Dialogic® Brooktrout® SR140 Fax Software with Avaya Aura® Communication Manager 6.0.1 using an H.323 Trunk Interface

Installation and Configuration Integration Note

IMPORTANT NOTE

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1 Scope

This document is intended as a general guide for configuring a basic installation of the ***Avaya Aura®*** ***Communication Manager*** using an H.323 trunk interface with the Dialogic® Brooktrout® SR140 Fax over IP (FoIP) software platform. The interoperability includes H.323 call control and T.38/T.30 media.

The configuration information contained in this document is based on the following document from Avaya:

Avaya Solution & Interoperability Test Lab Report: *Application Notes for Configuring Dialogic Brooktrout SR140 Fax Software with Avaya Aura® Communication Manager using an H.323Trunk Interface - Issue 0.1.[5]*

The Dialogic Brooktrout SR140 Fax Software is a host-based Fax over IP (FoIP) engine utilized by fax servers to send and receive fax calls over an IP network. In the tested configuration, Avaya Aura® Communication Manager routed fax calls to and from a fax server utilizing the Dialogic Brooktrout SR140 Fax Software via an H.323 trunk.

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 ***Avaya Aura®*** ***Communication Manager*** using an H.323 trunk interface.

The sample configuration shown and/or referred in the subsequent sections was used for **Avaya DevConnect Certification Testing** performed at **Avaya DevConnect Labs**. Therefore, it is quite possible that the sample configuration will not match an exact configuration or 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 will sometimes be denoted herein as SR140. The ***Avaya Aura®*** ***Communication Manager*** will be denoted herein as Avaya Aura CM or some other form thereof. All references to the SDK herein refer to the Dialogic® Brooktrout® Fax Products SDK.

2 Configuration Details

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

2.1 Avaya Aura® Communication Manager with G650 & G450 Media Gateways

Vendor	***Avaya***
SW Model	***Aura® Communication Manager 6.0.1***
Hardware	***Avaya G650 Media Gateway*** ***Avaya G450 Media Gateway*** ***Refer to Network Configuration Section for details***
IP Device	***Dialogic® Brooktrout® SR140 Fax Server***
Protocol to SR140 Fax Software	***H.323***
Additional Notes	***DSP resources required as noted below in the Avaya DSP Resource section***

Avaya DSP Resources
Fax calls consume DSP (Digital Signal Processing) resources for processing fax data on the TN2302AP IP Media Processor (MedPro) circuit pack and the TN2602AP IP Media Processor circuit pack in the Avaya G650 Media Gateway, and the integrated Voice over Internet Protocol (VoIP) engine of the Avaya G450 Media Gateway. To increase the capacity to support simultaneous fax calls, additional TN2302AP and/or TN2602AP MedPro circuit packs may need to be installed in the Avaya G650 Gateway, and additional Avaya MM760 Media Module or Modules may need to be installed in the Avaya G450 Media Gateway. The information contained in the table below indicates DSP capacities/usage in the Avaya media processors. Customers should work with their Avaya sales representatives to ensure that their fax solutions have adequate licenses and DSP resources to match the intended fax capacity/usage.

Platform Device	**DSP Resources per Platform Device**	**DSP Resources per FoIP Call**
TN2302, MM760	64	4
TN2602	64	1

2.2 Dialogic® Brooktrout® SR140 Fax Software

Vendor	***Dialogic***
Model	***Dialogic® Brooktrout® SR140 Fax Software***
Software Version	***Tested with SDK 6.2.4***
Protocol to Aura Communication Manager	***H.323***
Additional Notes	***None***

2.3 Network System Configuration

The test configuration was designed to emulate two separate sites with multiple Port Networks at one site (Site 1), and modular Gateway resources at the other site (Site 2). **Figure 1** illustrates the configuration used in these Application Notes, with a focus on the configuration at Site 2. Communication Manager Servers and Gateways at the two sites were connected via H.323 and ISDN-PRI trunks. Faxes were alternately sent between the two sites using these two facilities.

