Faxination Whitepaper

Fenestrae Faxination Server 2013 R2 adds fax, SMS, and MMS communication to a company’s messaging infrastructure. Fenestrae software supports sending and receiving to/from email systems like Microsoft Exchange, Lotus Domino, business applications like SAP or Oracle, and virtually any application, employee, and business process.

This document introduces Fenestrae Faxination Server, highlights a number of important features, and explains how these are used by existing Fenestrae customers. The potential benefits of using Fenestrae Faxination Server will become evident as each feature is presented.
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Fenestrae Solutions

Fenestrae offers software-only solutions that support fax, SMS and MMS communication from the desktop, MFP devices or business applications. Fenestrae has native Fax-over-IP (FoIP) connectivity making it possible to implement the solution as single server (virtualized or not), create a high availability system (Network Load Balanced Cluster) or embedded on IP PBX system.

[Figure 1: Fenestrae Faxination Server 2013 R2]

Integrated multi-channel messaging

Today's business communications rely on a bewildering mix of different formats, networks, applications, and protocols. In parallel, messaging is taking an increasingly important place as business processes extend beyond the company's boundaries and the information flow becomes more and more time-critical.

Fenestrae products deliver a unified mix of mobile and fax messaging, seamlessly integrated into the most popular business applications such as Microsoft Exchange Server and infrastructure platform technologies such as Net web services while also supporting universal messaging standards like SMTP.

Fax Messaging

Faxing remains a fundamental function in day-to-day business operations and is a key component in Unified Communications. Fax requires a minimal infrastructure, is format insensitive, and a universal standard.
Fax allows large and midsize organizations to carry out their most-sensitive, valuable, and mission-critical processes. Compliance and corporate governance initiatives will push more organizations from fax machines to fax servers, to provide better records of the documents that were sent and received.

There are more than 100 billion fax pages are transmitted around the globe annually. Knowledge workers handle 178 facsimile documents per week on average. The fax volumes processed in EMEA and the US are decreasing slowly but the business value remains high. The fax volumes in the Asian and emerging markets are increasing.

A few examples are:

- Financial institutions use fax to process their multibillion $£€ transactions.
- Large global investment companies log significant fax traffic with orders and confirmations from customers.
- Law firms use fax servers and fax machines to exchange hand-marked-up contract drafts, as well as final signed versions, as a legally valid means of communication.
- An oil company with global operations and exploration uses fax servers to overcome primitive infrastructure in emerging areas with local dial-in numbers for its teams. It moves its long-distance fax communications from public networks to the Internet in countries with exorbitant long-distance rates.
- Oil companies use fax to receive fuel orders and send bills to their national networks of independent filling stations.

Conventional faxing via a standalone fax machine is today being replaced by fax servers. Integration of fax servers with the copier/scanner/multi-functional peripheral (MFP) devices from companies like Ricoh® and Canon® enable a more efficient and cost-saving process.

Fax messages received by Fenestrae fax solutions can be routed to the intended recipient's Microsoft Exchange inbox or other messaging applications such as SAP, Microsoft SharePoint, document management systems, generic SMTP, or any web service-aware application. The server performs this function by mapping fax numbers to the user mailboxes, network locations, printers, or web service URLs. The technologies supporting these virtual numbers include DID¹, PBX² and ISDN³.

Inbound routing of fax messages eliminates the cost of manually handling incoming faxes and significantly enhances office efficiency. Furthermore, direct inbound routing improves the speed of incoming fax are distribution and prevents these faxes from being read by unauthorized personnel.

**Mobile Messaging**

1 - *Direct Inbound Dialing* is a mechanism that assigns multiple different telephone numbers to a single physical telephone line, essentially creating a private fax mailbox for multiple users.

2 - *Private Branch Exchange*, telephone system that switches calls between users on local lines while allowing a certain number of external phone lines to be shared.

3 - *Integrated Services Digital Network*
SMS is an everyday part of many people's lives, illustrated by the more than one billion wireless subscribers worldwide sending and receiving approximately one billion SMS messages per day\(^4\). Many use SMS primarily to communicate with friends, colleagues, and partners in a fast, easy, and non-intrusive way. Increasingly, however, companies are using SMS messaging to inform customers about events, products, and services they have registered and interest in.

- Financial institutions can automatically notify their customers whenever a transaction (deposit or withdrawal) occurs on their account.
- Animal control officials can use SMS as an automated data retrieval system for accessing a database of pet owner details from the field.
- Students can be automatically informed of class cancelations or venue changes.
- IT administrators can be automatically notified of server problems.
- Dentists can remind their clients about upcoming appointments.

Besides the standard 160-character (non-unicode) SMS messages, Fenestrae Faxination Server also supports other types of mobile messaging such as USSD, WAP OTA, binary messages, ring tones, and multimedia messaging (MMS). MMS is a wireless service available on GSM networks that is capable of sending and receiving binary messages such as pictures, animations, sound effects, ring tones, and rich text.

**Short Message Service (SMS)**

Mobile text (SMS) messages can be sent and received with Fenestrae Faxination Server using a GSM modem or, in higher volume environments, UCP, OIS, CIMD and/or SMPP protocols using a direct connection (TCP/IP, X.25 or dial-up) to the mobile operator's SMSC (Short Message Service Center).

Several mobile messaging parameters (characteristics) can be set within the product by manipulation of the SMS message format. Parameters include message label, return path, network validity period and so on. This helps firms customize their SMS services for different applications, target groups, marketing campaigns, etc.

