The Mobile Print Enterprise, 2015

Are businesses ready for mobile printing?

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Mobile devices are transforming business productivity. For many, the workplace is no longer defined by the traditional office; employees are now accessing corporate applications, data, and services from multiple devices and locations every day. With a highly mobile workforce, organisations need to ensure employees have the same access to corporate applications as they would from the desktop, while protecting sensitive data. One area in need of better control, which has yet to catch up with the desktop experience, is printing.

Due to a diversity of mobile platforms and printer and MFP (multifunction peripheral) devices, mobile printing is often viewed as cumbersome and inflexible. The mix of proprietary approaches from each vendor, together with a range of third party solutions, has created a rather complex market. Although the Mopria alliance seeks to redress the balance through developing standards around mobile printing, there is still progress to be made in creating an intuitive mobile print experience.

Quocirca expects mobile printing to only become more widely adopted once mobile printing is as simple as desktop printing – and enterprises certainly do not want to pay a premium for this capability. Quocirca's research reveals growing interest in mobile printing with 83% of organisations indicating they are interested in mobile print capabilities. Yet only 14% have deployed a mobile print solution, reflecting not only the lower priority assigned to mobile printing but also a potential lack of understanding on what solution meets the business needs.

This report outlines some key market trends and highlights mobile print offerings from key players in the market and is a revision of the 2012 report.

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Are businesses ready for mobile printing?

Most businesses are reliant on printing to a certain extent and, although print volumes are flat to declining, there is still a need to provide easy access to printing for mobile workers. This could simply being able to send a print job wirelessly to an office printer from a smartphone, sending a print job in advance to an office printer while on the road or allowing guest visitors to print securely from their mobile devices.

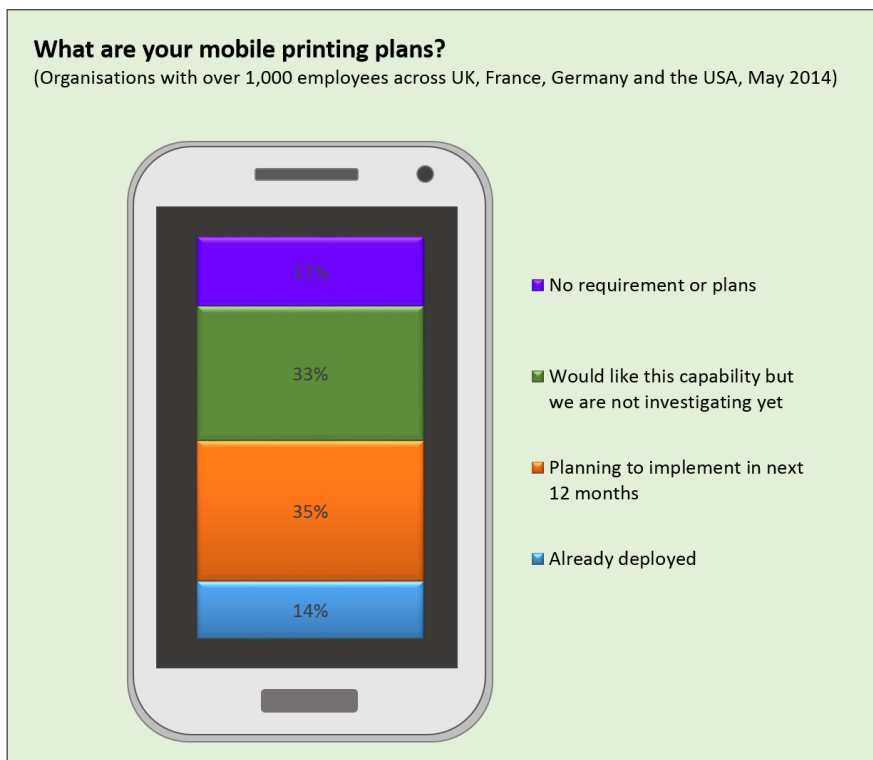|	
The BYOD phenomenon continues unabated	As printing shifts from the desktop to the mobile device, IT must extend its print infrastructure to the mobile worker. By providing the ability to submit a print job from any mobile device to any printer, securely and reliably, employees gain more flexibility and convenience to print on the move.
The security risks of mobile printing must be addressed	Recent Quocirca research revealed that 70% of organisations have experienced one or more accidental data breaches through printing. Unsecured mobile printing can result in confidential information being left in output trays, exposed to prying eyes. This can be overcome through secure job release, or 'pull-printing', which uses authentication to release print jobs and also maintains a full audit trail.
Mobile printing must be centrally managed	Mobile printing must be tightly integrated into an existing enterprise print management strategy to ensure costs are contained and security risks are mitigated. Print jobs from mobile devices must be subject to the same controls and scrutiny as those from the desktop, to ensure mobile print usage can be monitored and controlled. Third party solutions such as Nuance Equitrac and Ringdale FollowMe address these requirements across mixed fleet environments.
The Mopria alliance is seeking to redress a lack of standards	Today, the market is characterised by a mix of hardware, software and cloud-based printing services. Approaches to submitting a print job include sending documents as an email attachment via a public or private cloud to a registered printer, submitting a print job through a web browser or direct printing over Wi-Fi. The Mopria alliance aims to drive the adoption of selected standards by mobile, printer and OS industry leaders and support mobile software application providers in deploying print functionality.
Printer manufacturer solutions suit a standardised environment; ISVs offer solutions for mixed fleets	Most manufacturers offer a variety of mobile printing solutions for their own devices. HP, perhaps, has the broadest and diverse portfolio, although most vendors now offer some form of mobile print solution, including support for Apple's AirPrint and Google's Cloud Print. Meanwhile, vendor-independent solutions, such as Cortado and EFI PrintMe Mobile, provide mobile printing support across a multi-vendor environment.
Managed Print Services (MPS) contracts must encompass mobile printing to ensure full enterprise printing control	A managed print service can significantly reduce the complexity, cost and risk of unmanaged printing through a process of device consolidation and continuous management. This enables organisations to maintain control and ensure security of all printing, regardless of where it originates.

