

Inbound Document Routing and Delivery Provided by HylaFAX™

In multi-user environments, especially the environment of an enterprise business network, wide use of a separate traditional HylaFAX client program to find and view received facsimile documents can pose a threat to information security, tax actual reception timeliness, risk user-caused data loss, and burden information exchange overhead. In environments where these factors are non-negligible, facsimile document routing must be considered.

Inbound facsimile documents received by the HylaFAX faxgetty program are created and stored in a special “receive queue” under the HylaFAX spool directory on the HylaFAX server. Once received, all authenticated HylaFAX clients are capable of viewing any document. This poses a security risk for environments where the system may receive sensitive information that should only be made available to the intended recipient. The HylaFAX server can be configured to route inbound facsimile documents directly to the intended recipient. Doing this reduces the risk to information security and sidesteps a myriad of related problems that are introduced when many users have access to the HylaFAX receive queue.

Upon completion of their reception, facsimile documents and other received session data are processed in order to determine the appropriate routing and delivery method. Based on those results the documents and other received session data are delivered and notification is given of their receipt and delivery. Available to HylaFAX are the common delivery methods of e-mail attachments, automatic printing, and filesystem operations such as copying the documents to a particular directory. Available routing methods can be based on received DID (Direct Inward Dial, also known as DNIS), CID (Caller Identification, also known as ANI or CNID), TSI (Transmitting Subscriber Identification, also known as CSID), transmitted T.30 subaddressing, receiving device name, or manual inspection.

Delivery Methods

E-Mail Attachment: One of the most common forms of document delivery is by e-mail attachment. If the HylaFAX server is networked and configured properly for sending e-mail, then the received facsimile notification scripts are capable of MIME-encoding the facsimile documents as TIFF, PDF, or PostScript e-mail attachments and sending them along with the received facsimile notification message. This delivery method limits the waste in received “spam” faxes but relies heavily upon a fully reliable mail system. If the recipient does not frequently use e-mail, then e-mail attachment delivery may not be suitable.

Automatic Printing: The received facsimile notification scripts are easily configured to automatically print received documents. This requires that the HylaFAX server have connectivity to (either direct or networked) and proper configuration for a printer. This delivery method more closely resembles the operation of a standalone fax machine but is

likely more costly to operate than others and relies heavily upon a fully reliable printing mechanism.

Filesystem Operations: The received facsimile notification scripts are also able to copy received facsimile documents to any accessible filesystem, locally or remote, where the intended recipient would subsequently retrieve them. Notification of the received documents could be done in some other fashion, such as producing an audible sound through a device, sending a page or e-mail, or something similar.

Routing Methods

Manual Inspection: The automation of this method pales in comparison to the others, however, for smaller businesses which do not want the expense of other technology or multiple lines and modems, all incoming facsimile documents may be delivered to a company receptionist who, in turn, redirects the documents to the intended recipient. This method generally requires less initial investment and may also be less costly in the long-run if this activity (or the volume of it) does not distract the receptionist from usual activities, but it does introduce the variable factor of human error, a variable factor of delayed delivery, and a variable factor of confidentiality infringement.

Advantages:

- small initial financial investment
- available for all equipment

Disadvantages:

- variable privacy risk
- potential greater long-term cost of practice
- introduces greater risk of human error in routing
- increased delay in delivery

Receiving Device Name: The HylaFAX server can be configured to use multiple available modems (or multiple modem ports on multi-port or digital modems). Because each phone line is connected to a different modem the **number dialed** therefore corresponds with a distinct device name (if the lines are not part of a “hunt group”). The facsimile notification scripts are capable of routing facsimile documents based on the device name. Thus, documents received by different modems can be delivered to different recipients. Hardware costs will vary greatly depending on the type of hardware used. This configuration is only suitable for environments where the number of lines is equal to or greater than the intended number of recipients. Where the intended number of recipients is greater than the number of lines, then DID-based routing should be used instead.

Advantages:

- less-costly than DID per-number for a small group of numbers
- recipient is explicitly identified by the sender
- available for all equipment

Disadvantages:

- potentially large hardware and phone-line cost

T.30 Subaddressing: The HylaFAX server is capable of sending, receiving, and routing received documents by T.30 subaddress information (see ITU-T T.30 5.3.6.1.3). A subaddress is a series of characters up to twenty in number sent by the transmitter during the initial facsimile protocol (not via dialtones) which typically identifies the intended routing or recipient. Unfortunately, although many new standalone fax machines are capable of receiving subaddress information, most are not capable of sending it. Consequently, using T.30 subaddressing as a routing mechanism will likely only be useful in HylaFAX-to-HylaFAX communication or in uncommon environments where all senders are able to use it.

Advantages:

- “no-cost” financial investment
- available for most equipment

Disadvantages:

- most senders don’t support it

TSI-based Routing: Like T.30 subaddress information, Transmitting Subscriber Identification (TSI) information is sent during the initial facsimile protocol, and the HylaFAX server is capable of routing received documents with it. Unlike subaddressing, nearly all senders will transmit TSI. However, TSI is generally not altered with every transmission, and therefore identifies the **sender** more than it does the intended recipient. Therefore, TSI may only adequately be used for routing if all documents sent from any particular sender should always be delivered to a single recipient. Furthermore, many senders send empty TSI information, and many senders send identical TSI information (i.e. “Via Fax”) both which could make routing by TSI alone impractical. TSI is often more useful in screening communication than routing received documents.

Advantages:

- “no-cost” financial investment
- available for all equipment

Disadvantages:

- recipient is not explicitly identified by sender
- many senders may use identical identification

CID-based Routing: Caller Identification (CID) is received by the modem from the telephone company before the call is answered, and the HylaFAX server is capable of routing received facsimile using it. Similar to TSI, CID identifies the **sender** more than it does the intended recipient as it is largely unalterable and is often more useful in screening communication than routing received documents. Therefore, CID may only adequately be used for routing if all documents sent from any particular sender should

always be delivered to a single recipient. Furthermore, many senders do not transmit CID information due to lack of technology support or by deliberate disabling which could make routing by CID alone impractical. Caller-ID service requires both hardware (modem) support and support from the local telephone company.

Advantages:

- small initial financial investment

Disadvantages:

- recipient is not explicitly identified by the sender
- not available for all equipment, lines, and senders

DID-based Routing: Probably the most sought-after routing method, Direct Inward Dial (DID) identifies the **number dialed** and therefore the intended recipient. Like CID, DID is generally received by the modem from the telephone company before the call is answered, and the HylaFAX server can use it for routing purposes. With DID, a single line and modem can answer calls to many different numbers. Therefore, each intended recipient could have their own assigned DID number, and all documents received from calls to that number could be delivered directly and automatically to them. DID service requires both hardware (modem) support and support from the local telephone company. Unfortunately, DID hardware and services are not inexpensive. Digital equipment must also generally be used since, although analog DID-capable modems are available, many telephone companies do not provide analog DID services.

Advantages:

- recipient is explicitly identified by the sender
- low cost-per-number for large groups of numbers

Disadvantages:

- potentially large equipment and phone-line cost

Other Routing Methods: Other common document routing methods such as DTMF (Two-Stage Dialing) and OCR are also available with proper hardware and third-party software. Their usefulness may not be suitable for most environments. The HylaFAX document routing routines are “scriptable”, and thus many other potential routing methods are available with other software or customized scripts.