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INTERSTAR

whitepaper

FoIP-Driven Green Solutions Make Business Sense



Can UC



what's missing?™



FAX: A strategic GREEN component in UC & converged IP solutions



nature
by SAGEM

Sagem-Interstar Inc. is the global leader in advanced fax server solutions for IP networks. Its field-proven XMediusFAX™ leverages IP telephony and Unified Communications (UC) systems to enhance productivity, collaboration, and ROI by integrating fax on the desktop. Deployed worldwide in enterprises and service provider sites since 2002, XMediusFAX is the most mature T.38 Fax over IP (FoIP) software on the market. As the North American subsidiary of Sagem Communications, Sagem-Interstar, with its globally recognized excellence in delivering scalable, secure and survivable FoIP solutions, is empowering businesses to fulfill the compelling promise of UC.

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1.0 Introduction

1.1 Positive Impact of “Green” Software Solutions

Saving the planet via “green” initiatives is all the rage in today’s environmentally conscious society. When it comes to matters of the environment, becoming a good corporate citizen is no longer seen as an honourable undertaking but rather, a duty. Companies feel compelled that the products and services they offer their end customers address their overall business needs while delivering those solutions in an environmentally friendly way.

As a pioneer and global leader in T.38 “software only” or “boardless” Fax over IP (FoIP) solutions, **Sagem-Interstar’s XMediusFAX™** provides its customers the technology they need to address all their faxing requirements in an environmentally friendly way while saving themselves money - a veritable win-win situation.

It’s true. A piece of software can significantly reduce the environmental impact of an enterprise organization – in addition to increasing efficiency and saving money. Sagem-Interstar’s fax solutions help companies “go green” by moving them from paper to digital workflows. This significantly reduces overall paper use and generates environmental benefits. [See sidebar]

Reducing paper demand helps preserve wild habitat, water and air quality. It also reduces the emission of persistent organic pollutants such as dioxins. In the workplace, it means less noise and heat from machines, less exposure to paper dust and fine particles of potentially toxic toner. Less paper waste means less landfill as well.

1.2 Going Green Improves the Bottom Line

Reducing your organizations impact on the environment through fax means a positive impact on your bottom line. In a large enterprise organization*, reducing faxing and fax-related printing translates into savings of up to \$2 million or more per year. By eliminating obsolete, single-function fax machines, a large organization can also save hundreds of thousands of dollars a year on electricity, leasing costs, and maintenance contracts.

1.3 Sample Carbon Footprint Analysis

Paper and energy usage are the two largest contributors to the carbon footprint left by business fax machines. High levels of carbon dioxide (CO₂) prohibit heat from the Earth to be released into space, creating the well known “greenhouse effect” phenomenon.

Green Benefits of FoIP Solutions



In a large company*, Sagem-Interstar’s network fax solutions can eliminate up to one ton of paper use per day – or up to 200 tons (0.18 million kg) a year.



Over 1.8 million gallons (7 million litres) of fresh water are required to produce that year’s worth of paper – enough to fill a city reservoir.



In only two years, our large company’s fax paper use would have consumed a forest equal in size to New York Central Park, according to EPA statistics.



Making just one day’s worth of paper for fax uses enough electricity to power the average home for six months.









Manufacturing one day’s worth of paper for fax generates 60 lbs (27.2 kg) of toxic pollutants. That’s 12,000 lbs (5443 kg) in a single year.

* Note: Usage figures for each benefit listed above are based on a company of *30,000 employees sending/receiving two pages per day on average

2.2 General Trends in FAX Architectures

The following general market trends within the FAX industry are highlighted to specifically outline their relation to environmental impact. As businesses take advantage of these trends, they benefit financially through energy and capital savings while increasing workforce productivity. They make direct contributions to lowering CO₂ emissions by reducing their energy consumption and usage of paper to help save trees.

