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## Brooktrout Technology Whitepapers

### Techniques for Inbound Fax Routing

By Christopher Darsch, Manager of Sales Engineering

#### Abstract:

*When developing an electronic messaging application that includes fax capabilities, one of the common items to consider is the means by which a received fax will reach its intended recipient. There is a surprisingly wide range of options available, each having both advantages and disadvantages. The inbound routing technique(s) that are ultimately implemented will be chosen based on a number of factors, including the expected amount of inbound fax traffic, the availability/appropriateness of a given technique for the fax application, the end user's cost of implementation, and whether the sender of the fax needs to have any knowledge of the specific technique being used. This paper provides a summary of commonly used inbound routing techniques along with a discussion of their relative merits.*

#### **Manual Delivery** [Forward to Addressee by a "Routing" Operator]

Manual Delivery is, of course, the simplest method of inbound routing. With this technique, an administrator periodically checks an electronic inbox for new faxes. When new faxes are found, the fax cover page is viewed and the fax is electronically forwarded to its intended recipient. Although this method requires minimal initial investment by the end user, it has many disadvantages. Among these are a loss of privacy, a risk of delivery to the wrong person, the potential for significant delivery delays, and the overhead of having the administrator review each and every fax that is received. Needless to say, manual delivery is not very much better than using fax machines. This technique only makes sense if inbound traffic is minimal or initial costs must be as low as possible. Fortunately, for those who are installing the TR114 Fax and Voice Board, they do not have to worry about the security of their network fax server.

#### **Called Party Identification** [Includes DID and DNIS Routing]

Called party identification is information passed over the phone line by the telephone company which identifies the dialed number. Like calling party



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identification, it is usually a service with an ongoing monthly charge. A special type of analog line called DID (Direct Inward Dial), along with a particular type of TR114 board from Brooktrout can be used to implement this technique for low-density applications (for more information, consult our DID white paper: <http://www.brooktrout.com/whitepaper/did.htm>). With digital phone lines (T1/E1/ISDN PRI or BRI), a service known as DNIS (pronounced "DEE-nis", it stands for Dialed Number Identification Service) provides the called party identification. Most of Brooktrout's digital line interface cards support DNIS. With called party identification, each end user of your application would have a different fax phone number, and callers wishing to send a fax to that person simply use that person's unique fax phone number. This doesn't mean that a separate phone line is required for each recipient, however! The phone company simply provides as many "logical" phone numbers as necessary, and then maps these phone numbers to the much smaller pool of "physical" phone lines that are connected to the fax server. This technique is by far the most reliable form of inbound fax routing, and it does not require that the sender have any special knowledge of your fax application. The primary downside is that the phone company charges a small amount for each additional phone number that is needed, and your customers may be forced to reserve more numbers than they initially need in order to have guaranteed room for growth.

### ***Calling Party Identification***

Calling party identification is information passed over the phone line by the telephone company which identifies the caller. As such, it is typically considered a service with an ongoing monthly charge. If analog phone lines are used, this service is usually referred to as Caller ID. On the other hand, for digital phone lines (T1/E1/ISDN PRI or BRI) this service is typically known as ANI (pronounced "annie", it stands for Automatic Number Identification). At present, most Brooktrout digital line interfaces support ANI, but the analog line interfaces do not support Caller ID. There are external devices, however, that can capture Caller ID and pass it to your application. The calling party identification technique is useful if faxes from a certain phone number always go to the same person in your organization. To use this technique, your application must provide a routing table that directs faxes from a specific phone number to a specific person. If a received fax does not come from a number in the routing table, then it must be reviewed by an administrator and electronically forwarded. Remember, too, that calling party information is not always available; it may be blocked by the caller or the call may have originated from a location that cannot provide calling party information. When the calling party information is not available, manual intervention by the administrator is once again required in order for the fax to reach its intended recipient.

### **OCR**

OCR stands for Optical Character Recognition. In this context, what it means is that your fax application will attempt to electronically "read" a portion of the fax image to determine the intended recipient. The primary disadvantage to this technique is that, in order for it to be successful, the sender of the fax must follow a special procedure. This is true because OCR technology is not currently good enough to interpret a handwritten name reliably at standard fax resolutions, and it will often have trouble even if the name is typeset due to skewing of the image or other problems. There are three ways to try to deal with this limitation: 1) Instruct the sender to use a particular typeface,

typically of the sans serif variety (like Arial), in a large point size, 2) Instruct the sender to encode specific information in the fax header, or 3) Give the sender a special cover page to use. This "special cover page" is highly application-specific and may include items such as framing targets and bar codes. Obviously, this technique is not well-suited to general purpose faxing but may work reasonably well for special applications. And again, manual intervention is required for faxes that cannot be electronically read. Note that Brooktrout does not currently offer OCR technology; we do however make the fax image available in a standard format so that a third party technology can perform OCR as needed.

### **Two Stage Dialing**

With two stage dialing, also referred to as DTMF routing, the sender dials a fax number and, when the call is answered, dials an additional routing code in response to a voice or tone-based prompt in order to get the fax to its intended recipient. While this method can be fairly reliable, it does require the sender to follow a special procedure. Depending on the equipment that the sender is using, as well as the sender's expertise, difficulties may be encountered. If the routing code is incorrect or missing, the end user will have to depend on an administrator to forward the fax to its final destination.

### **Fax Protocol Data**

Within the fax protocol, there are provisions for identifying both the calling party (Transmitting Subscriber ID [TSI]) and an inbound routing number (Subaddressing). The TSI can be used in a manner similar to calling party identification, except that it may be less reliable since the information can easily be changed by reprogramming the sending fax machine. As far as subaddressing, it can be used in a similar fashion to two stage dialing. Unfortunately, however, this portion of the fax protocol is relatively new and not widely used, so it may be difficult or impossible for the sender to encode the routing information. Therefore, this technique is not well-suited to general purpose faxing, although it can work fairly well in special cases where you have control over the sending fax technology.



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Brooktrout, Inc. 250 First Avenue, Needham, MA 02494-2814, U.S.A. Phone: +1 781 449-4100 Fax: +1 781 449-9009

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