**SMS delivery Notifications**

Fenestrae Faxination Server enables SMS traffic between the operator's SMSC and back-end applications. It is possible for Fenestrae SMS solutions to request and receive SMS delivery notifications of two types:

1. Delivery notification of message to the SMSC
2. Delivery notification of message to the handset (when supported by the mobile operator)

Delivery notifications can subsequently be forwarded to a back-end application or the originating user. This provides the ability to create a complete audit trail of your company's critical message flow.

**Multimedia Messaging (MMS)**

With support for MMS, Fenestrae makes it possible to bring real-time business communication to a higher level by providing the path to send voice/sound, pictures or even PowerPoint presentations from the desktop.

\(^4\) www.gsmworld.com
or business application to customers/consumers with MMS-capable mobile devices. Fenestrae MMS communication makes use of the IP connection to an MMSC provider via the MM7 protocol.

Business and IT challenges

Fenestrae Faxination Server is designed to help companies deal with some of the most important business and IT challenges today.

- How can we effectively leverage fax, SMS, MMS into our business strategies?
- How can we reduce our investment costs in hardware and software and decrease our monthly telecommunications costs?
- What about my compliancy & regulations?
- Is my messaging solution future-proof?

Improving operational efficiency by having the ability to speed up business processes and management decision-making, as well as eliminating workflow interruptions are both high on the agenda. Improving business productivity through the automated and real-time distribution of business-critical information, regardless of device, location, and time, is often seen as a means to achieve these goals.

Other challenges include finding ways to optimally use mobile messaging and integrate it into existing systems. Organizations can gain a competitive advantage by using this emerging communication channel to improve customer experience, service levels, and satisfaction.

Recent high-profile cases have raised awareness of the need to provide full accountability for all corporate electronic messaging in the form of detailed logs, end-to-end delivery confirmations, and archiving.

The abovementioned business challenges are often addressed in the context of diminished IT budgets and pressure on IT departments to do more with less. Consolidation of servers, applications and infrastructure, for example, is a means in which IT environments can reduce costs and enhance the functionality of staff in order to respond to ever-changing business needs.

Fenestrae Faxination Server offers a single solution that helps firms respond to these businesses and IT challenges.

Unified Communications

Unified Communications allows desktop users and business applications to communicate in a variety of different ways. Unified Communications vendors primarily focus on voice, email, conferencing, instant messaging, and presence but do not offer a mature, bi-directional fax and mobile messaging solution. Fax communication is a legally binding and essential means of communication for government and businesses today. SMS/MMS communication is used for productivity improvement, reminders, and time-critical alerts. Fenestrae offers fax and mobile messaging solutions that integrates seamlessly into any Unified Communications infrastructure without the need for client software or additional management tools. Fenestrae products are software-only, highly scalable and can be completely virtualized. Because of these unique specifications, Fenestrae solutions will generate significant cost reduction and fit into any carbon footprint program.
Microsoft | Cisco | Avaya | NEC | Fenestrae
--- | --- | --- | --- | ---
Telephony | +++ | ++++ | ++++ | ++++ | ++++
Conferencing | +++ | ++++ | +++ | ++ | +++
Messaging | ++++ | +++ | +++ | ++ | +++
IM and Presence | ++++ | ++ | +++ | ++ | +++
Clients | ++++ | ++ | +++ | ++ | +++
CEBP* | ++++ | ++ | +++ | ++ | +++
Administration | +++ | +++ | +++ | ++ | +++
SMB Bundle | ++ | +++ | +++ | ++ | +++
Fax | | | | | ++++
SMS | | | | | ++++
MMS/RCS | | | | | ++++

Figure 2: Gartner; Critical Capabilities for Unified Communications – August 2009

Fenestrae extends these UC environments with additional channels, adding support for the sending and receiving of FAX, SMS, MMS messages from the desktop and any business application.

**Electronic document handling**

Electronic document handling is a key application for knowledge workers in every company. It has been estimated that white-collar workers process almost 180 documents weekly⁵, with up to a quarter of invoices, purchase orders, bills of lading, and confirmations being communicated via fax.

While valuable efficiency gains can be obtained by integrating fax functionality into a user's desktop email client, even more significant savings can be achieved by integrating fax messaging into automated business processes, multi-function peripherals (MFP) like Xerox, Canon, Ricoh, Océ and HP, and back-end ERP, CRM and legacy/custom systems.

Integrating electronic communications such as mobile messaging and fax to enterprise systems means fewer interruptions in workflows, faster business processes, and the elimination of errors caused by manual handling.

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⁵ - Gallup Institute and the Institute for the Future
Fenestrae Faxination Server provides a means for companies to perform production-faxing functions:

- Mail-merge to email for Exchange or SMTP faxing
- Merge-to-printer to send faxes to the Print Queue Connector/Share folder
- Exchange Distribution Lists
Fenestrae Benefits

Having an integrated and reliable messaging infrastructure that can be extended to support multiple business applications as well as mobile and fax messaging is an extremely valuable asset to any company.

Fenestrae Faxination Server (FFS) takes integrated and multi-channel messaging solutions to the next level for firms that require:

- Improved performance, scalability and availability for server consolidation initiatives
- A single messaging platform that improves Business to Employee (B2E), Business to Business (B2B), and Business to Consumer (B2C) communications channels
- Integrated support for multiple back-end applications for seamless, rapid, and low-risk integration
- A standards-based web services interface to leverage enterprise application integration
- Support for multiple message types (fax, SMS, MMS) and built-in document conversion features that can be extended easily
- Integration of MFP’s directly into your business communications
- Centralize management of users and business applications

Besides being able to seamlessly integrate IT systems with a multitude of communication channels, such solutions should also meet a company’s needs in terms of reliability and scalability as well as any corporate or legal compliance requirements. At the same time, the new generation of messaging solutions should be able to support an IT department’s consolidation and rationalization efforts and offer a dynamic solution for constantly changing IT environments.

