: Initialize the new database

The next step is to initialize the new database, creating the required database tables and initial data. To initialize the database:

1. On the server, open a command prompt. (If you see 'Access Denied' errors, run the command prompt as an Administrator).

2. Change (`cd`) to the server binaries directory. e.g.

   `Windows: cd "C:\Program Files\PaperCut NG/MF\server\bin\win"`

3. Run the following command: `db-tools init-db`.

A message is displayed to indicate that the connection details are correct and the database was initialized correctly.

Step 11: Load the data into the new database

This step loads the data (that was exported in Step 2) into the database. To import the data:

1. On the server, open a command prompt. (If you see 'Access Denied' errors, run the command prompt as an Administrator).

2. Change (`cd`) to the server binaries directory. e.g.

   `Windows: cd "C:\Program Files\PaperCut NG/MF\server\bin\win"`

3. Run the following command: `db-tools import-db "backup file name"`.

   This command shows the data import progress.

If no errors occur, the application is ready to restart.

Step 12: Restart PaperCut NG/MF

The data is now in the new database and you can restart the server.

For more information, see Stop and start the Application Server.

Wait 30 seconds for the server to start, then log in to the Admin web interface. If you can log in successfully, then the upsizing process worked successfully.

4.   Configuring PaperCut NG/MF

After you have finished the Configuration Wizard, you need to configure a few options within the Admin web interface.

- Create shared accounts
- Configure Direct Printing
- Set print prices
- Configure reports

This is all you need to do get your PaperCut NG/MF system up and running. There are, however, many other options that you can configure to suit your needs.

4.1.   Create shared accounts

PaperCut NG/MF has two types of accounts: personal accounts and shared accounts. Personal accounts are automatically created when users are imported into the system. Shared accounts can be created manually in the Admin web interface on an as-needed basis, or, if you have a large number of accounts, you can automate the account creation process. You should have a list of shared accounts that you created in the preparation stage of your implementation (see Identify staff shared accounts).

Some uses of shared accounts include:

- Allocate and budget printing by business areas (e.g. cost center)
- Track printing by project, phase, client or account
- Track printing by client/matter - popular in legal and accounting firms

4.1.1.   Add customer/client and internal shared accounts

The account spreadsheet you prepared earlier contains both your client accounts as well as your internal office accounts. Now it is time to add them to PaperCut NG/MF.

1. Select **Accounts > Batch Import / Update**.
2. Add the accounts in one of the following ways:
   - **Import a tab delimited file:**
     a. Click **Choose file**; then select the file you prepared before the installation.
     b. Click **Import**.
   - **Manually add accounts:**
     a. In the **Actions** menu, click **Create a new account**.
     b. Add the account details; then click **OK**.

3. Click the **Accounts** tab to see a neatly created tiered structure of accounts.

	NAME ↑	CODE	BALANCE	RESTRICTED
🔓	[Template Account]		$0.00	No
🔓	Mr Blue		$0.00	No
🔓	Family Law	BLU0001	$0.00	No
🔓	Mrs Red		$0.00	No
🔓	Wills	RED0001	$0.00	No
🔓	Mrs White		$0.00	No
🔓	Conveyancing	WHI0001	$0.00	No
🔓	Family Law	WHI0002	$0.00	No

If your accounts have a tiered structure, such as the example provided above, you can prevent users from charging to the parent code (the client) ensuring a child code (matter) is selected.

1. Click the **Accounts** tab.
2. In the **Actions** menu, click **Bulk account actions**.
3. In the **Account Selection** area, select **Parent accounts** from the drop-down list.

4. In the **Change security settings** area, select the **Remove security group** check box; then select the **[All Users]** group.

5. Click **OK**.

    The **Shared Account List** page is displayed.

4.1.2. Grant access to shared accounts

By default, no users are automatically granted access to accounts; you must manually allow access to accounts. You also need to update the new account creation rules so that all staff are automatically granted access to any future accounts.

To grant access to existing accounts:

1. Click the **Accounts** tab.

2. In the **Actions** menu, click **Bulk account actions**.

3. In the **Change security settings** area, select the **Add security group** check box; then select **[All Users]**.

4. Click **OK**.

To grant access to any new accounts created in the future:

1. Click the **Accounts** tab.

2. Select **the Template** account.

3. Click the **Security** tab.

4. In the **Groups** area, select the **[All Users]** group; then click **Add**.

4.2. Configure Direct Printing

The Direct Print Monitor intelligently creates printers in the Application Server Printer List. It creates one printer with multiple print queues (that is, one from each computer). Every print queue with an IP address or hostname that matches the printer, is linked to the printer.