-  Fax Machines Replaced by Fax Servers - Costly and inefficient legacy technology which may require numerous fax machines, analog POTS lines, expensive long-distance telecom charges, expensive fax boards, and other specialized hardware and supplies (e.g., toners and paper) is continuously evolving as organizations are migrating towards the implementation of fax server software to address their day to day faxing requirements.
-  PSTN/PBX Evolving to VoIP/IP PBX - Organizations equipped with traditional PSTN/PBX based infrastructures are moving forward with the implementation of VoIP capable networking gear based on VoIP/IP PBX. With this migration, organizations are able to better leverage state-of-the-art "boardless" Fax over IP (FoIP) server technologies.
-  Emergence of "Boardless" FoIP Fax Servers - The market is evolving toward Fax over IP (FoIP) solutions that are "software only" or "boardless". This means that the solutions do not require intelligent PCI fax boards. Less hardware footprint equates to less energy usage which in turn means less CO₂ emissions.
-  Unified Communications Evolution-Integration of FoIP into VoIP - As organizations migrate towards VoIP based systems, they are presented with various network fax server options. FoIP solutions are easily integrated with VoIP systems and are sometimes offered as a bundled VoIP offering because they are compatible and easy to deploy with the capabilities of leading VoIP gateway manufacturers. By leveraging VoIP infrastructure capabilities, businesses avoid deployment of costly overlay networks to address their faxing requirements and can thus reduce their energy usage and resultant CO₂ footprint.
-  Importance of ECM - As the market evolves towards FoIP solutions, the realm of fax is migrating to an all-digital content infrastructure. Faxes become electronic documents either at creation using fax server software or once the paper is scanned into a computer via a shared multi function device (MFD). Residing as electronic documents, faxes can be sent from desktop to desktop, from application to desktop or from application to application. The digitized fax documents reside on computers and easily integrate into the enterprise content management (ECM) workflow of any organization including facilitating audit trail management to address regulatory compliance needs. Business processes are streamlined and faxes are printed only when necessary, resulting in positive impacts to the environment.
-  Transformative Power of Virtualization - As organizations of all sizes look to make more efficient use of their existing hardware resources, they are turning to new virtualization software technologies. Virtualization allows a single computer to perform as multiple computers by sharing its resources across multiple environments. Virtualization is rapidly transforming the information technology landscape and is changing the way people compute. Fax server solutions that are compliant to leading manufacturers of virtualization software can co-exist in a hardware optimized and energy efficient environment.



3.0 Industry Approaches to Fax System Deployments

3.1 “Boarded” Legacy FAX Server

Figure 1 below illustrates a legacy fax server infrastructure in which fax server software as well as associated hardware is installed into a new or existing network server. The fax software application may be one among many other applications on the server or may be installed as a stand-alone application for the sole purpose of handling fax transmissions and receptions. This architecture comprises dedicated analog fax lines as well as specialized fax boards, maintenance and supplies. In short, the increased cost and energy requirements of deploying dedicated fax boards contribute to a larger carbon footprint.

