



**Application Notes for Biscom FAXCOM Server with Avaya
Aura™ Communication Manager Using H.323 Trunks
– Issue 1.0**

Abstract

These Application Notes describe the configuration steps required for Biscom FAXCOM Server to interoperate with Avaya Aura™ Communication Manager using H.323 trunks. Biscom FAXCOM Server is a fax solution that uses a H.323 trunk interface from Avaya Aura™ Communication Manager to send and receive faxes.

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

1. Introduction

These Application Notes describe the configuration steps required for Biscom FAXCOM Server to interoperate with Avaya Aura™ Communication Manager using H.323 trunks. Biscom FAXCOM Server is a fax solution that uses a H.323 trunk interface from Avaya Aura™ Communication Manager to send and receive faxes.

Biscom FAXCOM Server utilizes the Dialogic Brooktrout SR140 Virtual Fax Board to support T.38 fax over the IP network, and integration with Avaya Aura™ Communication Manager is achieved through a H.323 trunk interface.

1.1. Interoperability Compliance Testing

The interoperability compliance test included feature and serviceability testing.

The feature testing focused on verifying the following on the Biscom FAXCOM Server:

- Proper handling of faxes via H.323 trunks, including: sending/receiving faxes, intra-site faxes, inter-site faxes over ISDN (PRI), inter-site faxes over IP (H.323), use of different media processor boards, simultaneous bi-directional faxes, and miscellaneous failure scenarios.
- Proper handling of faxes with different pages, resolution, complexity, format, and data rates.
- No adverse impact on intra and inter-site VoIP calls during faxes.

The serviceability testing focused on verifying the ability of the Biscom FAXCOM Server to recover from adverse conditions, such as disconnecting/reconnecting the Ethernet cable and stopping/starting the fax service on the Biscom FAXCOM Server.

1.2. Support

Technical support on Biscom FAXCOM Server can be obtained through the following:

- **Phone:** (978) 250-8355
- **Web:** www.biscom.com/support

2. Reference Configuration

As shown in **Figure 1**, both the Local and Remote sites have a Biscom FAXCOM Server. H.323 trunks are used to connect each Biscom FAXCOM Server with the local Avaya Aura™ Communication Manager. Routing between the two sites include both ISDN PRI and H.323 trunks.

The Remote site consists of two Avaya G650 Media Gateways, with each media gateway configured as a separate port network in a separate IP network region. The Biscom FAXCOM Server at the Local site is in IP network region 2.

The detailed administration of routing between the two sites is not the focus of these Application Notes and will not be described.

The administration procedures in these Application Notes are shown for the Local site. Unless specified otherwise, the same procedures need to apply to the Remote site using appropriate values for the Remote site from **Figure 1**.

