

FAX Servers

Introduction

This white paper provides useful background information on network fax technology. It will help you decide whether your company needs a network fax solution and which solution suits your company best.

The following topics are covered:

- Why you need a fax server
- Which type of fax server to choose
- Fax server features
- Least cost routing
- To internet fax or not to internet fax
- Inbound fax routing
- Fax cards
- GFI FAX & VOICE

WHY YOU NEED A FAX SERVER

Faxing manually is out of date. Research shows that a professional fax server solution can save your organization substantial costs, whilst improving your customer service and image.

LAN faxing has many benefits over cumbersome manual faxing. For example, with a fax server you can:

- Send faxes at the click of a button instead of having to print out every fax, carry it to the fax machine, wait for your turn, and possibly wait for it to retry when the number is busy.
- Store fax numbers centrally in one phonebook, eliminating the need to search for a fax number.
- Send faxes which are more legible and of better quality, since they are sent directly from your PC, using high-resolution techniques.
- Automatically route incoming faxes to the right recipient as soon as they are received. This ensures timely and secure delivery of documents.
- Track fax activity, by archiving faxes and using call accounting.
- Make sure that only you can view your outgoing and incoming faxes.
- Send faxes in the same way as you send e-mail.
- Only check one mailbox for e-mails and faxes.
- Automatically retry fax numbers if they are busy.
- Easily send faxes to groups of people.
- Schedule faxes to be sent during cheaper off-peak times.

These benefits translate into significant cost savings. The following table shows an estimate of how much a company can save by using a network fax solution:

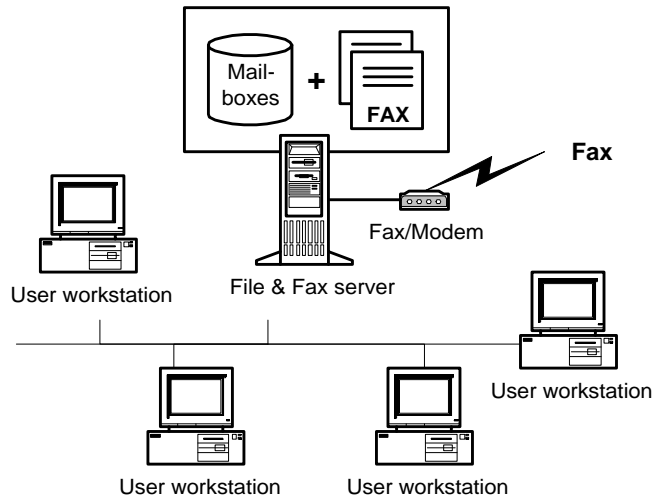
	Manual faxing	FAXmaker
Time to fax in minutes	5	0.5
No of faxes per week	500	500
Average labor cost per hr	\$ 30	\$ 30
Cost per week	\$ 1250	\$ 125
Weekly Saving		\$ 1125

Which type of fax server?

There are many different fax server products on the market. Broadly, they can be divided into 3 different categories:

1. "Independent fax servers" - Fax servers which include their own client software
2. "Hybrid fax servers" - Fax servers that include their own client software but have a link to an e-mail system.
3. "Email to fax gateways" - Fax servers which are integrated completely with a particular e-mail system and act as e-mail to fax gateways.

Type 1: Independent fax servers



How an independent fax server works

The first type of FAX server is applicable to companies who do not use e-mail within the company or do not wish to integrate fax with their e-mail system. These fax servers use a proprietary communication system between the client software and the fax server. This communication system can be file based (using a shared file area) or it can be network protocol based. User administration is linked to the fax server user database.

Recommendation: If your organization does not use e-mail or does not require e-mail to fax integration, this is an excellent choice of fax server. This type of fax server is very easy to install and maintain, and does not require knowledge of e-mail systems.

Requirements: A shared file area, i.e. a networked drive to which each workstation has access.