There are many benefits of the Fenestrae solutions. Because Fenestrae solutions can be installed centrally (consolidation), integrate in or communicate with the IP PBX network, companies will have immediate profits on:

**Competiveness**
The user or business application will have faster response times and no ‘lost’ communications.

**Reduced Carbon Footprint**
Reduced power consumption by removing obsolete servers (saves 2.4 tons of CO₂ per server/year) and fax machines (saves 0.2 Tons of CO₂ per fax machine/year). The average business fax machine consumes 5,000 sheets of paper annually, which can be reduced or eliminated with fax server technologies.

**Consolidation**
When organizations consider rationalizing their IT environments, server consolidation makes good business sense. By standardizing on a single operating system and platform, server productivity is maximized and companies can ‘do more with less’. The effective management of resources improves enterprise flexibility and reduces total cost of ownership (TCO).

Fenestrae Faxination Server is well suited to accommodate fax communications and messaging consolidation scenarios. The product’s modular architecture allows for the distributed (and remote) deployment of fax and SMS communications devices as well as integrated connectivity to remote installations of Microsoft Exchange Server and .Net Web services applications.
This enables organizations to consolidate their solutions via Fenestrae Faxination Server while serving users with remote devices and application connectors around the globe.

With this embedded concept, customers will have one single solution to support all required UC communication channels. This means that no additional hardware or software has to be purchased to give users or business applications the ability to communicate via voice or fax.

**Figure 3: Simplify your infrastructure**

**Cost Savings**
Cost Savings – Make server hardware and fax machines ($4500, - server/year) obsolete and reduce IT & Office Supplies management cost. Due to efficient utilization of the existing telephony and network infrastructure, the communication costs will decrease significantly.

**Compliance & Regulations**
Mitigation of Compliance Risk - Centralized and secure storage of all fax communications within the archiving/logging systems of the company.

There are many ways to log messages, traffic and transaction information in Fenestrae Faxination Server. Companies can log information as well as archive messages in Microsoft Exchange Public Folders. Other available logging mechanisms use CSV6 files, SQL/Access databases, or XML format. When configuring Fenestrae Faxination Server, the system administrator can define which message parameters are to be stored, and enable simultaneous activity logging to multiple locations. The logging/archiving module also has a development module, making it possible to store archived messages or log entries directly into your existing archiving system.

This feature helps companies to achieve full fax, SMS, MMS message accountability, something that is often required by industry regulators, partners and other company stakeholders. For example, companies utilizing Fenestrae Faxination Server can unequivocally prove to auditors that mobile warning messages sent to emergency personnel in the field have indeed been received on their handset, including the time at which they were received. By precisely time-stamping the receipt of system error notifications at a supplier’s service point of contact, Fenestrae Faxination Server enables companies to measure and monitor performance under service level agreements.

6 - Comma Separated Values
Fenestrae Products

The Fenestrae Faxination Server 2013 R2 product is divided into four general tiers – the User Edition, Standard Edition, Corporate Edition, and Enterprise Edition. These tiers represent the different ways that the software can be licensed, primarily in how many enabled users are allowed and how many fax lines are supported. Beyond these basic tiers, the software may be licensed a la carte for multiple host and device connectors. This allows Fenestrae Faxination Server to scale to the requirements of any customer, from the SMB market all the way to the Fortune 100 and global enterprises.

Support for Microsoft Windows Server 2008/R2 & 2012 /R2

Fenestrae Faxination Server 2013 is a 64-bit application and requires Windows Server 2008/R2 or Windows Server 2012/R2. The software is certified for both operating systems.

Faxination is Windows Hyper-V certified and is fully supported in VMware environments.

Message Integration

Fenestrae Faxination Server integrates multimedia messaging with the widest range of back-end applications.

Host System

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAP</td>
<td>Seamless integration into SAP systems via RFC or .Net web services.</td>
</tr>
<tr>
<td>Web services</td>
<td>Open and standards-based programming interface to integrate mobile and fax messaging with any web services-capable business application</td>
</tr>
<tr>
<td>Print Output</td>
<td>Integrates with any application able to print documents to a shared Windows printer (including non-Windows operating systems).</td>
</tr>
<tr>
<td>Multifunctional devices/</td>
<td>Supports the next generation of multifunctional copy/scanning devices, including Xerox Document Centre, HP, Ricoh, Canon and Océ devices</td>
</tr>
<tr>
<td>Copiers/Scanners</td>
<td></td>
</tr>
<tr>
<td>SMTP servers</td>
<td>Supports Internet standard email platforms</td>
</tr>
<tr>
<td>Office Communications Server</td>
<td>Secure, reliable and accountable mobile instant messaging</td>
</tr>
<tr>
<td>SharePoint</td>
<td>Route inbound Faxination messages to SharePoint document libraries to initiate a business workflow or create an archive of messages.</td>
</tr>
<tr>
<td>Inbound Directory Connector</td>
<td>Route incoming messages to folders that are shared on the network via the UNC path.</td>
</tr>
</tbody>
</table>
Seamless integration into Microsoft Exchange

Fenestrae Faxination Server integrates seamlessly with Microsoft Exchange Server and Active Directory in real time (no user database synchronization required). The native integration ensures that organizations benefit from optimal performance and a minimal need for IT management and support resources. Faxination messaging permissions and inbound routing codes may be assigned to an Exchange user mailbox or security/distribution groups. This helps to make Faxination the enterprise messaging solution with the lowest total cost of ownership (TCO).