Linking the print queues to a printer allows PaperCut NG/MF to consolidate the information from all linked queues and report on the printer as a whole. It also allows the print queues to dynamically use the configuration of the printer. If any print queues do not automatically link, you must manually link the print queue to the printer.

The linking process works as follows:

1. The first print queue added on a computer with the Direct Print Monitor installed creates a printer in the Printer List.

2. If a print queue on any other computer (with a Direct Print Monitor installed) has the same IP address or hostname as the printer, then a new printer is *not* created and the print queue is linked to the printer created in step 1.

⭐ **Tip:**
You should always use a consistent IP address or hostname for print queues to ensure they are automatically linked.

This process is automatic and works in most of cases. There might, however, be some rare situations where a print queue does not automatically link to the printer, or a print queue is incorrectly linked to the printer. In these cases, you need to manual link or unlink the relevant print queues.

Check that all print queues have been linked to the appropriate printer.

1. Click the **Printers** tab.

   This list includes all printers and unlinked print queues.

PRINTER ↑	PAGE COST	ATTRIBS.	TOTAL PAGES	TOTAL JOBS
[Template printer]	$1.00 (standard)	No filters	0	0
Xerox WorkCentre 5325 V4 PCL6 **2**	$1.00 (standard)	No filters	0	0
Samsung SCX-6x55X Series PCL6 Class Driver **3**	$1.00 (standard)	No filters	24	3
RICOH Aficio MP C3002 PCL 6 **1**	$1.00 (standard)	No filters	53	22
Lexmark Universal v2 XL Driver - X792	$1.00 (standard)	No filters	0	0
VirtualQueue-CM4540-HP Universal (virtual) **2**	$1.00 (standard)	No filters	0	0
HP Color LaserJet CM3530 MFP PCL6 Class Driver	$1.00 (standard)	No filters	0	0

Printers that are configured for Direct Printing can be either:

- **printer with linked print queues**—printers with linked print queues are indicated by an icon containing a number greater than one after the printer name (

  HP Color LaserJet CM3530 MFP PCL6 Class Driver **3**)

- **print queues that are not linked to a printer**—print queues that are not linked to a printer are indicated by an icon containing **1** after the printer name (

  Samsung SCX-6x55X Series PCL6 Class Driver **1**)

2. Click the printer for which you want to view the linked print queues.

   The **Printer Details: Summary** page is displayed.

3. Click the **Queues** tab.

This page displays the following information for each linked print queue:

- **Name**—the name of the printer
- **Hosted on**—the name of the computer

4.3. Set print prices

During the preparation stage, you determined your print cost model. Now it is time to enter that cost model into PaperCut NG/MF.

1. Click the **Printers** tab.

2. Click the **[Template printer]** link.

3. Click the **Charging** tab.

4. Enter the desired 'per page' pricing information.

    a. If you want to charge a single flat rate per page, in the **Charging type** drop-down list, select **Simple** then enter the per page rate.

    b. If you have more detailed pricing, in the **Charging type** drop-down list, select **Standard** then enter your charge rates.

5. Click **Apply**.

When you set the pricing on the **[Template printer]**, any new printers installed and displayed in PaperCut NG/MF will use these prices. However, these prices will not automatically apply to any printers already in the system. To apply the cost model to existing printers:

1. In the **Actions** menu, select **Copy settings to other printers**.

2. In the **Target** area, select the check box next to each printer you want to apply the cost model, or click **Select All**.

3. In the **Settings** area, select the **Cost settings** check box.

4. Click **Copy**.

If PaperCut NG/MF hasn't imported the printers from this server, restart the PaperCut NG/MF Print Provider service.

4.4. Configure reports

PaperCut NG/MF offers a wide range of reports that can be manually generated or scheduled and automatically emailed.

PaperCut NG/MF reports on the print usage of your organization. We recommend the following reports as a starting point:

- **Shared account printing - summary**—the total charges against the shared account for a given period.

