

# Deploying Exchange Server 2010 Unified Messaging with Sagem- Interstar XMediusFAX

October 29, 2009

## **Abstract**

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Microsoft Exchange® Server 2010 Unified Messaging forwards inbound fax calls to a dedicated partner fax solution, which then establishes the fax call with the fax sender and receives the fax on behalf of the UM-enabled user. The partner then sends the fax included as a TIFF attachment in the SMTP message destined for the receiver's mailbox. This paper documents the deployment of Sagem Interstar's XMediusFAX Solution with Microsoft Exchange Server 2010 Unified Messaging in MSIT's corporate "dogfood" environment.

References and resources discussed here are listed at the end of this paper.

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**Document History**

Date	Change
October, 2009	First publication

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## Introduction

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### Fax and Exchange Server 2010 Unified Messaging

Microsoft Exchange Server 2010 Unified Messaging relies on certified partner fax solutions for enhanced fax functionality such as outbound fax or fax routing. As a result, Exchange 2010 Unified Messaging no longer receives fax media on behalf of UM-enabled users but instead redirects incoming fax calls to a certified partner fax solution, which receives the fax media and sends it to the recipient's mailbox in the form of an email message with the fax included as a TIFF attachment. The Unified Messaging server then ensures that the final message delivered to the user is identical with the fax messages generated by the Exchange 2007 UM. Partner fax solutions must meet a set of specific requirements in order to interoperate with Exchange 2010 UM (1). Hence, customers can obtain specialized fax features provided by partner fax solutions, while users continue to receive and manage their faxes created by the Exchange UM server and delivered to their unified mailboxes together with their email and voice mail.

Sagem-Interstar's XMediusFAX is a certified partner fax solution designed for Exchange 2010 UM to deliver inbound fax while providing additional business critical functionality. XMediusFAX, a software only fax server solution provides critical capabilities such as outbound faxing, fax archiving, process automation and advanced routing. XMediusFAX offers feature rich integration tools for application integration and a complete suite of survivability options for Disaster Recovery, High-Availability and remote branch offices. For more details on Sagem-Interstar's products and solution, please visit <http://www.sagem-interstar.com/>

### Objectives

This document describes the pilot deployment of the new fax functionality in Microsoft's corporate dogfood environment. The sections that follow focus on the deployment aspects as they relate to lighting up the fax functionality. For each of the described system components, there will be other general basic requirements necessary; this document examines only the fax-related aspects. The document is aimed at messaging systems' administrators and integrators, who will be deploying Unified Messaging server role in an Exchange Server 2010 organization with a partner fax solution. This paper assumes that the audience is already familiar with the concepts of TCP/IP networks, Windows Server®, and the Active Directory® directory service. A high-level understanding of the features and technologies included in Exchange Server 2010 is also helpful. Detailed product information is available in the Microsoft Exchange Server TechNet Library at <http://technet.microsoft.com/en-us/exchange/default.aspx>.

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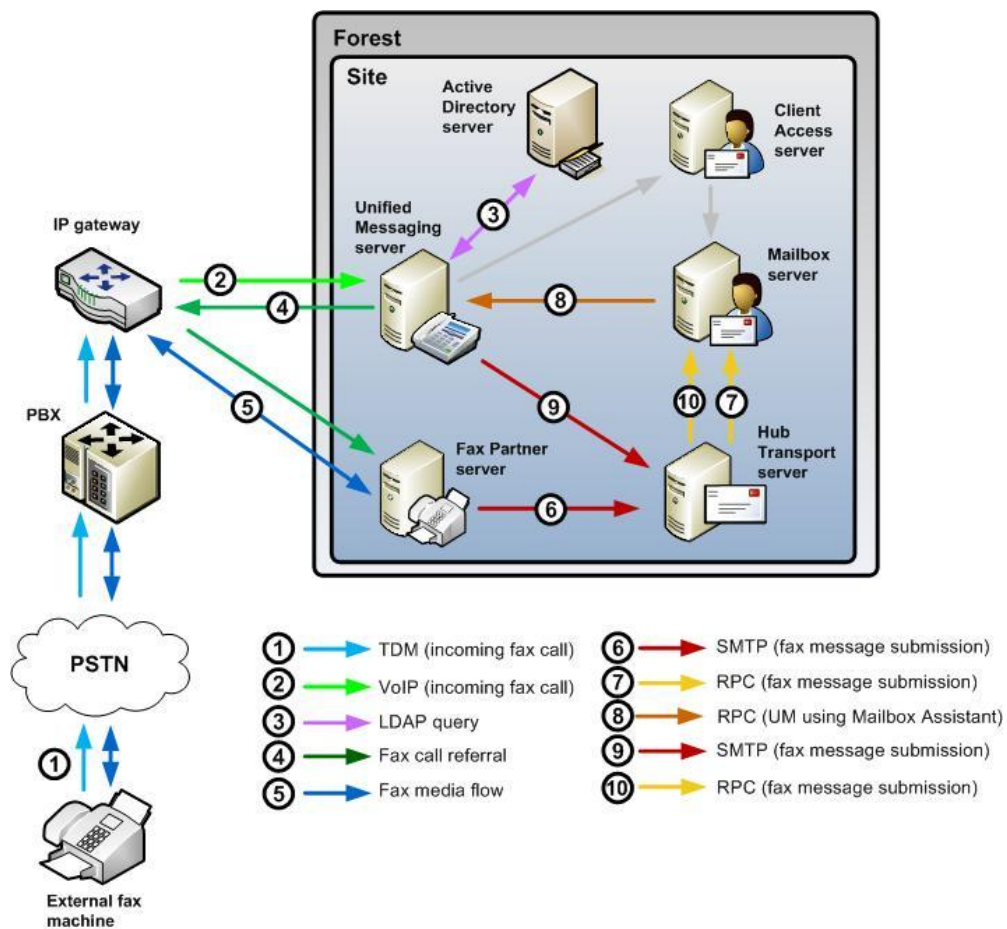
**Note:** *For security reasons, the sample names of forests, domains, organizations, and other internal resources mentioned in this paper do not represent real resource names used within Microsoft and are for illustration purposes only.*

