Fax over IP (FoIP) Transitions:

Technology changes and cost savings

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Fax over IP (FoIP) Transitions: Technology Changes and Cost Savings

FoIP overview

 "The more things change, the more they stay the same" is an old French proverb from the 1800's, but it can be applied to today's technology and communication advancements. This is particularly applicable to fax. Yes, fax!

Clearly, enterprise fax is no longer thought of as the innovative, ground-breaking communication infrastructure it once was. It has become a mature and mission-critical application to organizations of all sizes, and while technologists have predicted the demise of fax technology for years, it continues to thrive as a fundamental communication method. The demand for fax continues to be based on business's most basic needs to send and receive documents securely and/or have a personal signature. As the technology and infrastructure driving fax communications is changing, the basic need for faxed documents remains the same and given its historical foundation and reliance, fax isn't going away anytime soon.

The architectural landscape of enterprise fax has changed dramatically and progressed over the last decade. The pervasive accessibility to internet connectivity, cellular and wireless services, and the adoption of voice over internet protocol ("VoIP") for businesses has opened the gateway for leveraging the same infrastructure for fax. This is now known as fax over internet protocol ("FoIP") or in some cases, "internet fax".

There are both technology infrastructure considerations as well as significant business benefits driving the transition from traditional, hardware-based (i.e. physical server-based fax systems) to internet-based fax (i.e. virtual server-based systems). Specific to FoIP, the following benefits are being realized by companies worldwide.

Secure and compliant communications

While regulatory compliance mandates vary in restrictions and requirements, there are common, fundamental characteristics including traceability, auditability, and retention of communications governed by these mandates. Historically, fax communications were tracked only by the reporting available - and typically limited to the date and time, and the number of pages sent to the fax number of the recipient. Today, in order to fulfill compliant communication requirements, regulated employees must be identified when sending a fax and the contents of the communication should be text-searchable and archived for future auditability – all while insuring the fax communication is sent and delivered in a traditional fax fashion.

"Green" communications

In support of corporate environmental initiatives, an enterprise fax infrastructure provides the ability to eliminate inbound fax printing (and the associated consumables) through delivery of faxes to corporate email boxes. Faxes that are electronically stored no longer need to be printed and then faxed. Those that have been converted to electronic images can now be moved without the need for a paper hardcopy except for when required for specific business processes.

Least cost routing

Leveraging an organization's corporate intranet and redirecting faxes over a corporate network can reduce or eliminate traditional toll charges on many external and international communications. Further, when an internal fax communication is being sent from one corporate location to another, simply redirecting that fax over the intranet can avoid outbound and inbound fax-related charges.

Hardware consolidation and virtualization

Without the need for traditional and legacy hardware-based, physical server-hosted fax boards and devices, the entire enterprise fax infrastructure becomes software and network-based. Hardware supporting traditional fax technology can now be virtualized and consolidated.

Reliability

With fax communications remaining mission-critical in the enterprise, internet-based fax or a FoIP infrastructure, when well-designed and implemented, has the ability to provide immediate failover and redundancy and aid in recovery in the event of a disaster. This also means that messages in the process of being delivered, in the event of a failure, will be delivered upon successful failover and not lost.

The technology landscape changes while fundamental requirements stay the same

MFP on-ramp to fax communications

Multi-Function Printers (MFPs) that are capable of copying, printing, scanning, and faxing have become prevalent and highly distributed throughout organizations. Leveraging this office equipment as the on-ramp for fax communications eliminates the need for redundant hardware and can facilitate simultaneous functionality such as compliant communications. This is done without the need of a fax card or an analog line attached to the MFP.

Reduced costs

In a virtual fax environment, traditional analog phone lines can be reduced or eliminated, the software can be virtualized removing the costs of duplicative server hardware, and with least cost routing, and internal fax communications can be re-routed to avoid unnecessary long distance charges or per-click fax charges.

The migration of traditional fax machine-based communications to electronic inbound and outbound fax reduces paper-based fax to the point where the need for fax machines and their associated telecom expenses are dramatically reduced. It only makes sense to take this one step further and then eliminate the expense and regulatory risks associated with fax machines and use the MFP infrastructure for fax where paper-based fax remains a requirement.