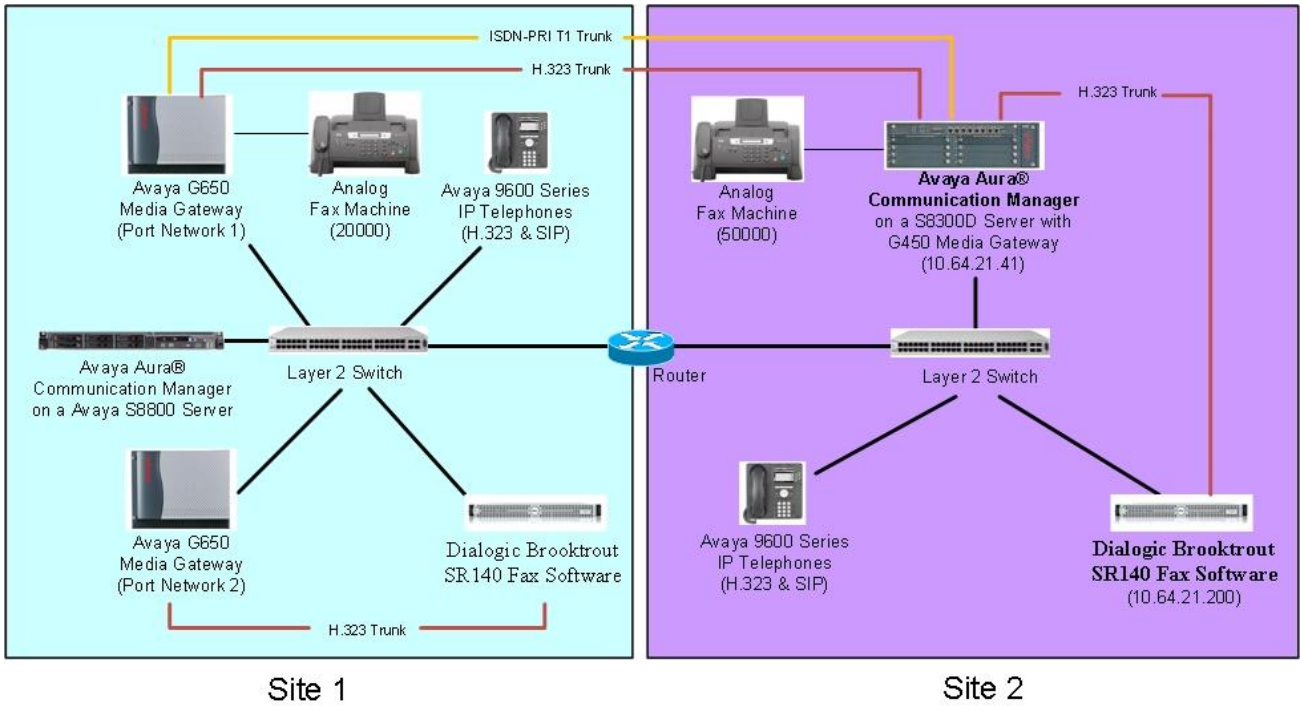


Figure 1: Dialogic Brooktrout SR140 Fax Software with Communication Manager

Site 1 had an Avaya S8800 Server running Communication Manager with two Avaya G650 Media Gateways. Each media gateway was configured as a separate port network in separate IP network regions. The fax server at this site communicated with Communication Manager via an H.323 trunk which terminated on a CLAN circuit pack in port network 2. IP media resources were provided by Media Processor (MedPro) circuit packs. Two versions of the MedPro circuit pack were tested in this configuration: TN2302AP and TN2602AP. Endpoints at this site included an Avaya 9600 Series IP Telephone (with H.323 and SIP firmware), and an analog fax machine.

Site 2 had an Avaya S8300D Server running Communication Manager in an Avaya G450 Media Gateway. The fax server at this site communicated with Communication Manager via an H.323 trunk. On the Avaya G450 Media Gateway, the signaling and media resources supporting the H.323 trunk were integrated directly on the media gateway processor. Endpoints at this site included Avaya 9600 Series IP Telephones (with H.323 and SIP firmware), and an analog fax machine.

The SIP phones at each site were registered with Session Manager (not pictured). Session Manager had no specific role in fax operations; therefore, this part of the configuration is not covered in these Application Notes. The IP telephones (H.323 and SIP) were not involved in the faxing operations. They were present in the configuration to verify VoIP telephone calls had on adverse impact on the FoIP faxing operations.

A fax call originating from a local fax server was sent to Communication Manager via an H.323 trunk. Based on the dialed digits, Communication Manager routed the fax call either to the local fax machine or to one of the trunks (ISDN-PRI or H.323) to reach the remote site. When the fax call reached the remote site, the Communication Manager at that site routed the call either to the local fax machine or to the local fax server over the H.323 trunk.

2.4 Avaya Aura® Equipment - Site 1

Equipment	Software/Firmware
Avaya S8800 Media Server	Avaya Aura® Communication Manager 6.0.1 (R016x.00.1.510.1 with Patch 19358)
Avaya G650 Media Gateway (at Main Site) - 2 CLANs - 2 MedPros – TN2302 - 2 MedPros – TN2602	 TN799DP - HW01 FW38 & HW13 FW 38 TN2302AP - HW20 FW120 TN2602AP - HW02 FW057
Avaya 9600 Series IP Deskphones (H.323)	Release 3.1 Service Pack 3 (96x0) Release 6 Service Pack 5 (96x1G)
Avaya 9600 Series IP Deskphones (SIP)	Release 2.6 Service Pack 5 (96x0) Release 6 Service Pack 2 (96x1G)
Analog Fax Machine	-N/A-
Fax Server – Dialogic FaxDiagTool on a Windows 2008 Server	Compiled with SDK 6.2.4
Dialogic Brooktrout SR140 Fax Software – Boston Bfv API – Boston Driver – Boston SDK – Boot ROM	 v6.2.4 (Build 12) v6.2.0 (Build 4) v6.2.4 (Build 12) 6.2.1B9

2.5 Avaya Aura® Equipment – Site 2

Equipment	Software/Firmware
Avaya S8300D Media Server	Avaya Aura® Communication Manager 6.0.1 (R016x.00.1.510.1 with Patch 19303)
Avaya G450 Media Gateway	31.18.1
Avaya 9600 Series IP Deskphones (H.323)	Release 3.1 Service Pack 3 (96x0) Release 6 Service Pack 5 (96x1G)
Avaya 9600 Series IP Deskphones (SIP)	Release 2.6 Service Pack 5 (96x0) Release 6 Service Pack 2 (96x1G)
Analog Fax Machine	-N/A-
Fax Server – Dialogic FaxDiagTool on a Windows 2003 Server	Compiled with SDK 6.2.4
Dialogic Brooktrout SR140 Fax Software – Boston Bfv API – Boston Driver – Boston SDK – Boot ROM	 v6.2.4 (Build 12) v6.2.0 (Build 4) v6.2.4 (Build 12) 6.2.1B9

2.6 Network Addresses

The following table lists the IP addresses and their descriptions used in subsequent sections.

Device #	Device Make, Model, and Description	Device IP Address
1	Avaya Communication Manager Server	10.64.21.41
2	SR140 Fax Server	10.64.21.200

3 Prerequisites

- None

4 Summary of Limitations

- None

5 Avaya Aura® Communication Manager Setup Notes

This section describes the Communication Manager configuration necessary to interoperate with the Dialogic Brooktrout SR140 Fax Software. It focuses on the configuration of the routing and H.323 trunk between Communication Manager and the fax server. All other components are assumed to be in place and previously configured, including the H.323 and ISDN-PRI trunks that connect Sites 1 and 2 in **Figure 1**.

The examples shown in this section refer to Site 2. Similar steps also apply to Site 1 using values appropriate for that location.

The configuration of Communication Manager was performed using the System Access Terminal (SAT). After the completion of the configuration, the **save translation** command was used to make the changes permanent.

The procedures for configuring Communication Manager include the following steps:

1. Verify Communication Manager License
2. Administer IP Network Region
3. Administer IP Codec Set
4. Administer IP Node Names
5. Administer H.323 Signaling Group
6. Administer H.323 Trunk Group
7. Administer H.323 Signaling Group - update
8. Administer Public Unknown Numbering
9. Administer Route Pattern
10. Administer AAR Analysis

Step	Description
1.	**Verify Communication Manager License** Use the **display system-parameters customer-options** command to verify that the Communication Manager license has proper permissions for features illustrated in these Application Notes. Navigate to **Page 2**, and verify that there is sufficient remaining capacity for H.323 trunks by comparing the **Maximum Administered H.323 Trunks** field value with the corresponding value in the **USED** column. The license file installed on the system controls the maximum trunks permitted. If there is insufficient capacity, contact an authorized Avaya sales representative to acquire the appropriate licenses.

```
display system-parameters customer-options                    Page   2 of  11
                                OPTIONAL FEATURES

 IP PORT CAPACITIES                                              USED
                      Maximum Administered H.323 Trunks: 12000 57
            Maximum Concurrently Registered IP Stations: 18000 9
              Maximum Administered Remote Office Trunks: 12000 0
 Maximum Concurrently Registered Remote Office Stations: 18000 0
               Maximum Concurrently Registered IP eCons: 414   0
   Max Concur Registered Unauthenticated H.323 Stations: 100   0
                         Maximum Video Capable Stations: 18000 0
                     Maximum Video Capable IP Softphones: 18000 1
                         Maximum Administered SIP Trunks: 24000 170
   Maximum Administered Ad-hoc Video Conferencing Ports: 24000 0
    Maximum Number of DS1 Boards with Echo Cancellation: 522   0
                              Maximum TN2501 VAL Boards: 128   0
                      Maximum Media Gateway VAL Sources: 250   1
           Maximum TN2602 Boards with 80 VoIP Channels: 128   0
          Maximum TN2602 Boards with 320 VoIP Channels: 128   0
    Maximum Number of Expanded Meet-me Conference Ports: 300   0

         (NOTE: You must logoff & login to effect the permission changes.)
```

