


Configuring SBC Edge for One Number Fax in MS Exchange Environment

 Not supported by SBC SWe Lite in this release.

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Overview

This Best Practice describes One Number Fax (ONF) feature configuration for the SBC Edge (SBC) in a MS Exchange environment. This document assumes you are familiar with the following:

- MS Active Directory and MS Exchange / Unified Messaging Server
- Sonus Edge (SBC 1000/2000)
- A third party Fax Server (i.e., RightFax, XMedius, etc.)


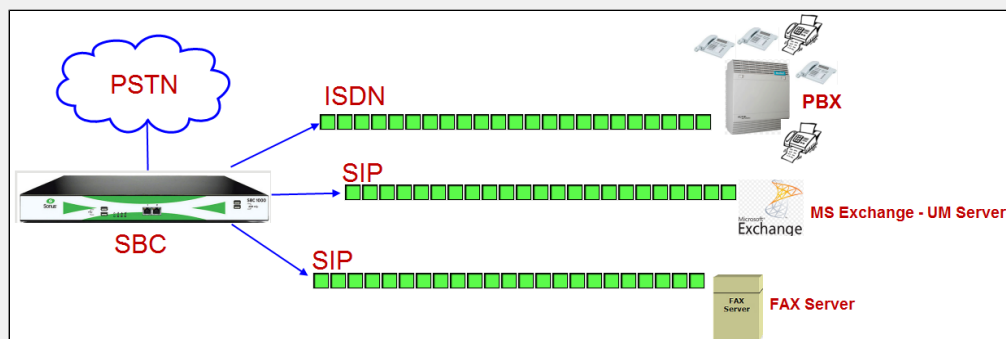
 This document assumes the SBC is already configured with Exchange UM Server. See [Best Practices - Upstream Deployment in PSTN - UX - eUM Server Setup](#).

Figure 1: Topology - One Number Fax in MS Exchange Environment



Configure One Number Fax

The table below lists the configuration steps required for One Number Fax; each of these steps is detailed below.

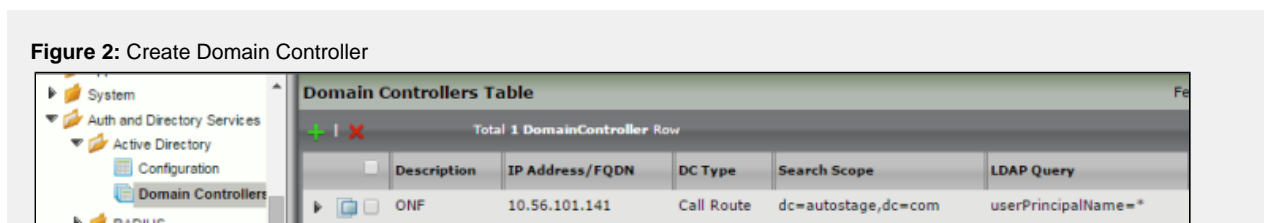
Table 1: One Number Fax - Configuration through the WebUI

WebUI Option	What to Configure
Domain Controller and Active Directory	<ul style="list-style-type: none"> • Domain Controller Configuration for AD query • AD Configuration for attributes (i.e: facsimileTelephoneNumber)
Action Configuration and Set	<ul style="list-style-type: none"> • Action Configuration for One Number Fax call • Action Set Configuration for ONF call determination and logic
Transformation Tables	<ul style="list-style-type: none"> • Transformation table for DIGIT dialing • Transformation table for AD normalization • Transformation table for non-digit dialing
Media List	<ul style="list-style-type: none"> • Media List Configuration with T.38 and CNG Tone Detection
Signaling Group	<ul style="list-style-type: none"> • ISDN Signaling Group with Action Set
Routing Tables	<ul style="list-style-type: none"> • Routing Table for FAX calls • Routing Table for VOICE calls
Licensing	<ul style="list-style-type: none"> • ISDN, DSP, and SIP licenses required for SBC - Exchange UM integration • One Number Fax feature is not controlled by license