- **Shared account printing-logs**—each print job charged against each shared account for a given period.

- **User printing - summary**—the print usage by individuals and can help encourage better printing practices.

4.4.1. Schedule reports

> ▶ **Important:**
> Before scheduled reports can be sent via email, you need to configure the SMTP server (outgoing email server). For information about how to configure email notifications, see Configuring email notifications.

1. Select **Reports > Schedule /Email Reports**.

Schedule a Report

Reports can be scheduled for automatic delivery via email or can be saved to disk.

To schedule a report, fill in the details to the right and press 'Add'.

⊘ More Information...

Type Shared account printing - summary ⌄

Title

Shared account printing - summary

An optional title to appear at the top of the report

Optional parameters

Shared account name :

Limit to a shared account (or multiple comma-separated shared accounts). Leave blank to include all accounts. E.g.: 'parent\child'.

Full shared account code :

Limit to a shared account with this code. Leave blank to include all accounts. E.g.: 'parentCode-childCode'

Parent account name :

Limit to one parent account and its sub-accounts. Leave blank to include all accounts.

Parent account code :

Limit to one parent account and its sub-accounts by the code of the parent account. Leave blank to include all accounts.

Invoiced : ⌄

Choose whether to show only invoiced jobs or not.

User group name : ⌄

Limit to one group. Leave blank to include all groups.

Single server name :

Limit to one print server.

Single printer name :

Limit to one printer.

Printers : All printers ⌄

Limit to selected printers.

Printer/Device group : ⌄

Limit to one printer/device group. Leave blank to include all printers and devices.

Show report parameters : ☑

Enable this option to print report parameters on the report header.

Format

PDF ⌄

Report

Daily ⌄

The next report will run on **Jan 11, 2017**. Click on **more information** to view the advanced reporting options.

Delivery

By Email ⌄

Recipients

A comma separated list of email addresses, e.g.: joe@domain.org,bill@domain.org

Add

2. Select the desired report options.

3. Click **Add**.

4.5. Configure the User web interface

You can easily tailor the User web interface to fit your requirements. PaperCut NG/MF provides configuration options to conveniently "hide" or disable selected features. Take the time now to enable and disable features applicable to your implementation. For example, if your organization does not intend to use TopUp/Pre-Paid cards, you can remove the card link from the User web interface. Additional details, including an explanation of the options, are detailed in Customizing the User web interface.

If you have HTML experience, you can tailor the "look-and-feel" of the User web interface. Suggestions include:

- Coordinating the page design with an existing "Intranet" site

- Adding text on key pages to explain the organization's IT policies and procedures

- Additional instruction text to assist users with managing their account

> ⭐ **Tip:**
> Much of the functionality in PaperCut NG/MF has come from suggestions from organizations running PaperCut NG/MF. If you have an idea, let the PaperCut Software development team know so they can evaluate it for inclusion in a future release.
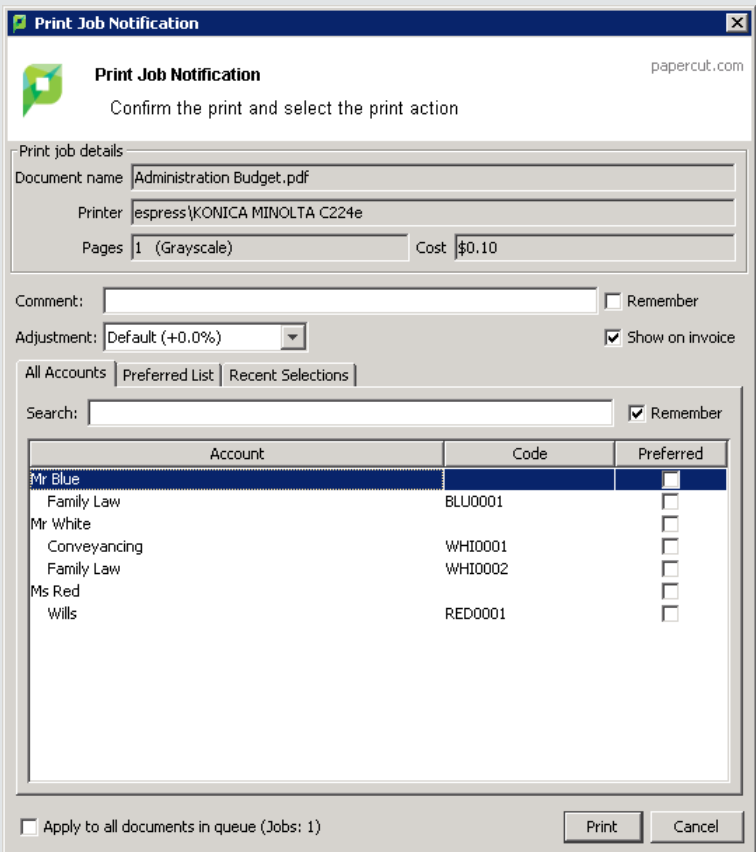
5. Testing the implementation

