Dialogic
Making Innovation Thrive™

Dialogic® Brooktrout® SR140 Fax Software with Mitel 3300 MXe Controller

Installation and Configuration Integration Note

IMPORTANT NOTE

November 2009 64-0600-02

www.dialogic.com

Copyright and Legal Notice

All contents of this document are furnished for informational use only and are subject to change without notice and do not represent a commitment on the part of Dialogic Corporation or its subsidiaries ("Dialogic"). Reasonable effort is made to ensure the accuracy of the information contained in the document. However, Dialogic does not warrant the accuracy of this information and cannot accept responsibility for errors, inaccuracies or omissions that may be contained in this document.

INFORMATION IN THIS DOCUMENT IS PROVIDED IN CONNECTION WITH DIALOGIC® PRODUCTS. NO LICENSE, EXPRESS OR IMPLIED, BY ESTOPPEL OR OTHERWISE, TO ANY INTELLECTUAL PROPERTY RIGHTS IS GRANTED BY THIS DOCUMENT. EXCEPT AS PROVIDED IN A SIGNED AGREEMENT BETWEEN YOU AND DIALOGIC, DIALOGIC ASSUMES NO LIABILITY WHATSOEVER, AND DIALOGIC DISCLAIMS ANY EXPRESS OR IMPLIED WARRANTY, RELATING TO SALE AND/OR USE OF DIALOGIC PRODUCTS INCLUDING LIABILITY OR WARRANTIES RELATING TO FITNESS FOR A PARTICULAR PURPOSE, MERCHANTABILITY, OR INFRINGEMENT OF ANY INTELLECTUAL PROPERTY RIGHT OF A THIRD PARTY.

Dialogic products are not intended for use in medical, life saving, life sustaining, critical control or safety systems, or in nuclear facility applications.

Due to differing national regulations and approval requirements, certain Dialogic products may be suitable for use only in specific countries, and thus may not function properly in other countries. You are responsible for ensuring that your use of such products occurs only in the countries where such use is suitable. For information on specific products, contact Dialogic Corporation at the address indicated below or on the web at www.dialogic.com.

It is possible that the use or implementation of any one of the concepts, applications, or ideas described in this document, in marketing collateral produced by or on web pages maintained by Dialogic may infringe one or more patents or other intellectual property rights owned by third parties. Dialogic does not provide any intellectual property licenses with the sale of Dialogic products other than a license to use such product in accordance with intellectual property owned or validly licensed by Dialogic and no such licenses are provided except pursuant to a signed agreement with Dialogic. More detailed information about such intellectual property is available from Dialogic's legal department at 9800 Cavendish Blvd., 5th Floor, Montreal, Quebec, Canada H4M 2V9. **Dialogic encourages all users of its products to procure all necessary intellectual property licenses required to implement any concepts or applications and does not condone or encourage any intellectual property infringement and disclaims any responsibility related thereto. These intellectual property licenses may differ from country to country and it is the responsibility of those who develop the concepts or applications to be aware of and comply with different national license requirements.**

Dialogic, Dialogic Pro, Brooktrout, Diva, Cantata, SnowShore, Eicon, Eicon Networks, NMS Communications, NMS (stylized), Eiconcard, SIPcontrol, Diva ISDN, TruFax, Exnet, EXS, SwitchKit, N20, Making Innovation Thrive, Connecting to Growth, Video is the New Voice, Fusion, Vision, PacketMedia, NaturalAccess, NaturalCallControl, NaturalConference, NaturalFax and Shiva, among others as well as related logos, are either registered trademarks or trademarks of Dialogic Corporation or its subsidiaries. Dialogic's trademarks may be used publicly only with permission from Dialogic. Such permission may only be granted by Dialogic's legal department at 9800 Cavendish Blvd., 5th Floor, Montreal, Quebec, Canada H4M 2V9. Any authorized use of Dialogic's trademarks will be subject to full respect of the trademark guidelines published by Dialogic from time to time and any use of Dialogic's trademarks requires proper acknowledgement.

The names of actual companies and products mentioned herein are the trademarks of their respective owners.

This document discusses one or more open source products, systems and/or releases. Dialogic is not responsible for your decision to use open source in connection with Dialogic products (including without limitation those referred to herein), nor is Dialogic responsible for any present or future effects such usage might have, including without limitation effects on your products, your business, or your intellectual property rights.

Any use case(s) shown and/or described herein represent one or more examples of the various ways, scenarios or environments in which Dialogic products can be used. Such use case(s) are non-limiting and do not represent recommendations of Dialogic as to whether or how to use Dialogic products.

1. Scope

This document is intended as a general guide for configuring a basic installation of the Mitel 3300 MXe Gateway for use with Dialogic® Brooktrout® SR140 Fax over IP (FoIP) software platform. The interoperability includes SIP call control and T.38/T.30 media.

This document is not intended to be comprehensive and thus does not replace the manufacturer's detailed configuration documentation. Users of this document should already have a general knowledge of how to install and configure the Mitel 3300 MXe Controller.

The sample configuration shown and/or referred in the subsequent sections was used for lab validation testing by Dialogic. Therefore, it is possible and even likely that the example configuration will not match the exact configuration and versions that would be present in a deployed environment. However, the sample configuration does provide a possible starting point to work with the equipment vendor for configuring your device. Please consult the appropriate manufacturer's documentation for details on setting up your specific end user configuration.

For ease of reference, the Dialogic® Brooktrout® SR140 Fax Software and Dialogic® Brooktrout® TR1034 Fax Boards will sometimes be denoted herein, respectively, as SR140 and TR1034. All references to the SDK herein refer to the Dialogic® Brooktrout® Fax Products SDK. The Mitel 3300 MXe will be denoted herein as Mitel 3300 or 3300 MXe, or some other form thereof.

2. Configuration Details

The following systems were used for the sample configuration described in the document.