Conclusion

The widespread adoption of smartphones and tablets, the growth of cloud computing and the increased need for convenience printing means that organisations must provide employees (and often site guests) with a secure and simple managed approach to mobile printing. Unless organisations are ready to invest in mobile print-enabled printer hardware, they will need to implement mobile printing point solutions according to the capabilities of their existing fleet. The emergence of Mopria as a strong industry alliance points the way for the future.

1. Introduction

The consumerisation of technology, or BYOD, is rapidly transforming the enterprise. Employees are looking to adopt a range of mobile devices – smartphones and tablets – instead of traditional desktops and laptops in order to improve their accessibility to corporate data, regardless of place and time. The diversity of mobile platforms brings with it complexity and printing from a mobile device today has still yet to match the simplicity of 'file > print' from a desktop device.

While print volumes may be diminishing, many organisations remain reliant on the printed page. Over half of respondents in a recent Quocirca survey indicated that printing is critical or very important to their business activities, signifying that, for many, the paperless office is still a utopian pipe dream. Indeed, the appetite for mobile printing has continued to increase since the 2012 Quocirca mobile printing study. The proportion of organisations that have deployed mobile printing has risen from just 5% to 14%, with 35% planning to implement mobile printing within the next 12 months. In fact, overall, 73% show an interest in mobile printing. The slow adoption of mobile printing is reflective of a rather nebulous market, a lower priority in the overall IT agenda and the reluctance to pay for mobile print solutions.

What are your mobile printing plans?
(Organisations with over 1,000 employees across UK, France, Germany and the USA, May 2014)

- No requirement or plans
- Would like this capability but we are not investigating yet
- Planning to implement in next 12 months
- Already deployed

Nevertheless, ignoring the need for mobile printing can have repercussions from a security standpoint. Without an approved approach to mobile printing, the rise of shadow IT means that employees will bypass IT to use alternative consumer printing apps. These solutions may not offer sufficient protection and will also prevent organisations from tracking and controlling print usage. Indeed, the risk of unsecured mobile printing cannot be overlooked. With recent Quocirca research revealing that 70% of organisations have experienced one or more accidental data breaches through printing, organisations need tighter controls on printing, particularly as mobile devices proliferate in the organisation. Using secure 'pull printing' can mitigate the risks of confidential information being exposed to unauthorised users by only releasing print jobs upon user authentication, such as a swipe card or PIN code, preventing printed output being left unclaimed in an output tray.