Testing is an important step with any software deployment project. Use the following test plan to verify that the setup and charging rules work as expected, and that print jobs are charged appropriately.

5.1. User Client tests

OBJECTIVE: To verify that the User Client automatically opens on login, and displays all of the available shared accounts.

METHOD: Log in to a network workstation under a user account and check that the User Client is available. Print a document for a selected shared account and verify that the account has been charged.

Test	Test Criteria	Passed?
User Client automatically opens on start up	1. On a networked workstation, restart the machine; then check that the PaperCut NG/MF icon is displayed in the system tray.	
Access to shared accounts	1. Send a test print job to any printer. The **Print Job Notification** screen is displayed. This screen allows you to select a customer/account/matter code.	

Test	Test Criteria	Passed?
	2. Provide access for the test user to all shared accounts. Verify that the appropriate accounts are available and the speed at which the account list is displayed is acceptable. If you are managing large client billing databases, consider using the methods outlined in the Knowledge Base article Large shared account deployments.	

5.2. Printer related tests

OBJECTIVE: To verify printers are correctly configured and supported by PaperCut NG/MF, and charging works as expected.

METHOD:

1. Log in to a network workstation under a standard user account and print a test document for each test case.

2. In the PaperCut NG/MF Admin web interface, select **Logs > Job Log**. The Job Log displays the details of all print jobs from all users.

3. Check that the page count and cost calculations are correct.

4. Click **Application Log**.

5. Check that there are no errors displayed in the Application Log.

Repeat this test cycle for all printers (or printer types if there are many printers).

Test	Passed?
Print a single page document.	☐
Print a multi-page document	☐
Print a color document with images	☐
If Advanced Charging options are used, test other attributes, such as Grayscale and/or Duplex discount.	☐

5.3. Accounting related tests

OBJECTIVE: To verify that all print jobs are being calculated correctly, recorded against the right printer, charged to the right user, and their account balances are being adjusted accordingly.

METHOD:

1. Log in to a network workstation under a user account and print multiple test documents with different page counts for each test case.

2. In the PaperCut NG/MF Admin web interface, select **Logs > Job Log**. The Job Log displays the details of all print jobs from all users.

3. Check that the page count and cost calculations are correct.

4. Click **Application Log**.

5. Check that there are no errors displayed in the Application Log.

6. Repeat the test cycle for all printers (or printer types if many printers).

Test	Test Criteria	Passed?
User accounting	Verify that all printed test documents are listed under the correct user account and that the page count and account balance associated with the user's account have changed accordingly.	☐
Printer accounting	Verify that all printed test documents have increased the printer's page count counter.	☐

5.4. Operational tests

OBJECTIVE: To verify user management and related tasks work as expected.

METHOD: Perform common user management tasks and verify the operations work and log as expected. Perform each of the following tests in the standard PaperCut NG/MF Admin web interface; then repeat the relevant tests in the User web interface.

Test	Test criteria	Passed?
User Creation	Check that user accounts are automatically created from domain users. 1. Delete the test user selected during installation. a. Select **Users**. b. Select the test user. c. In the **Actions** menu, click **Delete user**. 2. Synchronize with the domain user directory. a. Select **Options > User/Group Sync**. b. Click **Synchonize now**. 3. Check that the test user is listed on the **User List** page.	☐
Remote Access	Open the following URL from a remote system logging in using a standard web browser: `http://[server]:9191/admin`	☐
Access to Shared Accounts	Check that all users and groups have access to the correct shared accounts and the **[All users]** group has access to the **[Template account]**. 1. Click the **Accounts** tab. 2. Select an account. 3. Click **Security**.	☐

5.5. Other testing

Run PaperCut NG/MF for testing purposes for a period of one week. Regularly inspect PaperCut NG/MF **Logs > Application Log** for error messages or reported problems. You can do this testing

phase while preparing for rollout. Take the opportunity to familiarize yourself with the application.

