**Avaya Solution & Interoperability Test Lab**

# Application Notes for Cantata SR140 with Avaya Communication Manager - Issue 1.0

## Abstract


These Application Notes describe the configuration steps required for Cantata SR140 T.38 fax server to send/receive faxes via Avaya Communication Manager. SR140 is a software base fax server that runs on Microsoft Windows 2000 and subsequent versions to send and receive fax calls over the IP network. In the configuration described in these Application Notes, SR140 communicates with Avaya Communication Manager via an H.323 IP trunk. An ISDN-PRI trunk is also used between two Avaya Communication Manager systems.

Information in these Application Notes has been obtained through Developer*Connection* compliance testing and additional technical discussions. Testing was conducted via the Developer*Connection* Program at the Avaya Solution and Interoperability Test Lab.





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# 1. Introduction

These Application Notes describe the configuration steps required for Cantata SR140 T.38 fax server to send/receive faxes via Avaya Communication Manager. In the configuration described in these Application Notes, SR140 communicates with Avaya Communication Manager via an H.323 IP trunk. An ISDN-PRI trunk is also used between two Avaya Communication Manager systems. Fax calls are sent/received to/from an analog fax machine and remote SR140 fax server. SR140 sends outbound fax calls over the H.323 IP trunk to Avaya Communication Manager. Avaya Communication Manager routes the fax calls to analog fax machine or to remote SR140 fax server over an ISDN-PRI trunk. Similarly, for inbound faxes destined for SR140 fax server, Avaya Communication Manager routes the fax calls over the H.323 IP trunk to the SR140 fax server.

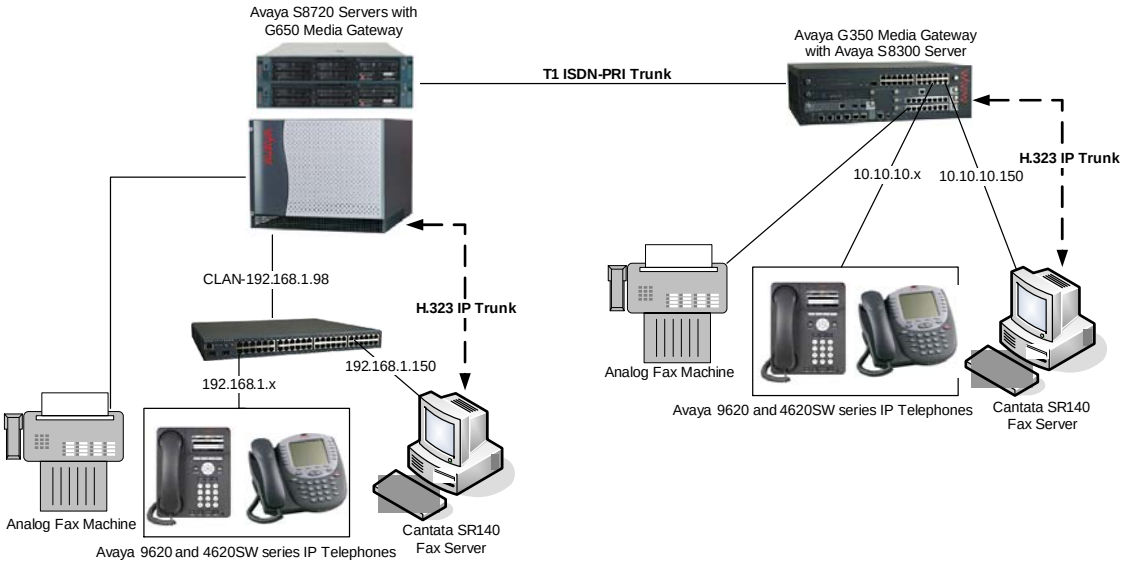


**Figure 1: Compliance Test Configuration**

**Figure 1** displays the network configuration that was utilized for compliance testing. Faxes are sent between the SR140 fax server and the analog fax machine. Also, faxes are sent between two SR140 fax servers across the ISDN-PRI trunk. Although the Avaya 9620 and 4620SW IP Telephones are not involved in the faxing operations, they are present in the configuration to verify VoIP telephone calls are not affected by the faxing operations and vice versa.