Step 1 - Configure Domain Controller and Active Directory

One Number Fax may or may not use the user's **facsimileTelephoneNumber** attribute that is configured in Active Directory (AD). If AD integration in Call Routing is desired, the Domain Controller and Active Directory must be configured in the SBC as follows:

1. Log into the WebUI and navigate to **Active Directory> Domain Controller**.
2. Create an entry with your domain controller's IP or FQDN (with the Call Route DC type, relevant search scope, and an LDAP query attribute), as shown below:



Navigate to **Active Directory> Configuration** and configure it as shown below:

Figure 3: Configure AD

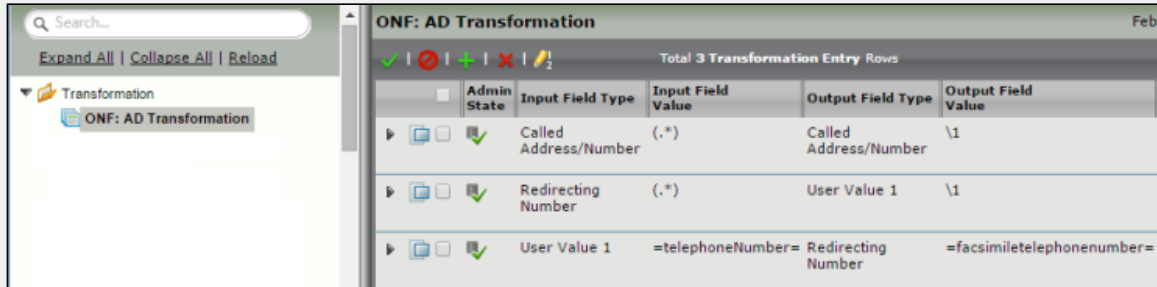
The screenshot displays a configuration interface for Active Directory. On the left is a navigation tree with categories like Transformation, Call Routing Table, Signaling Groups, Node Interfaces, Application Solution Module, System, Auth and Directory Services, and RADIUS. The 'Auth and Directory Services' section is expanded to show 'Active Directory', with 'Configuration' selected. The main area is divided into two sections: 'Active Directory Configuration' and 'Cache Settings'. In the 'Active Directory Configuration' section, 'AD Enabled' is set to 'True', 'Use TLS' is 'False', 'Operating Mode' is 'Updates', and 'Nested Group Lookup for Authentication' is 'True'. The 'Cache Settings' section includes 'Normalize Cache' (False), 'Update Frequency' (240 mins), 'Configure Initial Update Time' (False), and 'AD Backup' (Disable). The 'Cache Attributes' list contains 'telephoneNumber', 'userPrincipalName', and 'facsimileTelephoneNumber', with the latter highlighted in yellow. 'Add' and 'Remove' buttons are visible next to the list.

Step 2: Configure Transformation Tables

If AD in Call Routes is planned to be use in your deployment:

1. Log into the WebUI and navigate to **Transformation**.
2. Create a transformation entry to passthrough the Called Address/Number, and normalize the Redirecting Number as **facsimiletelephonenumber** using the AD integration.

Figure 4: Create Transformation Entry - AD in Call Route



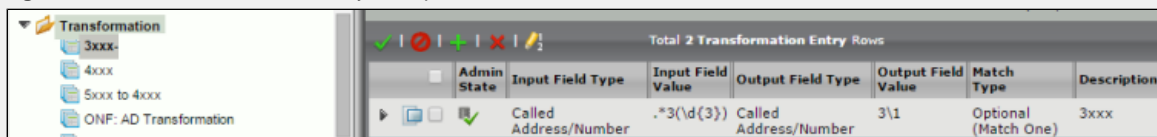
Admin State	Input Field Type	Input Field Value	Output Field Type	Output Field Value
<input type="checkbox"/>	Called Address/Number	(.*)	Called Address/Number	\1
<input type="checkbox"/>	Redirecting Number	(.*)	User Value 1	\1
<input type="checkbox"/>	User Value 1	=telephoneNumber=	Redirecting Number	=facsimiletelephonenumber=

If AD is not intended to be used in Call Routes in your deployment:

1. Log into the WebUI and navigate to **Transformation**.
2. Create a transformation entry to passthrough the Called Address/Number as shown below.