Step	Description
2.	**Administer IP Network Region** Use the **change ip-network-region** command to administer the network region settings. The values shown below are the values used during compliance testing. Note that the **IP-IP Direct Audio** settings must be disabled. ▪ **Authoritative Domain**: ***avaya.com*** ▪ **Name**: Any descriptive name may be used (if desired). ▪ **Intra-region IP-IP Direct Audio**: ***no*** **Inter-region IP-IP Direct Audio**: ***no*** By default, IP-IP direct audio (media shuffling) is enabled to allow audio traffic to be sent directly between IP endpoints without using media resources in the Avaya Media Gateway. Shuffling can be further restricted at the trunk level on the **Signaling Group** form. ▪ **Codec Set**: ***1*** The codec set contains the list of codecs available for calls within this IP network region.

```
change ip-network-region 1                                    Page   1 of  20
                              IP NETWORK REGION
  Region: 1
 Location:         Authoritative Domain: avaya.com
    Name:
 MEDIA PARAMETERS                Intra-region IP-IP Direct Audio: no
      Codec Set: 1               Inter-region IP-IP Direct Audio: no
   UDP Port Min: 2048                        IP Audio Hairpinning? n
   UDP Port Max: 3329
 DIFFSERV/TOS PARAMETERS
  Call Control PHB Value: 46
        Audio PHB Value: 46
        Video PHB Value: 26
 802.1P/Q PARAMETERS
  Call Control 802.1p Priority: 6
        Audio 802.1p Priority: 6
        Video 802.1p Priority: 5      AUDIO RESOURCE RESERVATION PARAMETERS
 H.323 IP ENDPOINTS                                     RSVP Enabled? n
  H.323 Link Bounce Recovery? y
  Idle Traffic Interval (sec): 20
    Keep-Alive Interval (sec): 5
            Keep-Alive Count: 5
```

Step	Description
3.	**Administer IP Codec Set** Use the **change ip-network-set** command to administer an IP codec set. IP codec set 1 was used during compliance testing. Multiple codecs can be listed in priority order to allow the codec used by a specific call to be negotiated during call establishment. The example below shows the values used during compliance testing.

```
change ip-codec-set 1                                          Page   1 of   2

                           IP Codec Set

    Codec Set: 1

    Audio         Silence      Frames   Packet
    Codec         Suppression  Per Pkt  Size(ms)
  1: G.711MU           n          2        20
  2: G.729A            n          2        20
  3:
```

On **Page 2**, set the **FAX Mode** field to ***t.38-standard***. The **Modem Mode** field should be set to ***off***.

Leave the **FAX Redundancy** setting at its default value of ***0*.** A packet redundancy level can be assigned to improve packet delivery and robustness of FAX transport over the network (with increased bandwidth as trade-off). Avaya uses IETF RFC-2198 and ITU-T T.38 specifications as redundancy standard. With this standard, each Fax over IP packet is sent with additional (redundant) 0 to 3 previous fax packets based on the redundancy setting. A setting of 0 (no redundancy) is suited for networks where packet loss is not a problem.

```
change ip-codec-set 1                                          Page   2 of   2

                           IP Codec Set

                                 Allow Direct-IP Multimedia? y
                 Maximum Call Rate for Direct-IP Multimedia:  2048:Kbits
          Maximum Call Rate for Priority Direct-IP Multimedia:  2048:Kbits

                        Mode                Redundancy
    FAX                 t.38-standard        0
    Modem               off                  0
    TDD/TTY             US                   3
    Clear-channel       n                    0
```

Step	Description
4.	**Administer IP Node Names** Use the **change node-names ip** command to create a node name and enter the IP address of the fax server. Enter a descriptive name in the **Name** column and the IP address assigned to fax server in the **IP address** column. Also note the node name of the processor (***procr***) as it will be used later to configure the H.323 trunk between Communication Manager and the fax server.

```
change node-names ip                                          Page   1 of   2
                                  IP NODE NAMES
     Name                 IP Address
 AES_21_46              10.64.21.46
 CM_20_40               10.64.20.40
 CM_22_12_CLAN1A        10.64.22.16
 CM_22_12_CLAN2A        10.64.22.19
 IPO_21_64              10.64.21.64
 SM_20_31               10.64.20.31
 SM_21_31               10.64.21.31
 default                0.0.0.0
 faxserver              10.64.21.200
 msgserver              10.64.21.41
 procr                  10.64.21.41
 procr6                 ::
```

Step	Description
5.	**Administer H.323 Signaling Group** Use the **add signaling-group** command to create a signaling group for use by the H.323 trunk to the fax server. Signaling group ***9*** was configured using the parameters highlighted below. Default values may be used for all other fields. ▪ Set the **Group Type** to ***h.323***. ▪ The **Trunk Group for Channel Selection** is left blank until the trunk group is created. It will be updated later. ▪ Set the **Near-end Node Name** to the node name that maps to the IP address of the processor (i.e. ***procr***) used to connect to fax server (see **Step 4**). ▪ Set the **Far-end Node Name** to the node name that maps to the IP address of the fax server configured in **Step 4**. ▪ Set the **Near-end Listen Port** and **Far-end Listen Port** to ***1720.*** ▪ Set the **Far-end Network Region** to the IP network region which contains Fax server. ▪ The **DTMF over IP** field was set to the default value of ***in-band***. ▪ Set the **Direct IP-IP Audio Connections** field to ***n***. This setting disables Media Shuffling on the trunk level. ▪ The default values were used for all other fields.

```
add signaling-group 9                                        Page   1 of   6
                                SIGNALING GROUP

  Group Number: 9                 Group Type: h.323
           SBS? n              Remote Office? n          Max number of NCA TSC: 0
         Q-SIP? n                                         Max number of CA TSC: 0
      IP Video? n                                     Trunk Group for NCA TSC:
        Trunk Group for Channel Selection:          X-Mobility/Wireless Type: NONE
       TSC Supplementary Service Protocol: a           Network Call Transfer? n
                                                     T303 Timer(sec): 10
    H.245 DTMF Signal Tone Duration(msec):
     Near-end Node Name: procr                    Far-end Node Name: faxserver
  Near-end Listen Port: 1720                    Far-end Listen Port: 1720
                                              Far-end Network Region: 1
           LRQ Required? n                     Calls Share IP Signaling Connection? n
           RRQ Required? n
       Media Encryption? n                         Bypass If IP Threshold Exceeded? n
                                                           H.235 Annex H Required? n
           DTMF over IP: in-band                  Direct IP-IP Audio Connections? n
    Link Loss Delay Timer(sec): 90                          IP Audio Hairpinning? n
           Enable Layer 3 Test? n                     Interworking Message: PROGress
                                                DCP/Analog Bearer Capability: 3.1kHz
```