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## 2. Equipment and Software Validated

The following equipment and software/firmware were used for the test configuration.

| Equipment | Software/Firmware |
|---|---|
| Avaya S8720 Servers | Avaya Communication Manager 3.1.4, Load 643.0 |
| Avaya G650 Media Gateway<br>• TN799DP C-LAN Circuit Pack<br>• TN2302AP Media Processor Circuit Pack<br>• TN793B 24 Port Analog Board<br>• TN464F DS1 Board | -<br>HW01 FW017<br>HW12 FW117<br>Vintage 5<br>Vintage 6 |
| Avaya G350 Media Gateway<br>• S8300B V2<br>• MM711AP 8 Port Analog Module<br>• MM710AP DS1 Module | Avaya Communication Manager 4.0.1, Load 731.2<br>Vintage 26.33.0, DSP Vintage 70<br>HW05 FW017<br>HW05 FW014 |
| Avaya IP telephones:<br>• 9620<br>• 4610SW | <br>1.5 (H.323)<br>2.8 (H.323) |
| Cantata SR140 Fax Server | 5.1.2 |
| Samsung MSYS 730 (used as analog fax machine) | - |


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# 3. Configure Avaya Communication Manager

This section provides the procedure for configuring Avaya Communication Manager. These Application Notes cover the configuration of Avaya Communication Manager running on the S8720 Server with Avaya G650 Media Gateway, however similar steps can be taken to configure Avaya Communication Manager running on the Avaya S8300 Server with Avaya G350 Media Gateway. The Avaya System Access Terminal (SAT) was used to issue the commands to Avaya Communication Manager. This configuration covers the following areas:

- Verify Avaya Communication Manager software options
- Verify network region for IP interfaces
- Administer IP codec
- Administer IP network region
- Administer IP node name
- Administer H.323 IP trunk
- Administer signaling group
- Administer H.323 IP trunk members

These Application Notes cover the configuration of the H.323 IP trunk between Avaya Communication Manager and Cantata SR140 to send/receive fax over IP network via Avaya Communication Manager. The detailed administration of dial plan, IP stations, analog stations, T1 ISDN-PRI trunk, and aar/ars routing patterns are assumed to be in place.

## 3.1. Verify Avaya Communication Manager Software Options

Use the "display system-parameters customer-options" command and navigate to **Page 2** to verify that **Maximum Administered H.323 Trunks** is greater than the number of **USED** H.323 IP trunks.

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

IP PORT CAPACITIES                                            USED
                     Maximum Administered H.323 Trunks: 500   237
          Maximum Concurrently Registered IP Stations: 200   10
            Maximum Administered Remote Office Trunks: 0     0
Maximum Concurrently Registered Remote Office Stations: 0     0
             Maximum Concurrently Registered IP eCons: 0     0
  Max Concur Registered Unauthenticated H.323 Stations: 0     0
                Maximum Video Capable H.323 Stations: 0     0
                 Maximum Video Capable IP Softphones: 0     0
                     Maximum Administered SIP Trunks: 1000  48

   Maximum Number of DS1 Boards with Echo Cancellation: 0     0
                            Maximum TN2501 VAL Boards: 10    2
                    Maximum Media Gateway VAL Sources: 0     0
          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: 0     0
```


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Navigate to **Page 4**, and verify that the **IP Trunks** field is set to "y". If not, contact an authorized Avaya account representative to obtain the appropriate license.