Native Microsoft Exchange integration for lowest TCO

In combination with Microsoft Exchange Server (version 2007/2010/2013), the messaging functionality of Fenestrae Faxination Server forms a simple yet powerful extension to Microsoft Outlook and does not require additional client software to be installed. This is an important advantage, as desktop software installation is a costly, time consuming and inconvenient intervention, especially for laptop users. Moreover, no desktop maintenance is needed during the lifecycle of the product.

Fenestrae Faxination Server makes sending and receiving an SMS, MMS, fax message as easy as managing email. To send a fax the user simply selects business fax contact from their Outlook address book or enters a fax number manually. To send an SMS, the user simply addresses an email to the mobile number or selects an SMS address from his or her Outlook address book.

Incoming messages are routed directly to the user’s mailbox, SharePoint site, public folder, printer, shared folder, or any other destination (using SMTP or web services).

Other supported features include integration in Microsoft Exchange and Microsoft Outlook address books and Contacts, RTF and HTML formatting of email messages, embedded images, attachment conversion, drag-and-drop, and custom coversheet integration.

Exchange UM: Single Number, No more additional fax numbers

With Microsoft Exchange Unified Messaging, it is possible to combine your fax and voice numbers. The Microsoft UM server in combination with an IP PBX or Media Gateway is able to determine if an incoming call is a voice or fax call.

Figure 4: Single numbers for voice and fax
When it is a fax call, the users' address is retrieved from the AD and the fax session is handed off to the Faxination server along with the recipient information. From there, the Faxination serve receives the incoming fax and processes it as normal. This functionality achieves:

- Personal fax for everyone
- Cost savings
  - No dedicated hardware
  - No dedicated lines/number plans
- Outlook integration
- Recognize fax message in Outlook
- Increased productivity
- Lower Total Cost of Ownership

Seamless integration into SAP

The Fenestrae SAP.Net Connector brings all the benefits of Faxination directly to SAP users by seamlessly integrating fax and mobile communications into all modern versions of SAP. Easily deployed and fully SAP-certified, the Faxination SAP.Net connector enables SAP users to exchange SMS and fax messages with suppliers, customers and personnel, so that urgent news and notifications get delivered to recipients without manual intervention.

The Fenestrae SAP.Net connector is certified as both SAP® Certified Integration (communication via SAP R/3 BC-CON interface) and Certified for SAP NetWeaver™.

Web Services

Fenestrae Faxination Server comes with support for (.Net) web services to integrate applications, systems, devices, and users. Fenestrae Faxination Server can be seamlessly integrated in web service applications and architectures using tools such as Microsoft Visual Studio and Java provide mobile and fax messaging capabilities to any web services-enabled business application.

Printer Queues and File-based Interfaces

Legacy systems are also supported. Fenestrae Faxination Server processes messages from applications which generate documents by means of a Windows printer driver (ASCII, PostScript and PCL are supported). This integration method is common with AS/400 systems and mainframes as well as legacy Windows applications that do not have SMTP capabilities. Via the Universal Output Connector (also known as Printer Queue Connector), Fenestrae Faxination Server monitors printer queues and processes documents delivered to those queues – no physical printer is involved.
SMTP email servers

Fenestrae Faxination Server processes email messages from any standard SMTP server and delivers these as a fax, MMS, or SMS messages. Similarly, when inbound messages are received by Fenestrae Faxination Server, they can be forwarded to the user’s SMTP Inbox. This method is often used in Microsoft Exchange environments when the level of integration is limited by company policies and in Lotus Domino environments where Microsoft Exchange and Outlook do not exist.

Multifunctional Peripheral support

Fax machines, scanners, and copiers have evolved to become network-aware multifunctional peripherals (MFPs). Fenestrae Faxination Server supports multifunctional machines allowing sending and receiving of fax messages to and from these devices while centralizing administration and message archiving.

By connecting the MFP devices to a centralized server the number of fax channels can reduced and there is no need to purchase additional (hardware) modules for the MFP to support fax.

Faxination supports the most common MFP devices from manufacturers such as the Ricoh, Xerox, HP, Canon and Océ. Other brands and devices may be supported through extensibility.

Notifications

The notifications from Faxination can be delivered in different ways:

- Send delivery and non-delivery notifications electronically to a mailbox
- Attach original message to electronic notification → Tiff or PDF format
- Allow resending from mailbox (original message attached to non-delivery notification)
- Print the notification on any MFP or printer
- Coversheets are fully supported

Identification

The authorization and authentication (identification) is integrated within the existing (AD) infrastructure:

- Option to disable Anonymous users. For compliancy, reasons prohibit users to send faxes without providing proper authentication.
- Centralized security: Allow users to send fax messages with ‘Domain\User’ authentication
- Allow users to send fax messages using PIN authentication.

SharePoint Integration

Microsoft SharePoint has become one of the most important applications used in business collaboration. The Faxination MS SharePoint Connector allows you to integrate your fax, SMS, MMS traffic into Microsoft SharePoint. With Faxination software, it is possible to use Microsoft SharePoint as a centralized logging store.

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7 - Simple Mail Transfer protocol
to route incoming message into a specific SharePoint document libraries, and configure rules in SharePoint to initiate workflows based on new messages. Faxination also allows integrating your message transactions into any archiving system using the XML archiving, the (shared) folder interface, or any ODBC-compliant database such as Microsoft SQL server or Oracle.