Business process impacts

Corporate compliant communications

While fax communications have stayed a consistent corporate requirement, government regulations and compliance have forced companies to change the way in which they handle corporate documents. Specifically, companies are revisiting their document collection and retention policies based on the compliance requirements of mandates such as Sarbanes-Oxley (SOX), Gramm-Leach Bliley, the Security Exchange Act of 1934 and Anti-Money Laundering (AML), the Health Insurance Portability Accountability Act (HIPAA), among many others, in order to ensure required documents are retained for their specified period of time and are immediately accessible.

Legacy fax-based communications do not fulfill corporate compliance and audit requirements. These traditional fax communications may not be compliant with corporate record retention policies or governing regulations due to the lack of information tracked during the transmission. Historically, the related information captured was limited to the receiving fax number and number of pages sent. Neither the identification of the sender nor the contents of the fax were accessible or auditable. With the increased scrutiny around regulatory compliance and corporate governance, it is now essential to track the fax sender, an image of the fax document(s), and other key data in order to maintain a complete and accessible audit trail.

Today's fax technology, especially when coupled with document routing software, not only handles the fax and delivery of a document, but in parallel it can route or store an image of that document in an archive for future access because it is no longer a standalone infrastructure and is connected to enterprise information systems. With full auditing capabilities, the same fax infrastructure will be able to capture the specific information about the fax (the metadata), who sent the fax, the receiving fax number, time and date, as well as delivery confirmation along with the document image. Further, when the fax infrastructure includes optical character recognition (OCR), a text-searchable version of the document may be stored and available for increased accessibility and corporate transparency.

Document and data digitization

Fax documents are but one component of an enterprise's document content and communication infrastructure. Whether a fax communication needs to be searched and retrieved by a user at their desktop or by an organization for auditing purposes that fax needs to become part of the company's information ecosystem.

Document digitization and its associated storage has changed the way we deal with documents. What was once a process that dealt only with paper has evolved into capturing an image of that physical document and saving that electronic image into a structure that provides for archive and retrieval with immediate accessibility. This is now a far cry from the time when paper was loaded into white trucks for offsite storage only to take days to recall and retrieve that document if ever needed in the future. This made the accessibility of documents required for compliance audits a significant risk in the ability to produce those documents in the mandated timeframes to avoid fines.

Increasingly, document storage is moving into its next generation that requires the ability to mine data from documents, including faxes. With an enterprise digital fax infrastructure this requirement is easily met because faxes being sent and received will already be digitalized into an image file. In order to search and retrieve the document, it is necessary to 'lift' the content from the image using OCR technology. Together, with the image and the content layered together, a fax can now be profiled and stored as a document (versus an image) in an organization's content management, archival, and/or collaboration system as a fully text-searchable record.

Green initiatives

The benefits of an enterprise fax infrastructure cannot be ignored from an environmental perspective, especially for those companies looking at innovative ways to reduce their carbon footprint and reliance on natural resources. An enterprise fax infrastructure provides the ability to eliminate the use of inbound fax printing and associated consumables. In addition, faxes that are electronically stored no longer need to be printed and then faxed from a traditional fax machine, but rather submitted directly to the enterprise digital fax server. Each traditional fax machine draws constant energy that increases a company's electricity costs and carbon footprint.