Advantages:

- Easy to install
- Easy to use
- Does not require a mail server

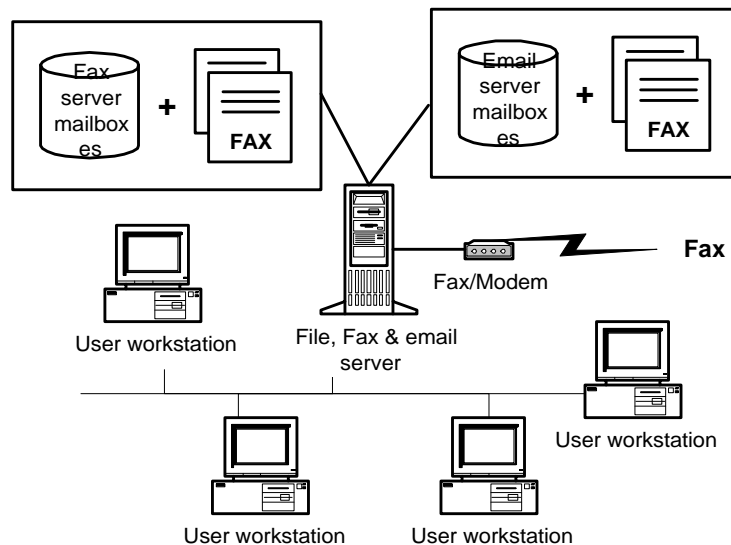
Disadvantages:

- No integration with e-mail
- No least cost routing
- Shared file area does not scale well for Wide area networks

Examples: FAXmaker for Networks

Type 2: A hybrid fax server

A hybrid fax server uses a proprietary communication system between the client and fax server, but can interface with a variety of e-mail systems at client or server level. User administration is linked to the fax server user database. These systems can often interface with a lot of e-mail systems since their level of integration is low.



Recommendation: This hybrid approach means that in most cases integration with the e-mail system is weak. Because a hybrid fax server does not take full advantage of the e-mail system's possibilities, administration overhead is large. Therefore this type of fax server is not recommended. If you do not need e-mail integration, it is better to go for an independent fax server instead of a hybrid one.

Requirements: A shared file area, i.e. a networked drive to which each workstation has access. Some workstations use a network protocol to communicate between the fax server and client. The e-mail portion would require a compatible e-mail system.

Advantages:

- Integrate with many different e-mail systems in one LAN

Disadvantages:

- Do not take full advantage of complete e-mail integration
- More difficult to install, due to integration with many different e-mail systems
- Network overhead due to proprietary communication system
- Extra administration overhead, due to separate user database

Examples: GFI does not produce a hybrid fax server. There are however other solutions that belong to this category.

Type 3: Email to fax gateways

The third type of Fax server integrates with a particular type of e-mail system, for example Microsoft Exchange server. This type of fax server leverages the e-mail system to allow fax clients to send and receive faxes. User administration is linked with the e-mail systems user administration. and total cost of ownership is low due to elimination of training.

Recommendation: This type of fax server is recommended in companies that use e-mail and have a mail server.

Requirements: A mail server, such as Microsoft Exchange Server or an SMTP/POP3 server such as Sendmail, Post.Office, Eudora WordMail, Netscape Suitespot, ISOCOR N-PLEX or Eudora WordMail.

Advantages:

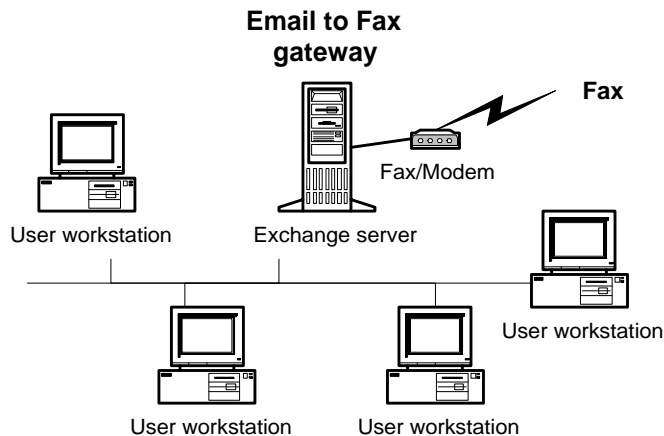
- Users do not need to learn a separate application to send and receive faxes.
- Users can check e-mail and faxes from one program.

