

Step 1: System requirements

Before proceeding with the installation the SysAdmin should take a few moments to verify system requirements. Is the operating system version supported and are patches up-to-date? (see [PaperCut MF System Requirements](#)).

Step 2: Print queue setup

Most small to medium Mac networks configure their workstations to print directly to the physical printers. This method of printing is *not* supported by PaperCut MF and instead administrators must set up global server hosted print queues. Some administrators are familiar with server queues, while others might need to invest some time into understanding Mac printing in more detail. The topic of Mac printing is complex and is deserves its own chapter! Read the first section of [Mac printing in detail](#) and ensure your organization's printers are set up as required.

Administrators should ensure that the server based print queues are set up and working as expected *before* attempting to install PaperCut MF.

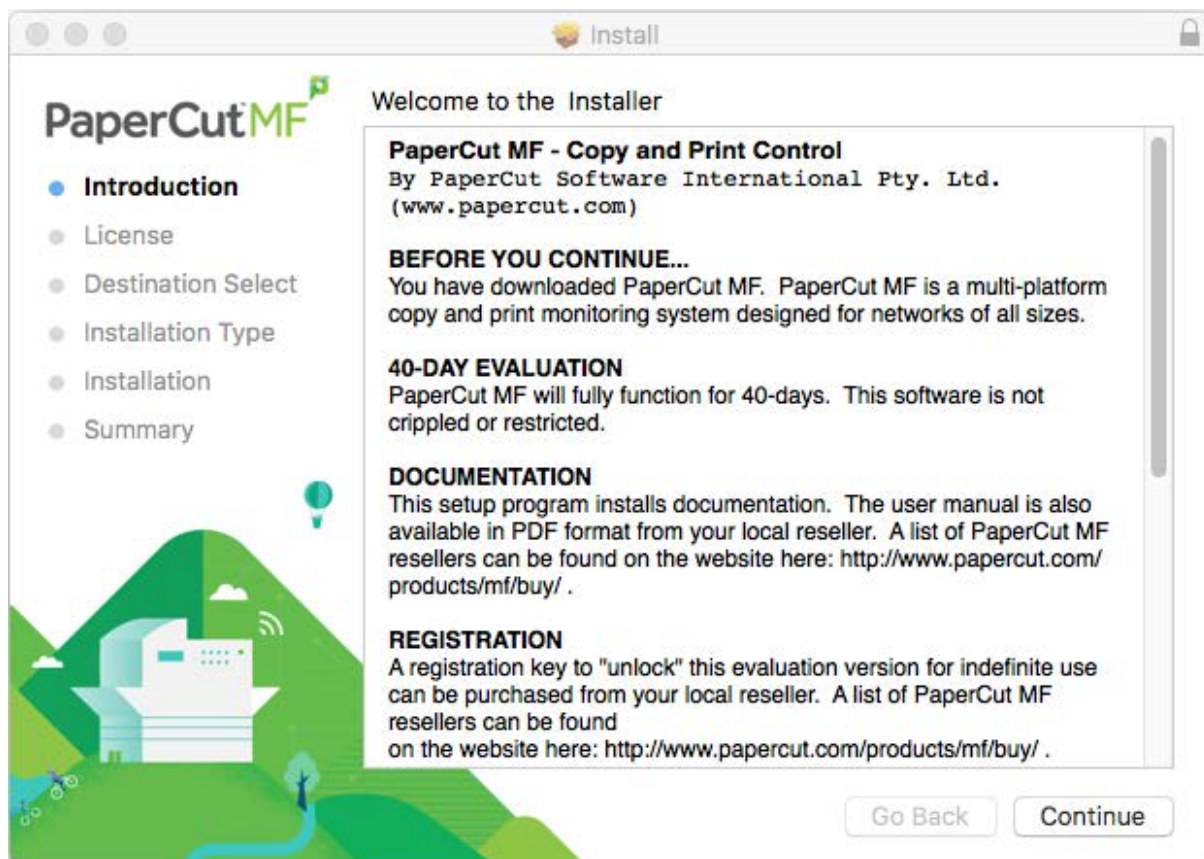
Step 3: Download and install PaperCut MF

PaperCut MF is supplied as a standard disk image containing the installer. Log on as an `admin` level account. Download and double-click Mac installer. Double-click the installer package named `PaperCut MF Standard Installation.pkg`. Follow the directions on the screen. The installation process takes between two and five minutes depending on the speed of the system. A system restart is not required but administrators are advised to perform installation on live production systems during periods of low activity - for example, not during backup operations or other administration activities.

The default install location is `/Applications/PaperCut MF`

Important:

Make sure you're installing the correct package. The similarly named PaperCut MF secondary server `Installation.pkg` installs only part of the application and is designed for more advanced networks.



Step 4: Run the Configuration Wizard

After you install PaperCut MF, a web browser is displayed with the PaperCut 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

PaperCutMF

This wizard will help you configure initial options and ready the system for use.

If this is the first time installing the application, we highly recommend reading the quick start guide in the user manual. [Open manual](#)

- Create Account
- Choose Organization Type
- Set Default Costs
- Sync Users
- Finish!

Create account

Type in the password to be assigned to the master administrator account. Please keep this password secure.

Username: admin

Password: [masked]

Verify password: [masked]

Your system location is currently set to English (Australia). If this is not correct, please change the setting below. The location defines default currency and date formats.

Location: System Default - English (Australia) ▼

Next →

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.

PaperCutMF

- ✓ Create Account
- Choose Organization Type
- Set Default Costs
- Sync Users
- Finish!

Organization type

Select an organization type to tailor the system defaults for your environment.

Education
Schools, colleges and universities.

Small/Medium Enterprise (SME) or Corporate
Businesses intending to monitor, report and control printing (e.g. print policies).

Professional (Client Billing)
Businesses intending to charge-back printing to customers or projects via a pop-up (e.g. engineering, architects, legal, etc).

← Previous **Next →**

This selection determines which system defaults are used.

- Select **Education**.
- Select **Small/Medium Enterprise (SME) or Corporate**.
- Select **Professional (Client Billing)**.
- Click **Next**.

3. Default cost for printing

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

PaperCutMF

- ✓ Create Account
- ✓ Choose Organization Type
- Set Default Costs
- Sync Users
- Finish!

Default costs for printing

In Australia, an appropriate cost for a grayscale printer would be \$0.10.

Color (cost per page) \$0.00

Grayscale (cost per page) \$0.00

After setup you will have the option to change costs if required.