By centralizing to an enterprise fax solution, these costs and impacts can significantly be reduced or eliminated. Depending on the path a fax takes through the organization, further reductions in offsite storage, retrieval, transportation, and postal costs can be achieved since an electronic document can be moved more easily around a corporate network (i.e. through e-mail). Through these greener and smarter processes, companies can improve the accessibility of their critical business information – providing 24/7 access from almost anywhere to any authorized user. That means faster workflows and more efficient business processes. Document security increases because paper copies are not floating around in the hands of multiple people and all of the associated costs are lower.
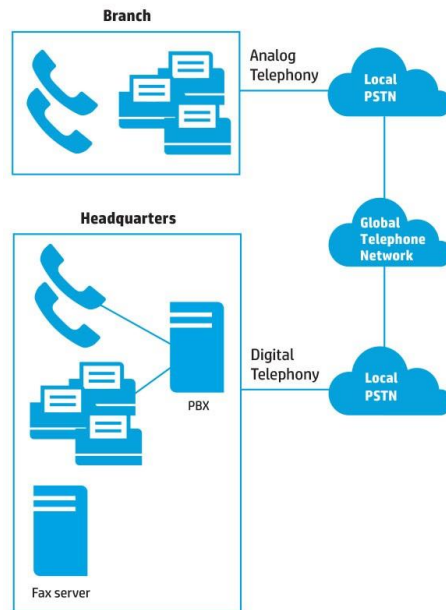
Enterprise fax infrastructure

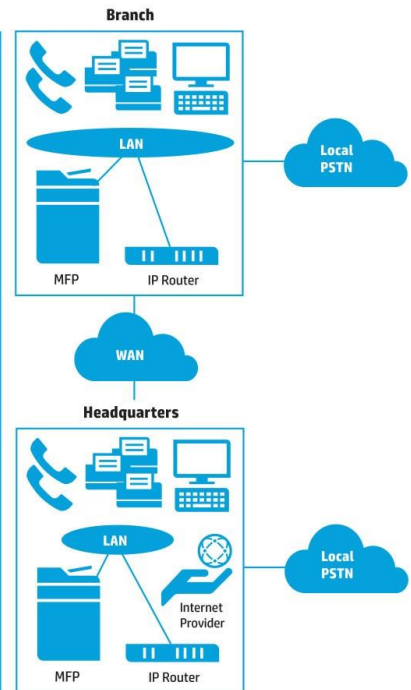### Using voice over IP (VoIP) systems for enterprise fax

Over the past several years, the large increase in VoIP networks has started to transition organizations from traditional public switch telephone networks (PSTN) and private branch exchanges (PBXs) to VoIP solutions. The trend of turning fax communications into a network traversing protocol in the corporate world has become an IT priority as companies tackle (or have completed) their voice communications.

FoIP is proving to be a very cost-effective routing capability for organizations with multiple offices. By integrating with the VoIP network, fax communications become part of the LAN/WAN-based VoIP network that is already in place. Assuming the organization is using VoIP corporate-wide with local gateways in each office, it is possible to route a fax with an Australian-based phone number that originates in Boston, MA to the organization's local VOIP gateway in Sydney for reduced toll costs and local delivery (for example). In addition, local phone numbers can be used to receive local fax communications and then these can be routed to the correct corporate fax recipient regardless of their current location in the VoIP infrastructure, also eliminating forwarding and toll call expenses.

