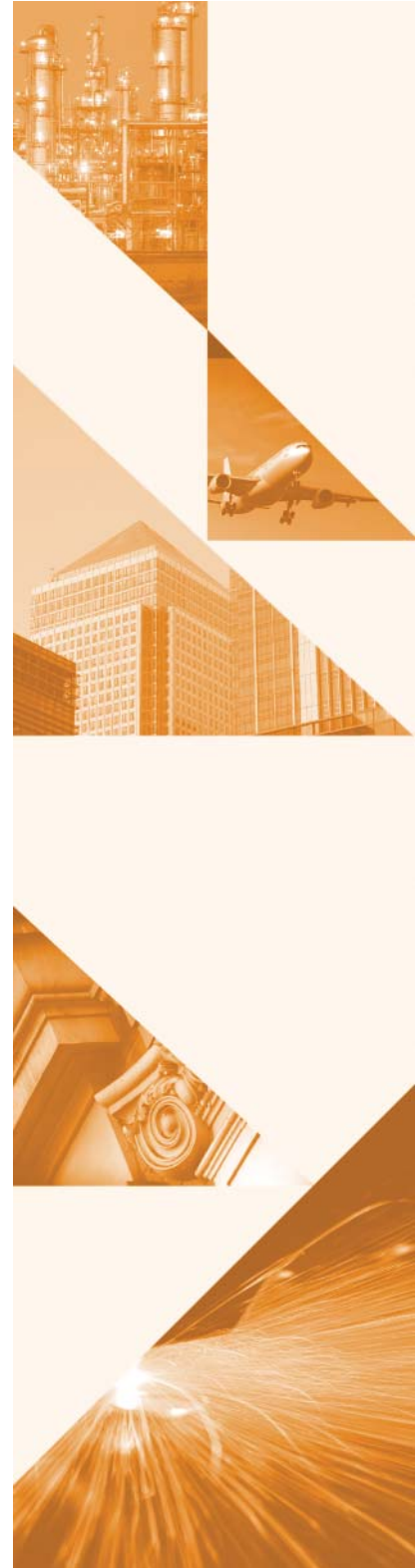


Fax Virtualization: The route to a centralised and consolidated fax environment

A Lane Telecommunications Guide



The fax market is in a state of transition and has been for some time. While many organisations around the world are seeing fax traffic rise, a significant number are seeing a sustained year-on-year decline. Whichever scenario is relevant; the driving forces of greater efficiency and lower costs are ever present and have been given added impetus by the current global economic climate. Consolidation, centralisation and virtualization have become the focus of activity throughout the IT world and fax has not escaped this movement. Indeed, fax and messaging servers provide significant opportunities for organisations of all sizes to make progress in these areas.

Within this white paper we discuss some of the innovations in fax technology, such as Fax over IP (FoIP), that provide opportunities to create a fax environment that fully integrates with the latest Unified Communications and Voice over IP (VoIP) installations in a highly centralised and virtualized environment. We also look at the issue of costly over-capacity in fax provision within an organisation that can be the legacy of declining long-term fax traffic. Fax vendors, such as Lane, are meeting this challenge head-on by developing centralised, fully featured fax server solutions that are packaged and priced to address the needs of organisations or departments for whom fax is still a business-critical resource but where volumes are lower.

The business imperatives that are driving the adoption of new technology in the fax market have really brought the issue of fax provision into focus for organisations of all sizes. Now is a very good time to review fax infrastructures in relation to broader strategic IT objectives - whether these be driven by the need to improve integration of fax with broader networked communications, to re-balance the provision of fax with the current requirement in order to save costs, to meet changing compliance obligations, to take advantage of virtualization opportunities or even to move towards a more environmentally sustainable communications infrastructure.

We start by looking at Fax over IP as this is the technology that allows modern fax and messaging servers to support a centralised communications infrastructure and to exist within a virtualized environment that delivers the consolidation within IT and communications infrastructures that so many organisations are seeking to achieve.

Fax over IP

Most medium to large businesses made the shift from stand-alone fax machines to fax servers some time ago, many are now looking at the next phase in the evolution of integrated business communications and considering moving fax onto their IP networks. Demand for ever greater convergence of data and communications networks is fuelled primarily by the cost savings that may be achievable through more efficient communications management and lower infrastructure overheads. Convergence in the voice market has gathered pace over recent years as standards have become well established and vendors have integrated IP capabilities into their equipment which has made migration relatively straightforward.