Step	Description
6.	**Administer H.323 Trunk Group** Use the **add trunk group** command to create a trunk group for the H.323 trunks to the Fax server. Trunk group ***9*** was configured using the parameters highlighted below. Default values may be used for all other fields. On **Page 1**: ▪ Set the **Group Type** field to ***isdn***. ▪ Enter a descriptive name for the **Group Name**. ▪ Enter an available trunk access code (TAC) that is consistent with the existing dial plan in the **TAC** field. ▪ Set the **Carrier Medium** to ***H.323***. ▪ Set the **Service Type** field to ***tie***. ▪ Set the **Member Assignment Method** to ***auto***. ▪ Set the **Signaling Group** to the signaling group shown in the previous step. ▪ In **Number of Members** field, enter the number of trunks in the trunk group. This determines how many simultaneous calls can be supported by the configuration. ▪ Default values may be used for all other fields.

```
add trunk-group 9                                          Page   1 of  21
                                TRUNK GROUP

 Group Number: 9                    Group Type: isdn          CDR Reports: y
   Group Name: H323 FaxServer              COR: 1        TN: 1        TAC: 109
    Direction: two-way        Outgoing Display? n         Carrier Medium: H.323
  Dial Access? n              Busy Threshold: 255  Night Service:
 Queue Length: 0
 Service Type: tie                   Auth Code? n
                                                 Member Assignment Method: auto
                                                           Signaling Group: 9
                                                         Number of Members: 25
```

Administer H.323 Trunk Group – Continued

On **Page 3**:

- Set the **Send Name** field and **Send Calling Number** field to ***y***. These settings enable the sending of calling party name and number to the far end.
- Set the **Format** field to ***public***. This field specifies the format of the calling party number sent to the far-end.
- Default values may be used for all other fields.

```
add trunk-group 9                                          Page   3 of  21
 TRUNK FEATURES
           ACA Assignment? n            Measured: none
                                 Internal Alert? n        Maintenance Tests? y
                               Data Restriction? n     NCA-TSC Trunk Member:
                                     Send Name: y      Send Calling Number: y
             Used for DCS? n                          Send EMU Visitor CPN? n
    Suppress # Outpulsing? n    Format: public
                                          UUI IE Treatment: service-provider

                                             Replace Restricted Numbers? n
                                           Replace Unavailable Numbers? n
                                                 Send Connected Number: n
 Network Call Redirection: none                  Hold/Unhold Notifications? n
              Send UUI IE? y     Modify Tandem Calling Number: no
                Send UCID? n
  Send Codeset 6/7 LAI IE? y
```

Step	Description
7.	**Administer Signaling Group – Update** Use the **change signaling-group** command to update the **Trunk Group for Channel Selection** field with the trunk group created in **Step 6**.

```
change signaling-group 9                                        Page   1 of   6
                                SIGNALING GROUP

  Group Number: 9              Group Type: h.323
          SBS? n           Remote Office? n          Max number of NCA TSC: 0
        Q-SIP? n                                     Max number of CA TSC: 0
     IP Video? n                                   Trunk Group for NCA TSC:
       Trunk Group for Channel Selection: 9       X-Mobility/Wireless Type: NONE
      TSC Supplementary Service Protocol: a          Network Call Transfer? n
                                                   T303 Timer(sec): 10
    H.245 DTMF Signal Tone Duration(msec):
    Near-end Node Name: procr                  Far-end Node Name: faxserver
  Near-end Listen Port: 1720                 Far-end Listen Port: 1720
                                           Far-end Network Region: 1
          LRQ Required? n                  Calls Share IP Signaling Connection? n
          RRQ Required? n
      Media Encryption? n                      Bypass If IP Threshold Exceeded? n
                                                       H.235 Annex H Required? n
          DTMF over IP: in-band                 Direct IP-IP Audio Connections? n
   Link Loss Delay Timer(sec): 90                        IP Audio Hairpinning? n
          Enable Layer 3 Test? n                    Interworking Message: PROGress
                                                DCP/Analog Bearer Capability: 3.1kHz
```

Step	Description
8.	**Administer Public Unknown Numbering** Public unknown numbering defines the calling party number to be sent to the far-end. Use the **change public-unknown-numbering** command to create an entry that will be used by the trunk group defined in **Step 6**. In the example shown below, all calls originating from a 5-digit extension beginning with 5 and routed across any trunk group (since the **Trk Grp(s)** entry is blank) will be sent as a 5-digit calling number.

```
change public-unknown-numbering 0                               Page   1 of   2
                        NUMBERING - PUBLIC/UNKNOWN FORMAT
                                              Total
 Ext Ext           Trk       CPN              CPN
 Len Code          Grp(s)    Prefix           Len
                                                    Total Administered: 2
  5  5                                          5      Maximum Entries: 9999

                                                    Note: If an entry applies to
                                                    a SIP connection to Avaya
                                                    Aura(tm) Session Manager,
                                                    the resulting number must
                                                    be a complete E.164 number.
```