Traditional Fax Architecture

Branch

Analog Telephony

Local PSTN

Headquarters

PBX

Fax server

Digital Telephony

Local PSTN

Global Telephone Network

VOIP-based Architecture

Branch

LAN

MFP   IP Router

Local PSTN

WAN

Headquarters

LAN

Internet Provider

MFP   IP Router

Local PSTN
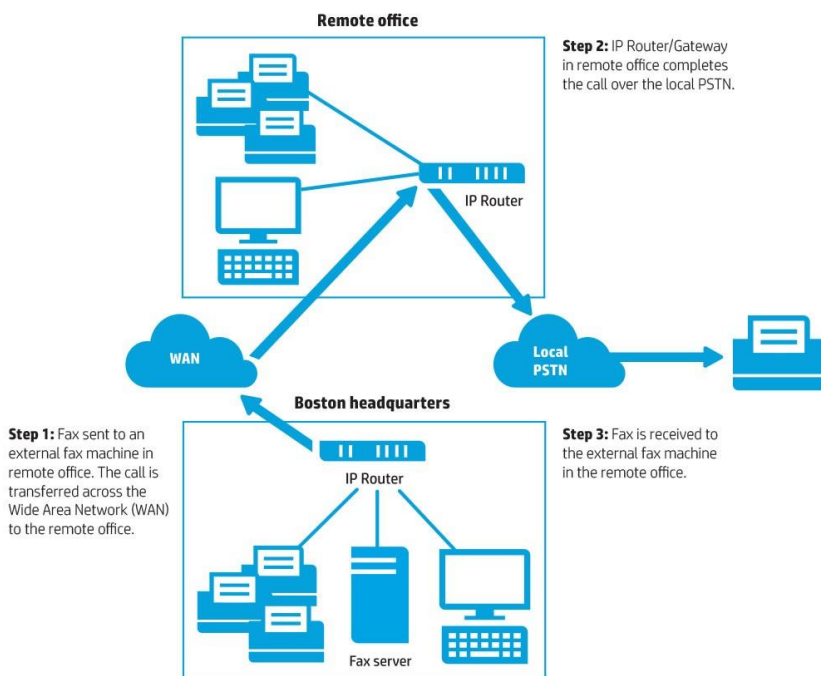
Least cost routing

The cost of fax communications is highly dependent on the "phone number" of the fax destination. Whether a local, long distance, or even corporate-internal fax number, there can be costs incurred if you are paying long distance charges or using a fax service provider to handle your fax traffic. With FoIP, international or toll-based calls can be rerouted through your corporate infrastructure and those high-cost international calls can be turned into lower cost local calls.

There are instances of global enterprises, where internal fax communications represent more than 60% of fax traffic. In an environment where outgoing and incoming fax are paid for on a per-page service basis, the costs are duplicative. With a well-structured FoIP environment, faxes intended for internal-corporate recipients can take advantage of significant cost savings by simply rerouting the fax to the intended destination over the corporate intranet and avoid the outbound and inbound fax costs. Further, faxes for regulated employees can be simultaneously delivered to compliant archives, increasing the value of the fax infrastructure accordingly.

Remote office

Step 2: IP Router/Gateway in remote office completes the call over the local PSTN.

IP Router

WAN

Local PSTN

Boston headquarters

Step 1: Fax sent to an external fax machine in remote office. The call is transferred across the Wide Area Network (WAN) to the remote office.

IP Router

Step 3: Fax is received to the external fax machine in the remote office.

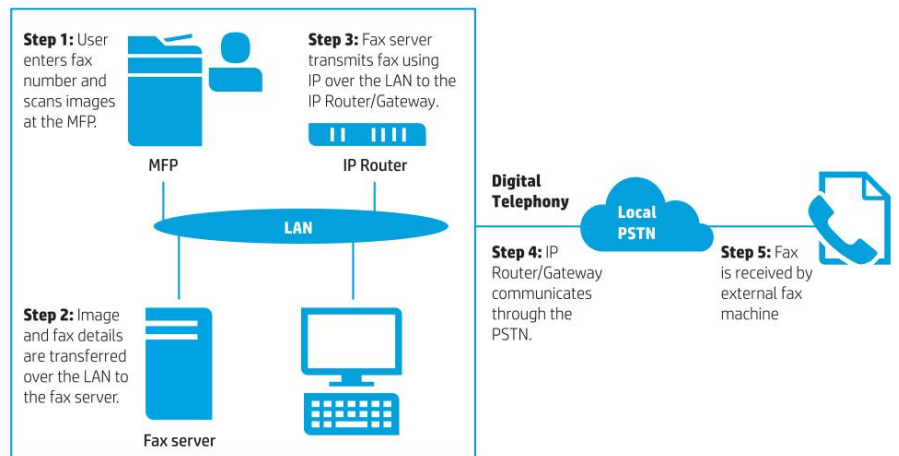Fax server

Confidentiality

Whether an incoming fax is delivered to a traditional fax machine or MFP, the document sitting on the output tray awaiting its recipient to pick it up presents a security and loss of confidentiality risk. Imagine a fax delivered after hours when general office workers are absent, but cleaning crews have access to documents left uncollected. This is a common risk associated with traditional faxing. Fax server technology provides the ability to deliver confidential and sensitive information directly to the appropriate recipient or a secure storage area or even provide the ability to "hold" a fax on an MFP (before printing) and only release the fax during standard business hours or when retrieved by the intended recipient.