Many organisations are already addressing the complexity, cost and risk of their print environments through effective print management. They now need to take the next step to encompass mobile printing within their strategy to enhance employee and

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business productivity. This report highlights market developments in mobile printing and covers some of the main offerings in the market.

2. Scope and definitions

Quocirca has included the following vendors in this study:

- Hardware vendors: Brother, Canon, HP, Konica Minolta, Kyocera, Lexmark, Ricoh and Xerox.
- Third party ISVs: Cortado, EFI, Nuance, PrinterOn and Ringdale.

Each vendor completed a written submission detailing its strategy and solution portfolio. These submissions were followed up with vendor interviews. The report also references a recent Quocirca survey of 125 IT managers in the UK, France, Germany and the Nordic regions.

Quocirca uses the following definitions:

- **Mobile printing:** For the purposes of this report, mobile printing refers to print jobs submitted by business users via a mobile device such as a smartphone or tablet. Consumer mobile printing hardware and software is not covered in this report.

- **Cloud printing:** In a cloud printing scenario, print jobs are transferred to a registered web or cloud-enabled printer via a private or public cloud.

- **Pull printing:** Pull printing functionality allows a document to be released only upon user authentication using methods such as proximity/magnetic/smart cards or biometric recognition. Users submit jobs to designated pull-printing queues and jobs are moved from the pull-printing queue to the dedicated print queue. Pull printing enhances security and minimises wastage by ensuring print jobs are only collected by authorised users.

- **Managed Print Service (MPS):** This is the outsourcing of the print infrastructure through a process of assessment, optimisation and on-going management. MPS comes in many flavours, from entry level basic MPS packages that wrap hardware, service, and supplies based on a cost per page contract, to more sophisticated enterprise engagements that include document workflow solutions, change management and continuous management, based on stringent service level agreements.

3. The market landscape

The widespread adoption of smartphones and tablets is certainly reshaping the printer market, providing hardware manufacturers with the opportunity to capitalise on the hardware, software and services opportunity.

A fragmented market

Given the diversity of mobile platforms and printer hardware, it is unsurprising that the mobile printing market is fragmented, characterised by an array of hardware, software and cloud-based services. The mobile printing ecosystem is broadly populated by printer/copier manufacturers and independent software vendors (ISVs) (Figure 2).

- **Hardware manufacturers:** These vendors offer a mobile printing portfolio that comprises hardware, software and services. Printers may be cloud or web-enabled as in the case of HP's ePrint or Ricoh's HotSpot range of printers. This allows devices to be registered for these vendors' respective cloud printing services. Most of the hardware-centric mobile print solutions are brand-specific, although some do offer multi-vendor support. Vendors that offer some form of mobile printing solution or service include Canon, HP, Lexmark, Konica Minolta, Ricoh and Xerox. Each varies in the completeness of their mobile print solutions portfolio. Hardware manufacturers such as Canon, HP, Lexmark, Ricoh and Xerox also offer mobile printing services as part of their managed print services (MPS) portfolio, enabling organisations to manage and track printing across both desktop and mobile environments.