OCR or Search, which is part of Microsoft SharePoint, can use the Faxination transaction documents for the business workflow. Sending fax/SMS/MMS messages out of Microsoft SharePoint or the business applications is possible too, using the Fenestrae Web Service, SMTP or MS Exchange connector. Faxination does not require any client applications or custom development to seamless integrate into Microsoft SharePoint.

Inbound Directory Connector

The Inbound Directory Connector allows you to route inbound messages to one or more UNC (Universal Naming Convention) paths anywhere on your network.

This feature can be used for archival purposes independent of the normal server backups or it can be used to interface with a document management system or some other workflow process.

The message that is stored in the network folder contains the original message (TIF, PDF, or PDF-with-OCR) and separate message properties file. The format of the message properties file can be in XML or HTM or in other format through the use of XML stylers. Each folder can have its own message property file format.
Features Overview

Seamless directory integration reduces administrative overhead

Fenestrae Faxination Server can be integrated with enterprise directories, particularly Microsoft Active Directory, which is a central component of Microsoft Windows and enables system administrators to store information about network-based entities, including details of user accounts. Active Directory provides a single point of administration for Fenestrae Faxination Server, supporting media as well as user settings and extending the schema from the Schema Master.

The advantages of using enterprise directories include:

✓ Simplified management with a single, consistent point of control for user accounts, applications and devices

✓ A high level of security - administrators benefit from powerful and consistent tools to manage security services for all users

✓ Extended interoperability through standards-based access to all features, including synchronization support for other directories

In addition to the Microsoft Active Directory management tools, the Faxination Address Manager, makes it possible to configure each ‘Host’, to set the default user settings per host system (e.g. permissions & coversheet), and based on the installed license (fax, SMS, MMS), ensures that only relevant data fields are displayed.

The same Faxination Address Manager can be used to determine which fax numbers are used within a define block of DID numbers. This ‘fax number availability’ data can be exported as an aid to organization number planning and directory production.

Integrated Fax over IP

Just like voice-over-IP (VoIP), fax-over-IP (FoIP) applications use the existing IP data communications infrastructure to eliminate or minimize dedicated fax resources, analog transport, and long-distance and global dialing costs associated with fax transmissions. With FoIP, the fax server solution can be completely virtualized. Therefore, FoIP generates significant cost savings on hardware investment and maintenance. With FoIP, a significant Carbon Emission (CO2) reduction can be achieved.

Centralized enterprise-based fax servers that support FoIP also enable organizations to host their own fax service while improving the economics, management, administration, security, control, compliance, and storage of fax communications.

When considering IP-based communications, the inclusion of fax as one of the converged communication channels helps create additional benefits. The rationalization of infrastructure and reduced IT management workload help drive down both direct and indirect costs involved with telephony and fax messaging. Fax-over-IP can save organizations money by centralizing administration and making more efficient use of existing telco connections.
Figure 5: Fax Over IP

The Faxination FoIP Connector supports all the possible architecture scenarios like single server, mirrored servers, Network Load Balancing and High Availability Clustering. The Faxination FoIP Connector can work in a centralized environment (all on one server) or decentralized (multiple connectors installed at branch offices).

With the Faxination FoIP Connector it is possible to lower your investment cost in the Unified Communications and ICT environments because there is no need for additional hardware. The same arguments that justify an investment in voice-over-IP technologies naturally extend to fax-over-IP.

The main difference in fax-over-IP compared to conventional fax deployments is the interface between Fenestrae Faxination Server and the IP PBX, allowing for a pure IP-based internal network. Fax messages can be sent through the IP PBX either over the PSTN or, with remote gateways, cost-free over the internet.

Fenestrae Faxination Server 2013 R2 has the option of an integrated fax-over-IP Connector to support FoIP SIP Gateways without the need for any additional software or hardware.

This FoIP Connector is certified for Cisco Unified Communications Manager (Call Manager) as well as Dialogic and AudioCodes Media Gateways.

Providing scalability

Enterprises deployed messaging solutions need to ensure their systems can be scaled successfully. Scalability is vital, for example, when an enterprise wishes to consolidate their IT environment. Fenestrae Faxination Server can be scaled in a number of ways.

Fenestrae Faxination Server is capable of processing high volumes of SMS, MMS, and fax messages. For example, Fenestrae customers have already deployed solutions that are guaranteed to process in excess of 15 SMS messages per second (emergency alerts). Other
Fenestrae customers have deployed fax solutions that integrate with multiple back-end systems serving tens of thousands of fax users with hundreds of inbound/outbound fax channels.

**High Availability**

Fenestrae Faxination Server is Microsoft Cluster Services aware, offering a fault-tolerant/failover solution by supporting active/passive configurations. After Fenestrae Faxination Server has been installed on the nodes of an active/passive clustered system, the Fenestrae Cluster Wizard handles the configuration of the services. If hardware or software should fail on a node, the same service is started on the other node, thus ensuring the continuous availability of business-critical messaging systems.

Fenestrae Faxination Server Enterprise Edition also supports deployment in IP load-balanced environments using the Windows Network Load Balancing Service (NLB) or hardware-based load balancers, thereby enhancing the scalability of critical enterprise messaging infrastructure. This is a key feature for large organizations carrying out server consolidation and IT rationalization projects.

**Application Support Scalability**

A likely first step for most organizations is to integrate multi-channel SMS, MMS, fax messaging with existing mail and collaboration platforms such as Microsoft Exchange or SAP. Fenestrae Faxination Server supplies native connectivity with these platforms. However, integration into more back-end systems can be extended easily using off-the-shelf connectors.

