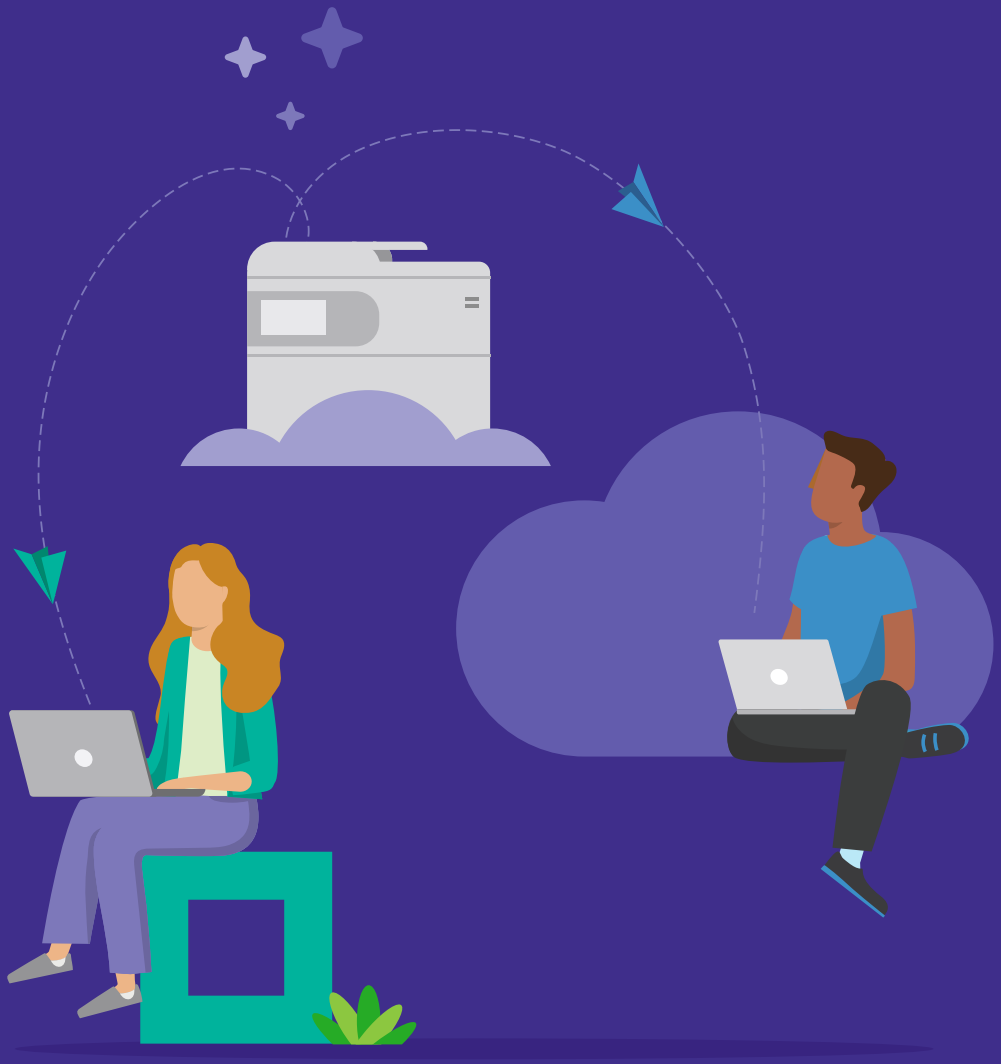
PaperCut



Everything you need to know about cloud printing in 2025

What *is* cloud printing anyway?

Cloud computing isn't new – it's quickly become a staple of everyday life.

Streaming music, movies, or TV?
You're in the cloud.

Backing up photos on your phone?
Cloud.

Using online spreadsheets?
Oh, you better believe that's cloud.

Like entertainment streaming and countless other software and infrastructure services, print management is also being enhanced by cloud computing.

It's an obvious enough desire: eliminate onsite print servers and leverage the cloud for your print environment = cloud printing. But there's more to it...