Step	Description
9.	**Administer Route Pattern** Use the **change route-pattern** command to create a route pattern that will route calls to the H.323 trunk that connect to the fax server. A descriptive name was entered for the **Pattern Name** field. The **Grp No** field was set to the trunk group created in **Step 6**. The Facility Restriction Level (**FRL**) field was set to a level that allows access to this trunk for all users that require it. The value of ***0*** is the least restrictive level. The default values were used for all other fields.

```
change route-pattern 9                                        Page   1 of   3
                     Pattern Number: 9   Pattern Name: faxserver
                                SCCAN? n     Secure SIP? n
    Grp FRL NPA Pfx Hop Toll No.  Inserted                          DCS/ IXC
    No          Mrk Lmt List Del  Digits                          QSIG
                                  Dgts                            Intw
 1: 9    0                                                         n   user
 2:                                                                n   user
 3:                                                                n   user
 4:                                                                n   user
 5:                                                                n   user
 6:                                                                n   user

     BCC VALUE  TSC CA-TSC    ITC BCIE Service/Feature PARM  No. Numbering LAR
    0 1 2 M 4 W     Request                                 Dgts Format
                                                         Subaddress
 1: y y y y y n  n           rest                                      none
 2: y y y y y n  n           rest                                      none
 3: y y y y y n  n           rest                                      none
 4: y y y y y n  n           rest                                      none
 5: y y y y y n  n           rest                                      none
 6: y y y y y n  n           rest                                      none
```

10.	**Administer AAR Analysis** Automatic Alternate Routing (AAR) was used to route calls to fax server. Use the **change aar analysis** command to create an entry in the AAR Digit Analysis Table for this purpose. The highlighted entry specifies that if the dialed number is 75000 and is 5 digits long, to use route pattern 9. Route pattern 9 routes calls to fax server.

```
change aar analysis 7                                         Page   1 of   2
                           AAR DIGIT ANALYSIS TABLE
                                Location: all            Percent Full: 1

          Dialed          Total     Route    Call   Node  ANI
          String         Min  Max  Pattern   Type   Num   Reqd
    75000                5    5     9        aar          n
```

6 Dialogic® Brooktrout® SR140 Software Setup Notes

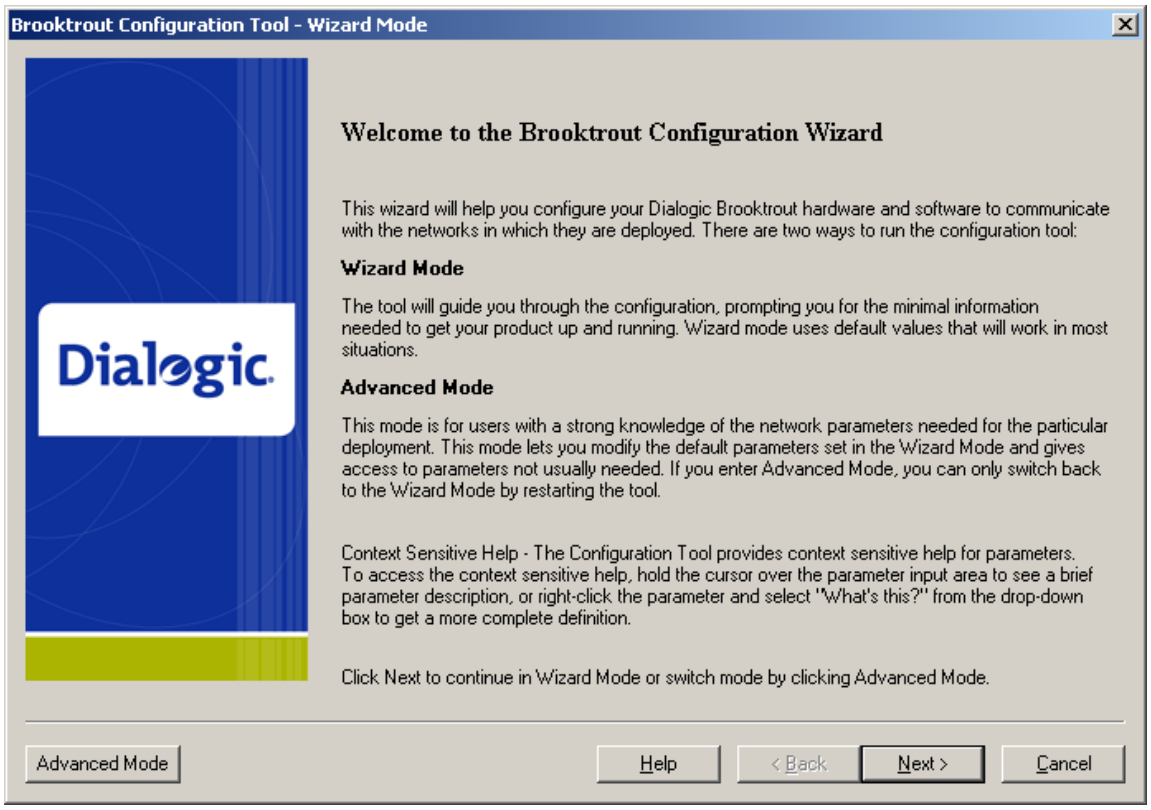
This section describes the configuration of the Dialogic Brooktrout SR140 Fax Software. It assumes that that a fax server application and all required software components, including Dialogic Brooktrout SR140 Fax Software, have been installed and properly licensed. For instructions on installing Dialogic Brooktrout SR140 Fax Software, consult the Dialogic Brooktrout SR140 Fax Software documentation (**Reference [3]**).