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## Solution Overview

### Fax Server Referral

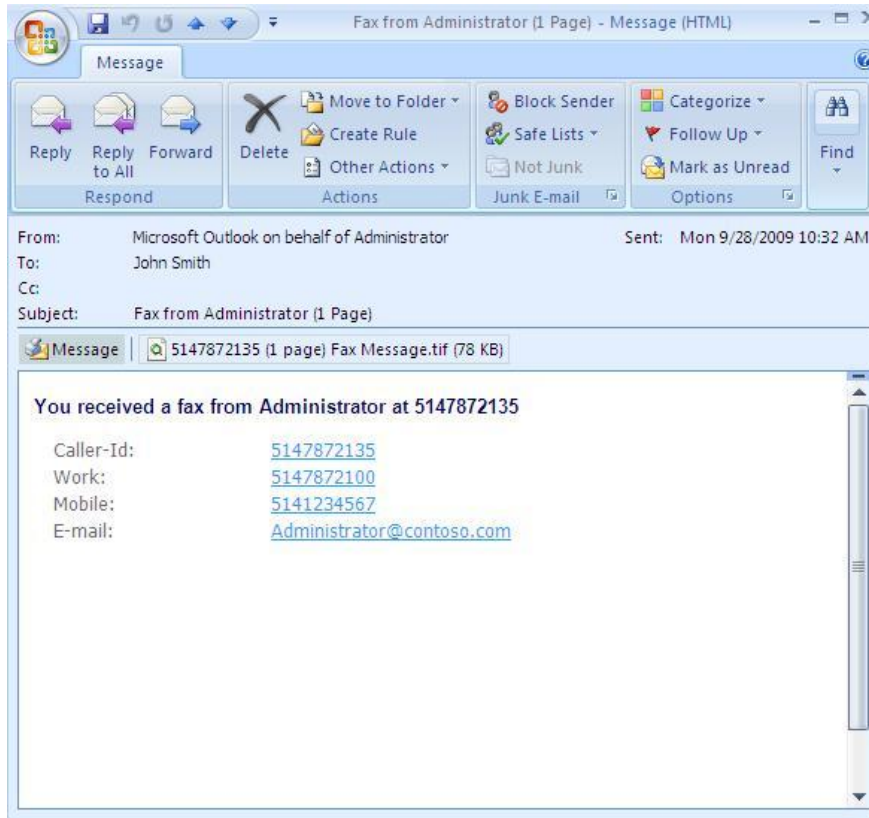
Exchange 2010 Unified Messaging server brings together the telephony world and the messaging world. In between the server and the PBX, there is a SIP Peer (such as a media gateway), that translates the TDM traffic into an IP-based traffic, which the UM server can understand. Fax calls rely on an additional component, i.e., a partner fax solution. A general overview of a fax call handling by Exchange 2010 UM is shown in Figure 1. When a fax signal reaches Exchange 2010 UM (light green arrow), the server queries Active Directory to determine whether the intended recipient of the call is provisioned for fax as well as to establish the SIP address of the partner fax solution, where the call should be referred (purple arrow). After having verified



**Figure 1: Overview of the fax call referral between Exchange 2010 UM server and Sagem Interstar XMediusFAX solution**

these, the UM server issues the fax call referral request to the SIP Peer, which then requests from the partner fax solution that the call be established (dark green arrows). After successfully establishing the call, the fax sender sends the fax media to the partner fax solution such as XMediusFAX (navy blue arrow). After the transmission, partner fax solution sends an email containing the TIFF image of the fax and special X-headers to the fax recipient via SMTP (yellow arrow). After the message

is authenticated as a valid partner fax and UM mailbox assistant detects a partner fax arrive in the user's mailbox, it issues an RPC call to the UM server, which ensures that the message's properties match those of fax messages created by Exchange 2007 UM (red arrow). Finally, UM sends the final fax message, as shown in Figure 2 to the recipient's mailbox via SMTP (yellow arrow). The details of fax call SIP signaling are given in the Appendix.



**Figure 2: An example Exchange 2010 UM fax message viewed using Outlook 2007**

All fax messages are also by default searchable in the Outlook Fax Search folder, as shown in Figure 3.

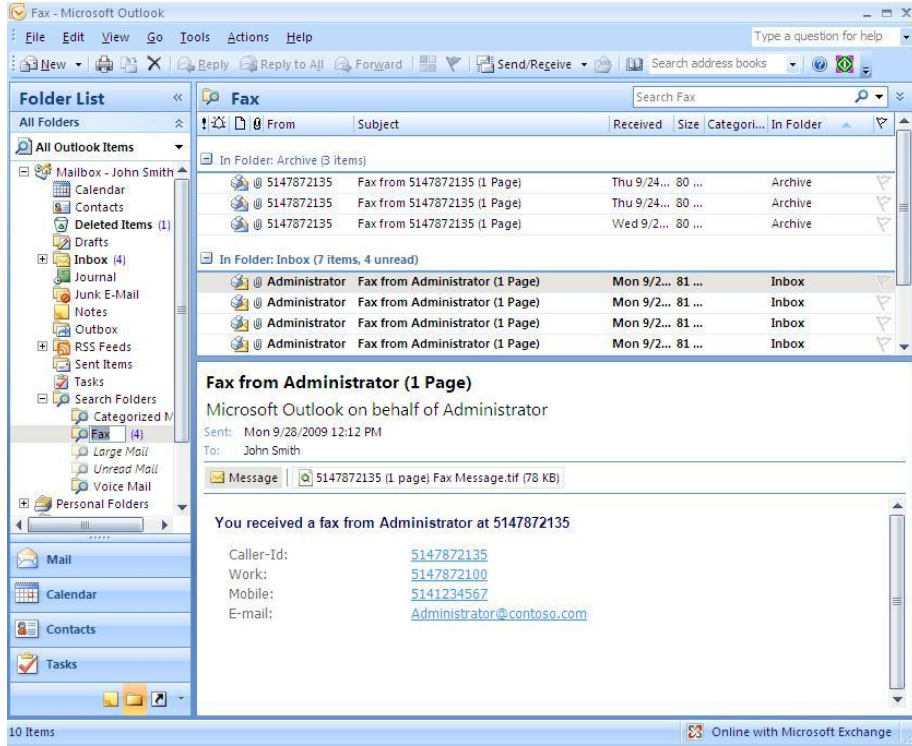


Figure 3: Fax search folder as seen in Outlook 2010

## Solution Overview

### Prerequisites and System Requirements

Here is the list of pre-requisite hardware and software to ensuring an integrated fax experience.