In the rush to integrate voice communications into IP networks fax has been somewhat overlooked but this is now changing and organisations are becoming aware of the role that fax servers can play in fully integrating communications and seamlessly exchanging documents throughout the business. Among other things, legacy back-office systems can be linked in to allow production fax runs over IP networks and inbound faxes can be routed to appropriate workflows via various data capture technologies within the fax server. The fax server becomes the central document exchange hub in the enterprise; linking remote locations and allowing the business to achieve compliance goals across the whole organisation.

FoIP (Fax over Internet Protocol, also called IP fax) is a method of sending faxes over the Internet or your wide area network. FoIP changes the transmission method of faxing in much the same way that VoIP (Voice over Internet Protocol) changes the transmission method of a phone call. In both FoIP and VoIP, data travels most of the distance between sending and receiving devices on a packet-switched network, often avoiding the long-distance phone lines of the telephone network. This reduces the cost of transmission and can be a more efficient setup for a business that already has access to Internet bandwidth or a wide area network.

Benefits of FoIP

Installing an IP fax server delivers wide ranging benefits due to their centralised and fault tolerant nature. The primary advantages are:

- **Lower maintenance costs:** In an IP fax solution it is possible for fax traffic to enter the IP environment via a gateway rather than through the PBX. As the maintenance costs of routers can be significantly less than those for a PBX, regular maintenance contract costs can be greatly reduced. The greatest cost savings are possible where a VoIP infrastructure is already in place as no new system components or additional support are required.

- **Lower operating costs:** Complex network infrastructures made up of disparate technologies are common in medium to large enterprises. Complexity is forced on the company as it expands and having to operate separate data and telephone networks adds to this issue. Integration of data, voice and fax communications over the IP network eliminates the need for a telephone network and allows support resources and personnel to be focused on the data network.
- **Easier deployment and maintenance:** In a VoIP/FoIP environment the location of the IP fax server is independent of the PSTN network access point as gateways provide the connection to the PSTN. The fax processing resources simply need access to a data network, Local Area Network (LAN) or Wide Area Network (WAN), where the gateway resides.

The various application servers on the enterprise WAN can now deliver services to all locations from one central data center, using the gateways in remote offices to gain access to the PSTN. This arrangement can reduce the number of parts that are remotely managed, consolidating maintenance and lowering costs. This also simplifies deployment to remote locations, enables greater consolidation of fax services, lowers disaster preparedness costs, and enables least cost routing via the WAN.

- **Better disaster readiness:** With a FoIP solution in place, the location of the fax server is independent of the user. Fax server deployment can, therefore, be reduced to one or two strategically located data centres. The number of sites requiring rapid response is significantly reduced and the fax servers can be located in the most secure and stable environments.
- **Lower risk of connection failure:** FoIP networks provide the flexibility to route traffic via fully functional nodes even if part of the network is down. A single fax server, or multiple load balanced redundant servers can be installed on multiple network nodes effectively eliminating the risk that the fax server will be without access to the network. This is critical where fax is the method of delivery for vital health or natural disaster alerts.
- **Least cost routing:** Using the gateways installed at remote locations as part of the FoIP network, companies can route calls and faxes across their WAN so avoiding any long distance call charges even if the fax is sent across the world. This also allows the business to improve customer service by using local fax numbers in each country.
- **Enhanced business productivity:** Fax server technology sits at the heart of the communications infrastructure and can be used to enhance a company's ability to streamline business process automation and improve document management. Investment in FoIP solutions provides an opportunity to integrate

communications and document management more fully into corporate workflows.

- **Virtualization:** New virtualization software technologies are becoming increasingly popular as organisations seek to improve efficiency and consolidate hardware resources. Software only FoIP solutions that are compliant with leading manufacturers' virtualization software, such as Lane's Passport Fax Server, can co-exist in a virtualized environment.

The implementation of FoIP can deliver the benefits outlined above but each organisation should conduct a review with a specialist, such as Lane, who can advise on where cost savings or productivity enhancements can be achieved. These will vary depending on the existing communications infrastructure, the geographic extent of the organisation's network and its specific fax and messaging requirements among other factors.