← Previous **Next →**



Important:

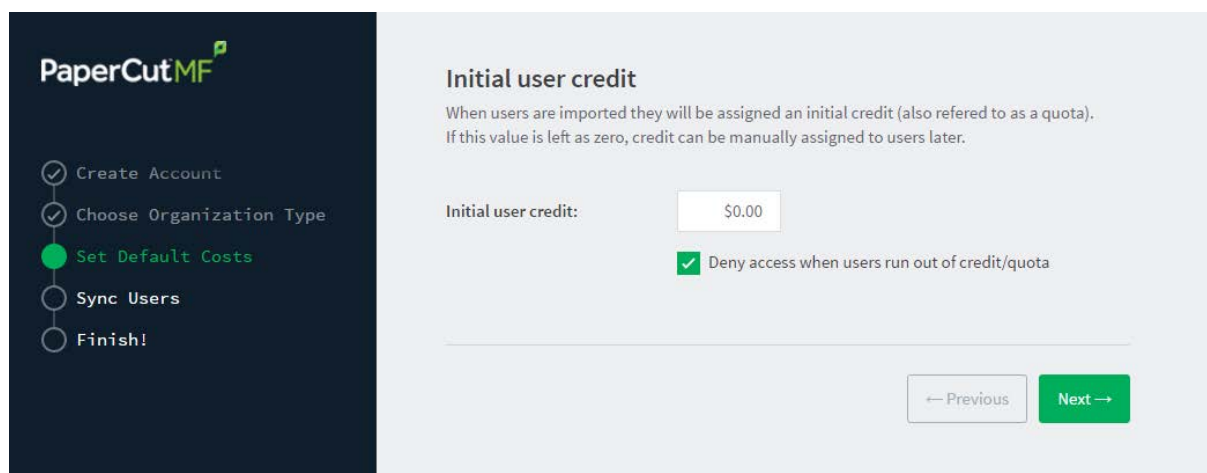
For an education implementation, where users are charged for their printing, leave these values as zero during the implementation stage, otherwise, students will not be able to print as they cannot yet add credit to their account.

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. Initial user credit (Education organization type only)

If you selected **Education** as the organization type, the **Initial user credit** screen is displayed.



If you selected **Small/Medium Enterprise (SME) or Corporate) or Professional (Client Billing)** as the organization type, go to step 5.

- a. Complete the following fields:
 - **Initial user credit**—enter the amount of credit each/quota each user will receive when the system is first enabled. You can change these settings after setup.
 - **Deny access when users run out of credit/quota**—select this check box to prevent users from printing when they run out of credit/quota.



Tip:

If you are evaluating PaperCut MF it might be appropriate not to disable printing when a users funds run out. This way you can be assured that user printing is not disrupted during the evaluation.

- b. Click **Next**.

5. User/group synchronization

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

PaperCut MF extracts user information out of the system or domain.

**Tip:**

During evaluation, most sites import all users from the system/domain into PaperCut MF.

- a. In **User source**, select the source of user account data:
 - **Mac Standard** (PAM, Local NetInfo, etc.)—if the user accounts are set up and defined on the local system. This option works with most Mac networks.
 - **Samba**—if the central user directory is a Windows Domain. The Samba option is available only if Samba is installed on the system. The Samba option is appropriate on medium to small networks currently operating in a Windows Domain environment.
 - **Azure AD Secure LDAP**—for organizations using Microsoft Azure AD Secure LDAP as a cloud based user directory service.
 - **LDAP** (Open Directory)—for large networks with existing Open Directory domains. This includes networks running Mac OS X Server with Open Directory, and Windows domains running Active Directory. PaperCut MF does its best to auto discover LDAP settings, but some knowledge of LDAP and/or Open Directory is required. More information on LDAP is available in [Synchronize user and group details with LDAP](#).
- b. Select one of the following options:
 - **Import all users**—import all domain user accounts.
 - **Import users from selected groups**—import a subset of users from a given group. This is useful when only a subset of users will use the printers.
- c. Click **Next**.

**Important:**

PaperCut MF automatically tries to detect the available directory services, saving you hours of potential configuration time.

- d. For Samba, LDAP, and Azure AD Secure LDAP, the Server Details page is displayed. Complete the following as required:

Samba

- i. Complete the following fields:
 - **Domain Server**—The name of the Windows domain server.
 - **Admin username**—The username of the user who has permission to connect to and query the domain server. The username/password you specify here is an Admin user on your Windows domain that has permission to add machines to the domain.
 - **Admin password**—The password for the above user.
 - ii. Click **Test Samba Settings** to test and confirm your settings before continuing.
 - iii. Click **Next**.
-

LDAP

- i. Complete the following fields:
 - **LDAP Server Type**—Determines which LDAP fields are used to get user and group information. PaperCut MF supports the following server types:
 - Unix / Open Directory
 - Microsoft Active Directory
 - Novell eDirectoryHowever, it is easy to support other server types by adjusting the LDAP fields PaperCut 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 check box.
 - **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 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**.

6. User Client options (Professional (Client Billing) organization type only)

If you selected **Professional (Client Billing)**, as the organization type, the **User client options** screen is displayed.

If you selected **Education** or **Small/Medium Enterprise (SME)** or **Corporate**, go to step 7.

The User client allows users to allocate print jobs to client (shared) accounts. The process works by:

- Pausing all jobs that enter the print queues.
- Displaying a popup on the user's workstation asking them to allocate the print job to an account. This is done by selecting the account from a list.
- After the user has responded to the popup, the job is released to the printer.

For more information about the account selection process and shared accounts, see [Shared accounts](#).

The account selection popup option is enabled at the user level. Once the option is enabled, the user *must* run the client software. If the client software is not running, the popup cannot display, and the job remains paused in the print queue. This option is considered high impact. You are presented with two strategies that allow you to choose the implementation approach that best suits your needs.

a.

Select the account implementation strategy:

- **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.

- **Immediate implementation (Enable for all users)**—enables the account selection popup for all users. Once the client has been deployed, the system is operational. If this option is selected, install the client software on user desktops immediately to prevent disruption of user printing services.

If in doubt, select the minimal impact strategy. This ensures the impact is isolated to only the nominated test account.

b. Click **Next**.

7. Confirm setup options

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

PaperCut MF

- ✓ Create Account
- ✓ Choose Organization Type
- ✓ Set Default Costs
- ✓ Sync Users
- **Finish!**

Confirm setup options

Please confirm that the settings you have entered are correct before continuing.

Admin username	admin
Admin password	(password hidden)
Initial user credit	\$0.00
Restrict access when credit expired	Yes
User source	Windows Active Directory (Import all users from the selected source)
Default color page cost	\$0.00
Default grayscale page cost	\$0.00

Previous Confirm

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.