- **Exchange Server 2010** running on Windows Server 2008 or Windows Server R2.
- **Sagem-Interstar XMediusFAX release 6.5** licensed with “Exchange Integration” activated. XMediusFAX supports Windows 2008/2003 32/64 bits.
- **VoIP gateway.** The gateway must be interoperable with Exchange 2010 UM (1).
- **Administrator Rights.** Administrator rights for Exchange 2010 UM and XMediusFAX are required.
- **Network Access.** The UM server needs to be able to receive calls from the VoIP gateway and redirect them to the fax server. The fax server must be able to submit SMTP traffic to the Exchange Hub Transport (HT) Server. UM and HT must be able to communicate.

### Deployment Steps

#### Media Gateway

The media gateway (SIP Peer) used in joint deployment must be certified as interoperable with Exchange UM (1). You must ensure that the newest version of the firmware is installed on the gateway. In our deployment, we used Dialogic DMG2000, whose firmware had to be upgraded to the newest available version (6.0.128) in order to allow for the fax call referral. We also had to remember about configuring the gateway to point to the IP of the DNS server to resolve the FQDN of the fax server as shown in **Error! Reference source not found.**

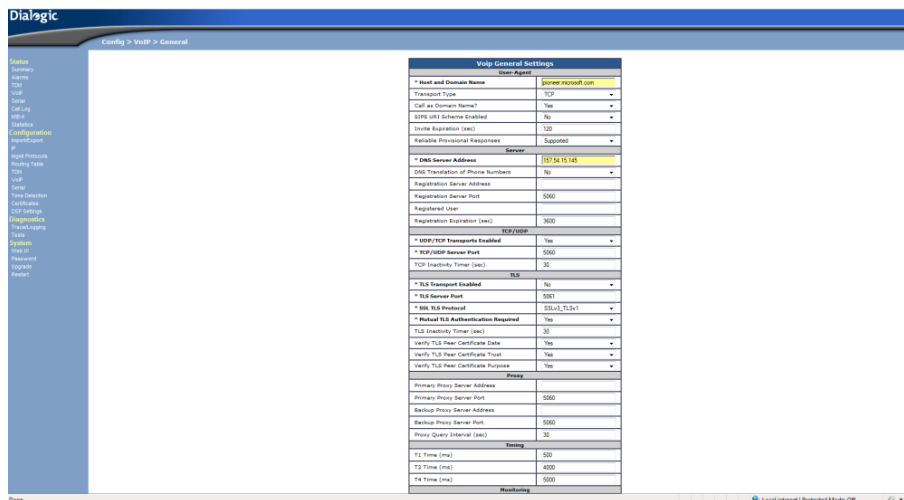


Figure 4: Dialogic DMG 2000 DNS server configuration screen.

Alternatively, configuring the UM server (described later in the document) with the fax server's IP rather than FQDN bypasses the need for the DNS configuration on the gateway. The gateway was configured to detect the fax tone as shown in Figure .

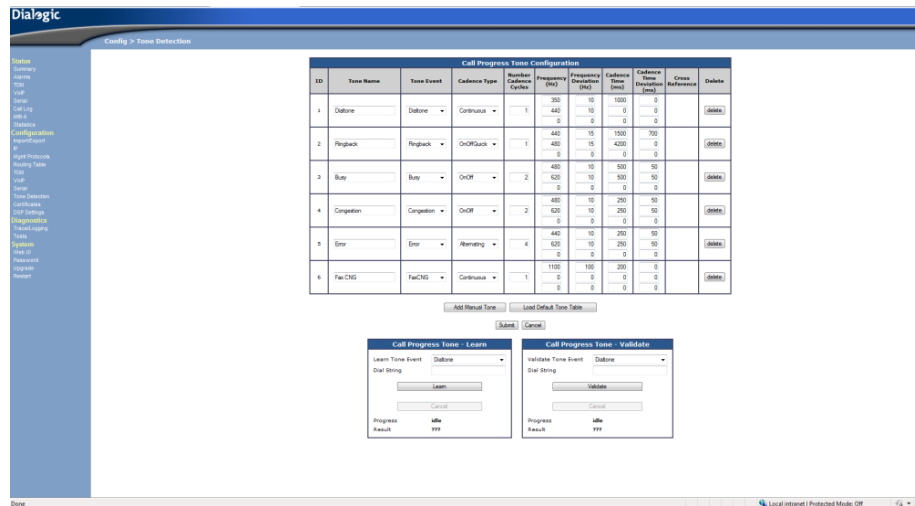


Figure 5: DMG2000 fax tone detection configuration.

### Corporate requirements on SMTP submission

Different enterprises may have different requirements with regards to SMTP submission. If a mail server tries to submit mail to other server on the company's network, it must typically be a member of a special security group to allow it for submission and relay using other servers (e.g., unauthenticated submission over port 25). The fax server was added to the Mail Servers security group for submissions on the MS internal network. (2)

### Corporate requirements on security policy

Corporate requirements also dictate the specific networking security policy. In MSIT's network, IPsec is applied to all traffic and hence specific messaging policies are applied to Organizational Units and Security Groups in specific forests and domains. The server hosting XMediusFAX had to be added to the Messaging OU to ensure that the proper IPsec policy is applied to the server.

### Firewall exceptions for fax media transmissions

Windows Firewall ports on the fax server must be configured to allow XMediusFAX to receive the SIP signaling (configurable, most often TCP 5060) as well as fax media which uses the ephemeral port range (UDP 49152-65535).

The solution of choice is to create a new Inbound firewall rule, type "Program", that allows the XMediusFAX Driver executable, located in:

*%ProgramFiles%\XMediusFAX\Bin\XMFaxDriver.exe* to accept all inbound connections. The rule, once enabled is shown in Figure .