Picture this: you're sitting at your office desk, near your printer. Traditionally, your office printer and computer connect via a wireless or wired network, and your printing has historically been facilitated with the help of an on-premises print server.

Historically, these servers have taken up valuable space in a server room, plus their need for time and energy to maintain them over the years (plus the additional costs and time if your IT teams are off-site, as many are nowadays).

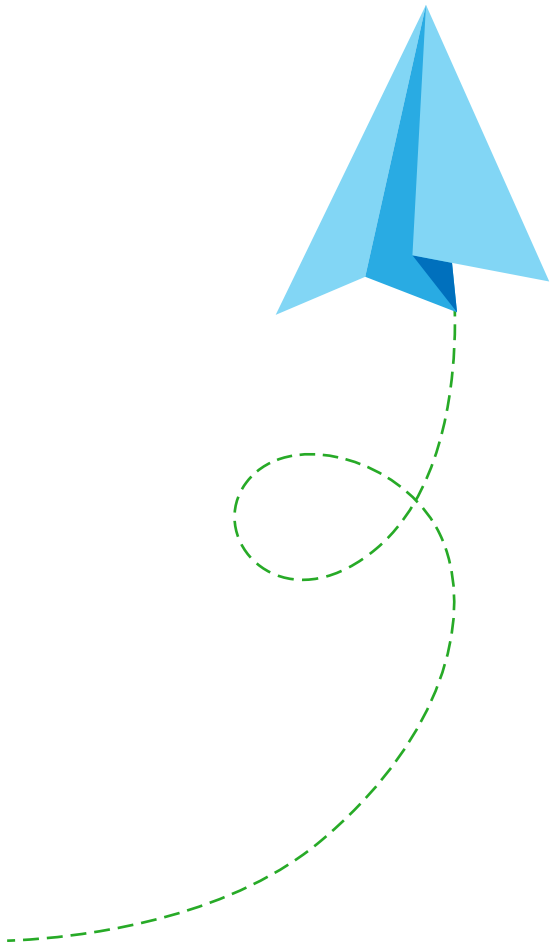
Unfortunately, you can't just unplug it and be done with the whole situation – to get to that stage, you need software that can talk to your printers and the cloud.

The cloud can't just reach into your local network and stuff documents into your printers by itself.

It's cloud computing, not magic.

Darn it.

Contents



How does cloud printing *actually* work?

As a society, we're getting used to having the cloud involved in our daily life, with our photos, documents, and more being 'sent up there' to be accessed as we need them.

But how does that work when it comes to printing out a document in real life?

First, sending the print job: the easy part. Your users hit print, and their computer sends it up to the cloud, no worries.

But getting that job back down to the printer? That's trickier. Most printers, MFDs, or MFPs can't talk directly to the cloud, especially those older devices that are still going strong.

That's why cloud printing needs a small helper (also known as a client) running somewhere on your network to fetch the job and hand it to the printer.

So far, this hardware challenge is a big reason why cloud print management hasn't fully taken over (yet).

To conquer the cloud, there are two problems you need to overcome:

Problem #1:

If you're sending print jobs to a service up in the cloud, you're sending your documents over the internet.

This can be a security concern, as well as being slow. You have to think about your organization's security risk positioning and what barriers you need to protect your intellectual property.

Problem #2:

Your print job's delivered to the cloud service provider (which you may not know the physical location of) but getting the print job from the cloud back to the printer in a fast and secure way is tricky, especially if you have a complex print environment.

To connect the cloud to the printer, extra software or hardware needs to exist somewhere on your network to fetch the print job from the cloud.

3 options for software/hardware combos:

► Software on the printer

Clouds can't talk to printers, but printers can talk to clouds (with the right software).

This means you can house the software directly on the printer, but you may find yourself up against compatibility issues if your printer fleet is made up of older legacy technology.

We've seen in most cases that computing power in on-site printers isn't a great substitute for computers, or at least not the resources needed to handle lots of print jobs, print queues, or large, complex jobs.

Historically, organizations with more complex print environments need a small box or device onsite (usually something like an always-on computer) that connects the printer directly to the cloud's software.