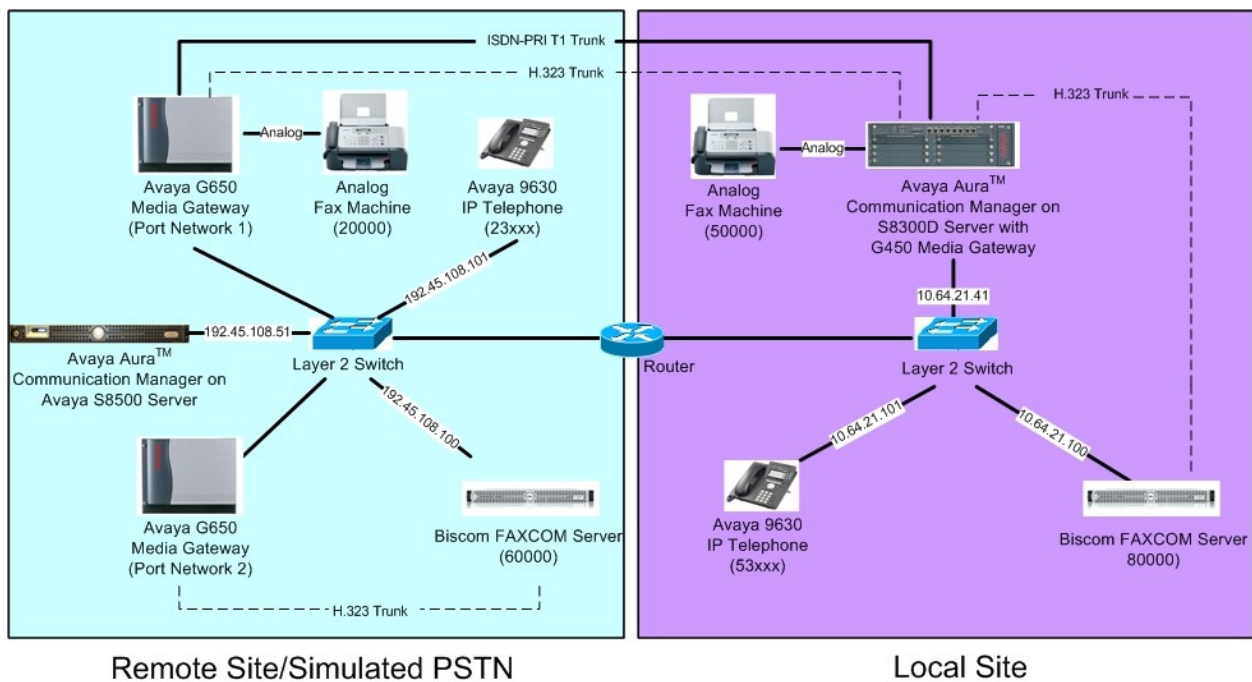


Figure 1: Biscom FAXCOM Server with Communication Manager Using H.323 Trunks

3. Equipment and Software Validated

The following equipment and software were used for the sample configuration provided:

Equipment	Software
Avaya S8300 Server with Avaya G450 Media Gateway (Local site)	Avaya Aura™ Communication Manager 6.0, R016x.00.0.345.0, Update 18444 (Avaya Aura™ System Platform: 6.0.1.0.5)
Avaya S8500 Server (Remote site)	Avaya Aura™ Communication Manager 5.2.1, R015x.02.1.016.4, Update 18433
Avaya G650 Media Gateways (Remote Site) <ul style="list-style-type: none">• TN799DP C-LAN Circuit Pack• TN2302AP IP Media Processor• TN2602AP IP Media Processor	HW01 FW024 HW20 FW120 HW02 FW051
Avaya 9600 Series IP Telephones (H.323)	3.1.1
Biscom FAXCOM Server	6.1.9
Dialogic Brooktrout SR140 SDK	6.2.4

4. Configure Avaya Aura™ Communication Manager

This section provides the procedures for configuring Avaya Aura™ Communication Manager. The procedures include the following areas:

- Verify Communication Manager license
- Administer IP codec set
- Administer IP network region
- Administer IP node names
- Administer H.323 signaling group
- Administer H.323 trunk group
- Administer route pattern
- Administer public unknown numbering
- Administer AAR analysis
- Administer IP network map

4.1. Verify Communication Manager License

Log in to the System Access Terminal (SAT) to verify that the Communication Manager license has proper permissions for features illustrated in these Application Notes. Use the “display system-parameters customer-options” command. 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 permitted. If there is insufficient capacity, contact an authorized Avaya sales representative to make the appropriate changes.

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

IP PORT CAPACITIES                                                    USED
      Maximum Administered H.323 Trunks: 4000 100
      Maximum Concurrently Registered IP Stations: 2400 2
      Maximum Administered Remote Office Trunks: 4000 0
Maximum Concurrently Registered Remote Office Stations: 2400 0
      Maximum Concurrently Registered IP eCons: 68 0
      Max Concur Registered Unauthenticated H.323 Stations: 100 0
      Maximum Video Capable Stations: 2400 0
      Maximum Video Capable IP Softphones: 2400 0
      Maximum Administered SIP Trunks: 4000 280
Maximum Administered Ad-hoc Video Conferencing Ports: 4000 0
      Maximum Number of DS1 Boards with Echo Cancellation: 80 0
      Maximum TN2501 VAL Boards: 10 0
      Maximum Media Gateway VAL Sources: 50 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: 300 0

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

4.2. Administer IP Codec Set

Use the “change ip-codec-set n” command, where “n” is an existing codec set number that will be used for integration with the Biscom FAXCOM Server. Enter the audio codec type “G.711MU” in the **Audio Codec** fields. Retain the default values in the remaining fields.

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

                               IP Codec Set

Codec Set: 2

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

Navigate to **Page 2**, and enter “t.38-standard” for the **FAX Mode** field. Retain the default values in the remaining fields.