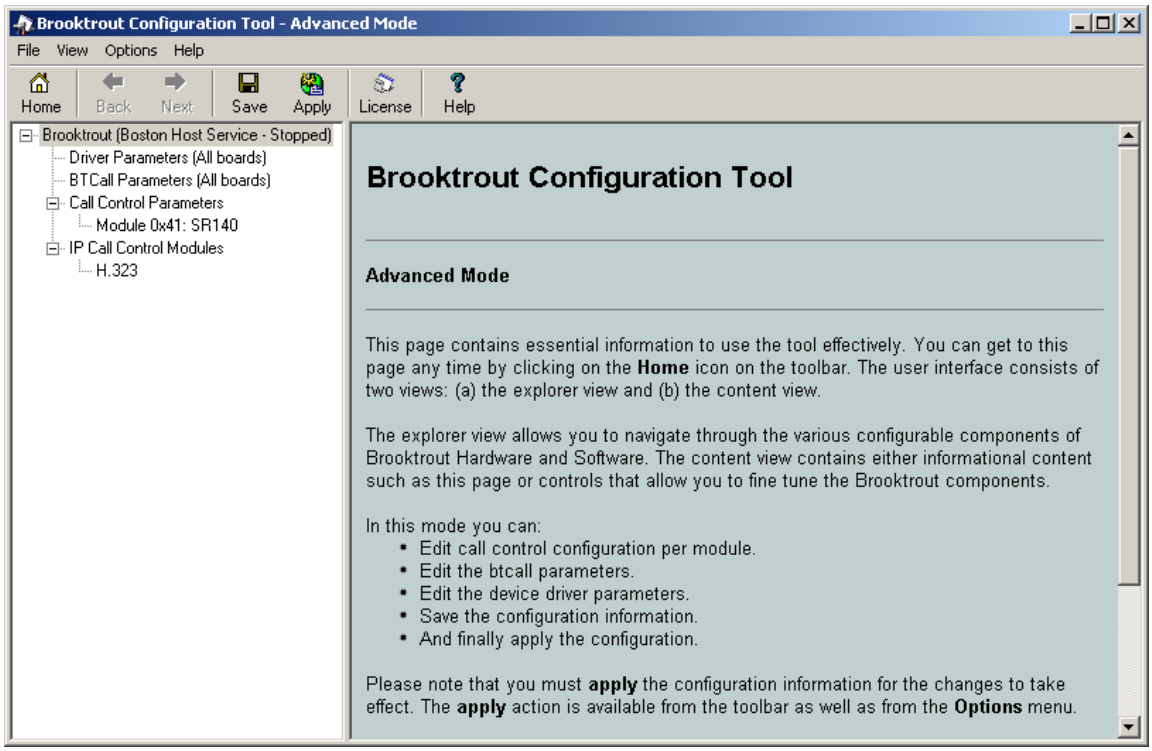
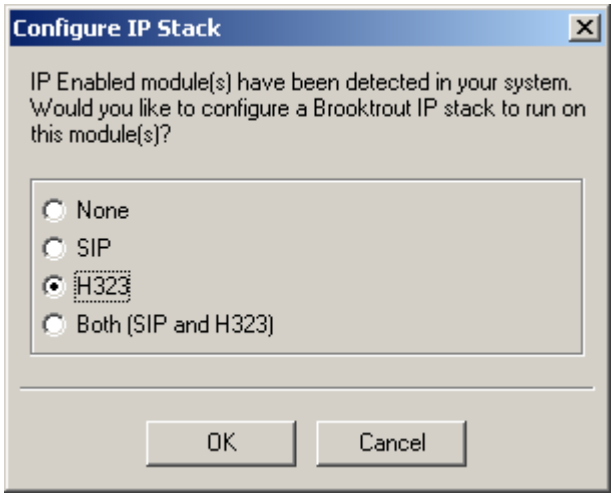
Note that the configurations documented in this section pertain to interoperability between the Dialogic Brooktrout SR140 Fax Software and the Avaya H.323 infrastructure. The standard configurations pertaining to the Dialogic Brooktrout SR140 Fax Software itself (for example, , administering fax channels) are not covered. For instructions on administering and operating the Dialogic Brooktrout SR140 Fax Software, consult the Dialogic Brooktrout SR140 Fax Software documentation (**Reference [3]**).

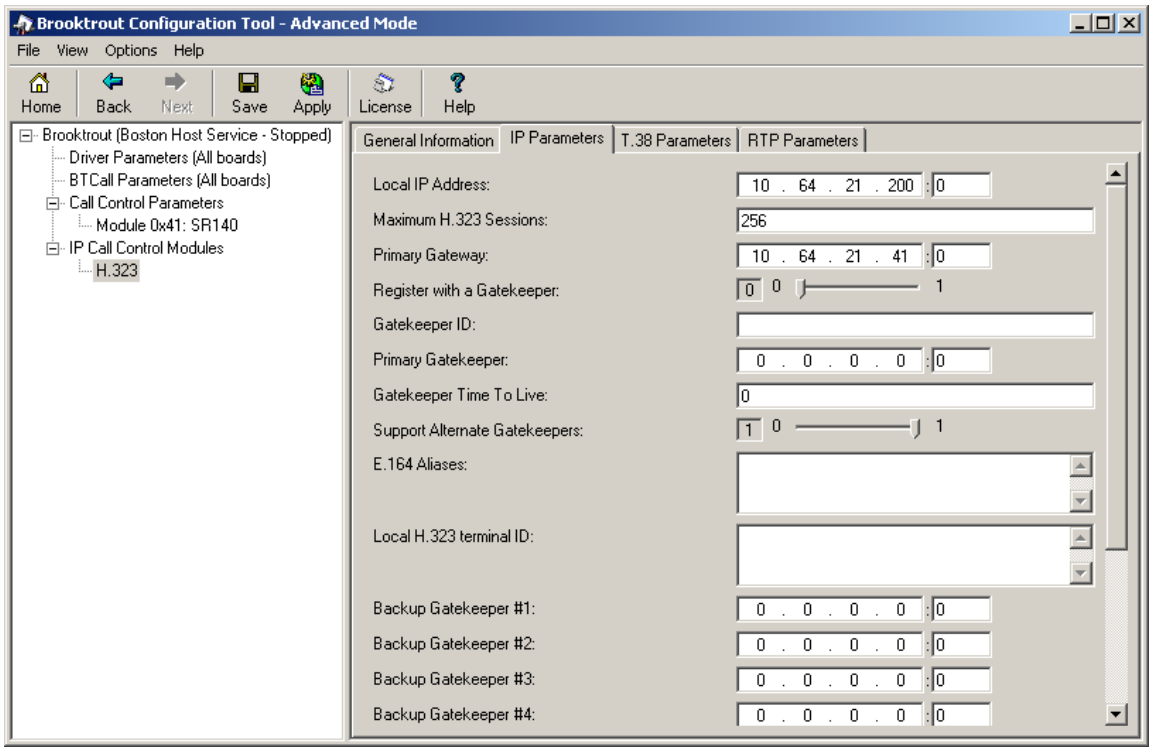
The examples shown in this section refer to Site 2 in **Figure 1**. Similar steps also apply to Site 1 using values appropriate for that location.