```
display system-parameters customer-options                      Page   4 of  11
                                OPTIONAL FEATURES

   Emergency Access to Attendant? y                               IP Stations? y
            Enable 'dadmin' Login? y
            Enhanced Conferencing? y                       ISDN Feature Plus? n
                  Enhanced EC500? y             ISDN Network Call Redirection? n
    Enterprise Survivable Server? n                          ISDN-BRI Trunks? n
       Enterprise Wide Licensing? n                                ISDN-PRI? y
              ESS Administration? y                 Local Survivable Processor? n
          Extended Cvg/Fwd Admin? n                       Malicious Call Trace? n
     External Device Alarm Admin? n                   Media Encryption Over IP? y
  Five Port Networks Max Per MCC? n      Mode Code for Centralized Voice Mail? n
                Flexible Billing? n
   Forced Entry of Account Codes? n                   Multifrequency Signaling? y
      Global Call Classification? n          Multimedia Call Handling (Basic)? n
             Hospitality (Basic)? y       Multimedia Call Handling (Enhanced)? n
 Hospitality (G3V3 Enhancements)? n
                      IP Trunks? y

           IP Attendant Consoles? n
```

## 3.2. Verify Network Region for IP Interfaces

Use the "list ip-interface all" command to verify IP network region for C-LAN and MedPro boards. In the example below, the C-LAN and MedPro boards are assigned to network region 1.

```
list ip-interface all

                                IP INTERFACES
                                                                        Net
ON Type   Slot   Code Sfx Node Name/      Subnet Mask     Gateway Address Rgn VLAN
                         IP-Address
-- ----   ----   ---- --- --------------- --------------- --------------- --- ----
n C-LAN   01A02  TN799  D CLAN-01a01      255.255.255.0   192.168.1.1      1   n
                           192.168.1.10
y C-LAN   01B02  TN799  D CLAN-01b02      255.255.255.0   192.168.1.1      1   n
                           192.168.1.98
y MEDPRO  01B03  TN2302   MEDPRO-01b03    255.255.255.0   192.168.1.1      1   n
                           192.168.1.97
```


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## 3.3. Administer IP Codec

Use the "change ip-codec-set n" command, where "n" is the valid codec set number, "2". Navigate to **Page 2**, and set the **Mode** for **FAX** to "t.38-standard". Submit this change.

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

                         IP Codec Set

                             Allow Direct-IP Multimedia? n



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

## 3.4. Administer IP Network Region

Use the "change ip-network-region n" command, where "n" is a valid network region number. On **Page 1**, set the **Codec Set** field to the IP codec set number administered in **Section 3.3**, "2".

```
change ip-network-region 2                                     Page   1 of  19
                            IP NETWORK REGION
  Region: 1
Location:         Authoritative Domain:
    Name:
MEDIA PARAMETERS                Intra-region IP-IP Direct Audio: yes
      Codec Set: 2              Inter-region IP-IP Direct Audio: yes
   UDP Port Min: 2048                     IP Audio Hairpinning? y
   UDP Port Max: 3029
DIFFSERV/TOS PARAMETERS                 RTCP Reporting Enabled? y
 Call Control PHB Value: 34      RTCP MONITOR SERVER PARAMETERS
        Audio PHB Value: 46       Use Default Server Parameters? y
        Video PHB Value: 26
802.1P/Q PARAMETERS
 Call Control 802.1p Priority: 7
        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
```


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Navigate to **Page 3**, find the row(s) where **dst rgn** is the network region(s) assigned to the C-LAN and MedPro boards. In the codec set column, enter the number of the IP codec set configured in **Section 3.3**. Submit these changes.

```
change ip-network-region 2                                    Page   3 of  19

                   Inter Network Region Connection Management

 src dst codec direct   Total          Video                          Dyn
 rgn rgn  set   WAN  WAN-BW-limits  Norm Prio  Shr Intervening-regions  CAC IGAR
 2   1    2     y        :NoLimit              y                          n
 2   2    2
 2   3
```

## 3.5. Administer IP Node Name

Use the "change node-names ip" command, to add a node name entry for Cantata SR140 fax server as shown below. Submit this change.

- **Name:** Enter a descriptive node name.
- **IP Address:** Enter IP address of Cantata SR140 fax server.