NOTE: In the example below, the endpoint extension numbers and the eUM Subscriber Number are 3xxx-.

Figure 5: Create Transformation Entry - Endpoint Extension and eUM Subscriber

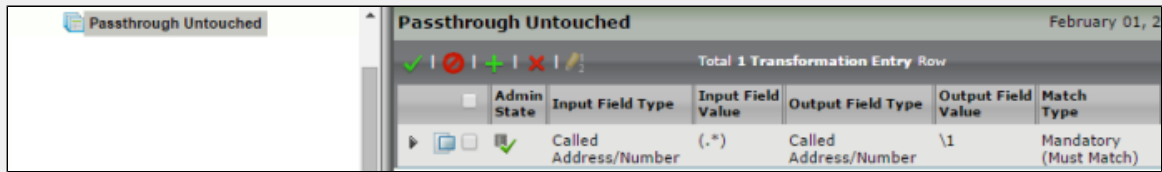


Admin State	Input Field Type	Input Field Value	Output Field Type	Output Field Value	Match Type	Description
<input type="checkbox"/>	Called Address/Number	.*3(\d{3})	Called Address/Number	3\1	Optional (Match One)	3xxx

3. Log into the WebUI and navigate to **Transformation**.
4. Create a transformation entry to passthrough the Called Address/Number as shown below.

NOTE: When a call is referred to the Fax Server by eUM, the request header does not contain an extension number. Therefore, this piece of transformation is needed for the calls going to Fax Server.

Figure 6: Create Transformation Entry - Fax Server by eUM



The screenshot displays a software interface for creating a transformation entry. The main window is titled "Passthrough Untouched" and shows a table with one data row. The table has the following columns: Admin State, Input Field Type, Input Field Value, Output Field Type, Output Field Value, and Match Type. The data row contains the following values: Admin State is unchecked, Input Field Type is "Called Address/Number", Input Field Value is "(.*)", Output Field Type is "Called Address/Number", Output Field Value is "\1", and Match Type is "Mandatory (Must Match)".

<input type="checkbox"/> Admin State	Input Field Type	Input Field Value	Output Field Type	Output Field Value	Match Type
<input type="checkbox"/>	Called Address/Number	(.*)	Called Address/Number	\1	Mandatory (Must Match)

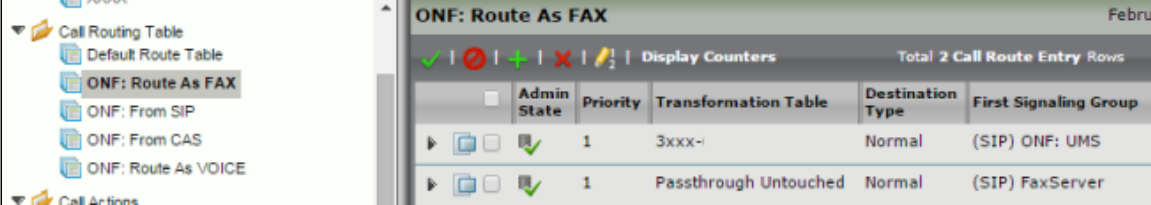
Step 3: Configure Routing Tables

Two Call route entries need to be created: one for Fax calls, and the other for Voice calls:

1. Log into the WebUI and navigate to the **Call Routing Table**.
2. Create the following two Call Routing Table Entries.