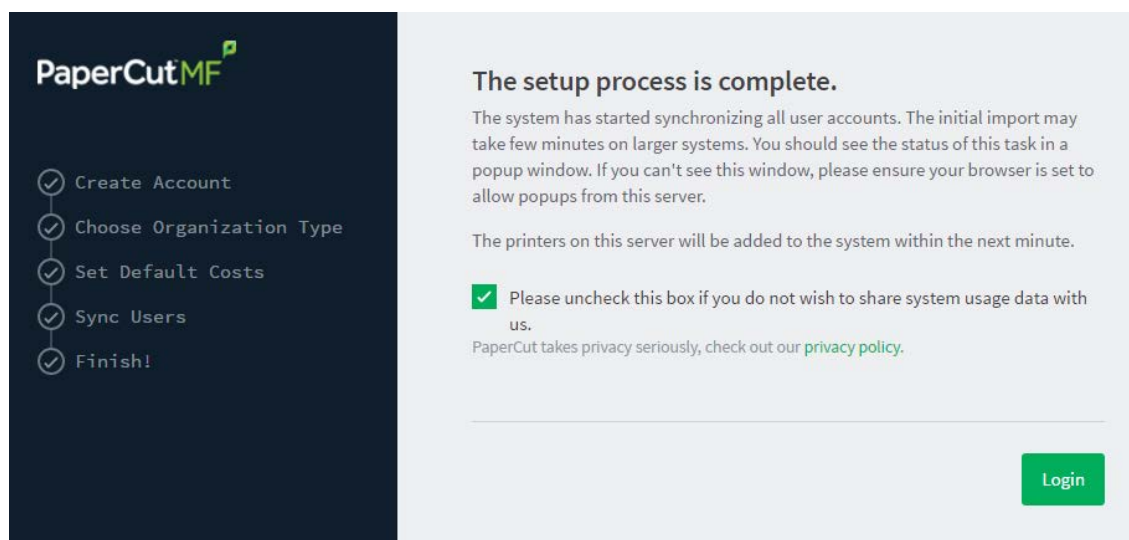
b. Click **Confirm**.

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

c. Click **Close**.

8. Setup complete

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



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

Step 5: Check the printer configuration

When you install PaperCut MF, your networked printers are automatically added to the system. Any new printers added to your network are also automatically added to PaperCut MF. You can, however, change the configuration so that new printers are not automatically added. You will need to do this if you have printers you do not want monitored by PaperCut MF. For more information, see [Add and remove/delete/ignore printers](#).

The monitored printers are listed on the **Printer List** page. If the printers are not displayed, try printing a document. The first job triggers registration.

Step 6: Sharing the User Client software

The PaperCut MF client software is located in the directory `/Applications/PaperCut MF/client`. You can share this directory over the network so workstations can access/install the client application. If you're running Mac OS X Server, use **Server Admin** to add a read-only file share called `PCClient`. Sharing with Protocols AFP for Mac clients, and SMB for Windows clients is recommended.

Users can have the client software start automatically using the OS X "Open at Login" feature. Manually start the PaperCut MF client software, command-click the dock icon, select **options** and the "Open at Login" from the small pop up menu.

Step 7: Deployment for a Professional (Client Billing) installation



Note:

This step is a requirement for a Professional (Client Billing) installation.

Now that the system is tested and working, it is time to deploy the client software and enable the account popup for their use. It is important to deploy the client software before enabling the popup, otherwise users' printing is stopped/paused.

Deploy the client software

The User Client can be run directly from a network share (which is automatically configured on Windows). There is also the option to install the software locally on each workstation, however, this is not usually recommended because it makes the process of updating the client software more complicated.

For more information about client deployment options, see [User Client](#). Follow those instructions to deploy the client software, and then enable the popup as described below.

Enable the advanced client popup

Once the client software is deployed on user workstations, you can set the **Account Selection**. In a Professional (Client Billing) configuration, users who print jobs for clients are often given the Advanced account selection popup, however, other **Account Selection** options might be better suited for some users based on their job function. You can enable the popup on one user at a time or update for all users in bulk. Use the **User Details** page to enable the popup for a single user. To enable the popup for all users in bulk:

1. Click the **Users** tab.
The **User List** page is displayed.
2. In the **Actions** menu, click **Bulk user actions**.
The **Bulk User Operations** page is displayed.
3. In **Perform operations on users**, select the target group. To enable for all users select the **[All Users]** group.
4. In the **Change setting** area, select the **Change account selection setting** check box.
5. Select **Show the advanced account selection popup** option from the list.
6. If you do not want to allow users to charge printing to their personal account, clear the **Allow user to charge to their personal account** check box.
7. Click **OK**.
A confirmation window is displayed.
8. Click **OK**.

Once completed, the account popup is enabled for the selected users.

When the popup is enabled for all users, perform some testing from users' desktops. To test, log in to the user workstation, perform a print, and check that the account popup is displayed and the job is logged as expected.

Step 8: Testing

Following a fresh installation, it is highly recommended to test core features of the system. For further details, see [Testing the installation](#).

What next?

Take some time to explore the features of PaperCut MF before continuing reading at [Implementation by example](#) or [Tour](#). Business users might be interested in trying the popup client software as covered in [Client software](#). If desired, the client software should also be deployed to other workstations. This procedure is detailed in [User Client](#).

2.4.2. Mac printing in detail

This section of the manual is split into different sections for ease of use, one section covering Mac OS 10.8+ installations, and another covering Windows hosted print queue setup. In most cases only one section applies on your network. As Mac systems have become more popular recently, many sites are opting for Mac print servers to support their Mac workstations. You can install PaperCut MF directly on a Mac print server, offering native, end-to-end Mac printing.

2.4.2.1. Terminology

Below is an overview of the common terminology.

Print queue: There are typically two ways of providing shared multi-system access to a printer:

1. Configure each system to print directly to the device. The device needs to be networkable (e.g. have an Ethernet connection) and support multiple connections.
2. Configure a shared print queue. In this setup, only one system connects directly to the device (e.g. a server) and in turn the device is shared on the network via a print queue. Other systems on the network print to the shared queue rather than directly to the device.

Option 2 is regarded as a better solution on multi-user networks as it provides a higher level of scalability, allows for centralized administration, and allows administrators to move or remap devices without needing to propagate changes to workstations. PaperCut MF requires a shared print queue as it works by intercepting the jobs as they pass through the server's queue.

CUPS: CUPS is the print queue system used by Mac. This is the same queue system used by many other UNIX based platforms including popular Linux distributions. Apple is a major supporter of CUPS.

IP Printing: This is a generic term used to describe a number of print protocols that are used to exchange print documents between a computer, a server queue, or a physical printer. (Note: This term is also occasionally used incorrectly to describe the "JetDirect" print protocol discussed below)

IPP: This is an acronym for Internet Printing Protocol. This is the "native" print protocol used by CUPS and the Mac. It's a modern protocol designed to work well on modern networks including local networks, or even over the internet or a WAN.

LPR: LPR/LPD is the traditional UNIX based print protocol.

JetDirect/Socket: This is a very simple print protocol used to transmit print jobs to a physical printer on a TCP network. The printer accepts connections on port 9100. In Windows, this print protocol is often referred to as a `Standard TCP/IP Port`, and in some cases generally as IP Printing. Almost all network printers support this method.

Bonjour Printing: This is not a print protocol, but instead is Apple's method of publishing printers on a network so workstations can locate the device/queue.

Where possible PaperCut MF works with all print protocols, however, we do recommend some over others. The following set up procedure highlights methods that have shown to work in most environments.