- Users do not need to switch to a separate program to send a fax.
- Administrators have less overheads because they do not need to administer a separate user database.
- Administrators have less support requests from users.
- Because the fax server does not have a proprietary communication system, there is less network overhead and less cause for errors.
- Application integration through the mail 'Send' command in desktop packages is available.
- Easy to install as fax server is specifically designed for the mail server
- Least cost routing is possible using the mail server.

Disadvantages:

- Users must be familiar with an e-mail system beforehand.
- Some fax features are not available.
- The fax server that you choose must be designed specifically for the e-mail system that you have chosen.

Examples: FAXmaker for Exchange and FAXmaker for SMTP/Intranet



Fax server features

Fax servers offer many different features. Below we explain some of the more complicated ones.

Least cost routing

If you are a multinational organization, you can take advantage of least cost routing by leveraging your Wide area network (WAN). The best way to do this is to use the least cost routing system included with your e-mail system. A proprietary least cost routing system, if included with your fax server, will almost certainly not be able to handle WANS in the same way as a professional e-mail system and will therefore only cause the administrator additional installation and troubleshooting hassles.

To internet fax or not to internet fax

Internet fax has received a lot of publicity over the past year. We believe its use is limited to fax broadcasting applications.

The reason for this is that Internet fax offers little or no advantages over e-mail. The point of fax is that one can have secure, immediate delivery of a message. With Internet fax, this is not guaranteed and therefore one might as well send an e-mail instead!

Further disadvantages are that you will have to invest in equipment, a virtual private network (VPN) and maintain it. The installation cost and maintenance of such a system will in many cases far outweigh the cost savings achieved on the fax call itself.

The alternative

Instead of this, you could consider linking your fax server to an Internet fax service such as JFAX or FAXAWAY. These services are gaining in popularity but are still maturing in terms of functionality.

FAXmaker for Exchange & SMTP will be supporting these services (Q3 998) by allowing certain faxes to be sent using JFAX or Faxaway. This way the functionality gap is closed.

Inbound fax routing

An important ability of network fax packages is the ability to automatically route an incoming fax to the right recipient in your company. There are several ways of achieving this:

1. ISDN/DID routing
2. OCR routing
3. Line routing
4. DTMF routing
5. CSID routing
6. Manual routing

Fax routing based on ISDN or DID trunks

Using either an ISDN line or a DID trunk, users can be assigned personal fax numbers without having to install physical fax lines for each number. The number of the line is passed to FAXmaker upon receiving the fax, and therefore FAXmaker can route the fax to the correct user.



Dialled number is passed to FAXmaker via ISDN or DID

Search in Database.

Fax routing based on ISDN/DID

Requirements:

For routing based on ISDN

An ISDN Line with Msn numbers

An active ISDN CAPI 2.0 card such as an EICON Server BRI (approx. cost \$500)

For routing based on DID

A DID line with X amount of numbers
A Brooktrout TR114 DID card (approx. cost \$2000)

Recommended environment

Any environment where 100% reliability is required for inbound fax routing, i.e., legal & accounting offices.

OCR fax routing

This method routes a fax to the correct user by recognizing the text on the fax (OCR), and finding keywords related to a recipient, for example first name, last name or job function.



Fax routing OCR of fax

Requirements:

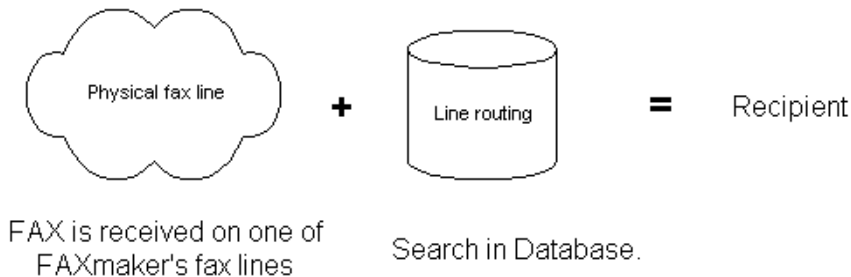
The OCR fax module (cost \$195)
Faxes that are to be routed must be typewritten.