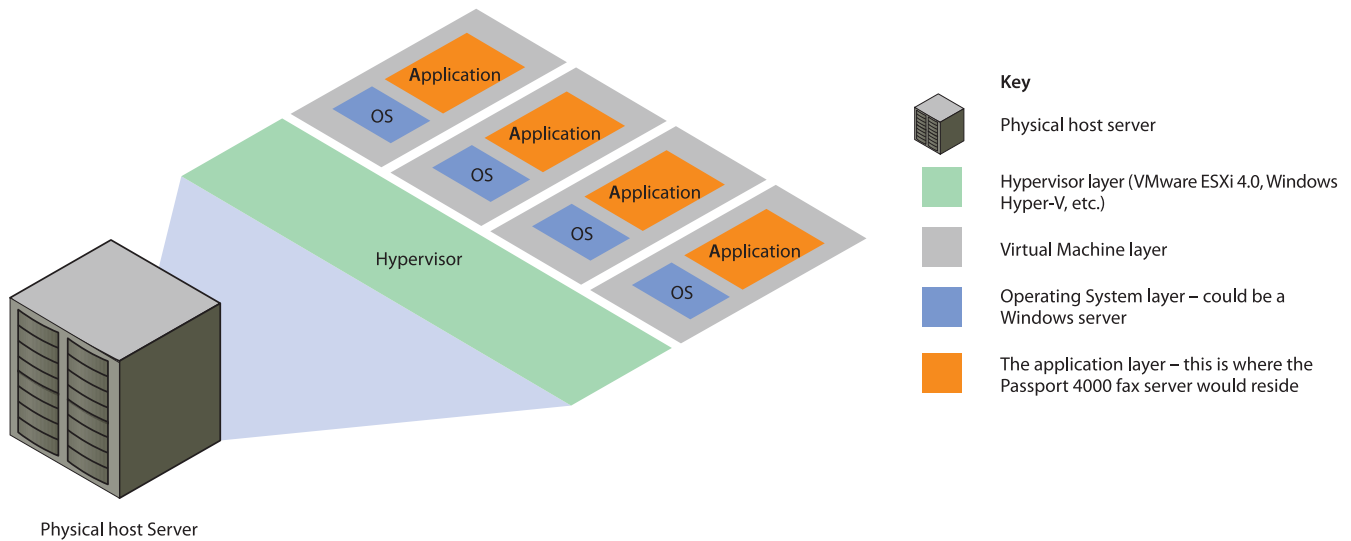
Fax lives comfortably in a virtual world

Many organisations have been considering the issue of what to do with fax in the longer term. Whether fax usage is growing or falling within the organisation, opportunities exist to bring fax onto the IP network and to gain access to the many potential benefits as described above. Whether a business can actually realise all of these benefits depends on a number of factors relating to fax usage and the nature of the existing communications infrastructure, the one that is available to all, however, is virtualization of the fax server.

Virtualization is the process of consolidating multiple physical computers onto a single traditional hardware server using virtualization software products such as VMware and Microsoft Hyper-V. The software partitions the physical server into separate, secure virtual machines that each run independently of one another with distinct operating systems and applications on each virtual machine, each with their own processors, memory, networking storage and BIOS. Consolidation of multiple servers into one utilises far more of the available hardware capacity than the traditional approach of running one application per server.

Benefits of virtualization include:

- Significantly reduced infrastructure costs as fewer physical servers are required meaning less hardware, less maintenance, less energy usage and lower administration costs.
- Improved operational flexibility as virtualization allows server and storage resources to be set up or re-purposed as required to meet changing business needs. Disaster recovery is also much easier to manage in a virtualized environment.
- Greener IT - reduced overall energy use and space requirements lower the organisation's carbon footprint.



The diagram above shows how the various software 'layers' reside on the physical server with VM software allocating resources dynamically and creating multiple simulated computer environments each capable of acting as an independent server. Each of these virtual machines is able to run separate operating systems and applications - one of which could be the fax server.

Lane's Passport 4000 Fax over IP (FoIP) solution leverages field-proven Dialogic® Brooktrout® fax technology to deliver high performance, reliability, and scalability. Brooktrout® SR140 Fax Software performs well in virtual environments and has been tested running multiple SR140 channels simultaneously on separate VMs on a single host server. This enables hosting of multiple fax services or hosting fax and voice services on a single physical server.

Brooktrout SR140 provides:

- VMware ESXi 4.0 and Windows Server 2008 R2 Hyper-V support, offering multiple virtual deployment options
- Scalability from 2 to 120 channels in a single server or virtual machine
- Simple deployment, with boardless fax processing
- High speed, based on the V.34 fax standard - twice the speed of V.17 fax products
- T.38 IP fax protocol that encapsulates Dialogic® Brooktrout® T.30 fax data stream - ensuring interoperability with new fax equipment and highly reliable, efficient fax processing
- G.711 fax pass-through, supporting fax on an IP network when a gateway or IP network operator does not support FoIP (T.38)
- Voice play and record, DTMF detection and generation, inbound fax routing

Provision of fax services where traffic is in long-term decline

It is an uncomfortable reality for fax vendors that although global fax usage is probably still growing, a significant number of organisations are finding that fax usage is declining and in some cases this has led to an imbalance between IT resources committed to maintaining the fax infrastructure and the actual amount of fax traffic. For many of these organisations, fax remains a business-critical part of the communications landscape so provision needs to be made for it into the future. Clearly, as pressures to lower costs through ever greater centralisation and consolidation grows, fax provision must become more flexible, better integrated and scaled appropriately for the organisation's requirements.