PaperCut's recommended setup procedure is:

- Install the printers on the server using a compatible driver.
- Test printing from the server.
- Share your printers.
- Set up the workstations to connect to the server's shared print queues.

2.4.2.2. Optional hardware configuration

Some printer models support several of the connection methods listed above. If the printer offers the option to disable these protocols through their web administration page, you should turn off all except the connection method that you will use. This minimizes the chance of incorrect configuration, and the chance of a workstation user discovering the printer directly. Some printers also support access control via IP address. If this is available, consider setting access control so only the server IP can submit print jobs directly to the printer.

2.4.2.3. Handling unauthenticated systems (e.g. laptops)

Print queues in Mac OS X by default are unauthenticated. Authentication in an Open Directory environment is instead performed at the time of system login. Unauthenticated systems such as laptops fall outside this. The introduction of unauthenticated systems on your network mandates the need for an extra layer of authentication. To address this need, PaperCut offers two options:

- Popup authentication via the PaperCut client software.
- Authentication via a Release Station or the web-based release interface (end user login > **Jobs pending release**).

It is your decision whether or not the authentication policy/procedure is to be applied to all systems on the network, or just "untrusted" laptops.

Network-wide policy

This is the simplest solution and provides a consistent procedure and policy across all your users irrespective of their access method (such as via workstation or their own laptop). Select your authentication method and enable this option on ALL print queues. The set up procedure for both methods is summarized as follows:

Using popup authentication

1. Select the **Unauthenticated printer** option on all printers. You can apply this to multiple printers via **Copy settings from Printer to Printer**.
2. Ensure that all workstations have the PaperCut client software installed. This includes both authenticated lab systems and laptops. The PaperCut client must be running to be able to print successfully.
3. Instruct users that they need to enter their username and password in the PaperCut client. You you can set PaperCut MF to save the credentials for a defined period of time if required.

Using hold/release queue authentication

1. Select the **Enable the hold/release queue** check box on all print queues. Jobs do not print until a user has authenticated and released the job.
2. Set up Release Stations, or, on the **Options** tab in the PaperCut Admin web interface, select the **Allow users to view held jobs** check box.
3. Instruct users on how to release their jobs. This procedure must be followed by all users.

Laptop only policy (advanced)

One problem with the network-wide policy discussed above is that the authentication method (e.g. client popup or hold/release queue) also applies to authenticated systems. In some ways this is a positive (i.e. provides a consistent policy), while in other ways it can be viewed as an unnecessary on trusted authenticated systems. This section discusses a solution appropriate for larger sites.

The solution is to set up two servers. One server hosts a set of queues for authenticated systems, while the other server provides queues for unauthenticated systems. Network router or firewall rules are used to ensure that only authenticated systems have access to the authenticated queues. Laptops systems must use the other queues. This is best done with partitioned IP address ranges and/or subnets. An experienced network administrator can assist with restricted server access by IP address.

2.4.2.4. Eliminating popup authentication via Mac Login Hook

You can use popup authentication to provide a secure environment. For example, there might be a mix of lab systems and unauthenticated laptops. The lab systems are managed and secured via authentication against a central user directory source, while the unmanaged systems (e.g. laptops) are limited to local user authentication only so user identity is indeterminate. Use popup authentication at the print queue level to provide an added level of user verification.

This is an advanced topic and is targeted at experienced Mac administrators with command-line knowledge. The double-authentication is eliminated by having the system login also perform the PaperCut log in via the system login hook. After the administrator has confirmed that the workstation is securely authenticating via a central directory service, they endorse the system by copying a shared secret file onto the workstation. To perform this endorsement, follow these steps:

1. Setup the PaperCut client on the workstation and configure it to start via the login hook as explained in detail in [Multi-User Install](#).

2. Use a secure method (e.g. USB key or `scp`) to copy the file located on the PaperCut primary server at:

```
[app-path]/server/data/pc-shared-secret.dat
```

to the workstation in either of the following locations:

```
/etc/pc-shared-secret.dat or /Library/PCClient/pc-shared-secret.dat
```

3. Set ownership and permissions on the file using the command line as follows:

```
sudo chown root /etc/pc-shared-secret.dat sudo chmod 600 /etc/pc-shared-secret.dat
```

4. Test login and verify that PaperCut popup authentication step has been eliminated by printing to an unauthenticated printer. Confirm that the job prints and logs as expected.
5. Repeat the steps above for each trusted directory authenticated system (e.g. lab system) on the network, or use system imaging processes.

2.4.3. Mac hosted print queues for OS 10.8+

This section discusses printer setup on systems where print queues are hosted on Mac OS 10.8+. There are some very minor differences between the two setup instructions, but they follow the same structure. See [Windows hosted print queues](#) if you have Windows hosted print queues.

2.4.3.1. Installing the printers

Install the printer on the system running PaperCut using a compatible driver. For example, a driver supplied by Apple or the manufacturer. If there is a choice of driver, we recommend a Postscript or PPD based driver. Follow the manufacturer's suggested setup procedure for this part of the implementation. If the manufacturer supports various connection methods, we recommend using JetDirect/Socket if possible. Here is an example of a procedure that sets up a standard printer using a plain JetDirect/Socket connection:

1. Select **System Preferences**.
2. Select **Print & Scan** (in 10.9, this is named **Printers and Scanners**).
3. Click **+** to add a new printer.
4. Click the **IP** tab.
5. In the Protocol list, select **HP Jetdirect - Socket**.
6. Enter the printer's IP address.
7. Give the printer a simple name *without* spaces.
8. Select the driver or printer model from the list; then click **Add**.

Print some test pages to the newly configured printer, such as printing a web page from Safari. Confirm that printing works as expected before continuing. Be sure to test multiple options such as Duplex and Grayscale. If printing is not working as expected, see the troubleshooting section below.

**Note:**

If you are adding new printers, configure PaperCut to monitor the new print queues. For more information, see [Add and remove/delete/ignore printers](#).

Address: 10.100.64.32
Valid and complete address.

Protocol: HP Jetdirect - Socket

Queue:
Leave blank for default queue.