- **ISVs:** These vendors include Breezy, EFI, Cortado, PrinterOn and Pcounter, who all offer vendor-agnostic mobile print solutions. These are particularly suitable for organisations operating a mixed fleet, avoiding the need to implement multiple solutions for each mobile platform and printer or MFP. In many cases, hardware vendors will partner with ISVs to deliver multi-vendor support where appropriate.
- **Operating system vendors**: Printing support is available through Apple's AirPrint. AirPrint is built into most popular printer models. AirPrint features include easy discovery, automatic media selection, and enterprise-class finishing options. Google Cloud Print offers printing from smartphones or tablets with Gmail for mobile, Google Docs for mobile and other supported apps to cloud-enabled printers. Google Cloud Print Ready printers register themselves directly with the Google Cloud Print service
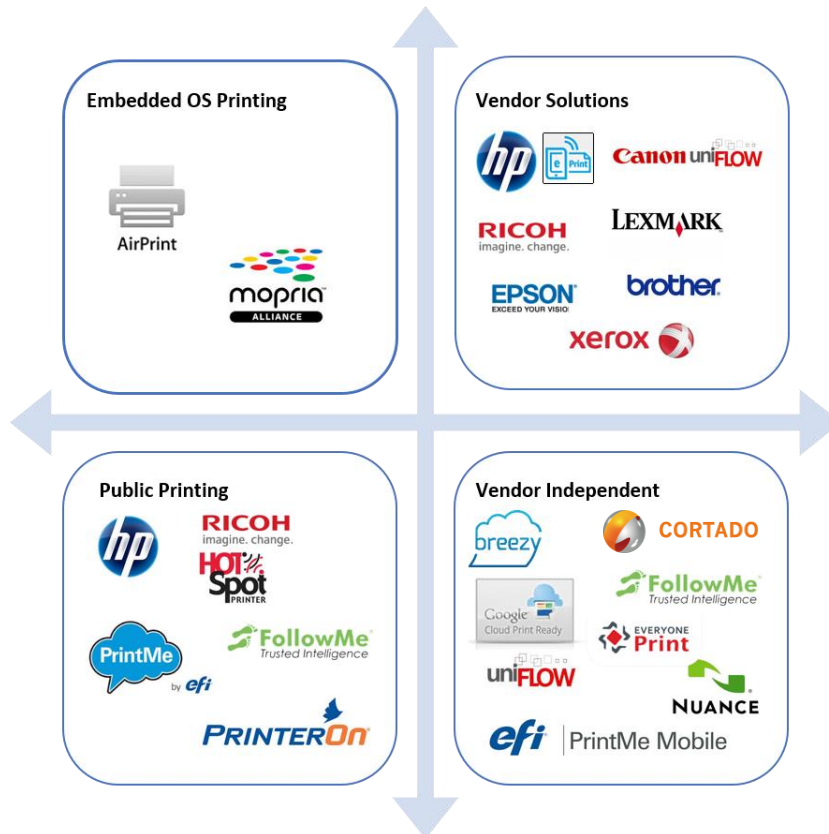

Figure 2: Mobile Printing Ecosystem (Enterprise solutions)

Usage scenarios

Mobile printing usage scenarios can be broadly categorised as:

- **Public printing/guest printing services.** Printing from public printing 'hot-spots' such as hotels, business centres, airports that offer Wi-Fi connectivity, web access and print and copy services. Mobile workers can discover printers or send print jobs as an email attachment from their mobile devices. Public print locations require an authentication code before users can release a print job from a designated printer. Print jobs are typically submitted via email or through a web browser. Examples include EFI's PrintMe service, which is available at more than 3,000 public locations, HP ePrint public print locations, such as FedEx and Hilton, and Ricoh's HotSpot printing, which uses PrinterOn's public printing network. Meanwhile, Cortado enables organisations to set up their own guest printing, enabling guests to print to cloud connected company printers or Wifi connected printers
- **Printing across a corporate network.** Printing from any device to any printer or MFP across a corporate network promotes user mobility across company locations. Printing may be direct from a mobile device or application, via an email attachment to a registered printer or through a web browser, using a public or private cloud. When deployed in the enterprise, it is critical that mobile print solutions are vendor-agnostic, use a private cloud approach and employ encryption and authentication methods to ensure document security and privacy.

There are a number of ways to print from a mobile device, although capabilities vary across vendor and mobile platform (Figure 3).
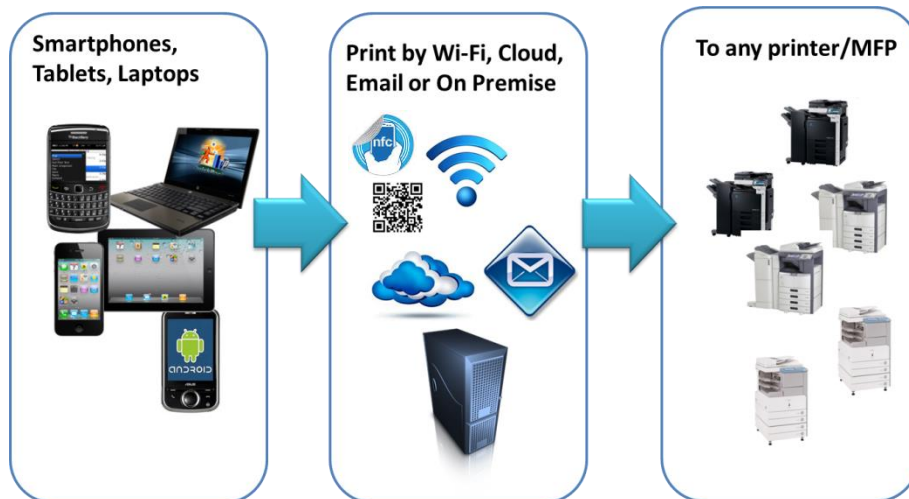