Recognising this fact, Lane has developed Passport 4000 Small Business Edition (SBE) which is a fully featured fax and messaging server that delivers the core benefits of the full Passport 4000 solution but is presented in 2 and 4 line configurations aimed at the needs of smaller businesses or departments within larger organisations. It is a cost effective, easy to use, simple to manage, centralised fax solution suitable for any business or business unit that:

- Sends and or receives anywhere up to 2500 pages of fax in an 8 hour working day.
- Wants to improve efficiencies and enable desktop faxing for staff.
- Has a need to send faxes from a back office system or in-house application.
- Would like to implement Fax over IP.
- Is looking for a new technology fax solution.

Lower fax costs

Savings take many forms from hardware rationalisation to infrastructure consolidation and lower call charges. Passport 4000 SBE Fax Server can deliver cost reductions in a number of ways. The seamless integration of fax into an efficient communications system enables intelligent and automatic delivery of information to and from users, workgroups or workflows, whether they are inside or outside your organisation, without user intervention.

Consolidation of fax operations into a single robust fax server reduces the number of distributed fax lines required and makes better use of the lines being used. Savings are realised by cancelling expensive direct analogue exchange lines for stand alone fax machines and freeing up costly extensions on the in-house PBX. Most stand alone fax machines are idle for the majority of the day but they are still using electricity and taking up valuable office space; Passport 4000 SBE eliminates these costs and, as it uses no consumables, further savings can be made when stand-alone machines are removed.

In a Fax over IP installation, as discussed above, the fax server environment can be virtualized saving valuable computer room rack space and further consolidating communications over your IP network. Centralising fax traffic through Passport 4000 SBE over the network reduces IT management time associated with operating multiple fax implementations across the company. Tracking of inbound and outbound faxes and monitoring fax configuration anywhere on the network becomes a simple task. Many organisations may already have a mix of various fax server systems and stand alone fax machines resulting in high maintenance fees. Much lower annual maintenance costs can be achieved by consolidating all fax functions into Passport 4000 SBE and retiring stand alone fax machines.

As organisations re-evaluate their fax requirements, packaged, cost-effective solutions such as Passport SBE provide an easy way of migrating to a lower cost solution while maintaining or enhancing fax service provision throughout the organisation. Lane will even offer a substantial 'trade-in' discount where organisations are upgrading to a Passport fax server from an existing system to ease the transition to a more appropriately scaled solution. In addition to reduced costs, Passport SBE can:

- Fax-enable users at their desks for improved efficiency.
- Integrate back office and in-house applications for greater control.
- Deliver fast and secure document distribution through direct routing.
- Meet business and regulatory compliance

So what does all this look like in practice?

Strategic consolidation, virtualization and centralisation policies, driven by the quest for greater efficiency and lower costs, have been the driving force behind change in the fax market but new fax server technologies have enabled the fax industry to respond with solutions that deliver lower costs, deeper integration and considerable productivity improvements. Lane has transitioned a number of its clients to its latest Passport 4000 fax and messaging server resulting in considerable benefits. Nidera is a good example of this and demonstrates the challenges and benefits discussed in this document.

Nidera Handelscompagnie B.V. located in Rotterdam, is the international trading and shipping part of Nidera with offices in the US, Europe and Asia. The group trades grains, oilseeds, vegetable oils, oilseed meals, and ocean freight. In addition, the group has recently become active in the bio-energy and green power markets supplying feedstock, trading biodiesel and bioethanol and supplying biomass to power producers.

Over the last 10 years, Nidera has relied on Lane's Passport 3000 fax server to fax-enable various business systems and deliver desktop fax services through the corporate Lotus Notes email environment across geographically dispersed offices.

When originally set up, the fax solution in place was appropriate for the fax communications needs of the business. As fax traffic has been decreasing steadily over the years, however, the fax environments in place became oversized for the volumes they had to handle. While recognising that fax remained a business-critical part of the communications infrastructure, Nidera needed to review their requirements and find ways of managing the reduction in fax traffic into the future.