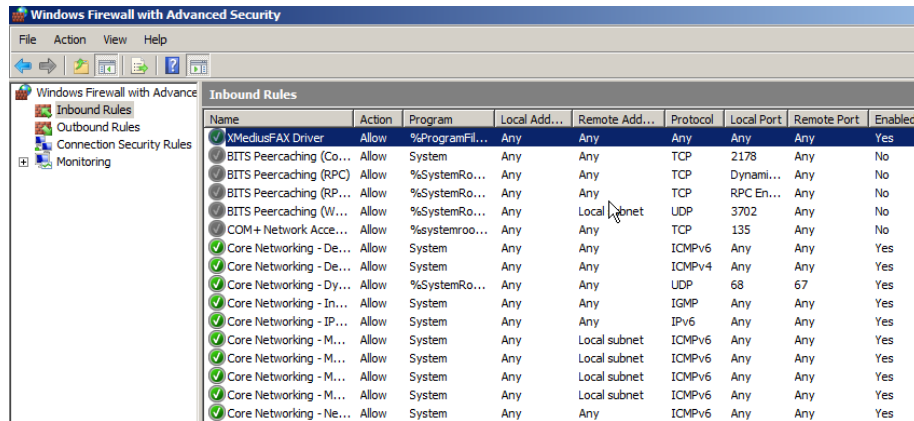


Figure 6: Windows 2008 Firewall Inbound rule for XMediusFAX.

### XMediusFAX Configuration

The full XMediusFAX deployment and configuration instructions are given in the Installation and Administration guides (3). This section describes the specific aspects of XMediusFAX integration with Exchange 2010 UM. Note that it is possible that the following configurations have been completed through the **First Time Setup Wizard** which runs immediately after the installation of XMediusFAX. Therefore the following steps may simply require that existing configurations are correct for your environment.

First, a special “Exchange UM Routing” rule must be added to the Incoming Routing Table to allow XMediusFAX to accept fax calls redirected from the UM server. To add it, we accessed the XMediusFAX Administrative MMC the Incoming Routing Table node which is available under the Configuration section of our Site (PIONEER) as shown in **Error! Reference source not found.** and used the “Add Exchange UM Rule” button. The Routing Table Entry Properties that pops up as shown in **Error! Reference source not found.** are then validated by clicking OK.

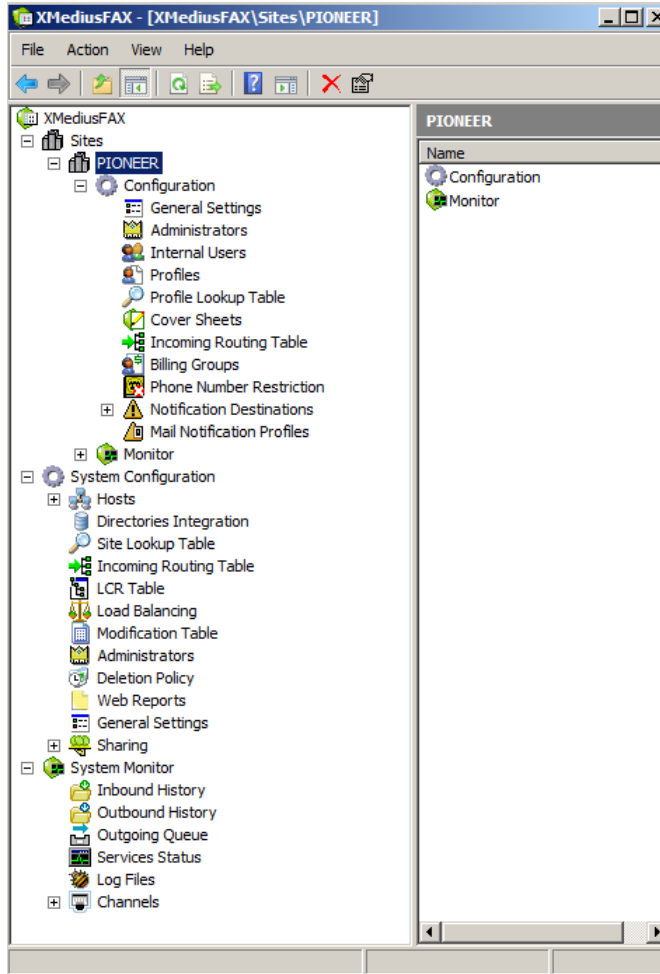


Figure 7 XMediusFAX Administrative MMC

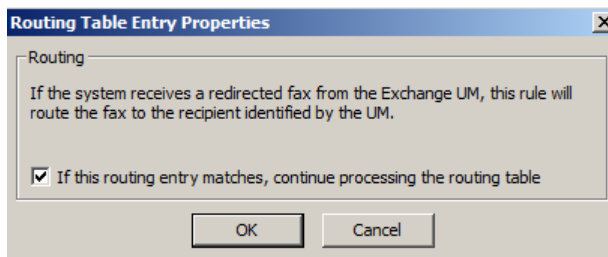
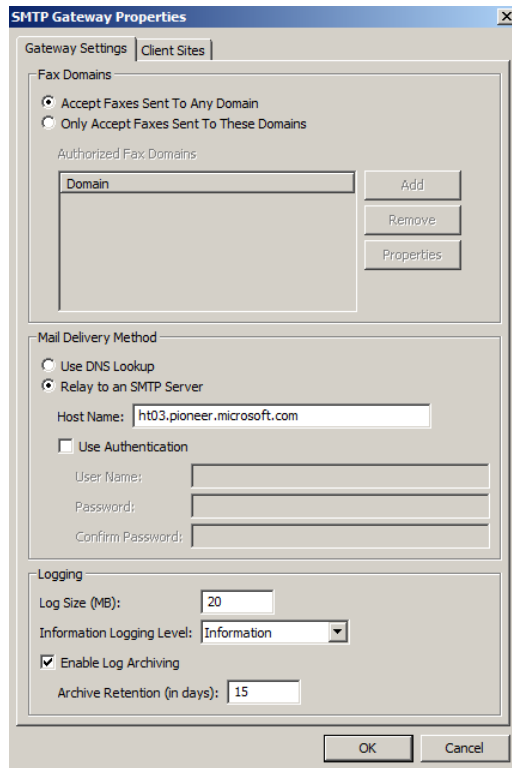