Figure 3: Printing from any mobile platform to any printer or MFP

- **Email or web browser:** This can use either a private or public cloud infrastructure depending on an organisation's requirements. A print job is sent to a printer's unique email address either by email or via a web browser. A limitation with printing via email is that content is constrained to what can be sent as an attachment and finishing options are not always available (e.g. duplex, booklet, stapling etc.). Web browser job submission may offer more flexibility on what type of document can be uploaded.
- **Wireless printing:** This is possible through two approaches:
    - Direct-to-printer wireless printing enables printing via a direct wireless connection between a mobile device and wireless printer without the need for access to a network. This requires either embedded OS print functionality for job rendering and routing (i.e. Apple AirPrint) or a mobile printing app. HP ePrint Wireless Direct Printing is one example and is supported on some of HP's LaserJet pro models.
    - Wi-Fi network printing solutions enable printing via a Wi-Fi network connection to any printer connected to the corporate network.
- **Universal print driver:** A universal driver provides users and administrators with a single driver for multiple devices, simplifying driver deployment and maintenance. A universal printer driver is particularly suitable for a multi-vendor print environment.
- **QR code:** Some mobile print solutions, such as those from Lexmark and Canon, offer Quick Response (QR) code print job submission, enabling the user to scan a QR code attached to the printer to print.

4. Recommendations

There is no silver bullet for mobile printing, and organisations need to develop a policy framework that balances business value and risk mitigation. Those organisations already operating a managed print environment may find this process easier, as they can leverage the experience of their provider to determine how best to support mobile printing. For those organisations that are not using MPS, the task is more challenging and they should seek initially to rationalise their existing fleet before introducing mobile print capabilities.

Quocirca recommends that a true mobile enterprise print solution should integrate with existing enterprise print management capabilities. For end-to-end control of printing across both desktop and mobile environments, enterprises should consider a managed print service that can proactively manage and control enterprise-wide printing.

Capabilities to look for include:

- **Support for multiple mobile platforms**. Users should have the ability to submit print jobs via a variety of methods, such as via email, a web browser or a smartphone application. Investigate what document formats can be printed and whether driver settings can be modified to customise print jobs.

- **Print security.** Any mobile printing platform must offer secure job release features that are consistent with any access control and authentication methods used for desktop printing. Limiting access to printers and MFPs to known users is a crucial step in safeguarding confidential or sensitive information. The most common authentication mechanisms include passwords, smartcards, and two-factor authentication, such as a combination of a password and card access. MFPs can be configured to authenticate users against the organisation's corporate directory via LDAP (Lightweight Directory Access Protocol), LDAP over Secure Sockets Layer (SSL) or Kerberos. Authentication can be implemented by either using an external authentication server, using authentication features embedded within a device, or by installing software that works with the MFP on a PC or workstation. This form of access control is also known as 'pull-printing'. Look for solutions that offer auditing and tracking of print jobs across desktop and mobile environments to ensure a holistic view and control of all printing activity. Strong third party offerings in this area include FollowMe by Ringdale and products from Nuance. In addition, Cortado products enable authentication with mobile devices via barcode scan and a fully vendor agnostic pull print solution without the need for any additional hardware.

- **Multi-vendor support.** Hardware-centric solutions may of course be most suited to organisations operating a standardised fleet environment. However, in reality most organisations operate a range of printers and MFPs from different manufacturers. To address the need for mobile printing across a mixed fleet environment, third party solutions should be considered. These include solutions from EFI, Cortado, Nuance and Ringdale's FollowMe solution. Quocirca recommends that organisations consider solutions that use a universal driver, enabling print jobs to be printed to any printer. This can also enable users to preview their print jobs and change finishing options before a job is printed.

- **Cost control and accounting.** Look for capabilities that enable restrictions and controls to prevent users from printing to more expensive printers, or exceeding print quotas. If such cost control and accounting is not integrated in the mobile printing platform, look for compatibility with leading cost recovery tools such as Equitrac and Print Audit.