A strategy of growth through acquisition has meant that Nidera has inherited a disparate range of systems and applications throughout its businesses. In a strategic move to reduce costs and improve efficiencies, Nidera is moving towards standardisation and centralisation of key business systems such as ERP. Where possible, these are being implemented in a virtual environment. A review of fax technology was included as part of this strategic overhaul.

It was clear that consolidation and centralisation could not be achieved to the level that Nidera required with their existing Passport 3000 fax server and so a new technology solution was required that could meet the company's requirements. These included:

- A centralised fax system located in the head office
- The ability to be implemented in a virtual environment
- To be able to run on the Microsoft Windows 2008 64 bit operating system
- To integrate with IBM Lotus Notes

- To integrate with the centralised business systems
- To be implemented to meet the fax volumes of head office but scalable to easily accommodate the other offices as they are brought online

After reviewing the options, Nidera chose Passport 4000, Lane's latest fax server product. Having provided fax solutions to Nidera successfully for over 10 years, Lane fully understood the requirement and could provide a field-proven solution that included a packaged Fax over IP infrastructure with the necessary IBM certified Lotus Notes and business systems integration. Utilising Fax over IP enabled the Microsoft Certified Passport 4000 fax server to be virtualized and for media gateways to be located in strategic geographic locations to meet regional faxing needs as additional offices are brought online.

The end result is a system that will significantly reduce Nidera's ongoing costs through; reduced maintenance as there is now only one fax server, reduced telephone line costs as there are less fax lines required, and reduced server and data-centre costs as the system is implemented in a virtual environment. The single, centralised system makes the task of administering the fax environment much simpler and, as there are no physical fax cards, the issue of fax card obsolescence is removed completely.

Jos Balster, Senior Systems Manager, Nidera ICT is pleased with the solution that is being delivered by Lane, "We recognised that although fax is still important for the business, the number of faxes that we send and receive has been decreasing year on year throughout the organisation. As such, we wanted to consolidate our fax messaging processes globally to reduce costs while at the same time taking advantage of the latest technology allowing us to follow the company's strategic plans for centralisation and virtualization of key business systems. Implementing a centralised, boardless FoIP fax server has enabled us to simplify the management of the organisation's fax messaging and lower the total cost of ownership."

Conclusion

As organisations roll out plans for greater centralisation and consolidation of IT and Communications systems, and increasingly look to virtualized environments as a way of achieving these goals, the fax industry has responded with new technologies that address these needs very effectively. Where the industry has been slow to react is in helping organisations to manage ongoing reductions in fax traffic where these are occurring.

Clearly, there are vested interests involved here as maintenance fees and ongoing support contracts are largely linked to the size of the installed system so fax vendors have been reluctant to pro-actively inform their customers about the savings potential if fax was consolidated or newer technology employed to lower total cost of ownership. In many cases, the cost savings can be so large that investment in an entirely new, packaged solution such as Lane's Passport 4000 SBE solution, is the best way forward as return on investment can be very fast when the fax solution is not only fully integrated and virtualized but is scaled to match the ongoing fax requirement of the business.

Now really is a good time to review the way that fax and messaging are handled throughout entire organisations as technology, strategic direction and economics are combining to make a compelling case for change.

About Lane Telecommunications

Since its formation in 1976 Lane has been at the forefront of messaging communications and is now recognised internationally as a leader in fax integration, across the financial, healthcare, manufacturing and transport industries. Based in the UK, US and Singapore, Lane has implemented systems across 50 countries and provided professional services in all time zones. Lane offers the very best solutions for integrating fax servers as a part of wider communications networks. As specialists in messaging solutions for over 30 years, Lane delivers seamlessly integrated fax and messaging systems across entire organisations and into consolidated data networks, across one site, many sites or across borders.



LANE Telecommunications Ltd

Ringway House
Bell Road
Basingstoke
Hampshire
RG24 8FB
United Kingdom
Tel: +44 (0) 1256 301550
Fax: +44 (0) 1256 301555

LANE Telecommunications Inc.

10 Lanidex Plaza West Suite 213,
Parsippany, New Jersey, 07054
USA
Tel: +1 973 526-2979
Fax: +1 973 526-2988
3 Innwood Circle
Suite 116
Little Rock, Arkansas, 72211
USA
Tel: +1 501 227-6637
Fax: +1 501 227-6245

LANE Telecommunications PTE Ltd

1 Thomson Road
#03-344D
Balestier Hill Centre
300001
Singapore
Tel: +65 6353 0555
Fax: +65 6353 7448