Figure 8: UM Routing Table Entry

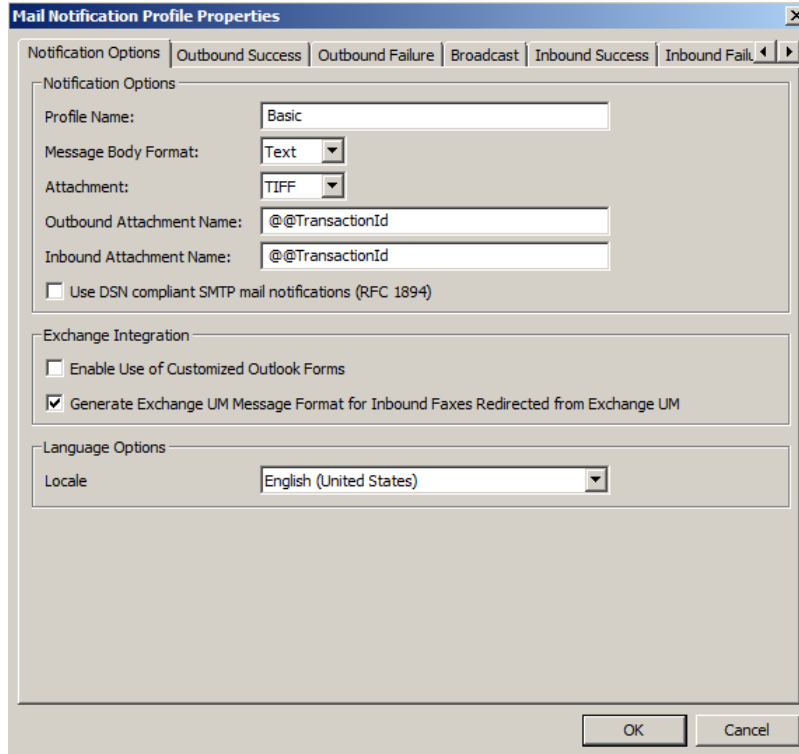
Second, XMediusFAX must be configured with an SMTP relay to submit the emails to. To do this, we selected our Host name in the Hosts group of the XMediusFAX Configuration Panel and accessed SMTP Gateway's Properties as shown in Figure . In the Mail Delivery Method section of the SMTP Gateway Properties dialog, we

selected the “Relay to an SMTP Server” option and entered the name of our Hub Transport Exchange server in the Host Name field as shown in Figure



**Figure 9: SMTP Gateway configuration node**

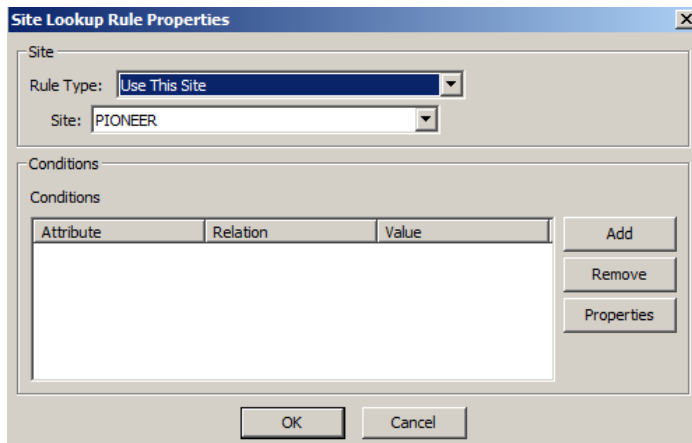
Third, the Mail Notification Profile must be configured under the Site’s configuration. In the Exchange Integration section of the Notification Options tab of the Profile, shown in Figure , we selected Generate Exchange UM Message Format for Inbound Faxes Redirected from Exchange UM to ensure that the messages coming from XMediusFAX are properly formatted for the UM server.



**Figure 10: Notification Profile**

Finally, you must define the site for all users since XMediusFAX must associate a Site and a Profile for every user. To do this, in the XMediusFAX administration interface, we access the Site Lookup Table node under System Configuration and edited the existing Site lookup rule, changing it to "Use This Site" and choosing the XMediusFAX site as shown in Figure .

**Note:** This setting change allows anybody to send and receive faxes through the XMediusFAX system. There are several ways to control users within XMediusFAX, please consult the Administration guide for more information.