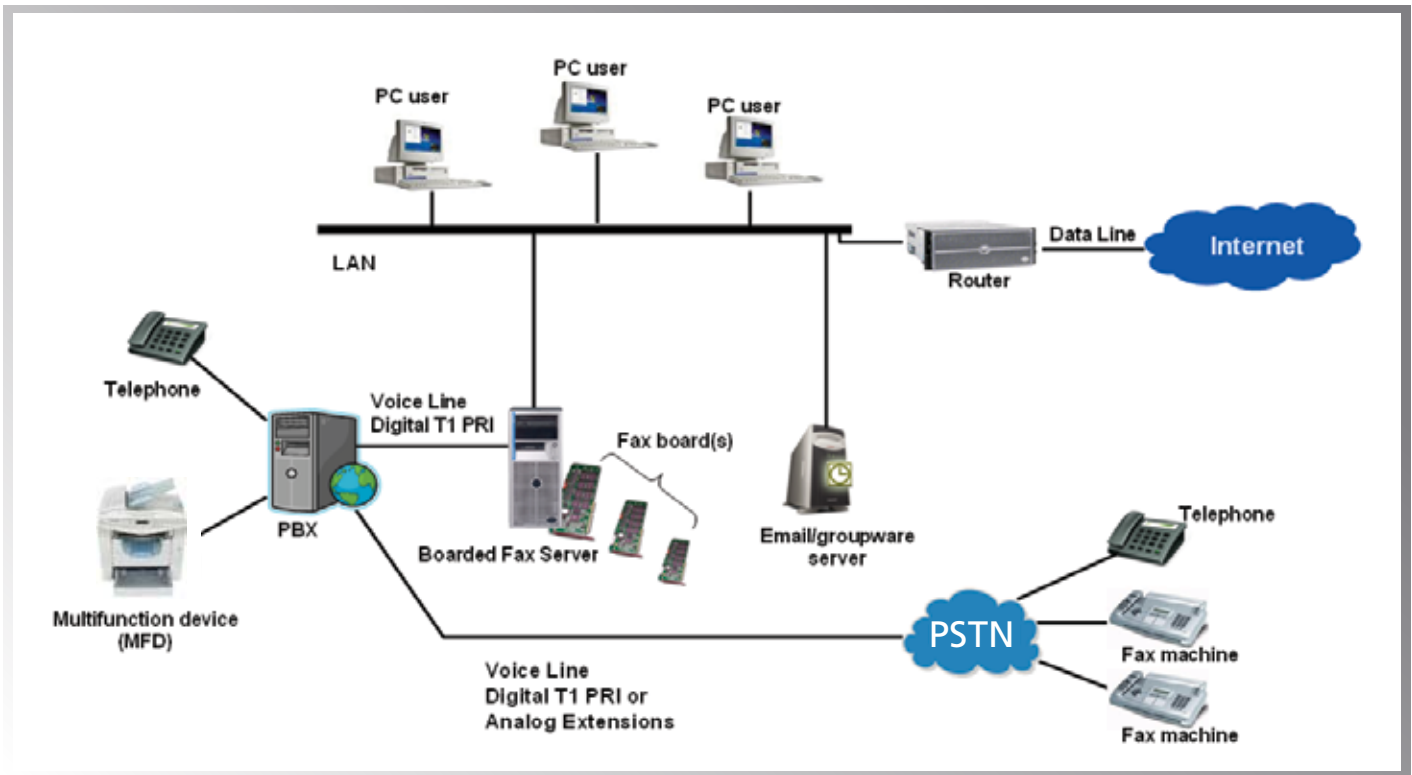


Figure 1: Legacy FAX Server “Boarded Solution”



3.2 "Boardless" (FoIP)

Figure 2 below illustrates a "boardless" architecture. As a software only solution, the architecture is built on T.38 FoIP technology (see T.38 FoIP Highlights below). The ITU T.38 is a public standard protocol supported by all the leading vendor's VoIP gateways and requires no additional hardware for adding faxing capabilities. The elimination of fax boards within this architecture leads to lower energy usage. Incorporating MFDs with consolidated fax, copier, scanner and printer functions in a single unit, energy consumption is significantly reduced. With MFD software connectors integrated within fax server software, a more cost-efficient and ECM optimized environment is achieved resulting in business benefits through improved workflow, document capture and traceability, audit trail and employee productivity. Coupled with additional eco-friendly technologies such as virtualization, organizations contribute to a greener environment and save thousands or millions of dollars in the process.