MFP-based Faxing

As organizations deploy multi-function printers ("MFPs") as part of their print/copy device consolidation initiatives, new fax on-ramps have become available. Smart MFPs (those containing embedded software for extensibility) when used in conjunction with the right enterprise fax software provider now provide the ability to scan a document to a fax number. This eliminates the need of having dedicated phone lines plugged into these devices for fax delivery.

Innovations in technology have led to a breed of intelligent MFPs that offer more advanced scanning capabilities to users. Through their extensible interfaces, these devices become valuable tools when executing complex document workflows, with fax being one of those workflows. With a direct connection to the centralized fax server, users can leverage their desktop applications to prepare fax communications without having to navigate the embedded soft keypads and reduced screen sizes found on many MFPs. These 'smart' devices also provide direct profiling and fax submissions from the device control panel to the fax server software, providing IT administrators with greater flexibility and control over how the MFP device is implemented and used.

MFPs enable the implementation of a centralized approach to enterprise fax. Cost savings through the reduction of analog phone lines, consumables, and maintenance of these different fax systems will prove to be a primary factor in the decision to centralize an organization's fax communications. This can lead to a very nice ROI for the organization.

Step 1: User enters fax number and scans images at the MFP.

Step 3: Fax server transmits fax using IP over the LAN to the IP Router/Gateway.

MFP

IP Router

LAN

Step 2: Image and fax details are transferred over the LAN to the fax server.

Fax server

Digital Telephony

Local PSTN

Step 4: IP Router/Gateway communicates through the PSTN.

Step 5: Fax is received by external fax machine

Centralization and consolidation

Rather than deploying servers and fax interface cards at remote locations (where IT skills are typically absent and where maintenance is difficult to provide), the distributed nature of fax over IP can deliver services to multiple locations from one central data center. This will provide an excellent economy of scale, maximize usage of IT resources and prevent the deployment of rarely used fax servers at sparsely populated remote offices. Further, as organizations centralize their fax infrastructure, they have the ability to combine multiple servers (often individual and physical servers) into a single, virtualized enterprise server. This will afford companies significant savings on annual maintenance, infrastructure, training and related operational expenses.

Virtualization

IT infrastructure virtualization is a trend that has gained strength and as organizations look to implement server-based software or new software systems they inevitably ask if the solution can be virtualized. Much like VoIP deployments, one of the key motivators of this trend is cost savings. To be both cost-effective and efficient, it makes sense to run multiple servers and software applications from one properly configured physical server. The cost savings come from the reduced need for hardware and the space and infrastructure required to host those servers.

Historically, enterprise fax solutions could not be virtualized due to the physical hardware requirement of the fax-modem cards that connected and communicated with the telephone infrastructure. With FoIP, the need for physical fax cards is eliminated by using a software host-based system which now lends itself to virtualization. While FoIP and virtualization were developed on two separate paths, they have merged into a powerful offering that can provide significant efficiencies and cost reductions to any organization.

Hybrid and cloud-based fax infrastructures

With the advent of internet-based fax, the ability to offer fax as a service model through cloud-based fax infrastructures has become of interest to companies of all sizes. While cloud-based fax services provide the ability to eliminate on premise fax infrastructures, there remains the potential that security, compliance and privacy concerns may force companies to adopt a hybrid model (i.e. enterprise fax solution with connectivity to cloud-based fax for delivery) to support fax communications where connectivity to the on-premises devices is maintained as well as user provisioning and document packaging for secure delivery.

Cost savings

Surprisingly, with all these changes and innovations, many environments have stayed the same and are still using traditional fax machines, regardless of the high cost to support these machines. The greater the number of fax machines generally leads to a greater return on investment for moving to fax over IP. Phone line charges are typically the largest expense of a fax infrastructure, but this can vary significantly based on an organization's negotiating and economies of scale power with a particular phone service provider. It is reasonable to expect the cost of an outbound toll-based call to be greater using individual phone circuits versus a centralized solution. Further cost savings can be realized when leveraging MFPs that are already distributed throughout the environment to provide the same fax on-ramp the legacy fax equipment had. As a result, maintenance and consumables (paper, ink, etc.) associated with that hardware may be eliminated.