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

                               IP Codec Set

                               Allow Direct-IP Multimedia? n

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

4.3. Administer IP Network Region

Use the “change ip-network-region n” command, where “n” is an existing network region that will be used for integration with the Biscom FAXCOM Server. For the **Codec Set** field, enter the codec set number from **Section 4.2**. Set **Intra-region IP-IP Direct Audio** and **Inter-region IP-IP Direct Audio** to “no” (this is required for inter-site fax calls over the H.323 trunks).

```
change ip-network-region 2                               Page 1 of 20
                                                    IP NETWORK REGION
  Region: 2
  Location: 1      Authoritative Domain: avaya.com
  Name:
  MEDIA PARAMETERS      Intra-region IP-IP Direct Audio: no
    Codec Set: 2      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
```

4.4. Administer IP Node Names

Use the “change node-names ip” command, and add an entry for the local Biscom FAXCOM Server. In this case, “FaxServer” and “10.64.21.100” are entered as **Name** and **IP Address**. Note the “procr” / “10.64.21.41” entry, which is the node name to the processor board, and will be used later to configure the Biscom FAXCOM Server.

```
change node-names ip                                     Page 1 of 2
                                                    IP NODE NAMES
  Name      IP Address
  AcmePacket      10.64.20.106
  CM-B1      192.45.108.55
  CM-B2      192.45.108.57
  FaxServer      10.64.21.100
  SES-A      10.64.21.61
  SM1      10.64.40.42
  SM2      10.64.20.31
  VoicePortal      10.64.10.32
  default      0.0.0.0
  procr      10.64.21.41
  procr6      ::
```

4.5. Administer H.323 Signaling Group

Administer a H.323 signaling group for a new trunk that will be created for the connection between Communication Manager and the Biscom FAXCOM server. Use the “add signaling-group n” command, where “n” is an available signaling group number. Enter the following values for the specified fields, and retain the default values for the remaining fields.

- **Group Type:** “h.323”
- **Trunk Group for Channel Selection:** The trunk group number from **Section 4.6** (this form will be submitted with this entry blank at first since the trunk group has not been created yet. Return to this form to fill in this field after completing the steps in **Section 4.6**).
- **Near-end Node Name:** Processor node name from **Section 4.4**.
- **Far-end Node Name:** Biscom FAXCOM node name from **Section 4.4**.
- **Far-end Listen Port:** “1720”
- **Far-end Network Region:** The network region number from **Section 4.3**.

```
add signaling-group 13                               Page 1 of 6
                                                    SIGNALING GROUP
Group Number: 13      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: 13          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: 2
LRQ Required? n              Calls Share IP Signaling Connection? n
RRQ Required? 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
Enable Layer 3 Test? n          Interworking Message: PROgress
H.323 Station Outgoing Direct Media? n  DCP/Analog Bearer Capability: 3.1kHz
```


4.6. Administer H.323 Trunk Group

Administer a H.323 trunk group to interface with the local Biscom FAXCOM Server. Use the “add trunk-group n” command, where “n” is an available trunk group number. Enter the following values for the specified fields, and retain the default values for the remaining fields.

- **Group Type:** “isdn”
- **Group Name:** A descriptive name.
- **TAC:** An available trunk access code.
- **Carrier Medium:** “H.323”
- **Service Type:** “tie”
- **Member Assignment Method:** “auto”
- **Signaling Group:** The signaling group number from **Section 4.5.**
- **Number of Members:** Enter desired value for number of trunk group members.

```
add trunk-group 13                                     Page 1 of 21
                                                    TRUNK GROUP
Group Number: 13          Group Type: isdn          CDR Reports: y
  Group Name: H323 - FaxServer      COR: 1          TN: 1          TAC: 113
  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: 13
                               Number of Members: 50
```

Navigate to **Page 3**. Enable the **Send Name** and **Send Calling Number** fields, and enter “public” for **Format**, as shown below.

```
add trunk-group 13                                     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
                               UII 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 UII IE? y          Modify Tandem Calling Number: no
  Send UCID? n
  Send Codeset 6/7 LAI IE? y
```

4.7. Administer Route Pattern

Create a route pattern to use for the newly created H.323 trunk group. Use the “change route-pattern n” command, where “n” is an available route pattern. Enter a descriptive **Pattern Name**. In the **Grp No** field, enter the trunk group number from **Section 4.6**. In the **FRL** field, enter a level that allows access to this trunk with “0” being least restrictive.

```
change route-pattern 13                                     Page 1 of 3
                Pattern Number: 13  Pattern Name: to Fax Server
                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: 13    0
2:
3:
4:
5:
6:
                n      user
                n      user
                n      user
                n      user
                n      user
                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
```

4.8. Administer Public Unknown Numbering

Use the “change public-unknown-numbering 0” command, to define the calling party number to send to the local Biscom FAXCOM Server. In the example shown below, all calls originating from a 5-digit extension beginning with 5 and routed over any trunk group will result in a 5-digit calling number.

```
change public-unknown-numbering 0                         Page 1 of 2
                NUMBERING - PUBLIC/UNKNOWN FORMAT
                Total
Ext  Ext      Trk      CPN
Len Code      Grp(s)  Prefix  Len
                Total Administered: 1
 5   5                5                Maximum Entries: 240
```