Business-critical systems come in many shapes and sizes. Fenestrae offers flexible tools that enable you to integrate messaging capabilities into legacy or custom-built systems. For example, Fenestrae Faxination Server can integrate with SMTP servers and process documents in print queues in standard text, PostScript, and PCL formats.

The .Net web services interface for Faxination enables enterprise developers to integrate multi-channel messaging capabilities into applications developed using tools such as Microsoft Visual Studio.

**Virtualization support**

Fenestrae Faxination Server supports virtualization solutions including Microsoft Hyper-V and VMware. Organizations use virtualization with servers to achieve more efficient hardware utilization. Virtualization allows one physical server to run multiple virtual machines, thereby using all available capacity of the hardware in question.

**Extensible Document Conversion capabilities**

Business information today is stored and exchanged in a variety of formats. Fenestrae Faxination Server supports a wide range of document formats that can be automatically converted into faxable .TIF format (virtually all common business document formats). Fenestrae Faxination Server also offers a means to add new document conversion utilities via an SDK.

Faxination document conversion takes advantage of the multi-threading capabilities of your server's CPU to convert multiple documents simultaneously. As document conversion is a CPU intensive process, this feature further improves the overall performance of your Fenestrae Faxination Server installation and prevents document conversion from becoming a performance bottleneck.
Document conversion is the process in which file attachments are converted into a transmittable format. For fax messages, the end result of document conversion is always TIF. For MMS messages, supported file formats are encapsulated in SMIL (Synchronized Multimedia Integration Language) format.

Fenestrae Faxination Server supports conversion on the centralized server of the most common business document formats. File attachments are examined by the Fenestrae Document Conversion Service at the binary level to determine the file type. Depending on the file type and configuration, the actual conversion may be performed in a variety of different ways. Conversion is performed in multiple stages when required.

- HTML file attachment and HTML message body
- Microsoft Word/Excel/PowerPoint
- Microsoft Visio
- Portable Document Format (PDF)
- Rich Text Format
- Open Document Format Text file/Spreadsheet/Presentation
- Word Perfect Document
- ASCII/ TXT
- XSL Formatted Output
- Pictures like JPG and BMP
- Postscript (PS)
- Printer Command Language (PCL)
- Fax TIF (various)

In the case of specific document format the Fenestrae Conversion Service can be extended easily via scripts and the supplied Document Conversion Wizard.

**Fenestrae Extended Document Converter**

The Fenestrae Extended Document Converter is a separately licensed feature that supports the entire standard file types list above plus hundreds more.

The Fenestrae Extended Document Converter converts all these hundreds document formats without the need of having a host program installed on the Fenestrae server. Therefore, there is no need to purchase additional license for any host programs like Microsoft Office, Adobe Acrobat and AutoCAD. This saves cost on licensing instantly. At the same time, the Fenestrae Conversion module increases the stability because it is designed to run as a Windows service unlike most host programs. Windows Server 2008/2012/R2 session security issues are also avoided in this way.

The Fenestrae Extended Document Converter module is a cheaper, better and more reliable way of converting outgoing documents.

Go to the Fenestrae support website for a complete list of supported document formats.
Efficient usage of Fax, SMS, MMS lines/ Line Management

With Scheduled Line Management (SLM), Fenestrae Faxination Server can maximize the utilization of the available fax, SMS lines. For example, you may want to reserve your fax lines for incoming or outgoing traffic at certain times of the day. If you expect large incoming volumes in the morning (say for response to a campaign), you can configure more incoming lines. These same lines might be needed in the afternoon for outgoing traffic. The system administrator can easy modify or enable/disable the rules, so that even ad-hoc mail merge processes can be supported.

When you have several outgoing channels configured and you send multiple faxes to the same destination number, Faxination can be configured to bundle this transaction and use a limited number of channels. Bundling outgoing fax messages and limiting the number of channels that can process the message will make the use of channels more efficient and save communications cost.

Optical Character Recognition (OCR) Module for enhanced fax content

With the OCR module, the incoming faxes are converted to a PDF with text that can be searched, copied, and indexed.

The optional OCR Module "reads" the incoming .TIF fax images (pictures of documents) and renders a PDF version with actual text. It can also create a text file in your message store, which can be indexed and searched. When archiving fax messages in SharePoint or a database, you can opt to have the text included with the archived TIFF or PDF image, or attached as a separate document.

The OCR text is also incorporated into the message body of inbound fax notifications, thereby providing an instant preview of the contents of a fax without opening the file attachment. Mobile users in particular can benefit from the ability to read a fax without downloading an attachment and opening a separate PDF viewer on their device.
Because the OCR’d text is stored within the PDF the content can be easily selected and copy/pasted into other documents or messages.

Figure 7: Search & Retrieve - Copy & Paste

Preview

When you want to see how your fax looks like before you actually send the message you can use the PREVIEW functionality.

Figure 8: Preview your fax

When the OCR PDF functionality is enabled, the user will receive the message in PDF format with searchable text.

Rich feature set overview

This section describes some of the extensive set of features offered by Fenestrae Faxination Server.
Convenient appending of disclaimer text enhances security
Appending a legal disclaimer to all outgoing email messages has become common practice among security-minded companies. The nature and content of the appended text normally depends on the department, country, or business process sending the message. Employee non-compliance with corporate rules on appended disclaimer text can expose the company to unacceptable commercial and legal risks.

Fenestrae Faxination Server minimizes this exposure by providing a convenient and dependable facility for appending legal disclaimers or other static data to outgoing fax messages.