```
change node-names ip                                          Page   1 of   2
                                  IP NODE NAMES
    Name                 IP Address
CLAN-1a02              192.168.1.10
CLAN-1b02              192.168.1.98
MEDPRO-1b03            192.168.1.97
cantata_sr140          192.168.1.150
```

## 3.6. Administer H.323 IP Trunk

Use the "add trunk-group n" command, where "n" is an unused trunk group number. On **Page 1**, enter values in the following fields. Submit these changes.

- **Group Type**: Set to "isdn".
- **Group Name**: Enter a descriptive name.
- **TAC**: Enter a Trunk Access Code that is valid under the provisioned dial plan.
- **Carrier Medium**: Set to "H.323".
- **Service Type**: Set to "tie".

```
add trunk-group 10                                            Page   1 of  21
                               TRUNK GROUP

Group Number: 10                  Group Type: isdn          CDR Reports: y
  Group Name: To sr140                     COR: 1        TN: 1        TAC: 210
   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: manual
```


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## 3.7. Administer Signaling Group

Use the "add signaling-group n" command, where "n" is an unused signaling group number. On **Page 1**, enter values in the following fields. Submit these changes.

- **Group Type**: Set to "h.323".
- **Trunk Group for Channel Selection**: Enter the number of the trunk group administered in **Section 3.6**, "10".
- **Near-end Node Name**: Enter the node name of the C-LAN board, "CLAN-1b02".
- **Far-end Node Name**: Enter the node name for Cantata SR140 administered in **Section 3.5**, "cantata_sr140".
- **Far-end Listen Port**: Enter "1720".
- **Far-end Network Region**: Enter the number of the IP network region administered in **Section 3.4**, "2".

```
add signaling-group 10                                          Page   1 of   5
                              SIGNALING GROUP

 Group Number: 10             Group Type: h.323
                            Remote Office? n          Max number of NCA TSC: 0
                                      SBS? n           Max number of CA TSC: 0
         IP Video? n                                Trunk Group for NCA TSC:
      Trunk Group for Channel Selection: 10
     TSC Supplementary Service Protocol: a
                         T303 Timer(sec): 10

   Near-end Node Name: CLAN-1b02            Far-end Node Name: cantata_sr140
 Near-end Listen Port: 1720               Far-end Listen Port: 1720
                                       Far-end Network Region:2
        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: out-of-band            Direct IP-IP Audio Connections? y
 Link Loss Delay Timer(sec): 90                       IP Audio Hairpinning? n
                                           Interworking Message: PROGress
                                      DCP/Analog Bearer Capability: 3.1kHz
```


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## 3.8. Administer H.323 IP Trunk Members

Use the "change trunk-group n" command, where "n" is the number of the trunk group administered in **Section 3.6**. Navigate to **Page 5**, and enter values in the following fields to add trunk members.

- **Port**: Enter "IP".
- **Sig Grp**: Enter the number of the signaling group administered in **Section 3.7**.

```
change trunk-group 10                                        Page   5 of  21
                                TRUNK GROUP
                                     Administered Members (min/max):   0/0
GROUP MEMBER ASSIGNMENTS                 Total Administered Members:   0