Recommended environment

OCR routing will achieve approximately 70% accuracy. This means that it will alleviate the routing burden. It will work in environments where most received faxes are typewritten. Furthermore it will only work in smaller companies/departments - for obvious reasons it will not be able to distinguish between users with the same name.

Line routing

Line routing allows you to assign a physical fax line to a user. For example, if your office had 4 fax machines in each department prior to purchasing FAXmaker, you could use those 4 fax lines with 4 fax modems to route the faxes to each department based on the number on which it was received.



FAX routing using the physical line on which fax is received.

Requirements:

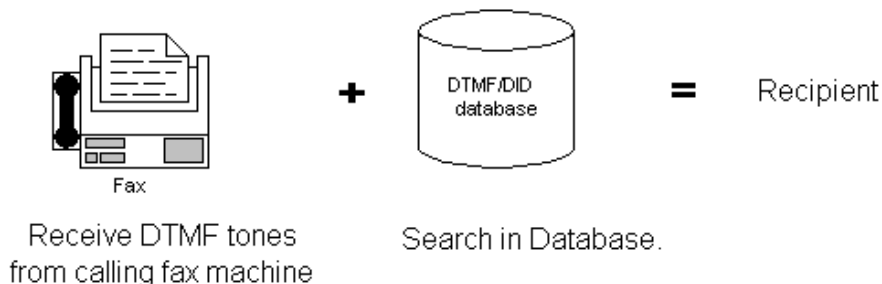
Two or more physical fax lines

Recommended environment

Highly recommended for environments where routing a fax to a specific department or workgroup are sufficient.

DTMF routing

This method requires the caller to enter an extension number when sending a fax. Alternatively, if your PBX has excess extension lines, you could program your PBX to pass the DTMF number automatically.



Fax routing based on DTMF

Requirements:

A Zyxel or Rockwell voice modem (check for compatibility with GFI)

User must input DTMF number. If PBX is used, the network administrator must have advanced technical telecommunications knowledge to operate and program the PBX.

Recommended environment

Only in specific environments where a special PBX is available or where one can explain to the callers (i.e. the senders of the fax) how to input the DTMF number

CSID routing

CSID or Sender ID routing is based on the FAX ID (identification of the fax machine), which can be matched to a recipient. FAXmaker allows you to automatically store the FAX ID of the receiving fax machine and relate it to the sender of the fax.



Fax routing based on CSID

Requirements:

None.

Recommended environment

Only in specific environments where each user sends and receives faxes from certain companies. For example, if you have sales representatives who are assigned to specific customers. But, if your sales and support people both interact with the same companies, then CSID routing is not recommended.

Manual routing

When no recipient can be determined for a fax, the faxes are routed to the default mailbox, from where the inbound fax router (a person designated to route faxes) can view the fax and select the right recipient.

Fax devices

An important choice for your fax server is the type of fax device to use. The following fax devices are available on the market:

1. Fax modems (either class 1 or class 2 or class 2.0)
2. Fax cards (for example Brooktrout or Gammalink)
3. Active ISDN fax cards (for example EICON)

Which fax device to choose?

Fax modems

Fax modems are best suited in all situations where no inbound routing is to be done using DID or DTMF. Although technically speaking you can use any class 2 modem, the reliability (how long you can leave the modem unattended); connect rate (average bps speed at which your faxes will be sent); and connect success percentage (the amount of fax machines the fax modem will connect to) will depend almost entirely on the quality of modem you use. We recommend using a quality fax modem such as Zyxel or Multitech. They may cost a little more, but they are well worth the extra money.

Why class 2 and not class 1? Class 2 is actually a more advanced protocol, which offloads a lot of the processing time to the modem. This allows your fax server to use less processor time and to be less sensitive to machine load. The fact that class 1 relies more on the PC processor will mean an increased burden for your server. Furthermore since FAX is a timing sensitive process, your faxes might fail more frequently.