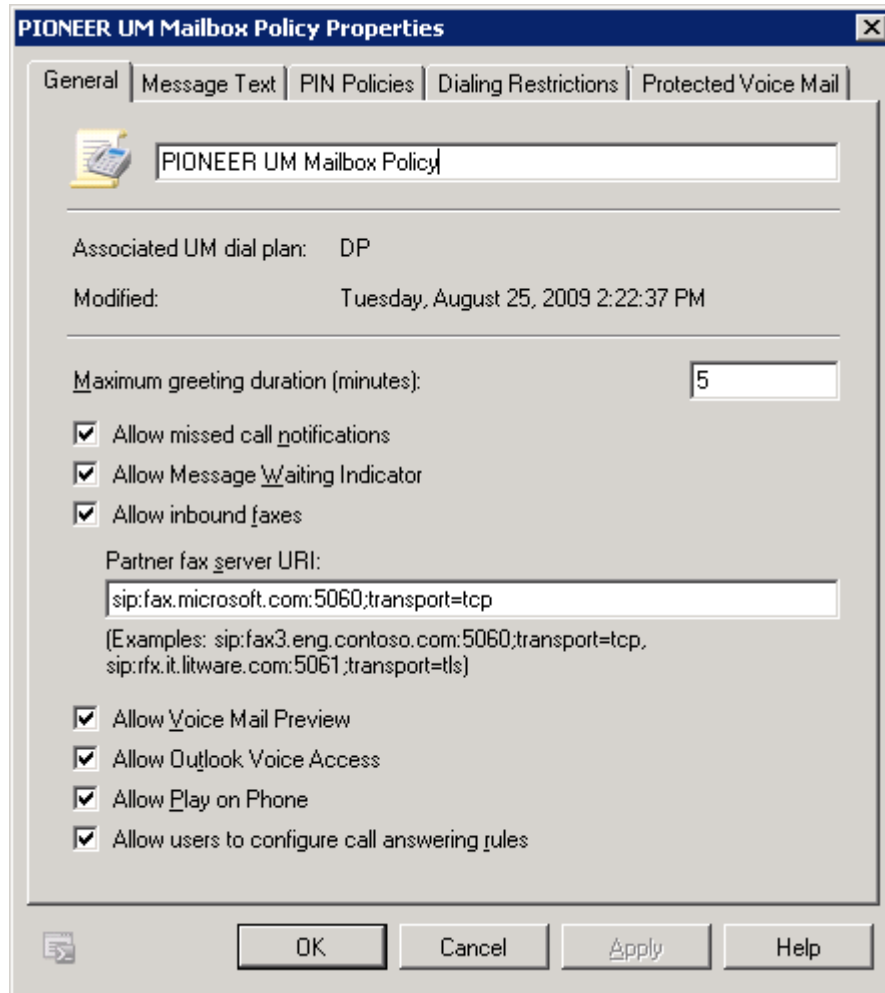


**Figure 11: User to Site mapping table**

### Exchange Unified Messaging Configuration

To configure the Exchange 2010 Unified Messaging server for interoperability with XMediusFAX, you must do exactly two changes on your Exchange servers: first, enable fax on UMMailboxPolicy; second, set an authentication mechanism between UM and Partner.

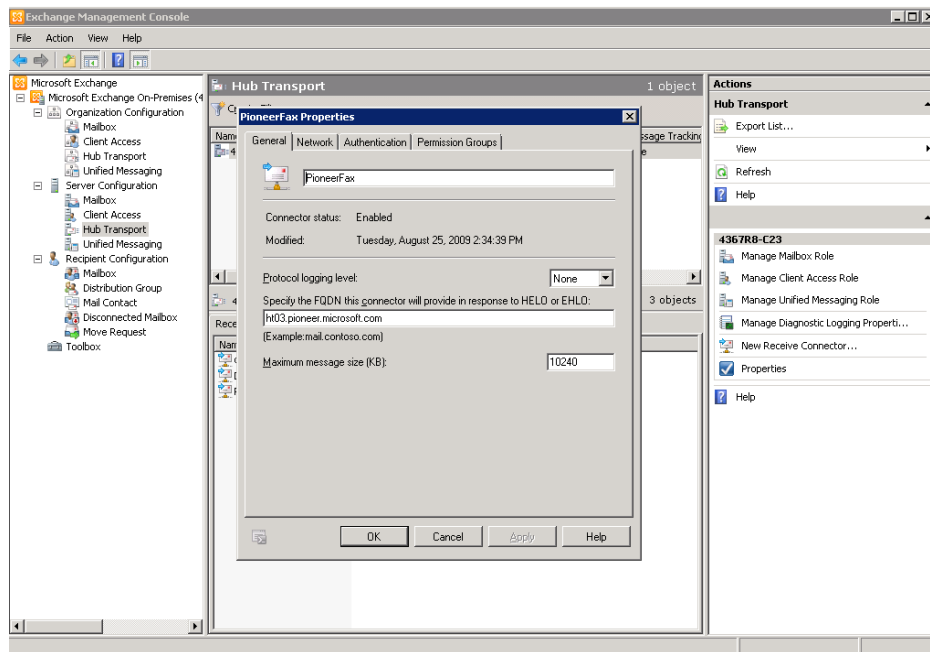
First, we enabled fax on the UMMailboxPolicy via Exchange Management Console by accessing the selected UMMailboxPolicy object under the Organization's Unified Messaging Configuration. The "Allow inbound faxes" attribute on UMMailboxPolicy was enabled and the Partner Fax server URI entered as shown in Figure .



**Figure 12: UMMailboxPolicy settings**

Second, the UM server must be able to authenticate the origin of the messages claiming to be coming from partner fax solution. Since XMediusFAX is deployed within the corporate perimeter and is therefore trusted, we decided to use a Receive Connector on the corporate Hub Transport server to ensure trust relationship between the UM server and the Partner, specifically an externally secured, IP-based Receive Connector allowing the traffic from XMediusFAX to enter Exchange as authenticated. On one of the Hub Transport servers (the same one as the SMTP relay

server selected in XMediusFAX above), under the Server Configuration in ECP, we created a “New Receive Connector” as shown in Figure .



**Figure 13: Creating a Fax Receive Connector**

The Fax Receive Connector uses all available local interfaces to receive mail and is configured to receive the mail directly from the fax server’s IP. For authentication, it relies on “Externally Secured” authentication method as it is a trusted server within the company’s perimeter. Permission Groups on this connector are set to Exchange Servers and Partners.

Alternatively to the UI-based setup, both the UMMailboxPolicy and the ReceiveConnector can be configured to accommodate faxing as follows:

```
[PS] D:\> Set-UMMailboxPolicy -Name <PolicyName> -AllowFax $true -FaxServerURI <Fax Server URI>
```

```
[PS] D:\> New-ReceiveConnector -Name <ConnectorName> -Bindings "0.0.0.0:25" -RemoteIPRanges <FaxServerIPRange> -AuthMechanism ExternalAuthoritative -PermissionGroups ExchangeServers,Partners
```

Where:

- <PolicyName> is the name of the UMMailboxPolicy object;
- <FaxServerURI> is the URI of the partner fax solution, for example “sip:fax.microsoft.com:5060;transport=tcp”;
- <ConnectorName> is the name for this ReceiveConnector object;

- <FaxServerIPRange> is IP address range of the host(s) where the XMediusFAX SMTP Gateway is running

## Fax Server Referral

The users should expect to see the faxes turn up in their mailboxes like before, with Exchange 2007 UM. An example fax produced with Exchange 2010 Unified Messaging and XMediusFAX is shown in Outlook 2010 in **Error! Reference source not found.** and is shown in Outlook Web App 2010 in Figure 1.