2.1 Mitel 3300 MXe Controller Gateway

Vendor	***Mitel***
Model	***3300 MXe***
Software Version	***9.0.3.15***
PSTN Device	***Dialogic® Brooktrout® TR1034 Fax Board***
Protocol from Gateway to PSTN	***T1 PRI ISDN***
IP Device	***Dialogic® Brooktrout® SR140***
Additional Notes	***Same firmware is used on 3300 CXi, CX, and MXe devices. Softswitch (call manager) option also available for overall network solution.*** ***T.38 licenses must be loaded.*** ***DSP module must be present.***

2.2 Dialogic® Brooktrout® SR140 Fax Software

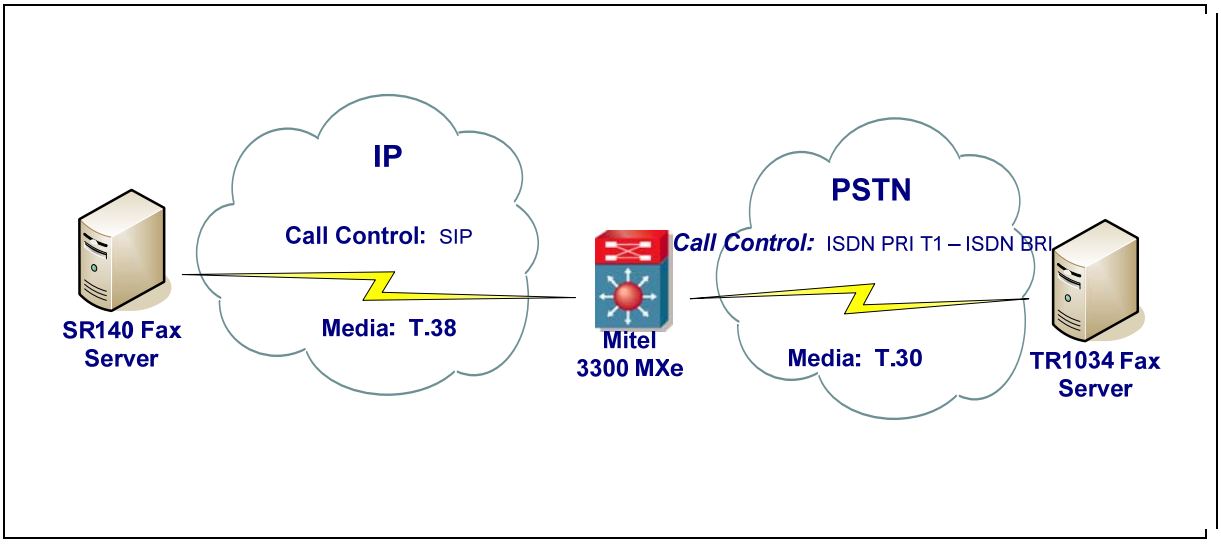
Vendor	***Dialogic***
Model	***Dialogic® Brooktrout® SR140 Fax Software***
Software Version	***Dialogic® Brooktrout® SDK 6.1.1***
Protocol to Gateway	***SIP***
callctrl.cfg file	***Default values***

2.3 Dialogic® Brooktrout® TR1034 Fax Board

Vendor	***Dialogic***
PSTN Device	***Dialogic® Brooktrout® TR1034 BRI Fax Board***
Software Version	***Dialogic® Brooktrout® SDK 6.1.1***
Protocol to PSTN Device	***BRI ISDN***
callctrl.cfg file	***Default values with European Community as country code.***

2.4 Network System Configuration

The diagram below details the sample configuration used in connection with this document.



Notes:

- SR140 Fax Server = Fax Server including Dialogic® Brooktrout® SR140 Fax Software and third party fax application.
- TR1034 Fax Server = Fax Server including Dialogic® Brooktrout® TR1034 Fax Board and third party fax application.

3. Prerequisites

For T.38, DSP II module, T.38 licenses and SIP Trunk licenses must be installed and enabled on the Mitel 3300 MXe.

4. Summary of Limitations

The Mitel 3300 MXe DSP module used in testing only supported v.17 14400 bps fax transfer on T.38.

By default, ECM (error correction mode) is turned off on the Mitel. ECM was enabled in one of the test configurations to improve the fax quality on the test network.

5. Mitel 3300 MXe Gateway Fax Configuration

SIP trunking was used for the interconnection. See IP Endpoint Configuration section for details.

5.1 Installing and Configuring the T.38 Licensing and Hardware Resources

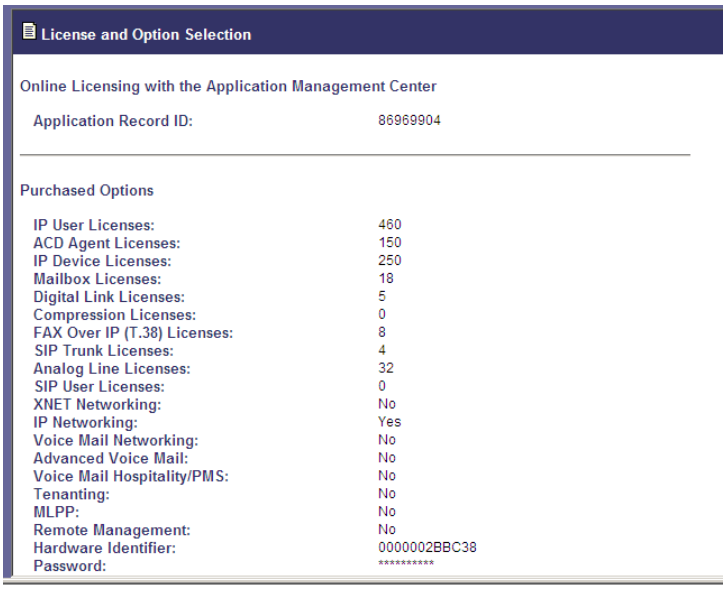
The following guidance was used when installing and configuring the Mitel 3300 for testing:

There are a number of limits that apply with T.38 faxing which include: software license limits, hardware limits and practical limits. A brief description of each is noted below:

- **Software license limits:** 64 sessions. Software license limits is the total number of T.38 licenses that can be entered in the License and Options select form. Licenses can be purchased in groups of 4 up to a maximum of 64. A reboot is required to enable new licenses.
- **Hardware limits:** T.38 Faxing requires the use of a DSP II card. Please note that available resources are determined if the license limits can be achieved. For example, if there are insufficient DSP resources for T.38 faxing, the operational limit may be reached before the license limit. Because DSP resources are allocated at 3300 initialization based on license numbers, not traffic requirements, it is possible to allocate all DSP resources and have nothing left for telecom tone receivers and generators, so calls cannot be made on the system. Although a maximum of 64 T.38 sessions can be provisioned, this is not a recommended configuration.
- **Practical limits:** 16 sessions. The practical limits are determined by the level of traffic that the system will handle at the same time as the T.38 sessions. There is a direct trade-off between traffic handling and FAX T.38 sessions. The practical limit of 16 is derived from the requirement to provide both T.38 FAX and support the full range of IP-Phone users with typical office traffic. If the unit is being used as a FAX gateway, WITHOUT any type of phones (i.e.: IP phones, SIP phones, any type of telephony Trunking or connected to voice/data applications) then it should be possible to increase this limit up to a maximum 32 T.38 sessions. This is assuming that the T.38 sessions are busy 100% of the time and there is sufficient traffic demand to keep these channels fully used.

T.38 licenses are referred to as “FAX over IP (T.38) Licenses”. If the number of T.38 licenses programmed exceeds the available DSP resources, a DSP alarm is raised and a maintenance log is generated.

The number of T.38 (8) and SIP trunking licenses (4) used in the test configuration is shown in the following screenshot titled: "License and Option Selection".



License and Option Selection

Online Licensing with the Application Management Center

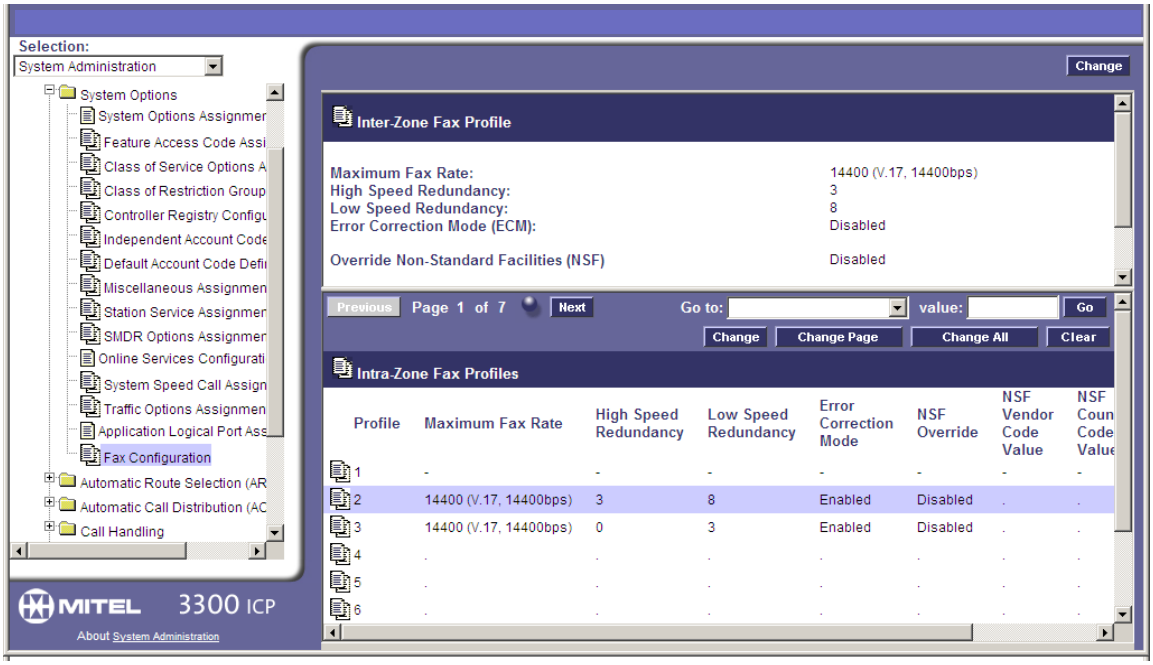
Application Record ID:	86969904

Purchased Options

IP User Licenses:	460
ACD Agent Licenses:	150
IP Device Licenses:	250
Mailbox Licenses:	18
Digital Link Licenses:	5
Compression Licenses:	0
FAX Over IP (T.38) Licenses:	8
SIP Trunk Licenses:	4
Analog Line Licenses:	32
SIP User Licenses:	0
XNET Networking:	No
IP Networking:	Yes
Voice Mail Networking:	No
Advanced Voice Mail:	No
Voice Mail Hospitality/PMS:	No
Tenanting:	No
MLPP:	No
Remote Management:	No
Hardware Identifier:	0000002BBC38
Password:	**********

5.2 Fax Configuration

This Fax Configuration form allows you to define the settings for FAX communication over the IP network.