Adaptable inbound message routing ensures immediate delivery to one or more recipients
Direct inbound routing is the ability to route incoming messages automatically to one or more users or business applications, eliminating the cost, inconvenience, and security concerns of distributing incoming fax messages manually. Inbound message routing enhances organizational efficiency and accelerates the distribution of messages. The confidentiality of messages is safeguarded by delivering fax messages directly to the intended addressee.

Inbound routing of messages to users or applications is supported via message parameters:
- The inbound number or short-code of incoming SMS messages
- A keyword present in the body of the message
- The fax or mobile number to which a message is sent
- Other user-defined parameters

Inbound routing enables organizations to set up multiple mobile services, connected to different back-end systems and user databases, using a single platform.

For example, consider a company director traveling overseas and accessing her mail using her laptop in a hotel room. A highly sensitive fax message to the corporate fax number at the head office is routed immediately upon receipt to her mailbox, unseen by any other person either at the head office or at the hotel where she is staying.

Universal Message Routing improves cost efficiency
Research has shown that in some industry verticals, fax traffic can account for as much as 40% of total corporate telephony expenses. It is also estimated that about 50 percent of all faxes in the studied companies are sent between locations within the same company. It is clear that companies can make significant savings on their bottom line by routing fax traffic over their mail system backbone using the (Vo)IP network, Exchange or SMTP.

By routing messages based on easily defined rules, Fenestrae Faxination Server eliminates the cost and inconvenience of handling paper faxes, queuing for access to a shared fax machine, and
redialing busy numbers, as well as the security exposure of printed faxes at both ends.

**Faxination Reporting Tool**
With the Faxination Report Tool, you have a good overview what messages are sent and received in a selected period of time. This report module is based on ASP.Net and is accessed via a standard web browser.

**Flexible Message Queue Management**
Fenestrae Faxination Server enables system administrators to create rules based on both sender- and user-defined parameters in order to prioritize messages, so that urgent, time-sensitive messages are not held up by lower-priority bulk fax or SMS mailings.

If an administrator has to delete a message from the message queue, for example after a power failure, the sender is notified that the job has failed through a standard notification message returned to the sender’s inbox or the sending application.

**Delegated Queue View**
The (centralized) message queue can be accessed using the Fenestrae Queue Manager tool. With Faxination 2013 R2, it is also possible to manage the queue via a web interface. Depending on the configured filters, a user/manager can see jobs only from the department, persons, or entire organization. Based on the granted rights the jobs in the queue can be paused, deleted, rescheduled, or resumed - all via the same intranet web page.

**Deliver Inbound Fax Messages as PDF Documents for wider acceptance**
This feature allows your users to receive and distribute inbound fax messages in the widely accepted PDF format instead of as .TIF images. This can be set on a per-user basis or as an organization-wide default. It eliminates the need for a .TIF viewer on each user's desktop and is rapidly becoming a more popular means of managing and viewing faxes.

**Microsoft SCOM support for better system management**
Fenestrae can deliver a “SCOM pack” with the Fenestrae Faxination Server. This makes it possible to manage Faxination services with the Microsoft System Center Operation Manager (SCOM) and generate alerts when services are not responding. Ask your Fenestrae sales representative about your SCOM integration options.

**Digitally Signed Printer Drivers assure you of full Windows compliance**
Both printer drivers used for document conversion are now digitally signed on their respective systems. The client-side Fenestrae Fax Printer (an optional component that can be used to perform certain document conversions on the workstations) is signed for Windows XP/Vista/7/8, while the server-side Fenestrae Conversion Printer is signed for Windows Server 2008/2012. Both are signed by the Windows Hardware Quality Lab.

**More Resilient Connectors prevent avoidable downtime**
With Fenestrae Faxination Server 2013, retry mechanisms are built into the Hosts-to-Kernel and Kernel-to-Devices communications. This improves the overall stability of the solution, especially in distributed configurations where network failures and application downtime can affect certain Fenestrae services.
Customizable Message Look and Feel
The look and feel of inbound messages and delivery/non-delivery notifications generated by Fenestrae Faxination Server can be customized. This means that it is possible to add company logo’s, change the colors used, and change the accompanying texts. This feature is especially useful when setting up Fenestrae solutions in a hosted or managed service environment.

Connection time logging for insight into departmental costs
Faxination 2013 also provides you with the option to log the connection time of all incoming and outgoing transmissions, as well as the number of attempts made per transmission. This functionality supports internal billing structures, as reports can be generated to show which regions or users consume the most fax traffic. It provides better insight into the true cost of faxing within your organization and facilitates the distribution of telephony expenses across multiple departments.

PDF Time/Date stamps
Overlay a time/date stamp on your incoming PDF files independent of the TSID/CSID data. This feature ensures a consistent time/date in your fax communications for time-critical workflows.

Self-Monitoring Service
When you have a consolidated system with, for redundancy reasons, remote connectors you want to be alerted/aware when something is going wrong with the communication between the different Fenestrae components. The Self-Monitoring service keeps an eye on the complete system and checks if connectors are communicating correctly with the Fenestrae server. When network issues are detected, Faxination generates Windows events. These events can be monitored with MOM/SCOM or any other Windows Event log monitoring tool.

Network issues do not necessarily translate into system failures -- the communication between the Faxination components is very robust and includes retry schema’s to avoid communication failures and the need for administrative intervention. Being aware of network hick-ups can prevent service failure, however – better safe than sorry.

Round the clock customer support for mission-critical communications
All of Fenestrae’s products and solutions are available with 24x7 technical support through Fenestrae’s Global Support Center. On top of a basic support package, a range of premium Service Level Agreements are available to cater to specific customer requirements. Fenestrae support and maintenance services ensure that your solution is always supported and that you are always supplied with the latest solutions and product updates. Furthermore, you have access to the Fenestrae Support Web where you can access the latest patches, service packs, knowledgebase, and other technical documents.
Implementation Scenarios

The following scenarios are examples based on actual Faxination customers.