      Port              Name        Night           Sig Grp
  1: IP                                              10
  2: IP                                              10
  3: IP                                              10
  4: IP                                              10
  5: IP                                              10
  6: IP                                              10
  7: IP                                              10
  8: IP                                              10
  9: IP                                              10
 10: IP                                              10
 11: IP                                              10
 12: IP                                              10
 13: IP                                              10
 14: IP                                              10
 15: IP                                              10
```

Verify that the number of trunk members matches the number of channels supported on the Cantata SR140 side of the IP trunk. The number of channels supported in Cantata SR140 is controlled via a SR140 license file.


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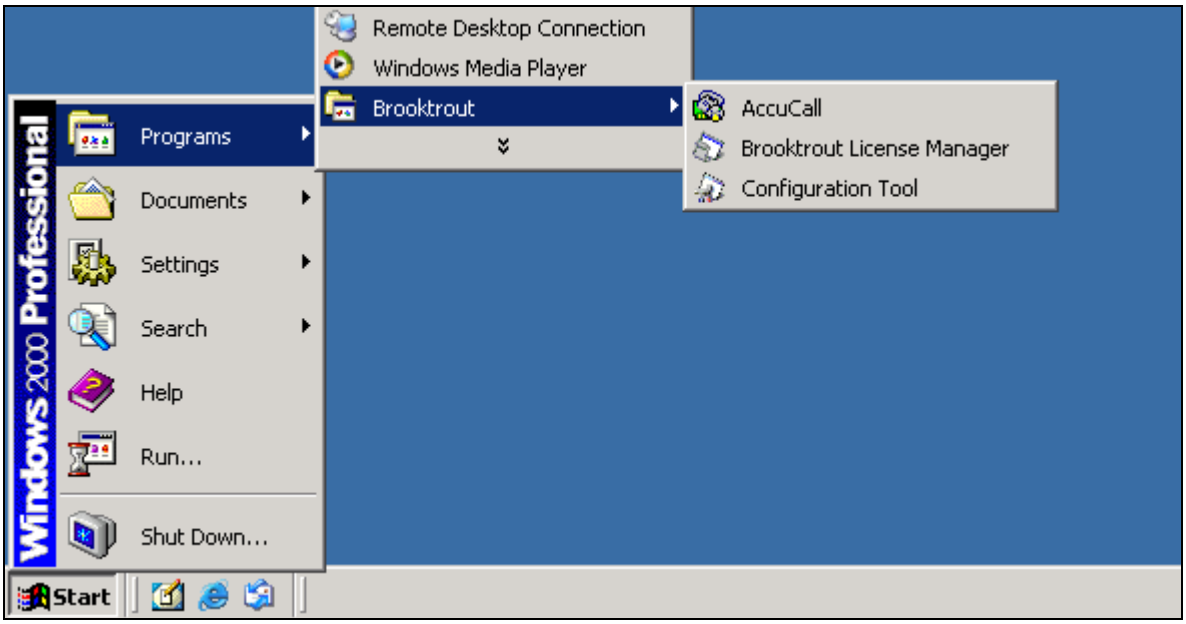
# 4. Administer Cantata SR140

This section describes the steps for configuring the SR140 fax server. For instructions on sending and receiving faxes, consult the SR140 user documentation. This configuration covers the following areas:

- Launch configuration tool
- Administer T.38 parameters

## 4.1. Launch Configuration Tool

On the SR140 fax server, navigate to **Start → Programs → Brooktrout** and select **Configuration Tool**.





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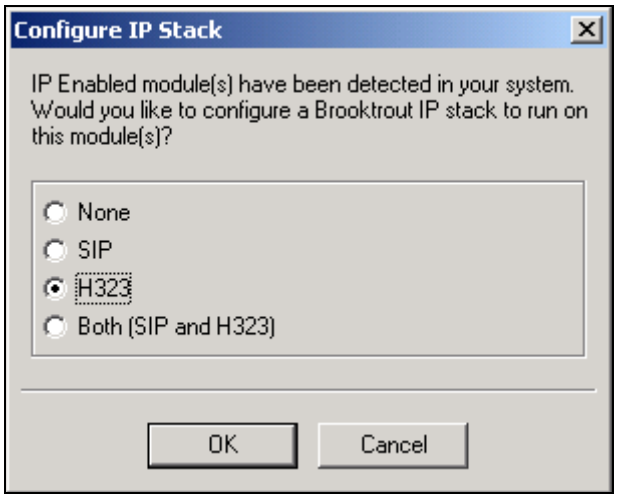
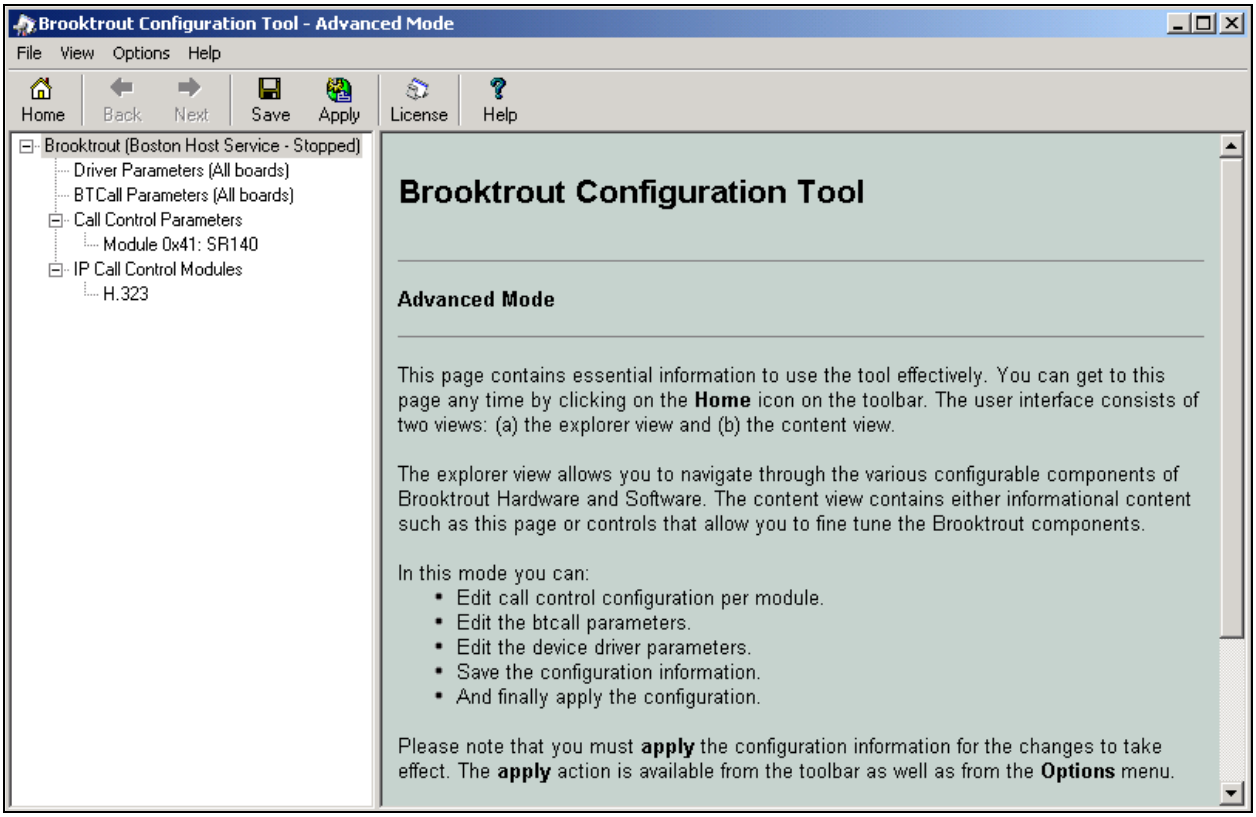
The **Configure IP Stack** window appears. Select the **H323** radio button to enable the IP module for H323 call control. Click **OK**.




The **Brooktrout Configuration Tool – Advance Mode** window appears.





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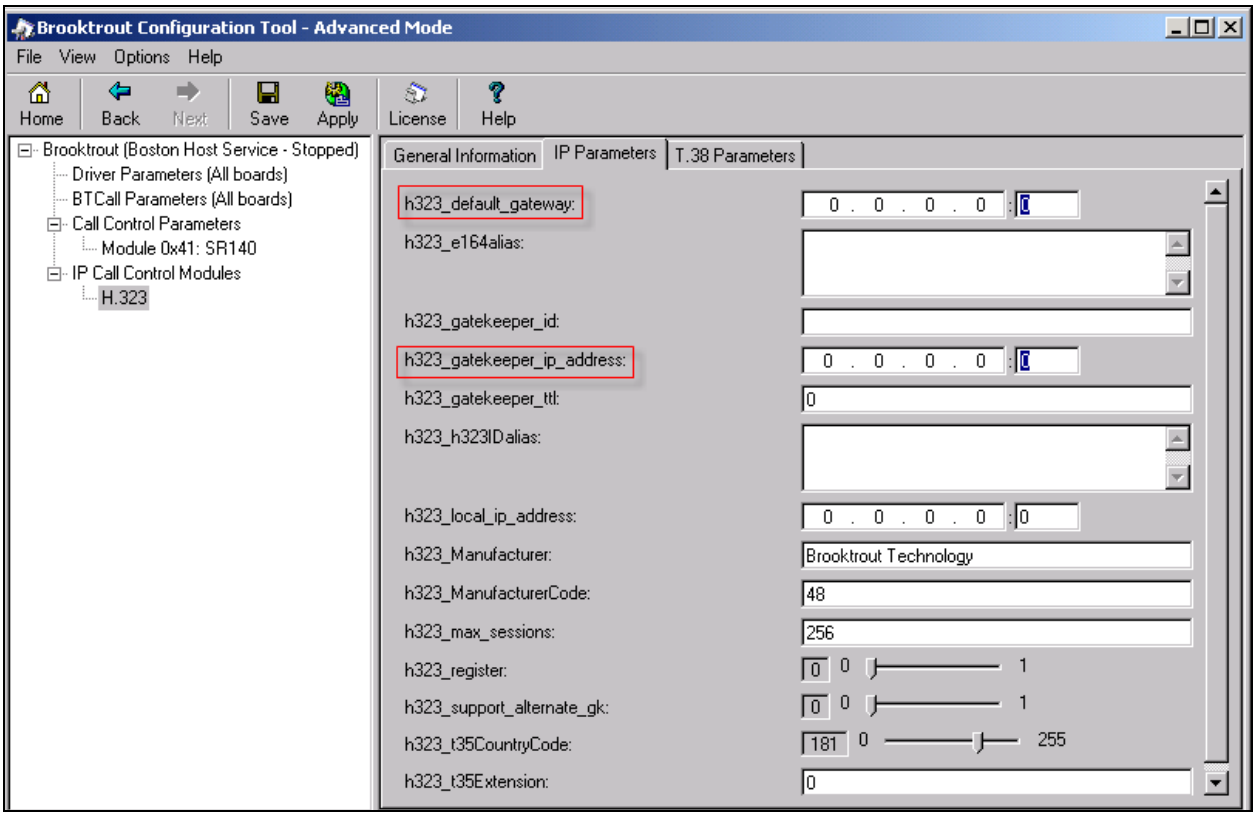
## 4.2. Verify IP Parameters

The SR140 considers if **h323_default_gateway** port is set to port "0", it uses port 1720 to listen. That's why "1720" must be entered in the **Far-end Listen Port** field in Avaya Communication Manager in **Section 3.7**. Similarly, SR140 considers if **h323_gatekeeper_ip_address** port is set to port "0", it uses port 1719 for call control.





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# 5. Interoperability Compliance Testing