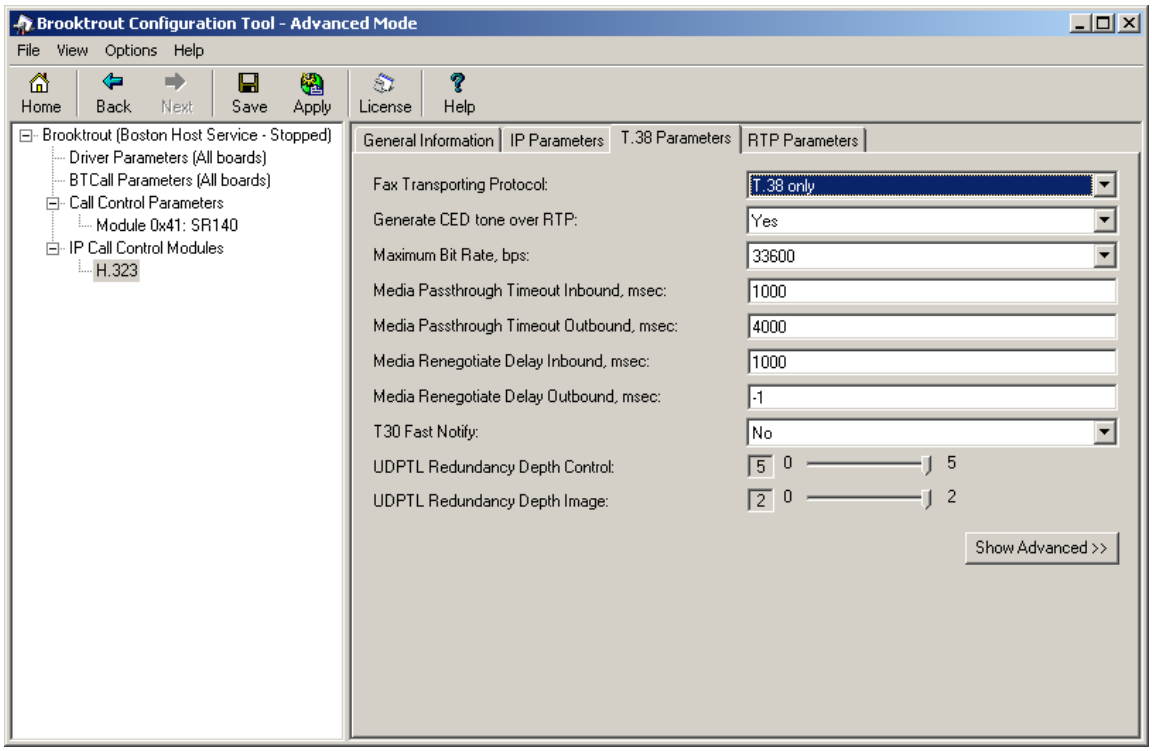
The configuration procedures covered in this section include the following:

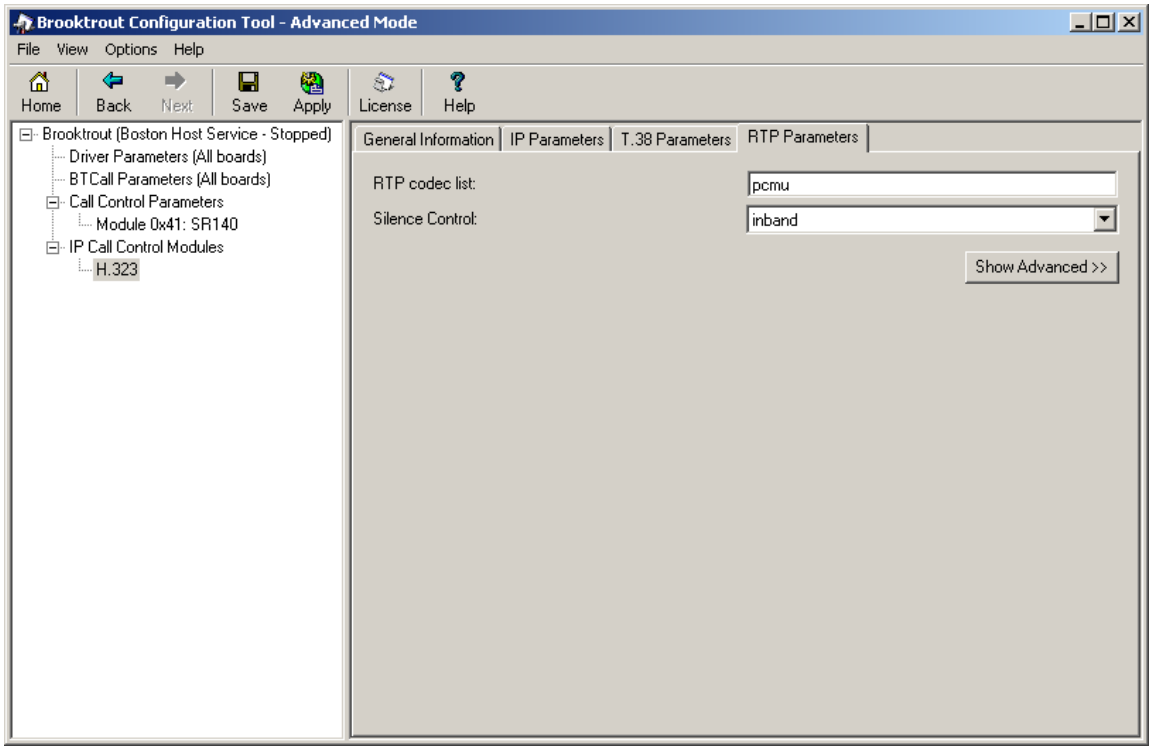
1. Launch Brooktrout Configuration Tool
2. Configure IP Stack
3. Configure H.323 IP Parameters
4. Configure T.38 Parameters
5. Configure RTP Parameters
6. Configure RTP Port Range
7. Complete Brooktrout SR140 configuration

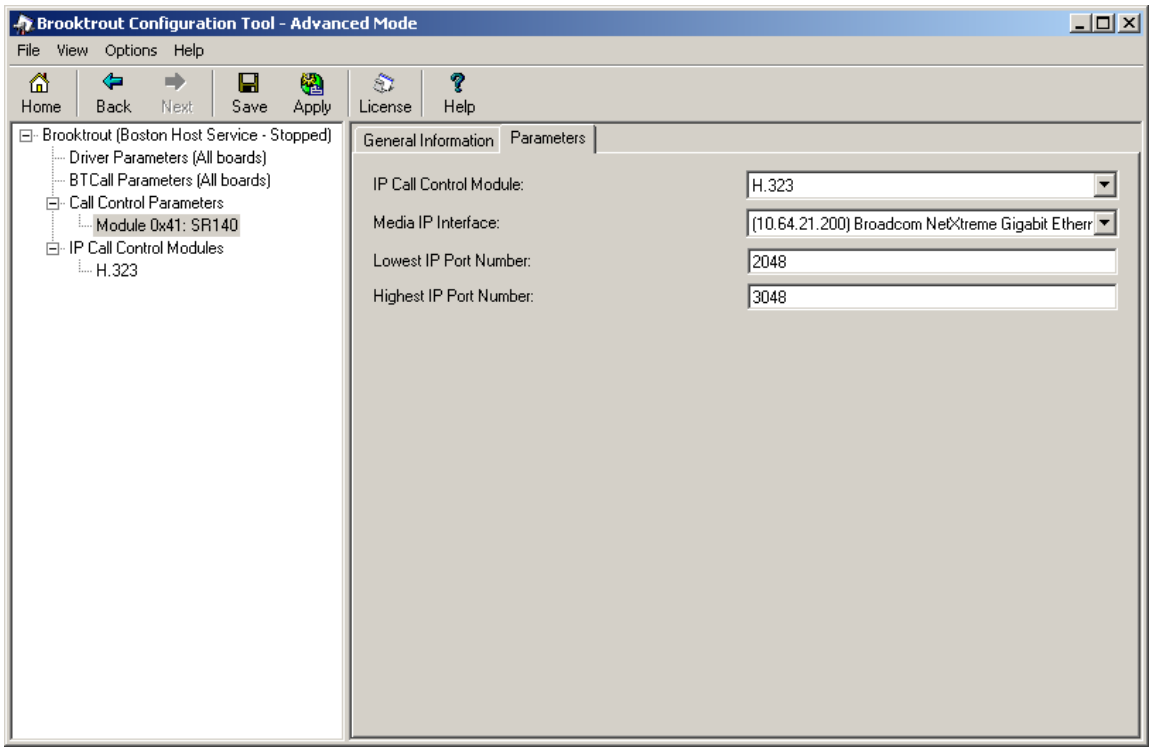
Step	Description
1.	**Launch Brooktrout Configuration Tool** Navigate to the path of the Brooktrout configuration tool (that is, . **configtool.exe**) and launch the tool. The **Brooktrout Configuration Tool – Wizard Mode** window gets displayed. Click the **Advanced Mode** button on the bottom left. 