- **Private or public cloud print services.** As corporate network access opens up, applications, storage, and infrastructure are moving to cloud computing environments. The shift towards cloud computing and the mobile consumption of information through applications such as Google Apps and Office 365 opens up wider opportunities to print, particularly as access to cloud-enabled printers grows. Enterprises and public sector organisations may prefer a private cloud deployment that lives within the firewall, to ensure the security of sensitive data. As many organisations are now looking to hybrid clouds that blend the benefits of private clouds with public clouds, solutions such as HP ePrint and solutions from Cortado offer both private and public cloud deployment options.

- **MPS.** The benefits of integrating MPS with mobile printing support should not be underestimated. A managed print service reduces the cost, complexity and risk of operating an unmanaged print infrastructure. This is achieved through a process of fleet assessment, device consolidation, implementation of document workflow tools and continuous management. If an organisation is using MPS and does not extend its coverage to include mobile printing, it is essentially

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opening its print infrastructure to escalating costs and security risks. Ensure that an MPS provider can provide integrated control of desktop and mobile printing.

- **Mopria certification.** Consider Mopria certified models to ensure mobile print compatibility. Many vendors have committed to addressing standardisation around mobile printing. Many next generation printers will support the Mopria Print Service for Android. Meanwhile, for printing from Apple devices, the de-facto standard remains AirPrint, which is now also widely supported by most manufacturers.

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5. Cortado

Cortado is a privately held vendor of enterprise solutions for mobility, printing, virtualisation and BYOD. Headquartered in Berlin and in business since 1999, the company has constantly focused on enterprise mobility management and print management solutions for large and medium enterprises.

Thanks mainly to its ThinPrint suite of solutions for print virtualisation and optimisation, the company has managed to establish itself as an international vendor of enterprise print management solutions particularly successful in remote application and virtual desktop environments (Microsoft, Citrix and VMware).

In the last five years the company has enhanced its existing solutions to address the growing need for mobile printing. Although it remains focused on large corporate customers and governments, it has also expanded its portfolio to target more SMB users and even consumers. With an established network of distribution partners, Cortado serves nearly 20,000 organisations worldwide, 60% of them being European customers, 25% from the US and the rest mainly from APAC. The company has constantly achieved organic growth through the years reinvesting its revenue in R&D.

Overall revenue in 2013 was roughly $US 15 million. Customers with mobile printing needs represented approximately 45% of the total. The company estimates that mobile printing-driven business grew by roughly 10% in Europe, whilst it nearly doubled in the US, year on year in 2013.

The company mainly sells through a two-tier channel model made of distributors and resellers and has an additional program for WaaS/DaaS/SaaS providers. It partners with print and server vendors installing solutions on site alongside print hardware and other IT infrastructure. It also partners with third party companies for NFC and authentication solutions.
Mobile applications are offered through on-line application stores.

Products Overview

Cortado addresses the need for mobile printing with a number of different solutions. These are all based on common proprietary core technologies, and each designed and packaged for different usage scenarios ranging from enterprise customers down to consumers. With all of the solutions Cortado mainly focuses on centralising print drivers to offer mobile users immediate access to print through a standardised printing interface through either a mobile application, remote desktop published application or a virtual desktop application. With its enterprise solutions it manages to do this essentially through a server based virtualisation layer which simulates native print drivers so that these do not have to be downloaded by the user. On the other hand with its consumer mobile printing solution, drivers are stored on a public cloud and users can access printing on any cloud or legacy peripheral through a mobile application.

Key features

ThinPrint Cloud Printer is a free printer vendor-agnostic app which enables mobile users to print from any app to virtually any printer through either a wi-fi connection or through a connected PC. The solution is provided in partnership with all print vendors members of the Cloud Printing Alliance. In excess of 6,000 print drivers are stored on Cortado's public cloud and made available for the user. Key features:
- Secure public cloud- based solution
- Enables printing from iOS, Android, Windows PC, Windows 8 and MacOS devices
- Printing directly to wi-fi and network printers within the users network or to any printer connected to a PC via Cloud Connector software (available for Windows and Mac OS)
- Enables printing of files stored on the mobile device as well as printing from native mobile app.