This piece of hardware does the heavy lifting, pulling from the cloud things that most printers can't do alone.

On a computer

A regular laptop can run the software to talk to the cloud, but in practice might not be the best solution for all businesses.

If a single computer is running the software and is turned off or enters standby, all printing stops, which doesn't tend to make for happy end-users.

If your business needs constant access to printing, this may not be the option for you.

On a dedicated device

An admin desktop that's always on could house the software, and it wouldn't even need a lot of computing power – but it still has the same issues as the computer above.

After a certain point, creating your own hybrid approach isn't too dissimilar to keeping your print server, and you're barely touching the edges of the full functionality you can have through a cloud provider.

Solutions like PaperCut Hive can be used to remove the need for a dedicated on-premises device altogether, allowing you to switch seamlessly to cloud printing.

Learn more

Read our blog: What are the benefits of cloud print management?

Before we move on, let's talk about "serverless printing"

If you're technically minded, you know that "serverless printing" essentially means removing your onsite print server costs/management because you've outsourced the role of a print server to a cloud service provider (saving you many pretty pennies, plus a decent amount of time!).

Yes, cloud printing is possible without an onsite server handling your print jobs. But, as we mentioned earlier, you still need *something* onsite to fetch your print job from the cloud.

Let's quickly dig into the why and find out what this looks like.

In general, you have two types of cloud print jobs.

The first we'll call "simple printing": you just need to send metadata to the cloud without any private information about the document or content.

This is like direct or mobile device printing – you want users to hit print from a laptop or mobile device, choose from a small list of predictable printers, and pick up their printout.

Where this works well:

- if the jobs don't need to be held until the user releases them
- you only have a small list of printers
- your users aren't too mobile,
- you don't need much information on print job types on your network.

The second type we've titled "complex" printing.

It's when the whole file can go to the cloud, then be downloaded back to the printer.

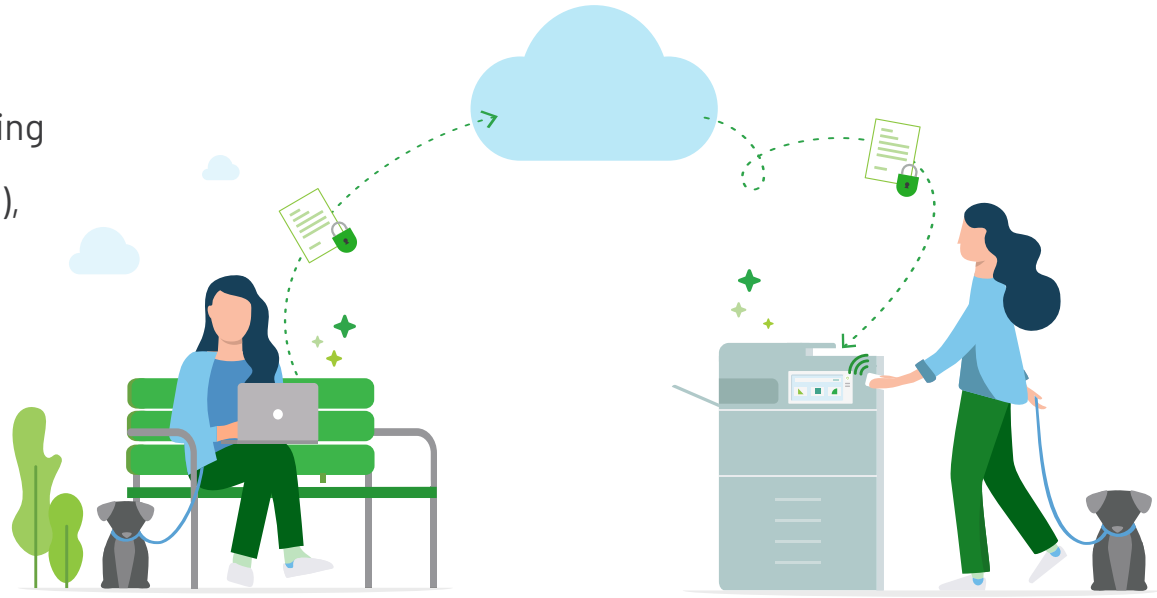
This is a must if:

- your employees/teams aren't in the office every day
- you have mobile employees who print to remote offices
- you have many printers on your network
- some of your printers are restricted use
- you have a large mixed fleet of printers
- you need to track departmental or client printing
- your network isolates printers (e.g., zero-trust), preventing direct printer access

The list goes on, but we'll stop there.