Step	Description
2.	**Configure IP Stack** The following configuration tool window is displayed.  Select **Options → Configure IP Stack** from the top menu. The screen below is displayed. Select **H323** and click **OK**. 

Step	Description
3.	**Configure H.323 IP Parameters** ***Important**: This step describes configuring the Primary H.323 Gateway address using the Brooktrout Configuration Tool. This method is sufficient if the fax server will communicate with a single H.323 gateway. Refer to the Dialogic Brooktrout SR140 Fax Software documentation for configuration details if the fax server will communicate with multiple H.323 gateways.* From the pane on the left, navigate to **Brooktrout → IP Call Control Modules → H.323** in the left navigation menu. Select the **IP Parameters** tab in the right pane. Configure the fields as follows: • **Local IP Address** – the IP address assigned to the fax server • **Primary Gateway** –for Site 2, set to the IP address of the Avaya S8300D Server (Note: for Site 1, set to the IP address of the CLAN circuit pack used to connect to fax server). Use default values for all other fields. 

Step	Description
4.	**Configure T.38 Parameters** Select the **T.38 Parameters** tab. Configure the fields as shown below in the screenshot. 

Step	Description
5.	**Configure RTP Parameters** Select the **RTP Parameters** tab. Set the **RTP codec list** value to use only a single codec, either ***pcmu*** or ***pcma*** to match the codec used in your region. 

Step	Description
6.	**Configure RTP Port Range** From the pane on the left, navigate to **Call Control Parameters → Module 0x41: SR140**. Select the **Parameters** tabs. Configure the **Lowest IP Port Number** and **Highest IP Port Number** values to match the **UDP Port Min** and **UDP Port Max** values in the **IP Network Region** configuration screen in Communication Manager. ***Note**: Communication Manager default port range is 2048 to 3329; however, the Brooktrout Configuration Tool range only spans 1000 ports. If you set Lowest IP Port Number to 2048, the Highest Port Number should automatically be set to 3048.* 

Step	Description

7.	**Complete Brooktrout SR140 Configuration**
	After verifying all the above parameters are properly set, click **Save** in the button menu and exit the Brooktrout Configuration Tool.
	
	In the **DocTransport Configuration** screen, click the **OK** button.
	
	From Windows explorer, navigate to the path of the Brooktrout call control configuration file (i.e. **callctrl.cfg**). Open the **callctrl.cfg** file and verify the following (making any edits as necessary):
	
	• Verify that the following configuration segment is present; and that the **rtp_codec** value under the **[host_module.1/rtp]** header matches the value specified in **Step 5** above, either "pcmu" or "pcma". (Note, `...` below indicates other entries under the header).
	
	`[host_module.1/rtp]`
	`...`
	`rtp_codec=pcmu`
	`...`
	
	• Verify that **rtp_ced_enable** is set to ***true*** under the **[host_module.1/t.38parameters]** header. (Note, `...` below indicates other entries under the header).
	
	`[host_module.1/t.38parameters]`
	`...`
	`rtp_ced_enable=true`
	`...`
	
	After making and saving any edits in the **callctrl.cfg** file, restart the fax server.

7 Verification Steps

The following steps may be used to verify the configuration:

- From Communication Manager SAT, use the:
  - **status signaling-group** to verify the signaling group to the fax server is in-service.
  - **status trunk-group** command to verify the trunk group to fax server is in-service.
  - **list trace tac** command to verify that fax calls are routed over the expected trunks.
- Verify fax calls can be placed to/from the fax server.

8 Conclusions

These Application Notes describe the procedures for configuring Dialogic Brooktrout SR140 Fax Software with Avaya Aura® Communication Manager using an H.323 trunk interface. Dialogic Brooktrout SR140 Fax Software successfully passed compliance testing.

9 Additional References

This section provides references to the product documentation relevant to these Application Notes. Avaya product documentation may be found at http://support.avaya.com.

[1] *Avaya Aura™ Communication Manager Feature Description and Implementation*, Doc # 555-245-205, Release 6.0, Issue 8.0, June, 2010.

[2] *Administering Avaya Aura™ Communication Manager*, Doc # 03-300509, Release 6.0, Issue 6.0, June, 2010.

[3] Dialogic Brooktrout SR140 Fax Software documentation may be found out http://www.dialogic.com/en/Products/fax-boards-and-software/foip/sr140.aspx.

[4] Product documentation for Avaya products may be found at:
https://support.avaya.com/css/Products/

[5] *Avaya Solution & Interoperability Test Lab Report: Application Notes for Configuring Dialogic Brooktrout SR140 Fax Software with Avaya Aura® Communication Manager using an H.323 Trunk Interface - Issue 0.1*

10 Frequently Asked Questions

- ”*I’m configured as near as possible to this the sample configuration described in this document, but calls are still not successful; what is my next step?”*
  - ➔ Provide this document to your gateway support.
  - ➔ Ensure T.38 is enabled on the gateway.
  - ➔ Confirm that basic network access is possible by pinging the gateway.

- ”*How do I obtain Wireshark traces?*”
  - ➔ The traces can be viewed using the Wireshark network analyzer program, which can be freely downloaded from *http://www.wireshark.org*.
  - ➔ To view the call flow in Wireshark, open the desired network trace file and select “Statistics->VoIP Calls” from the drop down menu. Then highlight the call and click on the “Graph” button.