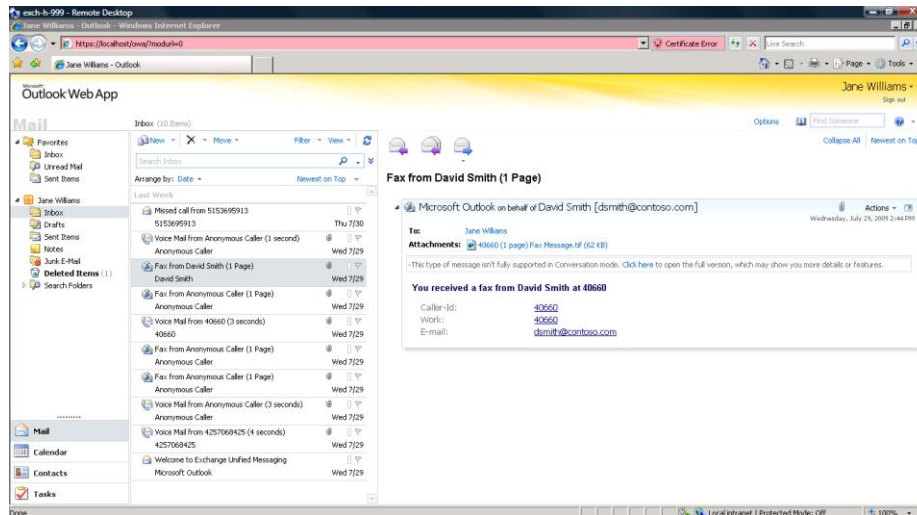


Figure 1: Example Exchange 2010 UM fax message as viewed in OWA 2010

## Troubleshooting Tips

Deployment of Exchange 2010 UM with a partner fax solution such as Sagem-Interstar's XMediusFAX is not complex, however it is recommended to remember the following:

1. Ensure proper network connectivity between the SIP Peer and the partner fax solution.
2. Ensure that appropriate ports on the SIP Peer (Media Gateway) for fax transmission are open (UDP 49152-65535) and firewall rules are set accordingly
3. Ensure that the UM user's mailbox has been set up correctly; ensure that voice mails left for the user appear in the user's inbox.
4. Ensure that Exchange Mailbox Assistant and Exchange Hub Transport services are started and running properly.
5. Ensure that you are using Exchange Server 2010 Build 14.00.0544.000 or later.
6. Ensure that the FaxServerURI attribute in UMMailboxPolicy points to the correctly set up partner fax solution.

7. Collect network captures to ensure that fax call is being transferred by Exchange 2010 UM. Verify that in response to SIP Invite message from the SIP Peer, UM is sending a REFER message containing "Referred-by" header.
8. If the faxes appear as unformatted regular emails in the users' inbox, then first check the headers of the message and determine if the Content-Class header contains "unauthenticated" as one of its values. If that is the case, then create a new Exchange Transport receive connector which specifically allows the fax partner (described in the Setup Instructions).

## Appendix

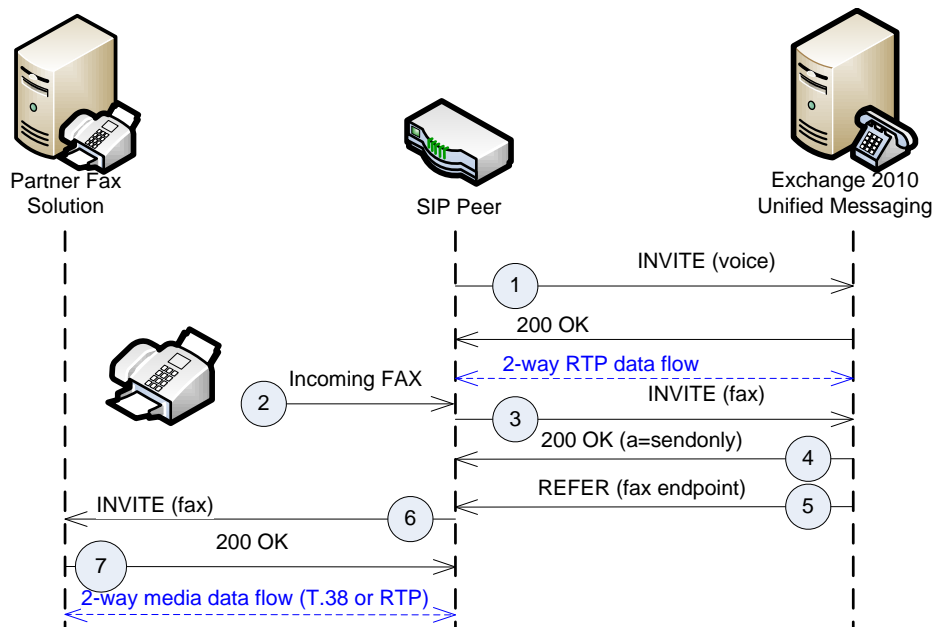
### Fax Call Referral Methods

#### Exchange 2010

An incoming fax call can be signaled to Exchange 2010 UM via either SIP re-INVITE from the SIP Peer (media gateway), CNG notification by the SIP Peer or CNG detection by the UM server. The following subsections detail the fax call referral in each case.

#### Re-INVITE from SIP Peer

The call flow in this scenario proceeds as shown in Figure 15 below.