Currently, there are services in the market that help with "simple printing" - they have printers communicating directly with the cloud to request and pull down jobs, as well as reporting back status.

If you look deeper at the technical requirements, this requires firmware/software on the MFD to support this, but it does remove the need for servers or clients on-premises communicating with the printer.



Why doesn't this work for "serverless" printing?

One major reason is processing power, with limitations on most printers. The more devices, print drivers, print spoolers, print queues, and printers you have to manage, the more bandwidth you'll need for all the additional processes.

This is also where the age of your printer may come into play – we ask a lot of printers nowadays, and some more... 'vintage' models can find themselves struggling to manage their core task in a modern workplace.

You also need to consider things like bandwidth throughput, latency of the working link, upload and download costs, print load capacity, and redundancy of internet links.

Another reason this won't work for everyone is the variation between printer brands – each brand would need its own software.

This option will only support a small number of brands however, this may change over time.

So why would you want hardware onsite?

Printers have limited processing power. If you're an organization with 100 printers or 1000 users, you need a reliable way to handle print requests and hundreds of print tasks.

This all takes a little more oomph than a printer can provide, especially if you want the ability to track tasks and keep an eye on the print-crazy employees.

Some providers of a cloud print management solution require something onsite to help – maybe a Raspberry Pi or similar hardware, or software installed on an always-on desktop.

You also have to consider security. Sending a job from a simple printer to the cloud opens up secure documents to the risks of being "on the internet".

You need to trust your cloud provider to handle your data carefully and ensure all points the job travels through are correctly maintained for security.

Again, because printers have limited processing power, having extra hardware onsite will ensure you have fail-safes in place to help with encryption and authentication.

“But why would we move to the cloud?”

With cloud services emerging as a cost-effective alternative to on-prem hardware when it comes to print management, more businesses are transitioning to cloud-based print management solutions.

Cloud services can potentially enhance security, scalability, and mobility, and print management is undoubtedly a slice of that pie.

Cloud provides a flexible, resilient, and reliable alternative to traditional data center services:

- **Room to add on and scale up**
- **Reduced print spend**
- **Increased ROI**
- **Less IT team burden**

However, it’s crucial to remember the “benefit and trade-off” approach when it comes to cloud print management and make business decisions with full knowledge of the trade-offs.

The 3 benefits and trade-offs of cloud printing

Print management in the cloud has its benefits, but it also has its drawbacks. It would be wrong to talk about cloud as a “perfect answer.”

The magic is in being able to talk about the trade-offs.

Simplicity vs control

Cloud computing allows us to simplify how we use technology. If it suits your print environment, you can completely remove the behind-the-scenes maintenance of print servers.

Fewer moving parts are simpler. The trade-off is that you may have less control: some people want to see the engine of their car, but others are just happy to hear it running.

Can your print environment benefit from simplicity, or do you (or your stakeholders) need to pop the hood?

Cost flexibility and elasticity vs predictability

Cloud-based printing reduces your infrastructure, and the hardware maintenance is handled for you. Self-hosting in one location is generally cheaper when you have the expert on-site, but what if there's a cost to access that expertise? What if you're operating in a distributed environment with multiple offices?

Different businesses with different physical limitations and levels of expertise will benefit from different approaches.

Cloud-based print management is rapidly deployed, so it lessens the burden of implementation and administration. It also has the benefit of auto-scaling, depending on your requirements or usage.

When self-hosting, you often need to commit to a server that fits your requirements, and if those requirements change, you need to buy a new one.