Filter on

DATE ↓	CHARGED TO	PRINTER	PAGES	COST	DOCUMENT NAME	ATTRIBS.	STATUS
Jan 28, 2017 3:46:01 PM	abel.stenback	server1\Physics Print Room 1	1	$0.25	Venn	A4 (ISO_A4) Duplex: No	Printed refund edit
Jan 28, 2017 3:41:13 PM	abel.stenback	server1\Physics Print Room 1	1	$0.25	WET PAINT	A4 (ISO_A4) Duplex: No	Printed refund edit
Jan 28, 2017 3:17:58 PM	abel.stenback	server1\Physics Print Room 1	1	$0.25	Periodic Table	A4 (ISO_A4) Duplex: No	Printed refund edit
Jan 25, 2017 12:42:16 PM	abel.stenback	server1\Medicine Library 1	1	$0.25	All glory to teapot	LETTER (ANSI_A) Duplex: No	Printed refund edit

Export/Print

Report based on above data

6. Rolling out PaperCut NG/MF

PaperCut NG/MF is now installed and tested and most of the technical work is complete. You should also address policy related issues, user training, and end user experience before going live. After you have gone live, you should plan for some regular daily, weekly, and monthly tasks.

6.1. Prepare for rollout

Policy Change

Most organizations have a formal "acceptable use policy" or a general "IT usage policy" covering the use of IT equipment. Smaller organization might have a "usage policy" that's informally conveyed by management.Consider modifying existing policies or documentation. In many cases a simple email or notice on the Intranet site is enough.

Staff Training

Most organizations delegate the day-to-day user management tasks to selected staff. Day-to-day user management includes:

- Keeping a general eye on activity and use
- Handling refunds or requests for additional quota

PaperCut NG/MF provides a web browser based management interface designed for non-technical users. Even though the PaperCut NG/MF Admin web interface is simple and intuitive, make sure you dedicate some time to run through standard operations with the selected non-technical staff and explain how these relate to policy and operation.

After training a staff member, grant them access to the Admin web interface. This step requires you to add the user's name to the list of approved administrators. The process is covered in detail in Assigning Administrator level Access.

End-User Training

End-user training revolves more around explaining policy changes and general awareness of the system. From an operations perspective, PaperCut NG/MF has minimal impact on end users. In most cases, users continue to use the network as they always have. Consider the following points when addressing end user training:

For Silent/Active Monitoring:

- Consider informing users that monitoring is taking place. Typically, organizations that announce such a policy change see a 10% to 20% reduction in printing use as users become aware that irresponsible use is being monitored.
- Modify "IT use policy" to ensure users are aware that all activity is monitored

For a Quota System:

- Detail when the system will come into effect
- Instruct users on how they can monitor their account status and usage in the user web tools interface

```
https://[servername]:9192/user
http://[servername]:9191/user
```

- Provide a general explanation of any changes to the "IT usage policy"

Example User Information Sheets that you can use as a starting point for your own information sheets or Intranet pages.

6.2. Go live

Installation and testing is now complete. Administration staff are trained in user account management, and all users have been informed of the policy changes.

During the installation, you selected **Minimal impact (Initial single user testing)** on the **User client options** page in the Configuration Wizard. This option enabled the User Client for only one account, allowing you to test your implementation without impacting users. Now you are ready to enable the User Client for other users as appropriate. Perform the following steps in the Admin web interface:

1. Click the **Users** tab.
2. In the **Actions** menu, click **Bulk user actions**.

3. In the **User Selection** area, in **Perform operations on users**, select **in this group**.

> ⭐ **Tip:**
> Alternatively, you can select **in this list**; then specify a list of usernames.

4. Select the group that will use the User Client popup.

5. In the **Change settings** area, select the **Change account selection setting** check box.

6. Select **Show advanced account selection**.

7. If you don't want users to have a personal account, clear the **Allow user to charge to their personal account** check box.