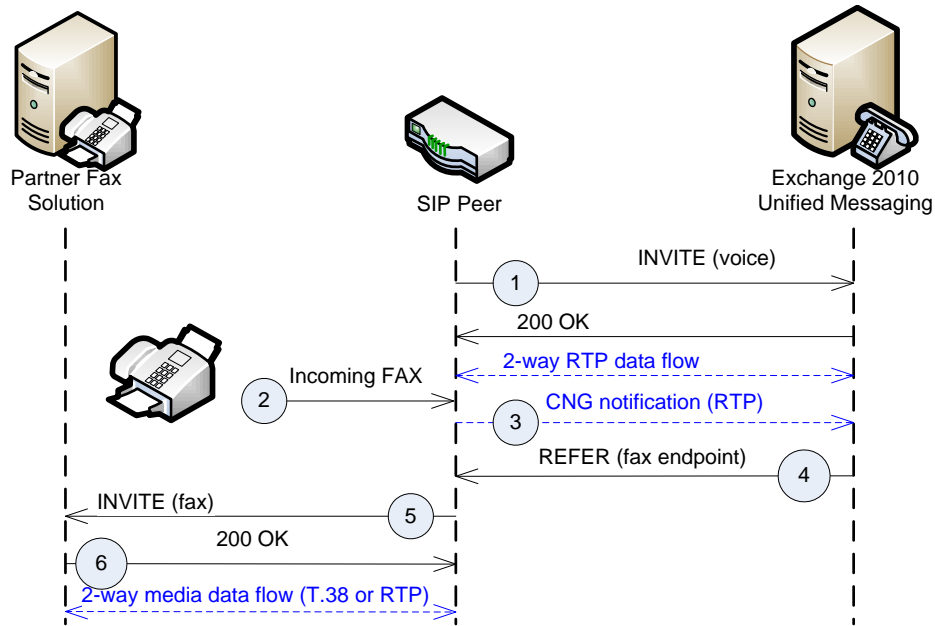


**Figure 2: Exchange 2010 UM fax call referral when the incoming fax is indicated with a re-INVITE.**

An inbound call to a UM pilot number is directed to UM as an INVITE with a voice (RTP/audio) SDP profile (1). UM accepts the invitation and media streams are established. After the call has been established, fax transmission is initiated by the caller (2). The SIP peer detects the calling fax tone (CNG). The SIP Peer issues a re-INVITE to the UM server, this time specifying a fax (T.38 or G.711) profile in the SDP (3). UM responds to the invitation with a 200 OK that places the SIP Peer “on hold” (4). UM issues a REFER, referring the SIP Peer to a Fax Partner Solution endpoint, obtained from its configuration data (5). The SIP Peer sends the fax session INVITE to the Fax Partner Solution (6). The Fax Partner Solution accepts the invitation, and a media session is established with the SIP Peer.

### CNG Notification by SIP Peer

The call flow in this scenario proceeds as shown in Figure 16 below.

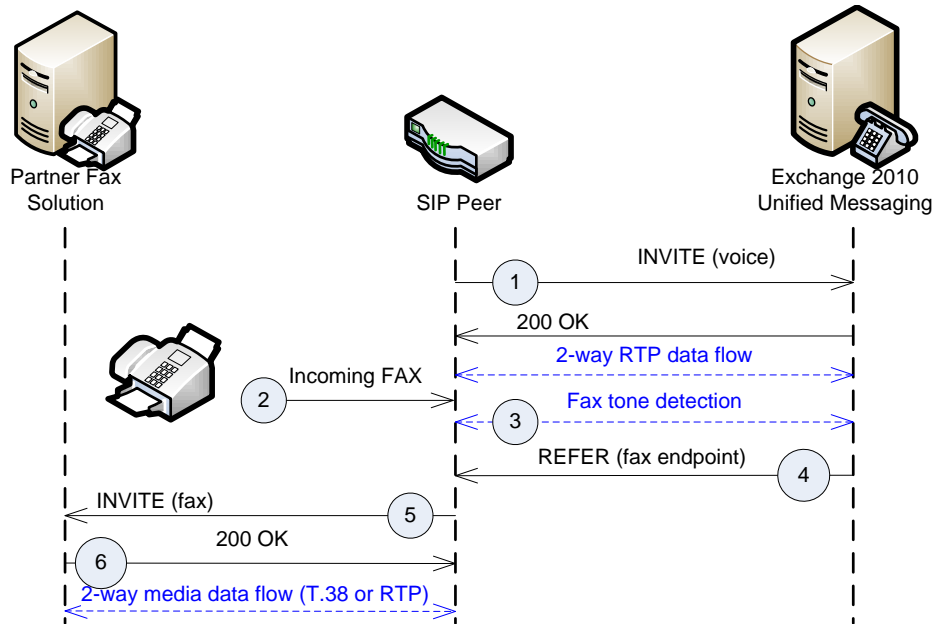


**Figure 3: Fax call referral after CNG notification.**

In this profile, first an inbound call to a UM pilot number is directed to UM as an INVITE with a voice (RTP/audio) SDP profile (1). UM accepts the invitation and media streams are established. After the call has been established, fax transmission is initiated by the caller (2). The SIP peer detects the calling fax tone (CNG). The SIP Peer notifies the UM server of the fax by sending a CNG notification in the RTP stream, compliant with RFC 4733 (3). UM responds to the notification by immediately issuing a REFER and thus referring the SIP Peer to a Fax Partner Solution endpoint, obtained from its configuration data (4). The SIP Peer sends the fax session INVITE to the Fax Partner Solution (5). The Fax Partner Solution accepts the invitation (6), and a media session is established with the SIP Peer.

CNG Detection by UM server

The call flow in this scenario proceeds as shown in Figure 17 below.



**Figure 4: Fax call referral after CNG detection by UM server.**

In this scenario, first, an inbound call to a UM pilot number is directed to UM as an INVITE with a voice (RTP/audio) SDP profile. UM accepts the invitation and media streams are established (1). After the call has been established, fax transmission is initiated by the caller (2). The UM server detects fax (CNG) tone in the RTP audio stream (3). UM responds to the notification by immediately issuing a REFER and thus referring the SIP Peer to a Fax Partner Solution endpoint, obtained from its configuration data (4). The SIP Peer sends the fax session INVITE to the Fax Partner Solution (5). The Fax Partner Solution accepts the invitation (6), and a media session is established with the SIP Peer.

<sup>1</sup> By default, Exchange UM servers do not check for fax tone in audio: each must be configured to do so.

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1. SIP Interoperability with Exchange UM. [Online]
2. Security Groups. [Online] [Cited: 8 3, 2009.] <http://technet.microsoft.com/en-us/library/bb123521.aspx>.
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