The cloud offers a flexible, auto-scaling system, compared to a more limited self-hosted system situation. The trade-off here is that it's out of your control in the cloud, which could be seen as a benefit or a drawback, depending on your print environment.

Security and compliance vs simplicity

With on-prem or self-hosted print management, the data and infrastructure are managed by you. You're in control. You know where the data is and have complete access.

This is one area where the cloud is net neutral or a loss in security and compliance. While you gain the provider's security expertise, you have less direct visibility into your data.

The benefit of self-hosted print management is that you're always in control, whereas cloud-based print management means third parties are handling elements like software updates and security fixes.

That said, most cloud print services use top platforms such as Google Cloud, AWS, or Microsoft Azure, so you can rest easy knowing security and resilience are top of mind.

It’s time to choose your own cloud adventure!

Just like each operating system is a different shape, and each printer model and make is different, clouds come in different forms too.

PaperCut's approach to print management is 'customer first'. We work hard to ensure our customers have choice: when it comes to operating systems, printer brands, and print management solutions.

Private, hybrid hosted, and single tenant = PaperCut MF

At a glance:

- **Modular**
- **Secure – stay in complete control of your data**
- **Scalable**
- **Hybrid and private hosted cloud compatible**
- **Built using Web Services**
- **Mobility Print and Print Deploy work in the cloud**
- **Google Cloud Directory and Microsoft Entra ID user sync built-in**
- **Deploy on Microsoft Azure, Amazon Web Services, Google Cloud Platform, or similar**

PaperCut MF is modular in nature and can be architected for private and hybrid cloud-hosted print management, including calibration for your desired cloud advantages.

You can customize print jobs to stay local on your network, and even design your set-up for high availability and redundancy.

Security is the biggest advantage of private and hybrid cloud environments, and PaperCut MF caters to this.

Deploy it in your secured cloud environment of choice and have full control over everything – from encryption certificates and authentication policies to where your data is located.

Another part of the demand for cloud is meeting the rise of the mobile worker. PaperCut MF's features cater to easy BYOD printing with Mobility Print - easily accessible via a web browser.

The hybrid cloud approach and built-in integrations mean you can leverage cloud directory services like Google Workspace and Microsoft Entra ID or scan to Microsoft OneDrive or Dropbox. You can even enable OCR (image to text) with a PaperCut MF checkbox.

Public, SaaS, and multitenant = PaperCut Hive/PaperCut Pocket

At a glance:

- **Cloud-native hosted SaaS print management**
- **Multitenant - serverless application**
- **Edge Mesh - innovative print management approach**
- **Self-healing - no single point of failure**
- **Print jobs can stay local**
- **Zero-trust network - highly secure job encryption**
- **Continuous deployment auto-updating with the latest features**

PaperCut Hive and PaperCut Pocket are our "built for cloud" platforms that borrow the best parts of IoT (Internet of Things). One of the core concepts at the forefront of IoT design is security, which we've brought into this cloud native platform as a design principle right from the first line of code.

As multi-tenant public SaaS solutions, PaperCut Hive and PaperCut Pocket are also designed with scalability and efficiency at the forefront of development. The platform is designed with a microservices architecture and modern continuous deployment development practices.

The benefits of this are new features become available quickly without needing to perform upgrades, and the cost savings at hosting at scale are passed through to organizations.

PaperCut Pocket is for small businesses looking at a DIY solution for cloud print management. PaperCut Hive is for scaling, distributed, and organizations looking for embedded MFD/MFP software.

Bring the best from the Internet of Things: Edge Mesh

There are loads of exciting things to discover with our built-for-cloud solutions. One is how it was influenced by the world of IoT to overcome the difficulties of marrying hardware and the internet.

Earlier, we touched on the three methods of connecting the cloud to printers – this is how PaperCut solved the challenge.

PaperCut looked at the best practices from IoT and adapted them for cloud-managed print management – specifically the concepts of Edge computing and self-healing Mesh.

The magic is in mixing the two to bring the benefits of on-prem and cloud together as one. This creates an 'and-and' environment rather than an 'and-or' trade-off.