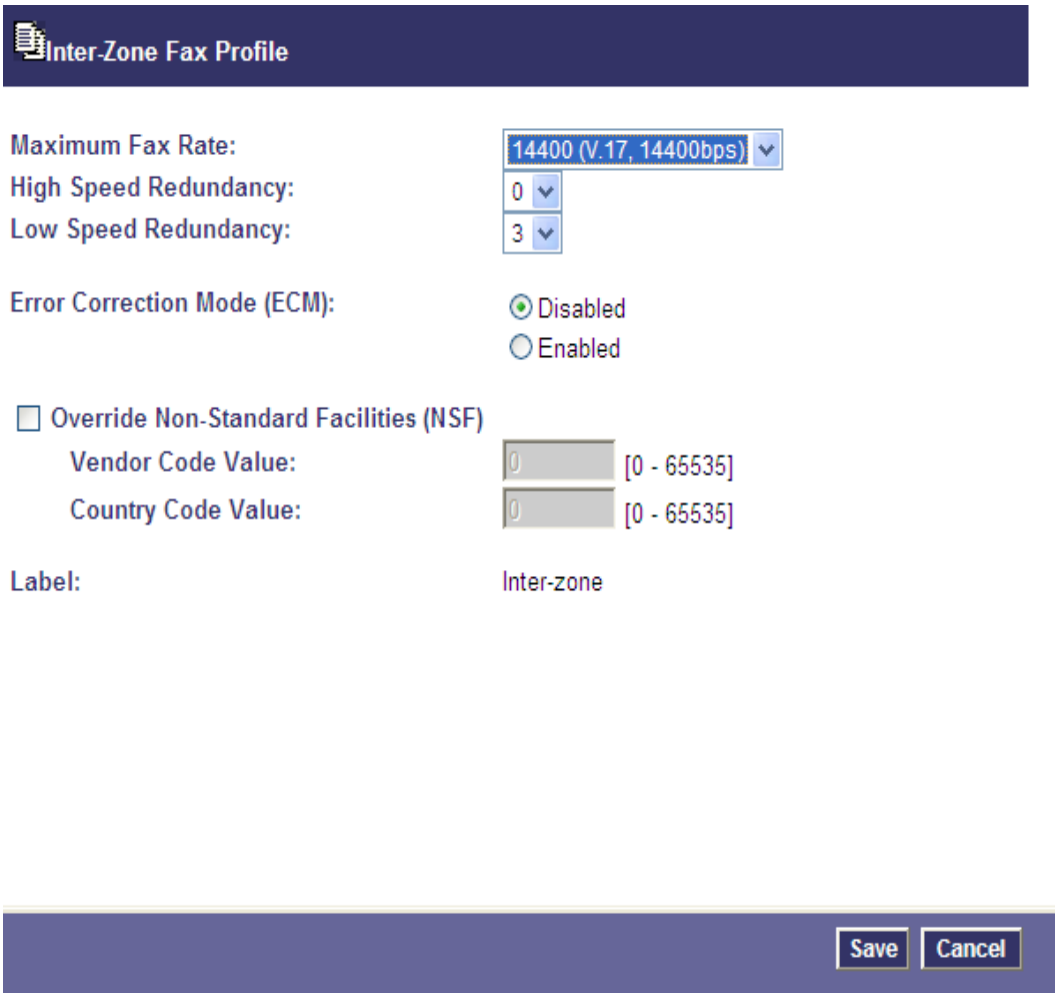
The Inter-Zone Fax Profile defines the FAX settings between the different zones in the network. There is only one Inter-Zone Fax Profile and it applies to all inter-zone fax communication. It defaults to V.29, 7200bps.

The Intra-Zone Fax Profile defines the fax settings within each zone in the network.

- Profile 1 defines the settings for G.711 pass through communication.
- Profiles 2 to 64 define the settings for fax relay (T.38) fax communication.
- All zones default to G.711 pass through communication (Profile 1).

Two new Profiles were created for T.38 fax, the Inter-Zone Fax Profile and Intra-Zone Fax Profile, and are shown in the following set of screenshots.

For the Inter-Zone Fax Profile, select 14,400 (v.17, 14400bps) maximum Fax Rate and disable Error Correction Mode (ECM). Save profile.



Inter-Zone Fax Profile

Maximum Fax Rate:	14400 (V.17, 14400bps)
High Speed Redundancy:	0
Low Speed Redundancy:	3
Error Correction Mode (ECM):	Disabled
Override Non-Standard Facilities (NSF)	Disabled
Label:	Inter-zone

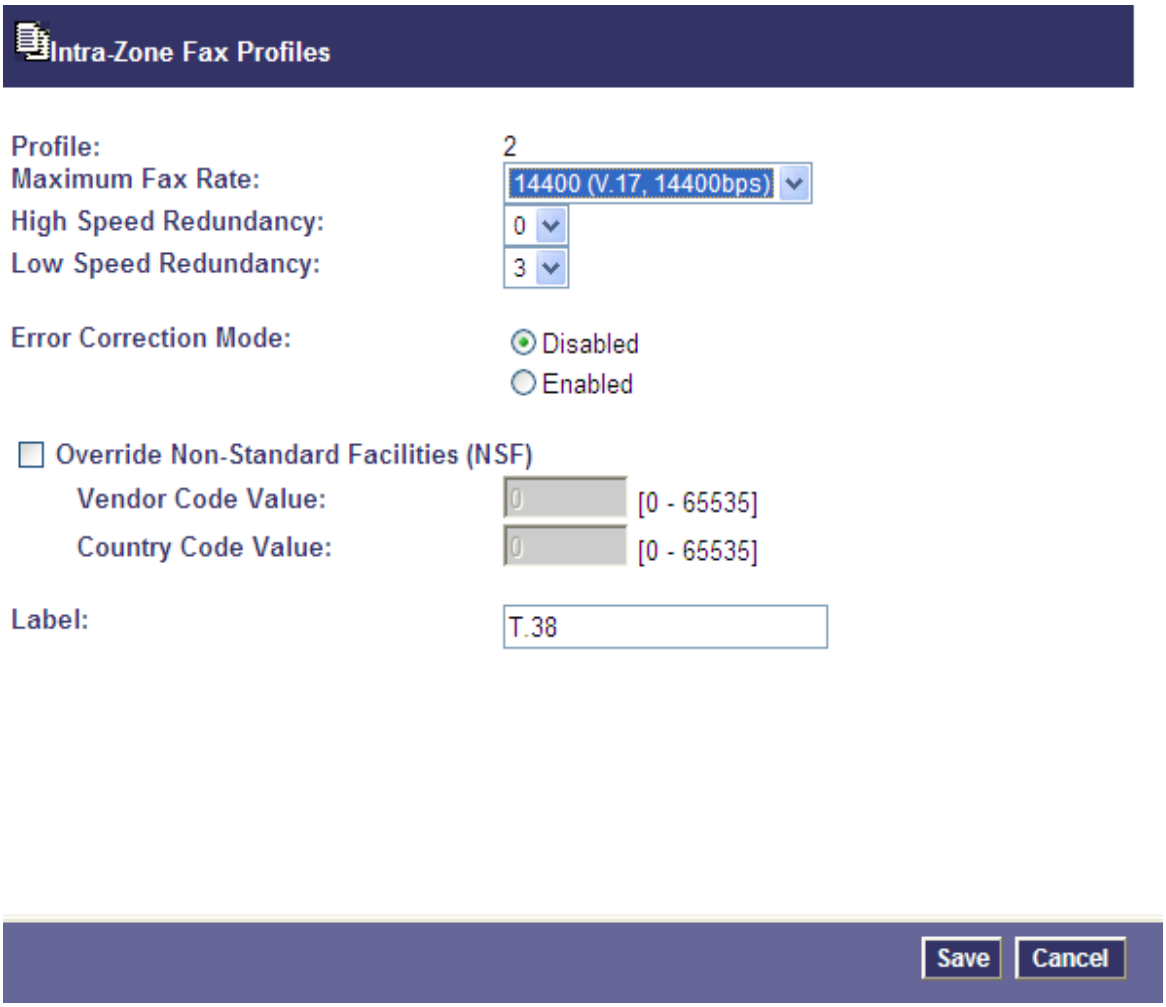
Previous Page 1 of 7 Next Go to: value: Go