Conclusion

As much as enterprise fax has stayed a mission-critical application for organizations of all sizes, there are ever-changing business initiatives and technology advancements going on all around the fax infrastructure. The rapid adoption of VoIP systems will quickly lead to the need for FoIP solutions built on the communication infrastructure. The introduction of "smart" MFPs capable of not only copying and printing, but scanning and connecting to fax as well, extend fax abilities well beyond the traditional fax machine or desktop. Between these two factors, corporate enterprises are now able to embark on unprecedented consolidation of hardware and related support and maintenance costs.

At the same time and also continuing to change, corporate record-retention policies and governing regulations have extended the focus of compliance beyond the digital document world and into the paper world, including fax communications. Now, compliant solutions can be offered through enterprise fax solutions with full accountability, audit-ability and accessibility of documents that originated in paper.

A digital fax solution is a natural complement to an organization's MFP fleet. An organization with a large fleet of fax machines is a prime candidate for implementing this type of solution because of the easily-identifiable ROI of replacing the fax machines and the other associated costs as well as the consolidation and virtualization of legacy fax infrastructures.

Additional Resources

HP Capture and Route

Learn more at
hp.com/go/hpcr

"The more things change, the more things stay the same." As corporate compliance requirements and other business objectives change, there is increasing rationale that the same document handling requirements must be applied to fax communications. And, as telephony and corporate information technology advancements are advancing and changing, the requirements of traditional fax communications are staying very much the same. However, these too must adapt to the changing technology landscape.

About HP Capture and Route
Included with every HP workflow platform, organizations can utilize a full-featured, enterprise fax system with high performance, flexibility, and scalability, as well as full integration with the advanced routing capabilities of document capture.

Because enterprise fax is an integrated part of the HP Capture and Route platform, companies can benefit from significant cost savings through the consolidation of scan and fax machines. Further, to achieve compliance with regulatory requirements, corporate record retention policies, or HIPAA guidelines, HP Capture and Route can enable the system to send faxes only to authorized recipients, thereby eliminating the possibility of confidential information being sent inadvertently to an incorrect fax number.

It's evident that increasingly forward-thinking enterprises are seeking to deploy new networks to support voice, video, and data on a single, unified IP network. HP Capture and Route is compatible with the latest Voice-over-IP (VoIP) and Fax-over-IP (FoIP) technology. It may also be configured to support outbound routing through cloud-based fax services.

HP Capture and Route directly integrates with the newest generations of multi-function printers (MFPs) across the enterprise. HP Capture and Route fully works with the embedded software on MFPs, allowing you to easily send faxes directly from the MFP device — with all of the manageability, usability, and cost-effectiveness of a centralized digital fax infrastructure.

In addition, with your MFP fleet as the fax onramp, HP Capture and Route can capture user identity to establish an audit trail and provide email notifications. This solution also enhances document communication processes by digitizing fax transmissions. There's no need to print out documents, take them to the fax machine for transmission and then discard them.

With HP Capture and Route you can:

- Send faxes directly from the MFP
- Deliver directly to desktop applications through our powerful integration capabilities
- Reduce or eliminate the costs of dedicated fax lines
- Use least cost routing to send internal-bound faxes directly to the destination/MFP without the assistance of a fax service provider or associated charges
- Capitalize on Voice-over-IP (VoIP) and Fax-over-IP (FoIP)
- Digitize fax transmissions and make faxes available at the point of delivery
- Fax-enable individual desktops and key business systems to minimize manual, paper faxing
- Accelerate business processes, reduce response times, and improve productivity
- Authenticate/identify users and capture inbound and outbound fax transmissions to support company information and retention policies, compliance requirements, and risk-mitigation policies
- Define fax numbers and destinations right from the desktop using the easy-to-use HP Capture and Route Client
- Save time and eliminate redundancy by batching large volumes of documents and scanning several Intelligent Routing Sheets simultaneously

For more information

hp.com/go/printingsolutions