At a basic level, PaperCut's Edge Mesh means all your print traffic stays on your local on-prem network (where technically possible). No going up to the cloud and back again, and it also means there's no single point of failure.

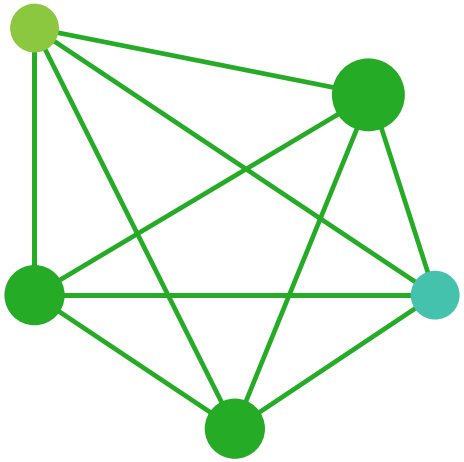
PaperCut Edge Mesh ensures your printing is secure and reliable and offers a speedy, simple user experience.

Thanks to the cloud SaaS model, features and updates for security are automatically deployed. You'll have the most current, highest-functioning version of the software at all times.

More on the Edge Mesh

As we've already highlighted, clouds can't talk to printers without some software help. That's where the Edge Mesh comes in. We take all the benefits you get with an onsite print server:

- offline functionality,
- near-zero latency,
- high security,
- locally held documents
- direct management



Then, we take away the printer server and offer the benefits of public cloud printing:

- scalability,
- high availability,
- cost effectiveness
- easy administration
- off-premise print submission.

Like many solutions currently on the market, the Edge Mesh works by having our smart software living on your computers, or clients you already have onsite.

You can dive into the details of how this all works by visiting our article, but to explain simply: we take your current on-site clients and use them to handle the communication and computing your retired server used to do.

No matter what you choose, don’t forget what’s important

From single-tenant private and hybrid hosted PaperCut MF, to multi-tenant public SaaS PaperCut Hive and PaperCut Pocket, our approach to cloud print management is driven by the same guiding principles...

Our four principles to cloud print management:

Security

Protecting sensitive information is present in everything we do, from the first line of code through to ongoing service and support.

Simplicity

It's possible to solve some amazing technical problems without compromising on a simple, joyful print experience.

Flexibility

We put our customers first and aim to offer you choice: any printer, hosting environment, platform, OS, or device.

Performance

With over 25 years of industry experience, PaperCut is committed to providing end-users and customers with a print management solution that performs for them every day.

Solution summary

From simple, joyful print experience, to a fast and flexible cloud print solution, to advanced print security - PaperCut offers a full suite of cloud print management solutions to fit your needs.

PaperCut MF

- Hybrid and private cloud compatible
- Mobility Print and Print Deploy work in the cloud
- Google Cloud Directory and Microsoft Azure AD user sync built-in
- Deploy on Microsoft Entra ID, Amazon Web Services, Google Cloud Platform, or similar

FIND OUT MORE

PaperCut Hive

- Built for scaling, distributed, and enterprise organizations
- Embedded experience at the printer
- Multi-tenant, zero-trust, and self-healing
- Continuous deployment auto-updating with the latest features

FIND OUT MORE

PaperCut Pocket

- Set it up yourself
- Multitenant - serverless application
- Zero-trust network, highly secure job encryption
- Self-healing - no single point of failure

FIND OUT MORE

About PaperCut

PaperCut is a leader in print management software, helping millions around the globe minimize waste with secure and simple printing experiences.

For over 25 years, PaperCut has been helping businesses of all sizes make printing easy and secure for their end users, with a cross-platform, vendor-neutral approach to technology.

PaperCut's global team work to create solutions with a focus on ease-of-use, reporting, and cost efficiency.

We empower businesses to securely manage printing, copying, and scanning, with features like secure print release, user authentication, and detailed audit logs.

If you're ready to upgrade how your business manages the way you print, PaperCut can help you create the best solution.

PaperCut™

Want to learn more about the benefits and features of print management solutions?

Visit www.papercut.com

Email sales@papercut.com