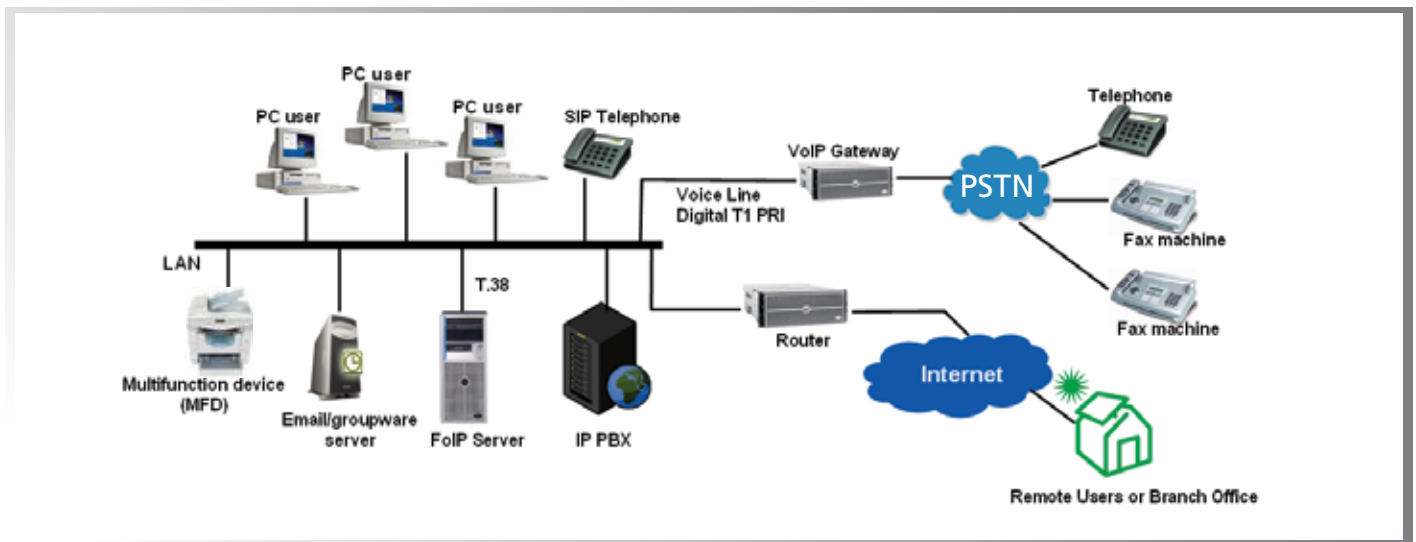


Figure 2: "Boardless" VoIP FAX SERVER Solution Solution

T.38 Fax over IP (FOIP Highlights)

- 📠 Protocol for real time faxing over IP networks
- 📠 Approved in 1998 by the International Telecommunications Union (ITU)
- 📠 For VoIP/IP PBX-based infrastructures
- 📠 Emerging as the globally accepted, secure, "legally binding", and reliable way of faxing over IP networks and the internet.
- 📠 Meets the requirements of the T.30 standard PSTN fax protocol.
- 📠 Uses H.323 or SIP for call signaling
- 📠 Interoperable with H.323 or SIP/T.38-compliant VoIP gateways



4.0 XMediusFAX – The Evolution to “Green” Faxing

As an industry leading IP fax solution, XMediusFAX, through its rich feature set and innovative architecture, enables users to adopt more eco-friendly business practices for their daily faxing needs.

4.1 Banning the Board

As the market rapidly evolves toward Fax over IP solutions that are “software-only” or “boardless”, XMediusFAX – the market’s first and industry leading T.38 fax server software, is helping customers reduce their carbon footprint while improving their bottom line. XMediusFAX facilitates “going green” by helping customers who have or are migrating to VoIP based network infrastructures move their daily faxing requirements towards an all software solution. In doing so, customers benefit from a reduced hardware footprint whereby fax machines, analog fax lines, fax boards, as well as consumables such as paper and toner and the cost of maintaining the fax hardware infrastructure are reduced considerably. Migrating towards an XMediusFAX FoIP solution contributes directly to lowering a company’s energy consumption and faxing related capital costs. By helping customers significantly reduce their energy and paper usage, XMediusFAX assists customers in minimizing their carbon footprint and lowering their contribution to the “greenhouse effect”.

4.2 Leveraging Virtualization

Virtualization consolidates existing and expected future workloads. This reduces the number of physical servers required, thereby reducing floor space, cooling, and capital costs. It also increases the utilization of servers to improve energy efficiency. Furthermore, virtualization can also serve as an effective means for placing additional computing capability into production⁽¹⁰⁾. By centralizing communications and embracing new virtualization initiatives, organizations can further realize cost savings by streamlining their hardware footprint. As a software only solution, XMediusFAX has no hardware dependencies and as such thrives in a virtual machine environment. This makes a great deal of business and administration sense, more specifically, managing numerous physical resources, and often remotely, from a single console yields highly efficient network management, as well as, cost and resource savings.