Cortado Corporate Server is an on premise enterprise mobility management solution designed to enable integration of mobile devices in the overall enterprise IT and print infrastructure. The solution is particularly suitable for the implementation of BYOD policies. As well as corporate file sharing, it enables to upload files to the corporate server and print them from any Android, iOS, Blackberry or html ready device through a local network or wi-fi. Key features:
- Windows Server-based on premise solution;
- Central management of mobile user print rights
- AirPrint supported from iOS devices; turning any network printer in organizations into an AirPrint printer
- Matches enterprise print security standards through password protection and SSL encryption for data transfers;

ThinPrint is a dedicated enterprise print management solution designed to enable printing from client devices through virtual desktops and remote applications. Particularly suitable for Microsoft, Citrix and VMware environments it centralises all print drivers on the server and gives access to print through a standardised virtual driver. The solution can be accessed by mobile users through any remote desktop published application.
Key features:
- Virtual driver VLayer simulates native print drivers for standardised user interface
- Fonts management and file adaptive compression to reduce overall stress on the network
- ThinPrint AutoConnect to insure users get the right printers connected with the right settings
- Security through password protection and SSL encryption
- Tracking and Reporting of print statistics

Personal Printing is a server based enterprise pull printing solution which enables users to authenticate at the print device. Using the same technology as ThinPrint engine, mobile users can print through a virtual driver and authenticate through near field communication (NFC) or barcode scan at any printer model.

Key differentiators
Cortado offers print support from a wide range of devices, for any file type and to virtually any printer.

For Cortado's enterprise printing solutions, the key differentiator is the VLayer virtual driver. This element facilitates printing as users do not need to download any print driver and standardises printing processes so that users are all prompted with the same interface from all devices.

Cortado optimises all data transfers through high file compression and font transfer management. The downside of not using native print drivers is that certain functionalities of high end printing devices may be compromised.

Cortado's ThinPrint Cloud Printer offers immediate access to print from a mobile device thanks to file processing on Cortado's public cloud. The solution gives the advantage of being able to use not only wi-fi and cloud enabled peripherals but also legacy devices connected to a PC or connected to a local wi-fi network.

Perhaps the strongest differentiator for Cortado's enterprise printing solutions is versatility. It offers print support to a wide range of devices, for any file type and to virtually any printer. At any end device, any printer, content can be located on the device or in the cloud or in a company's own data centre, printing via different routes (network or virtual channel or cloud or Wi-Fi) all with a secure authentication option (e.g. with authentication with mobile device at any printer model).

Quocirca believes that Cortado's solutions are well suited to enterprises requiring a flexible and vendor agnostic solution for mixed fleets.

About Quocirca

Quocirca is a primary research and analysis company specialising in the business impact of information technology and communications (ITC). With world-wide, native language reach, Quocirca provides in-depth insights into the views of buyers and influencers in large, mid-sized and small organisations. Its analyst team is made up of real-world practitioners with first-hand experience of ITC delivery who continuously research and track the industry and its real usage in the markets.

Through researching perceptions, Quocirca uncovers the real hurdles to technology adoption – the personal and political aspects of an organisation's environment and the pressures of the need for demonstrable business value in any implementation. This capability to uncover and report back on the end-user perceptions in the market enables Quocirca to provide advice on the realities of technology adoption, not the promises.

Quocirca research is always pragmatic, business orientated and conducted in the context of the bigger picture. ITC has the ability to transform businesses and the processes that drive them, but often fails to do so. Quocirca's mission is to help organisations improve their success rate in process enablement through better levels of understanding and the adoption of the correct technologies at the correct time.

Quocirca has a pro-active primary research programme, regularly surveying users, purchasers and resellers of ITC products and services on emerging, evolving and maturing technologies. Over time, Quocirca has built a picture of long term investment trends, providing invaluable information for the whole of the ITC community.

Quocirca works with global and local providers of ITC products and services to help them deliver on the promise that ITC holds for business. Quocirca's clients include Oracle, Microsoft, IBM, O2, T-Mobile, HP, Xerox, EMC, Symantec and Cisco, along with other large and medium-sized vendors, service providers and more specialist firms.

Details of Quocirca's work and the services it offers can be found at http://www.quocirca.com

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Quocirca has obtained information from multiple sources in putting together this analysis. These sources include, but are not constrained to, the vendors themselves. Although Quocirca has attempted wherever possible to validate the information received from each vendor, Quocirca cannot be held responsible for any errors in information received in this manner.

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