Change Change Page Change All Clear

Intra-Zone Fax Profiles

Profile	Maximum Fax Rate	High Speed Redundancy	Low Speed Redundancy	Error Correction Mode	NSF Override	NSF Vendor Code Value	NSF Country Code Value	Label
1	-	-	-	-	-	-	-	G.711
2	14400 (V.17, 14400bps)	0	3	Disabled	Disabled	.	.	T.38
3	.	.	.	.	.	.	.	
4	.	.	.	.	.	.	.	
5	.	.	.	.	.	.	.	
6	.	.	.	.	.	.	.	
7	.	.	.	.	.	.	.	
8	.	.	.	.	.	.	.	
9	.	.	.	.	.	.	.	
10	.	.	.	.	.	.	.	

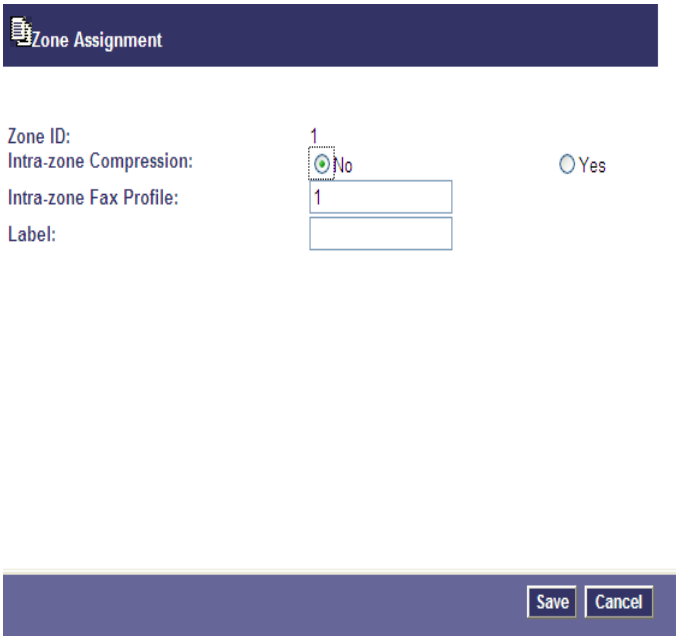
For the Intra-Zone Fax Profile, select 14,400 (v.17, 14400bps) maximum Fax Rate. ECM (Error Correction Mode) is disabled by default. Save profile.

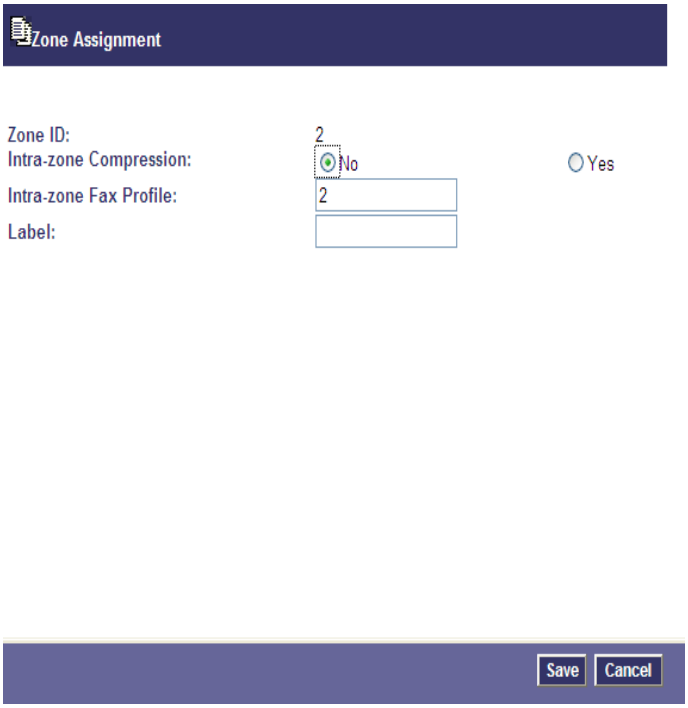


Note: the equivalent parameter for the High Speed Redundancy in the Mitel configuration is the UDPTL_redundancy_depth_image parameter in the Brooktrout configuration, and for the Low Speed Redundancy in the Mitel configuration is the UDPTL_redundancy_depth_control parameter in the Brooktrout configuration.

5.3 Zone Assignment

By default, all zones are set to Intra-Zone Fax Profile 1. For the test configuration, the Intra-Zone Fax Profile was set to 2 and profile was saved.