4.3 Streamlining Operations

The T.38 FoIP technology at the heart of the XMediusFAX solution enables VoIP networks to plug seamlessly into voice gateways, leveraging an organization’s IP investment. It consolidates voice and data traffic onto a single distributed IP network with minimized footprint and hence, clear green benefits. With this architecture, an organization can leverage its existing email, LAN, and WAN connections to route internal faxes between branch offices without ever incurring a long distance phone bill using Least Cost Routing (LCR). This can result in an organization reducing its telecom costs by at least 40%⁽¹¹⁾.

4.4 Enhanced Productivity

XMediusFAX provides additional cost benefits by increasing employee productivity by up to 90%⁽¹²⁾. Users no longer have to walk back and forth to fax machines. Client applications supported by the software allow users to send and receive faxes from their e-mail systems, their web browser, or from their ERP/CRM desktop applications. By fully enabling an organization’s faxing requirements with their existing e-mail / voice-mail systems to provide a unified messaging environment, its bottom line can be improved through compelling cost savings. By extending XMediusFAX features to an organization’s mobile workforce, productivity is further increased.



4.5 XMediusFAX System Integration

Figure 3 illustrates a typical implementation of an XMediusFAX fax server. The “boardless” solution easily integrates with existing e-mail systems to enable users to send and receive faxes from their desktops. As a software only solution, it can be deployed and administered on both Windows and Linux hosting environments.