Name: LibraryColor
Location: Library Room
Use: Apple LaserWriter Pro 810

Add

Tips and troubleshooting

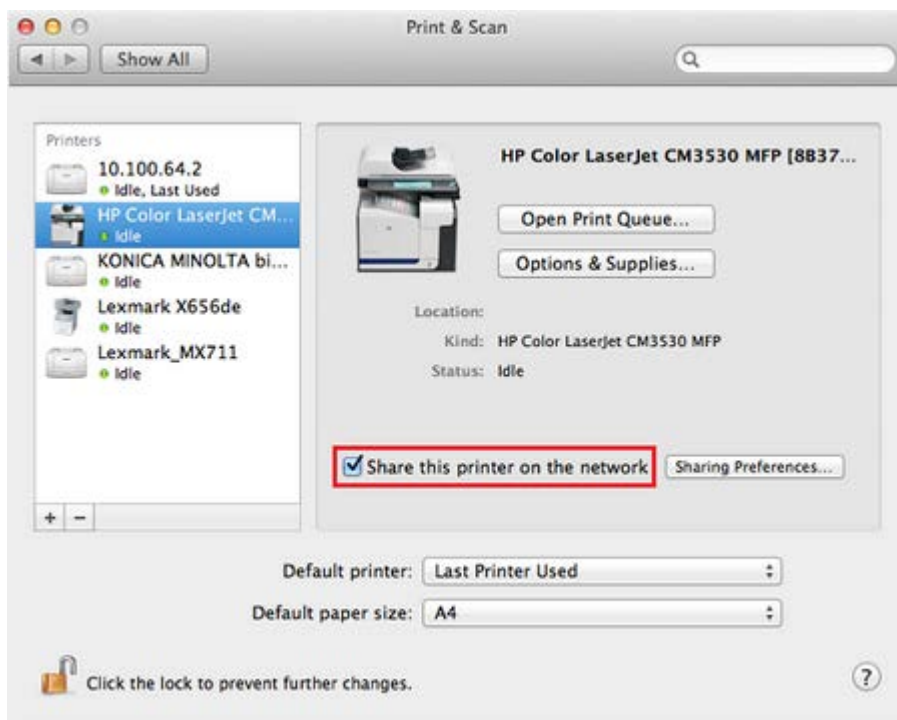
- Always try HP Jetdirect/Socket first, and use proprietary connection methods as a last resort
- If your printer does not support HP JetDirect/Socket, consider using IPP as an alternative
- If you are not able to install or find a driver for your printer, try the **Generic Postscript Driver/Printer**

2.4.3.2. Sharing the printers

On Mac OS 10.8, Apple removed the ability to share printers using the Server Admin app. Sharing printers is now easier, however, LPD has since been removed as an sharing option, and the default sharing method is now IPP. To share your printers, follow the below steps:

1. Open **System Preferences > Print & Scan** on the print server (in 10.9, this is named **Printers and Scanners**)
2. Click the printer you want to share

3. Select **Share this printer on the network**.



2.4.3.3. Setting up the printers on Mac workstations

Once the printers are set up on the server and shared, the next step is to install the printers on the workstations. This section includes the manual setup of print queues to workstations, as well as discussing a method of automating deployment via the Workgroup Manager. The goal is to add the printer on the workstation so it communicates with the server's print queues rather than directly to the printer. Protocols include IPP, LPD, or LPD added via Bonjour. The recommended setup is to use IPP, as this is the native protocol.

Manual setup

1. Open **System Preferences > Print & Scan** on the workstation (in 10.9, this is named **Printers & Scanners**)
2. Click **+**.
3. Select IP as the type; then select **Internet Printing Protocol - IPP** as the **Protocol**. If IPP is not compatible with this device, select **Line Printer Daemon - LPD** as the **Protocol**
4. In the **Address**, enter your server name (or IP Address).
5. In **Queue**, enter the the printer's **Queue Name** prefixed with **printers/**. For example: **printers/my_office_printer**.
6. Select the appropriate driver under **Print Using**.
7. Select **Printer Software**. If your model is not listed here, install the manufacturer's driver and repeat these steps again
8. Take some time to test printing from the workstation, and confirm that all functions of the printer are working.

**Note:**

If you have trouble connecting, ensure the queue name you are entering is correct. The queue name of the printer is set when the print queue is first created on the Mac server, and might be different to the visible printer name. The queue name is displayed on the print server under **System Preferences > Print & Scan > [select printer] > Options & Supplies > General > Device Name**.

If you have problems obtaining a driver for your printer, try the **Generic Postscript Driver**. This option works with most printers. If after a test print the printer stops with a connection error, check the printer sharing permissions on the server or try the alternate method discussed below.

The screenshot shows the 'Add' printer dialog box in macOS. At the top, there are icons for 'Default', 'Fax', 'IP', and 'Windows', along with a search bar. The main area contains several input fields and dropdown menus:

- Address:** 10.100.66.25 (with a note: 'Valid and complete address.')
- Protocol:** Internet Printing Protocol - IPP (dropdown menu)
- Queue:** printers/LibraryPrinter (with a note: 'Leave blank for default queue.')
- Name:** Library Printer
- Location:** Library Room
- Use:** HP LaserJet 4350 (dropdown menu)

An 'Add' button is located at the bottom right of the dialog.

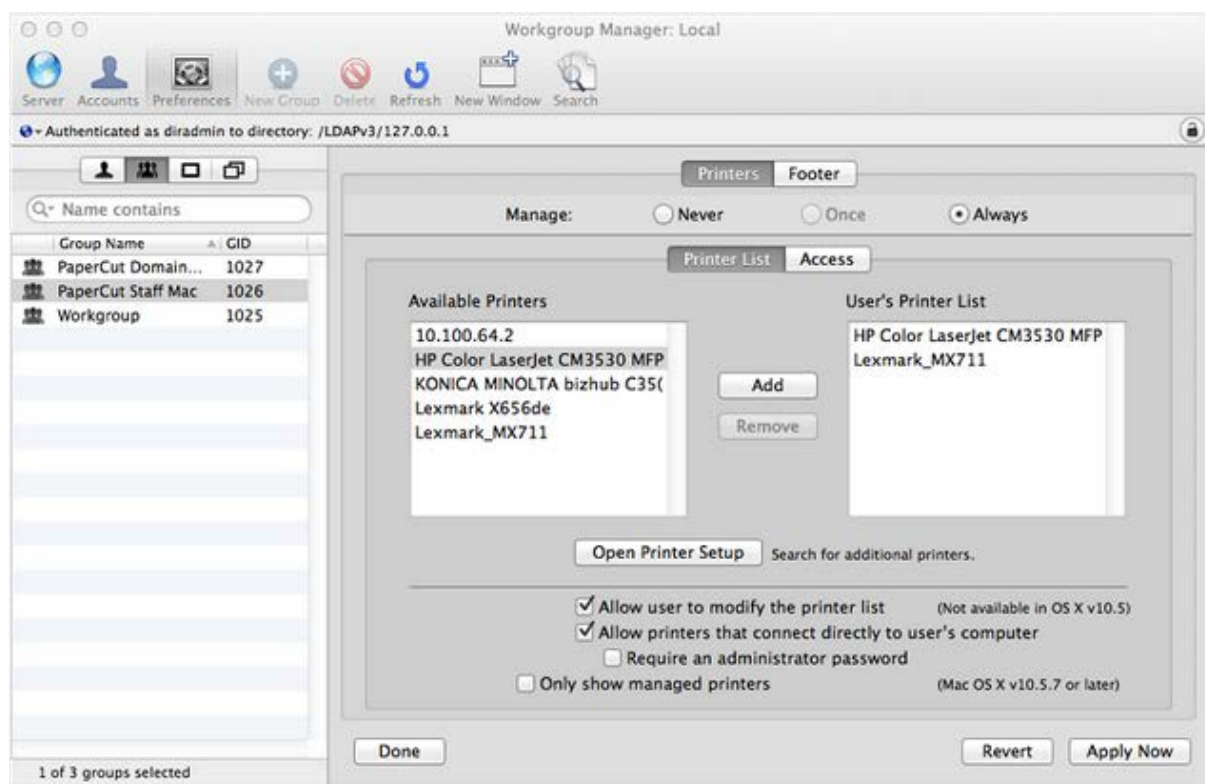
Publishing the printer via Workgroup Manager