Although FAXmaker includes a driver for US Robotics Sportster, GFI FAX & VOICE do not recommend the use of US Robotics Sportster modems, as these modems are more suitable for data than fax.

Fax cards

A number of fax cards are on the market, the most popular ones are Gammalink and Brooktrout. If you are planning to run DID inbound routing, then you will have to use a fax card and not a modem. FAXmaker supports Brooktrout TR114 fax boards.

ISDN active cards

An ISDN fax card is an excellent choice if you wish to use inbound fax routing or if you have ISDN installed. FAXmaker supports EICON Server BRI, AVM B1 and EICON Diva PRO ISDN cards.

GFI FAX & VOICE

GFI FAX & VOICE is the leading supplier of Windows NT based fax server software. Founded in 1992, GFI FAX & VOICE is a global company with offices in Rochester (NY), Hamburg (Germany), Malta and London (UK).

Leading the way through innovation and engineering excellence

In 1995, GFI FAX & VOICE was one of the first companies to launch a Windows NT based Fax server: FAXmaker. Soon after, in 1996, GFI FAX & VOICE again proved its cutting edge status by developing one of the first Exchange fax connectors, FAXmaker for Exchange. During this year, GFI FAX & VOICE partnered with Microsoft Asia to allow Microsoft to penetrate a market that required Fax as part of the Exchange server solution. In 1997 alone, GFI FAX & VOICE shipped 20,000 fax servers, proving FAXmaker to be one of the most popular fax server platforms for Windows NT.

GFI FAX & VOICE is also leading the way in e-mail management and automation. Launched in 1997, Emailrobot for Exchange/SMTP was the first application designed to help companies handle the fast increasing e-mail overload.

Corporate clients

GFI FAX & VOICE's customer list include: Microsoft, Digital, Honeywell, Siemens, Matsushita, Ericsson, OKI, Olivetti, Triumph Adler, Berliner Investment Bank, Bayersdorff A.G., PTT Telecom, Norwegian Telecom, Swiss Telecom, UK Police departments, German financial institutions, Giorgio Armani, Benetton and many more.

GFI FAX & VOICE is a privately held company, and employs 40 people.

USA & Canada
GFI FAX & VOICE USA
105 Towerview Ct.
Cary, NC 27513
Voice: 1 (888) 2-GFIFAX:
Fax: (919) 388-5621
Email: sales@gfifax.com

Central Europe
(Germany, Austria & Switzerland)
GFI FAX & VOICE GmbH.
Palmaille 59, 22767 Hamburg,
Germany
Tel 040-306810-0; Fax 040-306810-10
Email gfiger@gfifax.com

United Kingdom
GFI FAX & VOICE
Business Design Centre, Unit 111,
Suite A
52 Upper Street, London N1 0QH
Tel: +44-(0)171-226 28 66;
Fax: +44-(0)171-226 47 88
Email:
GFI FAX & VOICE Ltd.
'Communications House
Mediterranean Street, SGN 07,
St Julians, Malta
Tel: +356-382 418; Fax: +356-382
419
US direct fax number +1-212 208
2425
Email: sales@gfifax.com

The FAXmaker product range

The FAXmaker product range is a Windows NT based network fax solution that includes the following fax server products:

FAXmaker for Exchange

FAX gateway for Microsoft Exchange server that allows all users to send and receive faxes from Microsoft Outlook or the Exchange client. FAXmaker for Exchange includes a multi-line fax server, inbound fax routing, print to fax driver for Windows, support for Office documents, and fax management features.

FAXmaker for Networks

A network fax solution for Windows NT that allows all network users to send and receive faxes right from their desktop. FAXmaker for Networks includes clients for Windows 95, NT and 3.x and works with most popular networks and fax/modems. A 32 bit fax server for Windows NT and 95 is included.

FAXmaker for SMTP

FAX gateway for SMTP/POP3 mail servers, allowing all e-mail users to send and receive faxes from within their favorite e-mail application. All standard mail servers and e-mail clients (including Microsoft Outlook and Eudora) are supported. FAXmaker for Intranet includes a multi-line fax server, inbound fax routing, print to fax driver for Windows platforms and fax management features.