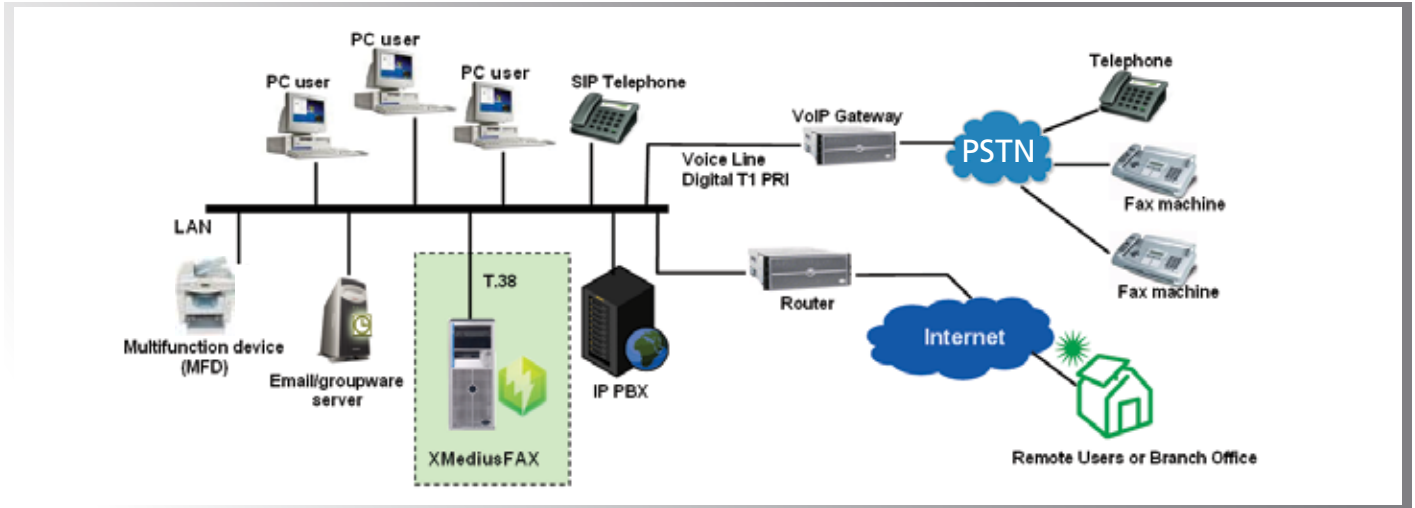


Figure 3: XMediusFAX Typical Implementation

4.6 XMediusFAX Architecture

Figure 4 below illustrates the example of the SP version of the XMediusFAX fax server. This architecture enables an organization’s diverse back office applications to seamlessly send faxes to the PSTN using a VoIP network. E-mail gateways and XML gateways connect the e-mail or SendFAX client to the XMediusFAX SP Server. Fax transactions are centrally queued on real-time replicated XMediusFAX Fax Managers. This ensures instant failover support, should a FAX Manager fail at any time. With intelligent load balancing, Fax Managers dispatch document conversion to a pool of rasterizers and T.38 drivers. Depending on the routing rules, incoming faxes can be sent to e-mail accounts, network folders, printers, or specialized JAVA/CORBA applications. All completed fax transactions are stored in a MySQL database that is accessible to users through a Web interface or to administrators through the Microsoft Management Console (MMC) snap-in. Figure 5 below illustrates the various client applications enabled via XMediusFAX for sending faxes.

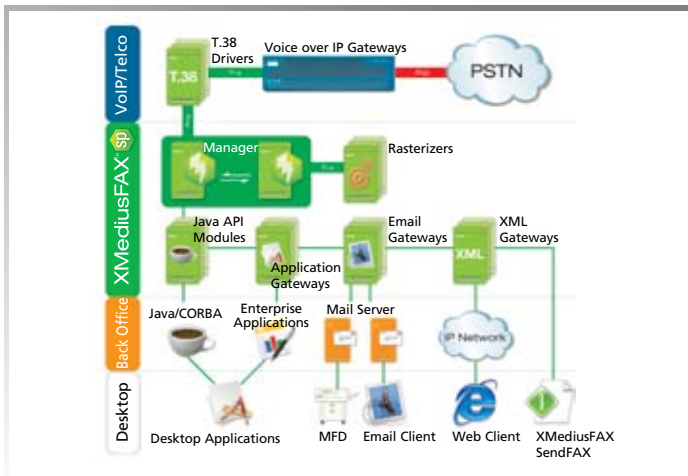


Figure 4: XMediusFAX Scalable Architecture (SP Version)

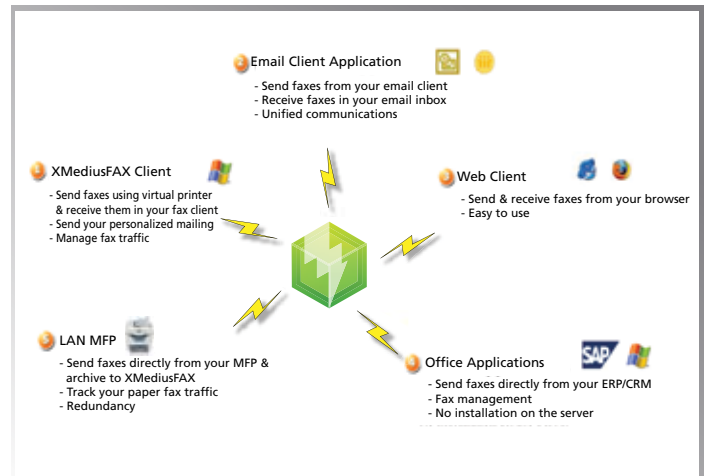


Figure 5: Five Ways to Transmit a FAX



5.0 Conclusion

As companies continuously strive to implement green initiatives within their organization, they are looking to new and more cost effective means to deploy these solutions. Organizations of all sizes seek to leverage existing infrastructure and implement solutions with a low total cost of ownership. The cost of going green may at times be prohibitive as companies evaluate the ROI on any new technology they plan on deploying. However, in the realm of fax, proven technologies exist which enable reliable and cost-efficient migration of real-time faxing to VoIP networks. The XMediusFAX T.38 real time FoIP server software delivers on the promise of helping organizations with their eco-friendly business practices while simultaneously enabling tangible business savings and economic benefits (see Table 1 below).