8. Click **OK**.

6.3. Suggested tasks

PaperCut NG/MF is now controlling and monitoring your printing environment. Like other important applications and network infrastructure, technical staff should allocate time to check system health, perform maintenance, and undertake regular backups. PaperCut NG/MF is designed as a "self-managing" system, however, regular backup and inspection is recommended. You can use the PaperCut NG/MF System Health Interface in conjunction with a monitoring tool, such as Zabbix, to monitor the system health and performance.

Suggested Daily Tasks

Undertake a full backup of all files located under:

```
Windows: C:\Program Files\PaperCut NG/MF
```

Use automated backup software. This ensures all PaperCut NG/MF data files can be restored in the event of system failure or other unforeseen problems.

> ▶ **Important:**
> PaperCut NG/MF includes a weekly backup option; however, this is designed to complement rather than replace a good off-disk package strategy.

Suggested Weekly Tasks

- Inspect the PaperCut NG/MF Application Log (**Logs > Application Log**) for any important messages or error events. You can also configure the system to automatically email nominated SysAdmins when errors occur.

- Inspect activity logs to ensure PaperCut NG/MF is recording all activity.

Suggested Monthly Tasks

- Check the PaperCut Software website for updates.

- Review your backup procedure.

- Review resource costs against any changes in the cost of toner, paper, and maintenance. Ensure that end users are properly informed if you change the prices.

Appendix

In this section:

- Sizing guide
- Account import formats

Appendix 1:   Sizing guide

The table below shows guidelines for the server specifications that are required to support PaperCut NG/MF in order to give consistent performance. Users refers to the number of active users per day. These guidelines apply both to physical hardware and to virtual servers / virtual machines hosted locally or remotely.

When deploying PaperCut NG/MF it is recommended that virtual servers are used where possible for easy scaling and quick backup / restore.

Always evaluate your host solution before deploying in order to make an informed decision regarding CPU load and memory usage.

PaperCut Authorized Solution Centers are able to offer architecture and infrastructure advice for large deployments.

Printers vs Users	Number of printers					
	5	20	100	1,000	5,000	10,000
1,000 users	1 CPU 2GB RAM	2 CPU 4GB RAM				
5,000 users	2 CPU 4GB RAM	2 CPU 4GB RAM	2 CPU 4GB RAM			
10,000 users	3 CPU 4GB RAM	3 CPU 4GB RAM +RDBMS	3 CPU 4GB RAM +RDBMS	3 CPU 8GB RAM +RDBMS		
20,000 users	4 CPU 6GB RAM	4 CPU 6GB RAM +RDBMS	4 CPU 6GB RAM +RDBMS	4 CPU 8GB RAM +RDBMS	4 CPU 8GB RAM +RDBMS	
60,000 users		4 CPU 6GB RAM +RDBMS	4 CPU 6GB RAM +RDBMS	8 CPU 12GB RAM +RDBMS	8 CPU 16GB RAM +RDBMS	10 CPU 16GB RAM +RDBMS
100,000 users			4 CPU 8GB RAM +RDBMS	8 CPU 16GB RAM +RDBMS	10 CPU 16GB RAM +RDBMS	10 CPU 16GB RAM +RDBMS
400,000 users				10 CPU 32GB RAM +RDBMS	10 CPU 32GB RAM +RDBMS	10 CPU 32GB RAM +RDBMS

Appendix 2:   Account import formats

> ### Important:
> Your Excel spreadsheet must be saved in the following format:
>
> - Text (Tab delimited) (*. txt)

Parent only

	A
1	WHI0001
2	WHI0002
3	BLU0001
4	RED0001
5	OFF0001
6	OFF0002
7	OFF0003
8	OFF0004

Parent with code

	A	B
1	Mr White- Conveyancing	WHI0001
2	Mr White - Family Law	WHI0002
3	Mr Blue - Family Law	BLU0001
4	Mrs Red - Wills	RED0001
5	Office - Newsletter	OFF0001
6	Office - Research	OFF0002
7	Office - Marketing	OFF0003
8	Office - Invites	OFF0004

Parent and child without code

	A	B
1	Mr White	Conveyancing
2	Mr White	Family Law
3	Mr Blue	Family Law
4	Mrs Red	Wills
5	Office	Newsletter
6	Office	Research
7	Office	Marketing
8	Office	Invites