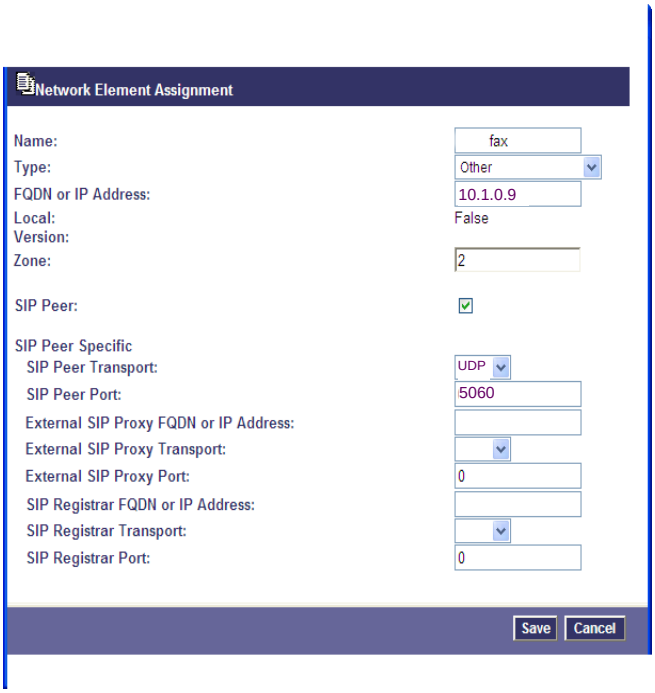
6. Deployment Details

6.1 Network Addresses

Device #	Device Description	Device IP Address
1	Mitel 3300 MXe	10.1.0.2
2	Dialogic® Brooktrout® SR140 Fax Software	10.1.0.9

7. IP Endpoint Configuration

The screenshot below shows the Network Element Assignment for the Mitel 3300.

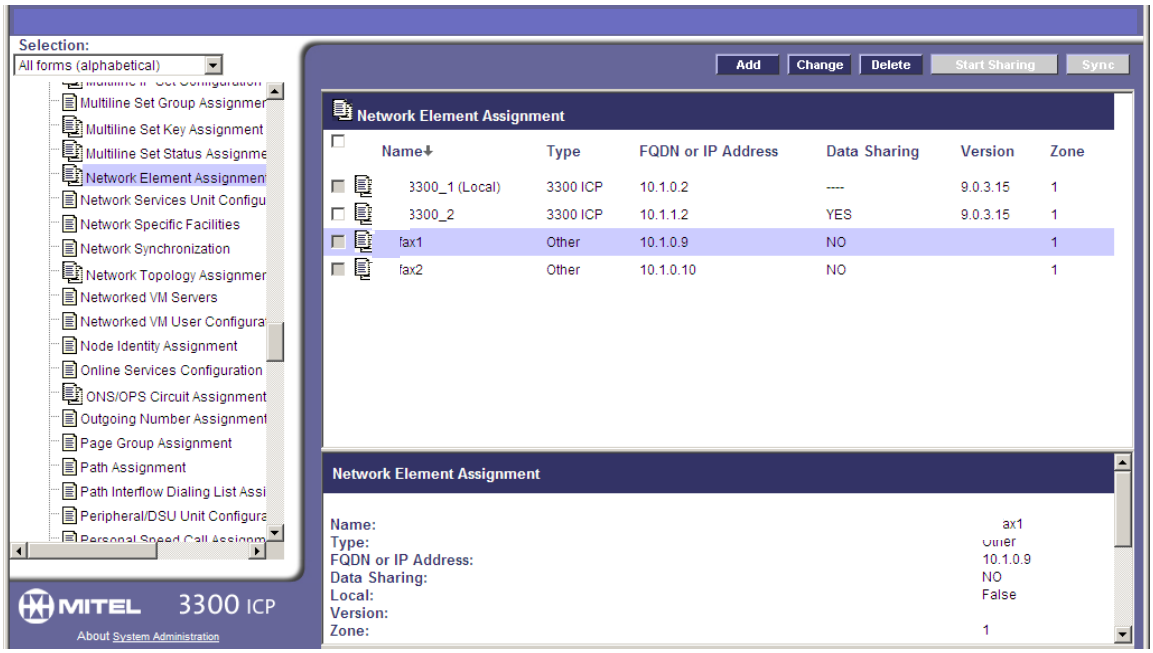


For the test configuration with the Dialogic® Brooktrout® SR140 Fax Server endpoint, the following values were used:

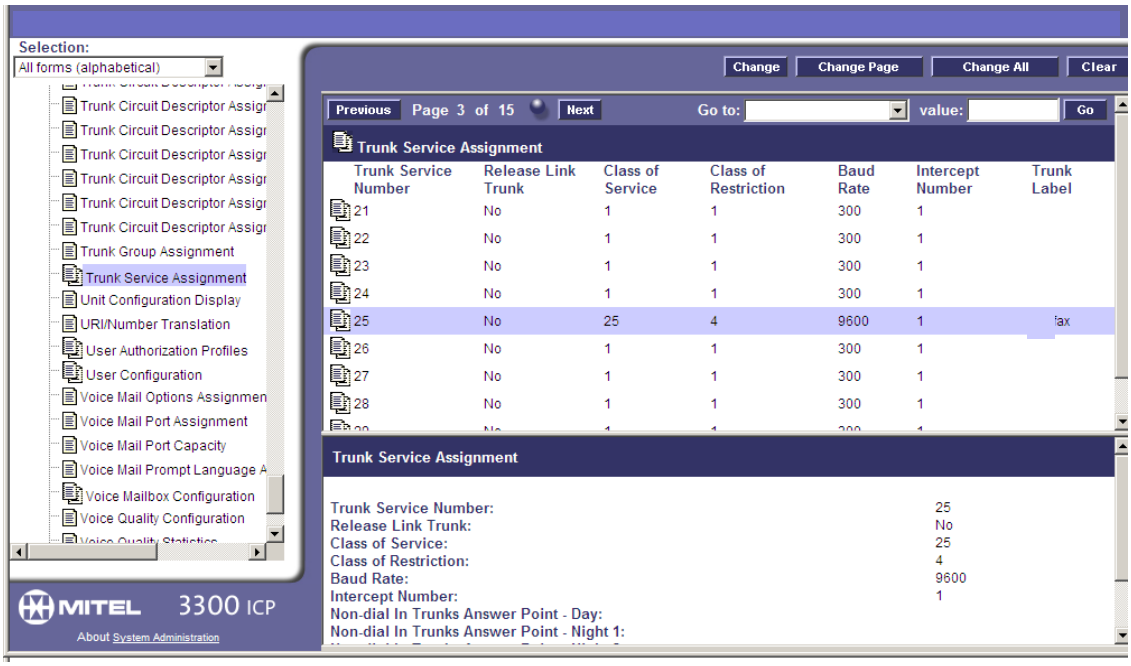
- Element Name: “fax”
- Type: Other
- IP address: 10.1.0.9
- SIP Peer: checked
- SIP Peer Transport: UDP
- SIP Peer Port: 5060