Manually installing the printer on each desktop on a large network can be tedious. Large networks using Open Directory can automate the process with Workgroup Manager. The key to successfully deploying/publishing printers via the Workgroup Manager is to publish the configuration from a working workstation rather than the server itself. The reason behind this is that it would publish the server's printer configuration. Since the server is configured to print direct to the device and not to the queue, this would be the incorrect configuration for user workstations. Instead, install the Workgroup Manager software on a configured workstation/client and publish its known configuration. We recommend having a workstation setup that is for Workgroup Manager administration and deployment only.

1. Select one workstation on your network. Follow the manual set up procedure as discussed above.
2. Test and confirm this workstation is configured and printing correctly. Also select other

settings as appropriate such as tray, duplex and other defaults. It is important to test this step before continuing. If printing is not working, this needs to be fixed before Workgroup Manager is used to publish your print queues.

3. Install the **Workgroup Manager** on this client workstation found on the Mac OS X Server install disk).
4. Open the Workgroup Manager, connect to your directory, then select an appropriate user group or computer group used to manage client settings.
5. Enter the **Settings/Preferences** area; then select **Printing**.
6. Select **Manage Always**; then add printer(s) set up in step 1.
7. Save the settings and exit (e.g. click **Done**).
8. Log onto another workstation and confirm that printer settings are being published as expected.



2.4.4. Windows hosted print queues

This section discusses printer configuration on Mac OS X workstation in environments systems where the print queues are hosted on a Windows operating system. See [Mac hosted print queues for OS 10.8+](#) if your print queues are hosted on Mac OS 10.8+.

When a printer from a Windows environment is shared and added to a Mac system, **Print and Scan** requests printer access credentials in the form of username and password. Any user that prints to this printer uses these supplied credentials. This means that the administrator that added the printer to the workstation is the owner of all documents printed from the workstation irrespective of the current logged in user.

The ideal solutions varies from network to network and depends on factors including:

- Your existing network configuration
- The mix and makeup of operating systems used on the network
- The underlying directory technologies (Active Directory, LDAP, etc.) if used
- Whether Macs are used by a single owner or multiple users

The following sections outline common set up scenarios and their pros and cons. Your solution might fit one of these scenarios or might be composed of a combination.

2.4.4.1. Scenario One: My own Mac (single user)

Many networks, particularly those in a business environment, have a dedicated desktop system for each user. This allows the desktop system's global settings to be customized for the user. Common examples include:

- Dedicated computers used in a business
- Staff laptops or desktops used in education

Requirements

- Printers hosted and shared from a Windows or Linux server.
- Mac systems used by a single user (or small group of known users).
- Each user has a domain account and password.
- The username associated with the account on the Mac matches the domain username (either the account used to log in, or the account set up as the automatic log in account).
- Running Mac OS X 10.8 or higher.

Installation

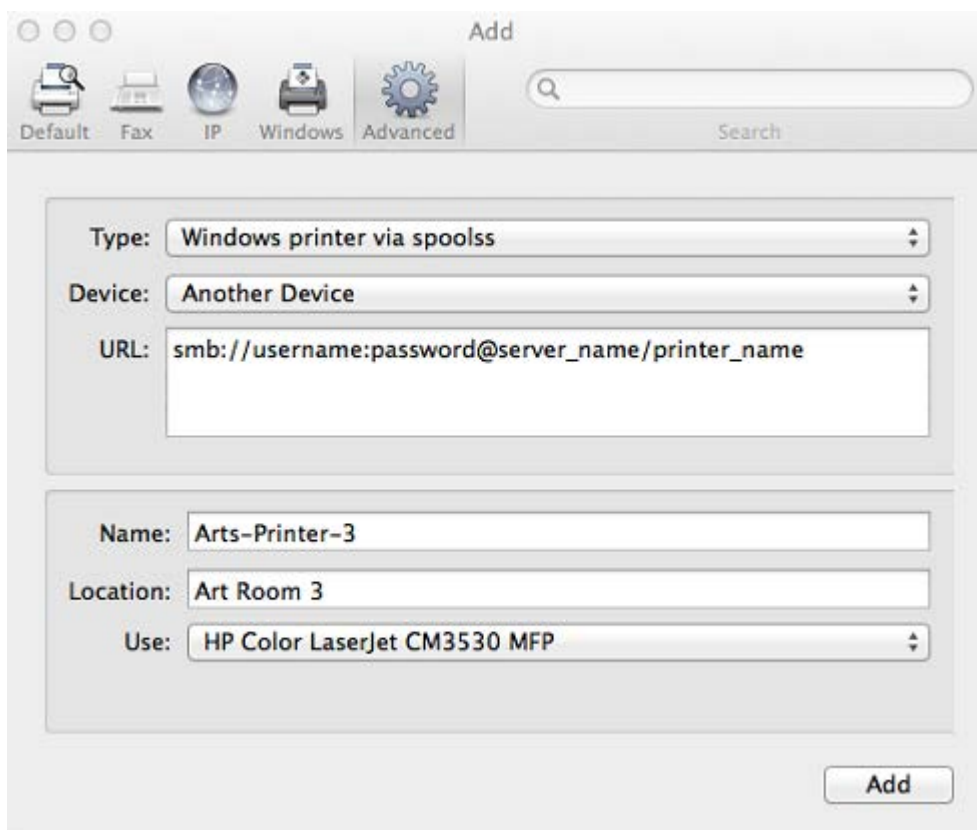
Check the user account information:

1. Start up the Mac, log in as the local administrator, and ensure the system is connected to the network.
2. Select **System Preferences**
3. Depending on your Mac OS version, select **Accounts** or **Users and Groups**.
4. Click **MyAccount**. (*Skip this step in Mac OS 10.8 and 10.9*)
5. Ensure that the **Short name** associated with the account matches the user's domain account username. If not, create a new working account as appropriate.

Set up the printers

1. Select **System Preferences > Print and Scan**.
2. Click **+** to add a new printer.
3. Control-click the toolbar; then select **Customize Toolbar**.
4. Drag the **Advanced** icon onto the bar; then click **Advanced**.