The interoperability compliance test included feature and serviceability testing. Feature testing focused on verifying if Cantata SR140 fax server can send/receive faxes through Avaya Communication Manager over H.323 IP trunk. Performance testing focused on continuously sending/receiving faxes to and from SR140 fax server. Serviceability testing focused on verifying that the Cantata SR140 fax server can resume faxing after failure recovery.

## 5.1. General Test Approach

The general approach was to use the SR140 fax server to send/receive faxes of varying page lengths, encodings, and resolutions to and from analog fax machine and another SR140 fax server. For performance testing 10 faxes of 2-pages and 3-pages were continuously sent to and from SR140. Serviceability testing included rainy day scenarios such as disconnect Ethernet cable from SR140 server, busy resources, non-fax destinations, IP signaling and trunk group busyouts, board resets, Avaya Communication Manager resets, and SR140 server resets.

## 5.2. Test Results

- All feature and serviceability test cases were completed successfully.

# 6. Verification Steps

This section provides the tests that can be performed to verify proper configuration of Avaya Communication Manager and Cantata SR140 fax server.

## 6.1. Verify Avaya Communication Manager

Verify the status of the signaling group using the "status signaling-group n" command, where "n" is the **signaling-group** number administered in **Section 3.7**. Verify that the **Group State** is "in-service".