Scenario 1: Centralized Fax solution Hybrid Network

A Global Enterprise in the banking/insurance sector did not use a centralized fax solution for processing their faxes. Faxes are used for money transfers, purchase orders, and communication with their SMB customers worldwide. Previously many departments used their own fax machine for fax communications. This resulted in high communication cost and serious compliance risks. Ongoing costs such as maintenance on fax machines, telephony, paper, and ink/toner were not very clear and did not fit into the carbon emission reduction goals of the company.

The solution is to have a centralized Faxination solution that is hosting fax communication for all business units. Each business unit still using their own applications but communicate via a shared fax server. Because the customer does not have yet an internal VoIP network, the Faxination Remote Fax Device concept is used to minimize the communication cost through least cost routing over the WAN/VPN.

The number of required servers was decreased dramatically (from 25 to 6) this resulted into significant maintenance cost reduction of the fax server hardware (approximately $100,000 per year), communication cost reduction and reduction of CO2 emission (40 Tons of CO2 per year). The Faxination solution generated faster and more reliable communication while all transactions were properly logged. No more fax machines were required and the utilization of telephone lines was intensified.
Scenario 2: Fax with IP network

Multinational company with branch office all over Asia uses fax communication to process purchase order information. Previously each branch office had its own fax solution; this resulted in high communication cost, compliance risks, and overhead on cost server maintenance.

The solution is to centralize one (clustered) Faxination solution that communicates with the back office applications on one side and with the IP network on the other.

With a centralized Faxination solution, the customer was able to centralize all fax software in one data center and use the IP network for transportation to the local branch offices. This resulted in a dramatic reduction of communication cost (approximately $30,000 per year) and server maintenance (approximately $17000 per year). They achieved a major CO$_2$ reduction (10 tons of CO$_2$ per year) and they were able to log all communication centrally to meet their latest compliance regulations.
Architecture

Fenestrae Faxination Server has a modular, component-based design which allows you to mix and match components to fit your exact requirements and to extend functionality and performance when needed.

**APPLICATION**

Fenestrae Faxination Server was developed using open standards and protocols ensuring that our customer base benefits from a proven, flexible solution with the lowest Total Cost of Ownership (TCO).

You can extend your unified communications platform with building-block components, including support for new message types, business applications and scalability features, at a time that is convenient for you and that meets your business requirements, and IT budget.

The distributed architecture of Fenestrae Faxination Server allows you to deploy and manage the core product centrally while connecting remote offices and subsidiaries. Remote locations can be connected across the corporate IP network or even over the Internet, as all Faxination components communicate using XML messages over HTTP/HTTPS (see Figure 2).

The concept of a centralized messaging platform supporting multiple (remote) applications and devices ensures optimal manageability and lowest TCO. Remote fax boards allow the use of local fax numbers and enable operational cost reduction through Least Cost Routing.

Fenestrae Faxination Server enables you to grow your integrated messaging solution and move towards a single, converged, multi-channel messaging solution, reducing the costs of managing multiple disparate systems.

![Figure 11: Faxination 2013 R2 architecture overview](image-url)
Can your organization benefit?

Ask yourself the following questions and discover whether your organization can benefit from deploying the Fenestrae Faxination Server messaging platform.

- Will your organization benefit from a single, proven solution that integrates all electronic messaging types with any business application directly out-of-the-box?
- Does your organization exchange documents with customers and partners using manual processes, rather than sending them securely and automatically directly from your core business applications?
- Do you think mobile messaging can be a valuable communications channel to your employees, customers and partners, and help you drive your service levels beyond those of your competitors?
- Are you seriously considering web services as a key technology to integrate your many applications and systems, allowing them to communicate with any device or interface?
- Do you have a staff that depends on precise, up-to-date, and real-time information in order to make accurate and efficient business decisions?
- Imagine sending real-time information directly to your customers' mobile phones or fax machines. Would your customers view this as an enhanced service?
- Do you need to invest in order to keep your messaging infrastructure compliant with regulations and stakeholder demands?
- Do you need to deliver well-integrated, reliable, and scalable messaging solutions while dealing with decreasing IT budgets?

If you answered yes to one or more of the above questions, Fenestrae can help to make your business truly real-time, while securely managing the flow of information, irrespective of the traditional boundaries of media, time, and space.

Faxing remains a fundamental function in businesses' day-to-day operations and is a key component in unified communications. Fax solutions that are implemented must add value to personal and business communication in such a way that it integrates into or works with the existing IP PBX.

Fenestrae solutions fit seamlessly into centralized FoIP integrated networks making it possible to leverage VoIP infrastructure. With the support for centralized deployment, Faxination allows customers to comply with the latest compliance regulations, reduce cost, and add competitiveness to businesses. Integrating into the IP network gives advantages in server maintenance and communication costs. It also reduces CO₂ emission significantly.
About Fenestrae

Founded in 1990, Fenestrae provides enterprise-class messaging and mobility software solutions to over 10,000 customers worldwide. Fenestrae is Microsoft Gold Certified Partner and Cisco Development Technology Partner. Fenestrae has been supplying Unified Communication solutions for Microsoft and Cisco enterprise customers for over a decade.

Headquartered in the Netherlands, with additional offices in the United States, United Kingdom, Germany, and Spain, Fenestrae's premier products are sold through worldwide partner network covering more than 60 countries.

Fenestrae Contact Details

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