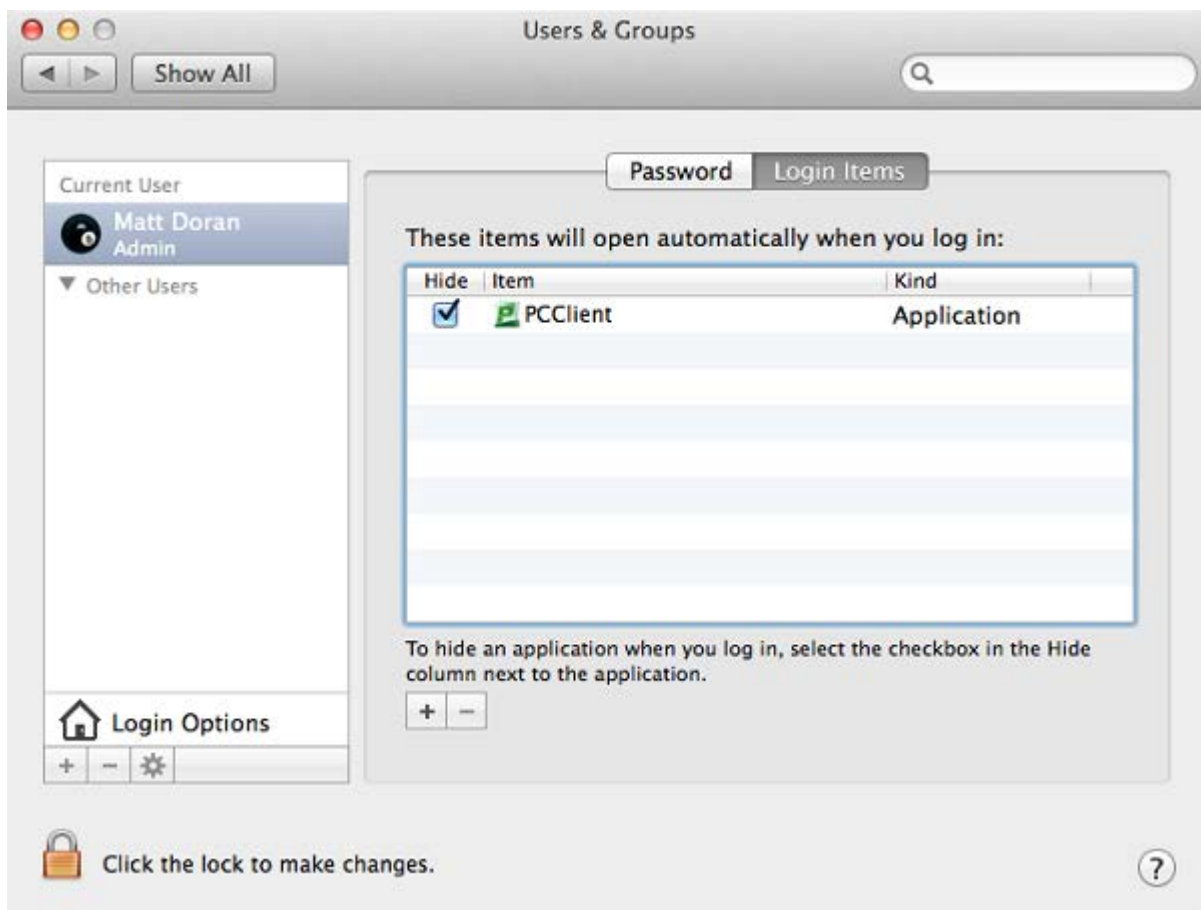
5. Select the **Windows printer via spoolss** device type.
6. Enter a **Device URL**, such as: `smb://username:password@server_name/printer_name`
 - Tip: `server_name` is the name of the server hosting the printer, and `printer_name` is the printer's share name
 - You might need to include the port in the DeviceURL: `smb://server_name:139/printer_name`
 - OS X can struggle with printer share names containing spaces. We recommend a share name without spaces
7. In **Name**, enter a friendly and informative printer name.
8. Choose a driver for this printer by selecting **Select Software** from the list.
9. Click **Add**.
10. Test print and ensure jobs are logged in PaperCut MF as the correct user.



Install the PaperCut MF User Client software

1. Open **Finder**; then select **Go > Connect to Server**.
2. Enter `smb://servername/pcclient` where `servername` is the name of the server hosting PaperCut MF. If you are prompted for a username and password, this is a username that has access to connect to the SMB share on your Windows server.
3. Drag the `PCClient` application across to the local **Applications** directory.

4. Open **System Preferences**
5. Select **Users & Groups**.
6. Click the **Login items** tab.
7. Click **+**; then select the newly installed `PCClient` application. Select the **PC Client** check box when it is displayed.
8. Restart the system and ensure the client starts upon login.



Tips and troubleshooting

- Get the user to log in to the Mac. Verify that the `PCClient` program starts automatically and shows the user's balance.
- Print to the newly set up printer. On the server's print queue, ensure that the job is displayed under the correct username.
- Ensure that the print job successfully reaches the printer and that the user gets charged in PaperCut.
- Check that the balance has changed to reflect the new balance in the `PCClient` program.

2.4.4.2. Scenario Two: The multi-user Mac with popup authentication

Schools and universities often have Macs available for student use in dedicated computer labs. In these environments the Macs are shared by many users and Scenario One is not appropriate.

Larger Mac networks already using LDAP or Active Directory authentication, or planning on doing so, might want to consider Scenario Three explained in the next section.

Scenario Two uses a popup authentication model. For more information, see [Popup authentication](#).

The end user's perspective:

1. The user sees the `PCClient` program running.
2. When the user prints a job, the client pops up a window requesting the user to enter a username and password. See [Popup authentication](#).
3. The user enters a domain username and password.
4. If the credentials are valid, the job is charged to the user account.

The explanation:

1. The print event is performed as a generic user - For example, "macuser", "student", etc.
2. In PaperCut MF, the "macuser" account is set up to use popup authentication by enabling the option **Unauthenticated user**. See [Popup authentication](#) for further details.
3. The popup requests the user to enter a username and password.
4. The password is authenticated and printing is charged against the supplied account.

Requirements

- Printers are hosted and shared off a Windows, Mac or Linux server.
- The Mac systems are set up to log in under a generic account name. (e.g. macuser, student, etc.)
- The domain contains a user account matching the generic account.

Installing the PaperCut MF User Client software

1. Open **Finder**; then select **Go > Connect to Server**.
2. Enter `smb://servername/pcclient` where `servername` is the name of the server hosting PaperCut MF. If you are prompted for a username and password, this is a username that has access to connect to the SMB share on your Windows server.
3. Enter account details for an account able to connect to the SMB share if requested
4. Drag the `PCClient` application across to the local **Applications** directory.
5. Command-click the newly copied `PCClient` application in the **Applications** directory. Select **Open Package Contents**.
6. Navigate to `Contents/Resources/`.
7. Double-click the `install-login-hook.command` script.
8. Restart the system and ensure the client starts upon login.

Configure the popup settings

1. Click the **Users** tab.
The **User List** page is displayed.
2. Select `macuser`.
3. In the **Account Details** area, complete the following:
 - **Balance**—set the account balance to zero.
 - select the **Restricted** check box.
4. In the Advanced Options area, select the **Unauthenticated user (enable popup authentication)** check box.
5. Click **Apply**.