```
status signaling-group 10
                         STATUS SIGNALING GROUP

       Group ID: 10                              Active NCA-TSC Count: 0
     Group Type: h.323                            Active CA-TSC Count: 0
  Signaling Type: facility associated signaling
     Group State: in-service
```


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Verify the status of the H.323 IP trunk using the "status trunk-group n" command, where "n" is the **trunk-group** number administered in **Section 3.6**. Verify that the **Service State** is "in-service/idle".

```
status trunk 10                                                    Page   1

                            TRUNK GROUP STATUS

Member    Port      Service State       Mtce Connected Ports
                                        Busy

0010/001  T00330    in-service/idle     no
0010/002  T00331    in-service/idle     no
0010/003  T00332    in-service/idle     no
0010/004  T00333    in-service/idle     no
0010/005  T00334    in-service/idle     no
0010/006  T00335    in-service/idle     no
0010/007  T00336    in-service/idle     no
0010/008  T00337    in-service/idle     no
0010/009  T00338    in-service/idle     no
0010/010  T00339    in-service/idle     no
0010/011  T00340    in-service/idle     no
0010/012  T00341    in-service/idle     no
0010/013  T00342    in-service/idle     no
0010/014  T00343    in-service/idle     no
```

## 6.2. Verify Cantata SR140

The following steps can be used to verify configuration from Cantata SR140 fax server.

- From the SR140 fax server, ping the appropriate Avaya G650 Media Gateway C-LAN and MedPro boards and verify connectivity.
- Verify that faxes may be successfully completed to and from the SR140 fax server.

# 7. Support

Technical support on Cantata SR140 can be obtained through the following:

- **Web:** http://www.cantata.com/contacts/technical_support.cfm
- **Phone:** North America – +1 781-433-9600
  Belgium – +32 2-658-5170
  United Kingdom – +44 1344-380-280
  Japan – +81 3-3234-2176
  China – 86-21-51095550
- **Email:** techsupport@cantata.com


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# 8. Conclusion

These Application Notes describe the procedures for configuring the Cantata SR140 5.1.2 T.38 fax server to send/receive faxes through Avaya Communication Manager 3.1.4 and 4.0.1. The Cantata SR140 is a software base fax server that runs on Microsoft Windows 2000 and subsequent versions to send and receive faxes over the IP network. In the configuration described in these Application Notes, SR140 communicates with Avaya Communication Manager via an H.323 IP trunk. An ISDN-PRI trunk is also used between two Avaya Communication Manager systems.

# 9. Reference

Product documentation for Avaya products may be found at http://support.avaya.com.

- *Administrator Guide for Avaya Communication Manager*, Issue 3.1, Feb 2007, Document 03-300509
- *Administration for Network Connectivity for Avaya Communication Manager*, Issue 12, Feb 2007, Document 555-233-504

Product documentation for Cantata products may be found on the software installation CD.

- *TR1000 Series SDK Installation and Configuration Guide*, Version 5.1, Nov 2006, Document 931-131-02


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