| XMediusFAX FEATURE | ENVIRONMENTAL BENEFIT | FINANCIAL BENEFIT |
|---|--|--|
| T.38 FoIP Technology based fax server | Leverage VoIP gateway capabilities to reduce hardware footprint. Lower energy consumption and CO ₂ emissions | Eliminate costly analog lines. Lower energy costs and overall TCO through cost savings realized by centralizing communications |
| "Boardless" fax server / "software only" solution | Reduced hardware footprint. Lower energy consumption and CO ₂ emissions. Integrates into digital document workflow process reducing reliance on paper | Lower energy costs. Lower hardware equipment maintenance and supply costs. Reduced administrative overhead |
| Virtualization compatibility | Streamlined computing hardware footprint leading to lower energy consumption and CO ₂ emissions | Efficient hardware resource utilization and reduced administrative overhead leading to lower TCO |
| Least Cost Routing (LCR) | Leverage existing LAN and WAN connections (reduced footprint) | Reduce telecom costs |
| Built-In Redundancy with Load balancing | Optimized best-in-class software requiring reduced hardware footprint | Lower energy costs. Lower installation and IT maintenance costs |
| MFP Integration | Reduce paper usage | Eliminate single purpose machines to save on overall energy consumption and improve workflow |
| OCR Fax Spam Filtering | Reduce paper usage | Lower hardware equipment maintenance and supply costs. Reduced administrative overhead |
| Enhanced Productivity / Fax Client Tools (i.e., Coversheet Editor, Page Management) | Reduce paper usage | Increased productivity |
| Flexible Client Access | Reduce paper usage | Increased productivity |
| Scaleable Architecture | Leverage existing VoIP infrastructure to enable extra channels for faxing via a licensing model | No extra hardware or 3rd party kits required |

Table 1: XMediusFAX Environmental and Financial Benefits



7.0 Glossary

CO₂ sequestration – The storage of carbon dioxide (usually captured from the “atmosphere” in a solid material through biological or physical processes).

CRM – Refers to Customer Relationship Management which is the term applied to processes implemented by a company to handle their contact with their customers.

ECM – Refers to Enterprise Content Management which is a set of technologies used to capture, store, preserve and deliver content and documents related to organizational processes.

ERP – Refers to Enterprise Resource Planning which is the planning of how business resources (employees, materials, customers, etc.) are acquired and moved from one state to another.

DOE – Refers to the U.S. Department of Energy.

EPA – Refers to the Environmental Protection Agency of the federal government of the United States charged with protecting human health and with safeguarding the natural environment: air, water, and land.

Fax Server – Software running on a on a server computer which is equipped with one or more fax capable modems attached to telephone lines (or more recently, software modem emulators which use T.38 FoIP technology to transmit the signal over an IP network).

FoIP – Refers to Fax over IP which is the process of sending and receiving faxes via a VoIP network.

Gateway – An entrance and exit into a communications network. A hardware or software set-up that translates between two dissimilar protocols.

LAN – Refers to a Local Area Network – Is a group of computers, printers or other hardware that are all connected in a reasonably small geographic location like an office or home.

LCR – Refers to Least Cost Routing which is a method of automatically selecting the minimum cost facility or path for transmission of a call.

MFD or MFP – Refers to Multifunction Device or Printer which is a machine that prints, faxes, scans, and copies.

PBX – A private telephone system switch used by medium and large companies used to connect to the local public telephone system.

PCI – Refers to the Peripheral Component Interconnect standard specification for a computer bus attaching peripheral devices to a computer motherboard.

POTS – Refers to the Plain Old Telephone Service – The standard telephone service that most homes use.

PSTN – Refers to the Public Switched Telephone Network – The international telephone system based on copper wires carrying analog voice signals.

SIP – Refers to the Session Initiation Protocol – An application layer control (signaling) protocol for creating, modifying, and terminating sessions with one or more participants.

T.38 – A standards based protocol for real-time fax over IP networks.

VoIP – Refers to Voice over IP which is an IP telephony term for a set of facilities used to manage the delivery of voice information over the internet.

Virtualization – A broad term that refers to the abstraction of computer resources.

WAN – Refers to a Wide Area Network – Allows file sharing among geographically distributed workgroups.



Do not overlook FAX as a strategic component in your UC & converged IP system.

Yes, FAX is still an efficient and modern way to communicate. It is legally binding and essential to mission-critical business processes. Fax over IP (FoIP), notably Sagem-Interstar's industry-leading XMediusFAX™ boardless FoIP solution, saves precious time and money.

XMediusFAX™

BOARDLESS, T.38 FAX OVER IP SERVER



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