Configuration was saved.

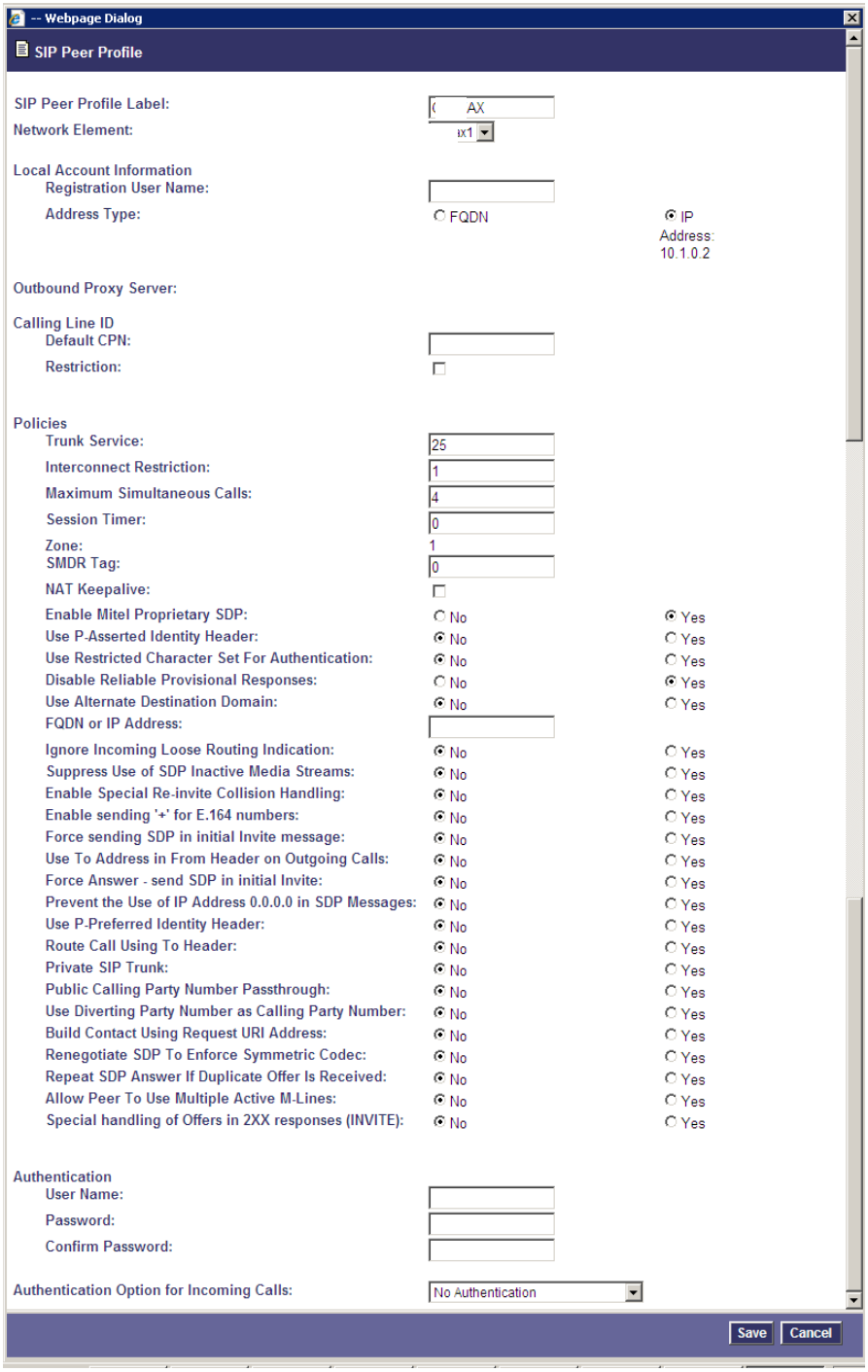
The IP Endpoint Configuration is shown in the following screenshot:



In the screenshot below, the test configuration is shown as Trunk Service Number 25.



This full SIP Peer Profile is shown below.