If users log in to the Mac using their AD/LDAP username, you can eliminate the authentication popup by configuring the client as described in [Popup authentication](#).

Tips and troubleshooting

- Get the user to log in to the Mac. Verify that the `PCClient` program starts automatically.
- Print to the newly set up printer. On the server's print queue, ensure that the job is displayed under the correct username.
- An authentication popup should display on the Mac. Enter a valid domain username and password.
- Charge the corresponding user for the job. Also check that the balance has changed to reflect the new balance in the `PCClient` program.

2.4.4.3. Scenario Three: Multi-user Macs using LDAP or Active Directory authentication

Larger networks often run the Macs in a domain environment either authenticating with an Active Directory or an LDAP network. In an authenticated domain environment, the identity of the user (the user's username) is known and verified at the time of log in. With the help of the TCP/IP Printing Services for Microsoft Windows, and the LPR/LPD support on the Mac, print jobs can be identified on the server and associated with the user's login name. This avoids the need for the popup authentication used in Scenario Two.

Using the LPR and IPP printing protocols on Windows print servers

LPR is a legacy protocol developed for UNIX that clients use to send print jobs to print servers. Microsoft has supported this protocol for a number of years via an add-on module called Print Services for UNIX (PSfU). Under certain conditions Windows LPD printers can cause issues when using PaperCut hold/release print queues. The information included here is to help customers understand the issue and document suggested workarounds.

The mechanism used by the Windows PSfU subsystem to accept LPR and IPP print jobs is different from other implementations in Windows such as native SMB based printers. In SMB the event notification to applications such as PaperCut is well behaved and reliable. Event notification for LPR and IPP based printing does not use the same set of underlying APIs and under some conditions the PaperCut print monitoring layer receives notification *after* the print job has started. This means that some print jobs can start to print before the hold instruction is issued. This job is then suspended in a **Paused Printing** state (i.e. both paused and printing) and this results in all other jobs on that queue being held up by the paused job.

The symptoms are generally not consistent, suggesting an underlying race condition bug in Windows. Things that can affect the problem include:

- Running the print server on a virtual machine
- The number of processors/cores
- The current load on the print server
- The version and patch level of Windows

Because the issue is in the underlying Windows print subsystem, it is not possible for PaperCut to quickly implement a reliable solution and Microsoft is unlikely to implement a fix to this legacy subsystem. If a site does experience this issue there are some steps that can help alleviate or fix the issue.

1. Use the SMB protocol for Windows based print server queues. Note that using SMB can place some constraints on how users authenticate and how anonymous users are able to print at your site. This is the recommended approach.
2. Use two print queues. Queue *A* is virtual and queue *B* is the real queue attached to the physical printer. Users print to *A* using LPR and PaperCut can always place a hold on the print job. PaperCut then redirects the job to *B* on release. Managing virtual print queues is documented in section [Find-Me printing and printer load balancing](#). Configure queue *A* to use a port with no printer (e.g. `LPT1 :`), it should be permanently *paused* (**Printer > Pause Printing**), and the virtual queue configuration for *A* in PaperCut should forward jobs to *B* (setting **Jobs may be redirected to these destination queues**).

If queue *A* is un-paused then the job will error, however, it can still be re-directed as needed.

Requirements

- Macs set up in multi-user mode authenticating off a domain. Either Active Directory or LDAP.
- Printers hosted on a Windows print server.
- The server needs the TCP Printing Services installed (also known as Print Services for Unix).

Installation

On the server hosting the printers, set up TCP/IP Printing:

1. Log in to the server as a system administrator.
2. Select **Control Panel > Add Remove Programs**.

3. Click **Add/Remove Windows Components**.
4. Select **Other Network File and Print Services**.
5. Click **Details**.
6. Select **Print Services for Unix**.
7. Click **Next** to complete the installation.

Some systems running firewall software can block LPD printing. On systems running firewall software, ensure that incoming connections from the local network are allowed on port 515.

On each Mac, add the required printers:

1. Select **Applications > Utilities**.
Open the **Printer Setup Utility**
2. Click **+** to add a new printer.
3. Click the **IP** tab in the top toolbar.
4. From the **Protocol** list, select **Line Printer Daemon - LPD**.
5. In **Address**, enter the IP address of the server hosting the printers .
6. In **Queue**, enter the printer's share name .
7. In **Name**, define a user friendly name; then select the printer type.
8. Click **Add**.
9. Repeat for other printers as necessary.

Installing the PaperCut MF User Client software

1. Open **Finder**; then select **Go > Connect to Server**.
2. Enter `smb://servername/pcclient` where `servername` is the name of the server hosting PaperCut MF. If you are prompted for a username and password, this is a username that has access to connect to the SMB share on your Windows server.
3. Enter account details for an account able to connect to the SMB share if requested
4. Drag the `PCClient` application across to the local **Applications** directory.
5. Command-click the newly copied `PCClient` application in the **Applications** directory.
6. Select **Open Package Contents**.
7. Navigate to `Contents/Resources/`.
8. Double-click the `install-login-hook.command` script.
9. Restart the system and ensure the client starts upon login.

Tips and troubleshooting

- Restart the system and ensure the `PCClient` application starts on login and lists the user's account balance.
- Ensure print jobs correctly show in the PaperCut job logs under the user's PaperCut account.

- Charge the corresponding user for the job. Also check that the balance has changed to reflect the new balance in the `PCClient` program.

Additional information and tips

The client install process is also covered in [User Client](#). After the first Mac is set up and the printing process is tested, provide the simplified client install notes covered in [Deployment on Mac OS X](#) to end users or other SysAdmins.

The `PCClient` client can accept command line options as explained in [Configure the User Client using the command-line](#). If the client is started via the login hook, you can define the command-line options in the file:

```
/Applications/PCClient.app/Contents/Resources/login-hook-start
```

Look for the line starting with `client_args` and the associated comments above.

2.5. Installation on Linux (CUPS and Samba)

2.5.1. Quick install: Linux (CUPS and/or Samba)



Important:

The following section assumes knowledge of general Unix/Linux system management including using the command-line, creating users, editing configuration files and understanding file permissions.

Step 1: System requirements

Before proceeding with the installation the SysAdmin should take a few moments to verify system requirements.

- Is the operating system version supported and are patches up-to-date? (see [PaperCut MF System Requirements](#)).
- Are printer(s) installed and hosted on this system and are they exposed to the network either via CUPS or Samba? Administrators should ensure that the print queues are set up and working as expected before attempting to install PaperCut MF.
- In a multi-user environment, printers are often shared with other network users. Other workstations should connect to these printers as "Network Printers". Ensure workstations are configured to print to the shared print queues. For example, a Windows workstation can connect to a samba exposed printer via `\\[samba_server]\[printer]`. Other Linux or Mac workstations use IPP via CUPS.
- Ensure that printers are configured correctly and work.