In **Fax Calls** where the CNG tone will be detected, a second entry needs to be added in the table to route calls to FAX Server:

Figure 7: Create Fax Entry

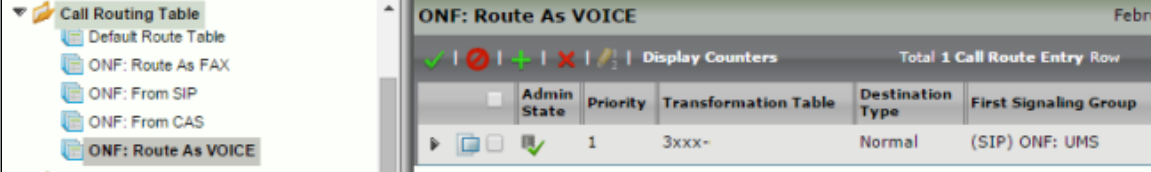


The screenshot shows the 'ONF: Route As FAX' configuration page. The left sidebar lists 'Call Routing Table' with sub-items: 'Default Route Table', 'ONF: Route As FAX', 'ONF: From SIP', 'ONF: From CAS', and 'ONF: Route As VOICE'. The main area displays a table with two entries:

Admin State	Priority	Transformation Table	Destination Type	First Signaling Group
<input type="checkbox"/>	1	3xxx-	Normal	(SIP) ONF: UMS
<input type="checkbox"/>	1	Passthrough Untouched	Normal	(SIP) FaxServer

For **Voice calls**, there is no need for an entry to Fax Server, therefore we create a Route Table for one entry for number transformation:

Figure 8: Create Voice Entry



The screenshot shows the 'ONF: Route As VOICE' configuration page. The left sidebar lists 'Call Routing Table' with sub-items: 'Default Route Table', 'ONF: Route As FAX', 'ONF: From SIP', 'ONF: From CAS', and 'ONF: Route As VOICE'. The main area displays a table with one entry:

Admin State	Priority	Transformation Table	Destination Type	First Signaling Group
<input type="checkbox"/>	1	3xxx-	Normal	(SIP) ONF: UMS

Step 4: Create Action Configuration and Action Set

1. Log in to WebUI and navigate to **Call Actions**.
2. Configure an **Action Configuration** as shown below:

Figure 9: Configure Action Configuration Table

Description	Action	Action Parameter 1	Action Parameter 2	Priority Key
CNG Detection Action	Detect CNG	4000 ms.	N/A	1
Route_As_FAX	Route Call	ONF: Route As FAX	N/A	2
Send Alert	Send Alert	N/A	N/A	3
Send Connect	Send Connect	N/A	N/A	4
Release Action	Release Call	Cause Code: 16	N/A	5
Route_As_VOICE	Route Call	ONF: Route As VOICE	N/A	6

If you plan to utilize AD in Call Route, create an Action Set as shown below:

Figure 10: Use AD in Call Route

Execute If	Transformation Table	Action on Success	Action on Failure	Description	Primary Key
Always	ONF: AD Transformation	Continue	Route_As_VOICE	AD Query	5
Always	None	Send Alert	Continue	Send Alert	4
Prior Success	None	Send Connect	Continue	send connect	7
Prior Success	None	CNG Detection Action	Continue	detect cng	8
Prior Success	None	Route_As_FAX	Continue	Route the FAX	3
Always	3xxx-	Route_As_VOICE	Release Action	route As VOICE	9

If you plan NOT to utilize AD in Call Routes, create an Action Set as shown below:

Figure 11: AD Not Used in Call Route

Execute If	Transformation Table	Action on Success	Action on Failure	Description	Primary Key
Always	3xxx-	Continue	Route_As_VOICE	AD Query	5
Always	None	Send Alert	Continue	Send Alert	4
Prior Success	None	Send Connect	Continue	send connect	7
Prior Success	None	CNG Detection Action	Continue	detect cng	8
Prior Success	None	Route_As_FAX	Continue	Route the FAX	3
Always	3xxx-	Route_As_VOICE	Release Action	route As VOICE	9

Step 5: Configure Media List

1. Log into the WebUI. on to WebUI and navigate to **Media List** in navigation pane.
2. Create/Modify the Media List to have **T.38 Media Profile and CNG Tone Detection enabled** as shown below:

Figure 12: Media List Configuration

The screenshot displays the configuration page for the 'ONF: UMS Media List'. The left sidebar shows a navigation tree with 'ONF: UMS Media List' selected. The main content area is divided into several sections:

- Description:** ONF: UMS Media List
- Media Profiles List:** A list containing 'ONF: G.711 A-Law Voice', 'ONF: G.711 Mu-Law Voice', and 'ONF: T.38'. The 'ONF: T.38' profile is highlighted. Action buttons (Up, Down, Add/Edit, Remove) are visible to the right.
- Crypto Profile ID:** None
- Media DSCP:** 46 (range [0..63])
- RTCP Mode:** RTCP
- Dead Call Detection:** Disabled
- Silence Suppression:** Enabled

Below these settings are three panels:

- Gain Control:** Receive Gain (0 dB, range [-14..+6]) and Transmit Gain (0 dB, range [-14..+6]).
- Digit Relay:** Digit (DTMF) Relay Type (RFC 2833) and Digit Relay Payload Type (101, range [96..127]).
- Passthrough/Tone Detection:** Modem Passthrough (Disabled), Fax Passthrough (Disabled), and CNG Tone Detection (Enabled).

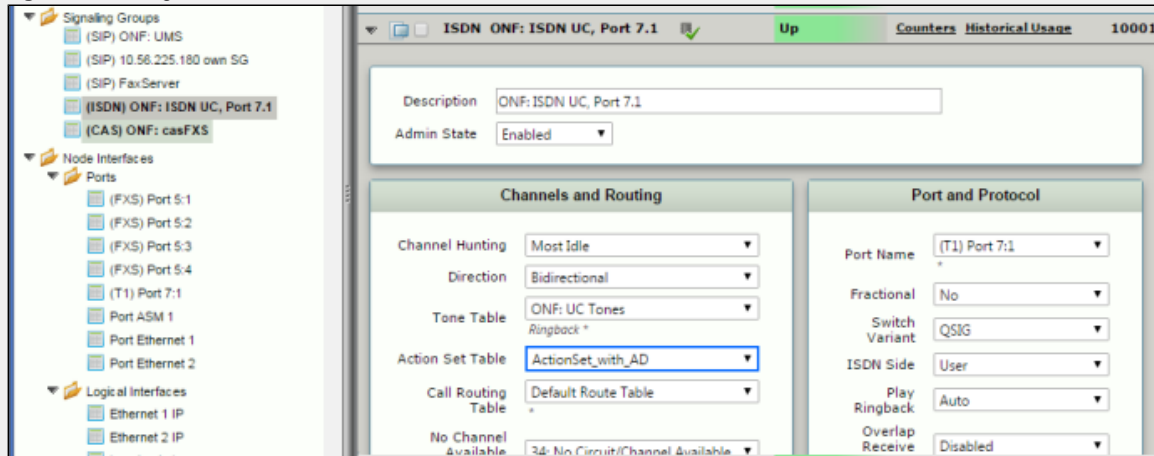
Step 6: Create Signaling Group

As depicted in Topology section, three signaling groups are needed to complete configuration for PBX - SBC - Exchange - Fax Server integration:

SBC - PBX

Ensure the relevant **Action Set** is applied to the ISDN Signaling Group as shown below:

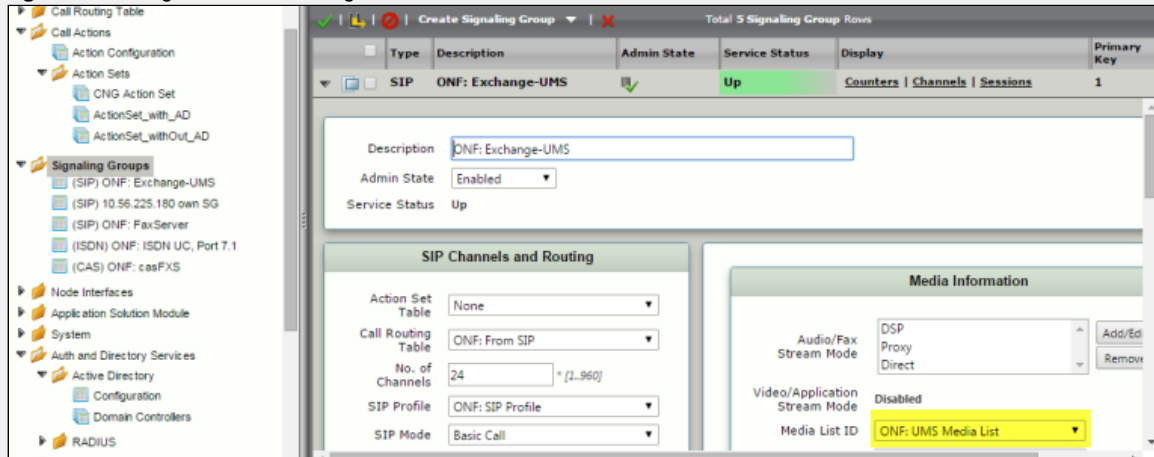
Figure 13: Configure SBC - PBX



SBC - Exchange UM

Ensure the relevant **Media List** is applied to the SIP Signaling Group as shown below:

Figure 14: Configure SBC - Exchange UM



SBC - Fax Server

Ensure the relevant **Media List** is applied to the SIP Signaling Group as shown below:

Figure 15: Configure SBC - Fax Server

The screenshot displays the 'Signaling Group Table' configuration page. On the left is a navigation tree with categories like Transformation, Call Routing Table, Call Actions, Action Configuration, Signaling Groups, Node Interfaces, Application Solution Module, System, Auth and Directory Services, and RADIUS. The 'Signaling Groups' section is expanded, showing several entries, with '(SIP) ONF: FaxServer' selected.

The main configuration area shows a table with one row:

Type	Description	Admin State	Service Status	Display	Primary Key
SIP	ONF: FaxServer	Enabled	Up	Counters Channels Sessions	3

Below the table, the configuration details for the selected group are shown:

- Description:** ONF: FaxServer
- Admin State:** Enabled
- Service Status:** Up

The configuration is divided into two panels:

- SIP Channels and Routing:**
 - Action Set Table: None
 - Call Routing Table: Default Route Table
 - No. of Channels: 24 (with a note * [1..960])
 - SIP Profile: Default SIP Profile
 - SIP Mode: Basic Call
- Media Information:**
 - Audio/Fax Stream Mode: DSP (with Add/Edit and Remove buttons)
 - Video/Application Stream Mode: Disabled
 - Media List ID: ONF: UMS Media List (highlighted in yellow)

Licensing

Ensure **DS1**, **SIP**, and the **Active Directory** licenses are available in your node as shown below:

Figure 16: Licensing

The screenshot displays the 'Current Licenses' section of a management interface, dated February 02, 2016. It is divided into two main sections: 'Port Licenses' and 'Feature Licenses'. The 'Port Licenses' section shows two rows: 'DS1 Ports' with 1 licensed port and 'FXS Ports' with 4 licensed ports. The 'Feature Licenses' section shows 18 rows, including 'SIP Calls' (25 licenses), 'SIP Registrations' (126 licenses), and several features like 'DSP Resources', 'Forking', 'SBA', and 'Active Directory' which are unlimited.

Current Licenses		February 02, 2016 13	
Historical Usage			
Port Licenses			
Total 2 PortLicense Rows			
Feature	Licensed	Number of Licensed Ports	
DS1 Ports	✔	1	
FXS Ports	✔	4	
Feature Licenses			
Total 18 Feature License Rows			
Feature	Licensed	Total Licenses	Available Licenses
SIP Calls	✔	25	25
SIP Registrations	✔	126	126
DSP Resources	✔	Unlimited	Unlimited
Forking	✔	Unlimited	Unlimited
SBA	✔	Unlimited	Unlimited
Active Directory	✔	Unlimited	Unlimited
Transcoding	✔	Unlimited	Unlimited