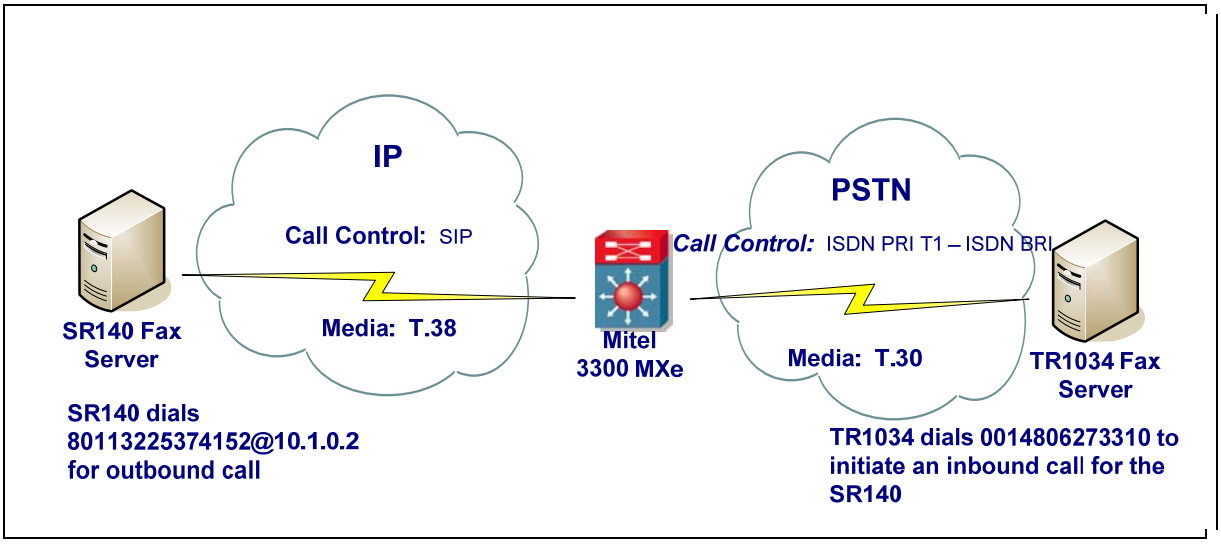
For the test configuration, the SIP Peer profile was configured with the following options:

- Network Element: the selected SIP Peer Profile was associated with the previously created “fax1” Network Element.
- Address Type: used the IP addresses in SIP messages
- Outbound Proxy Server: selected the Network Element previously configured for the Outbound Proxy Server
- Calling Line ID: the default CPN was applied to all calls
- Trunk Service Assignment: entered the trunk service assignment previously configured, #25
- SMDR: If Call Detail Records are required for SIP Trunking, the SMDR Tag should be configured (by default there is no SMDR and this field is left blank)
- The remaining SIP Peer Profile policy options are similar to the screen capture above.

8. Dialing Plan Overview

This section provides an overview of the dialing plan used for this document.

4 last digits place a call on SIP peer (Dialogic® Brooktrout® SR140 Fax Software)
8 + phone number places a call on T1 ISDN to the external PSTN network



9. Dialogic® Brooktrout® SR140 Fax Software Setup Notes

The Installation and Configuration Guides for SDK 5.2.x, SDK 6.0.x and SDK 6.1.x are available from the site:

http://www.dialogic.com/manuals/brooktrout/default.htm

For the sample test configuration, the SR140 was configured using the default values from SDK 6.1.1 and is shown below for reference.

```
  l3l4_trace=none
  l4l3_trace=none
  api_trace=none
  internal_trace=none
  host_module_trace=none
  ip_stack_trace=none
# Most of the time a path should be used for this file name.
  trace_file=
  max_trace_files=1
  max_trace_file_size=10
[host_module.1]
  module_library=brktsip.dll
  enabled=true
[host_module.1/t38parameters]
  t38_fax_rate_management=transferredTCF
  fax_transport_protocol=t38_only
  t38_fax_udp_ec=t38UDPRedundancy
  rtp_ced_enable=true
  t38_max_bit_rate=14400
  t38_fax_version=0
  media_renegotiate_delay_inbound=1000
  media_renegotiate_delay_outbound=-1
  t38_fax_fill_bit_removal=false
  t38_fax_transcoding_jbig=false
  t38_fax_transcoding_mmr=false
  t38_t30_fastnotify=false
  t38_type_of_service=0
  t38_UDPTL_redundancy_depth_control=5
  t38_UDPTL_redundancy_depth_image=2
[host_module.1/rtp]
  rtp_frame_duration=20
  rtp_jitter_buffer_depth=100
  rtp_codec=pcmu pcma
  rtp_silence_control=inband
  rtp_type_of_service=0
  rtp_voice_frame_replacement=0
[host_module.1/parameters]
  sip_max_sessions=256
  sip_default_gateway=0.0.0.0:0
  sip_proxy_server1=
  sip_proxy_server2=
  sip_proxy_server3=
  sip_proxy_server4=
  sip_registration_server1=
  sip_registration_server1_aor=
  sip_registration_server1_username=
  sip_registration_server1_password=
```

```
  sip_registration_server1_expires=3600
  sip_registration_server2=
  sip_registration_server2_aor=
  sip_registration_server2_username=
  sip_registration_server2_password=
  sip_registration_server2_expires=3600
  sip_registration_server3=
  sip_registration_server3_aor=
  sip_registration_server3_username=
  sip_registration_server3_password=
  sip_registration_server3_expires=3600
  sip_registration_server4=
  sip_registration_server4_aor=
  sip_registration_server4_username=
  sip_registration_server4_password=
  sip_registration_server4_expires=3600
  sip_registration_interval=60
  sip_Max-Forwards=70
  sip_From=Anonymous <sip:no_from_info@anonymous.invalid>
  sip_Contact=0.0.0.0:0
  sip_username=-
  sip_session_name=no_session_name
  sip_session_description=
  sip_description_URI=
  sip_email=
  sip_phone=
  sip_Route=
  sip_session_timer_session_expires=0
  sip_session_timer_minse=-1
  sip_session_timer_refresh_method=0
  sip_ip_interface=
  sip_ip_interface_port=5060
  sip_redirect_as_calling_party=0
  sip_redirect_as_called_party=0
[module.41]
  model=SR140
  virtual=1
  exists=1
  vb_firm=C:\fdtool-6.1.1\bin\bostvb.dll
  channels=6
[module.41/ethernet.1]
  ip_interface={567CDC61-517C-4CD5-8F10-3DF5CB9CCDEC}:0
  media_port_min=56000
  media_port_max=57000
[module.41/host_cc.1]
  host_module=1
  number_of_channels=6
```

No sip_default_gateway was filled in since the IP address of the gateway was specified in the dial string in the application. The following dial string was used for the outbound calls: 80113225374152@10.1.0.2. However, when the application does not allow specifying the gateway's IP address, make sure to fill in the IP address in the sip_default_gateway field. In our test scenario, this would be: sip_default_gateway=10.1.0.2:5060