4.9. Administer AAR Analysis

This section provides a sample AAR routing used for routing calls with dialed digits 8xxxx to the local Biscom FAXCOM Server. Note that other methods of routing may be used. Use the “change aar analysis 0” command, and add an entry to specify how to route calls to 8xxxx. In the example shown below, calls with digits 8xxxx will be routed as an AAR call using route pattern “13” from **Section 4.7**.

```
change aar analysis 0
```

Page 1 of 2

AAR DIGIT ANALYSIS TABLE						
Location: all						
Percent Full: 2						
Dialed String	Total Min	Total Max	Route Pattern	Call Type	Node Num	ANI Reqd
2	5	5	5	aar		n
6	5	5	5	aar		n
8	5	5	13	aar		n

4.10. Administer IP Network Map

Use the “change ip-network-map” command to assign the network region number from **Section 4.3** for incoming fax calls to the local Biscom FAXCOM Server, as shown below.

```
change ip-network-map
```

Page 1 of 63

IP ADDRESS MAPPING					
IP Address	Subnet Bits	Network Region	VLAN	Emergency Location	Ext
FROM: 10.64.21.100	/	2	n		
TO: 10.64.21.100					
FROM:	/		n		
TO:					
FROM:	/		n		
TO:					

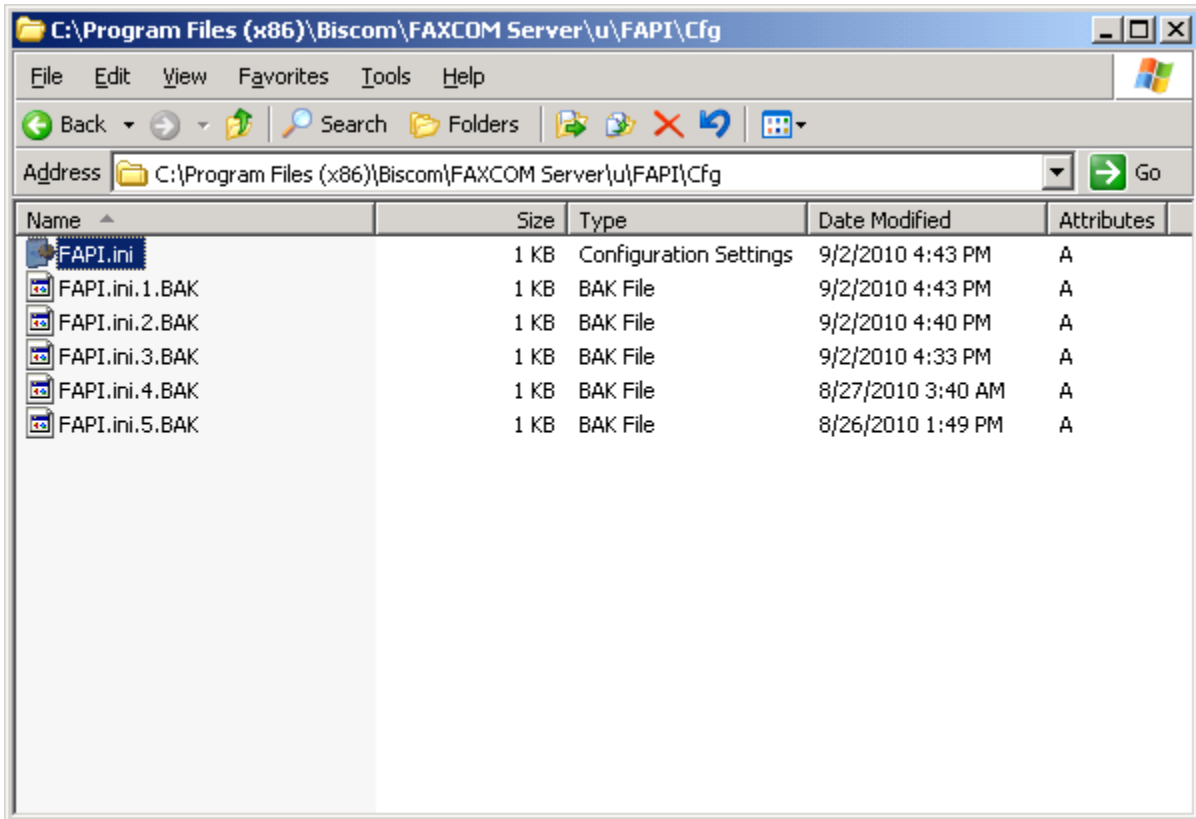
5. Configure Biscom FAXCOM Server

This section provides the procedures for configuring the Biscom FAXCOM Server. The procedures include the following areas:

- Administer FAPI.ini
- Start fax service

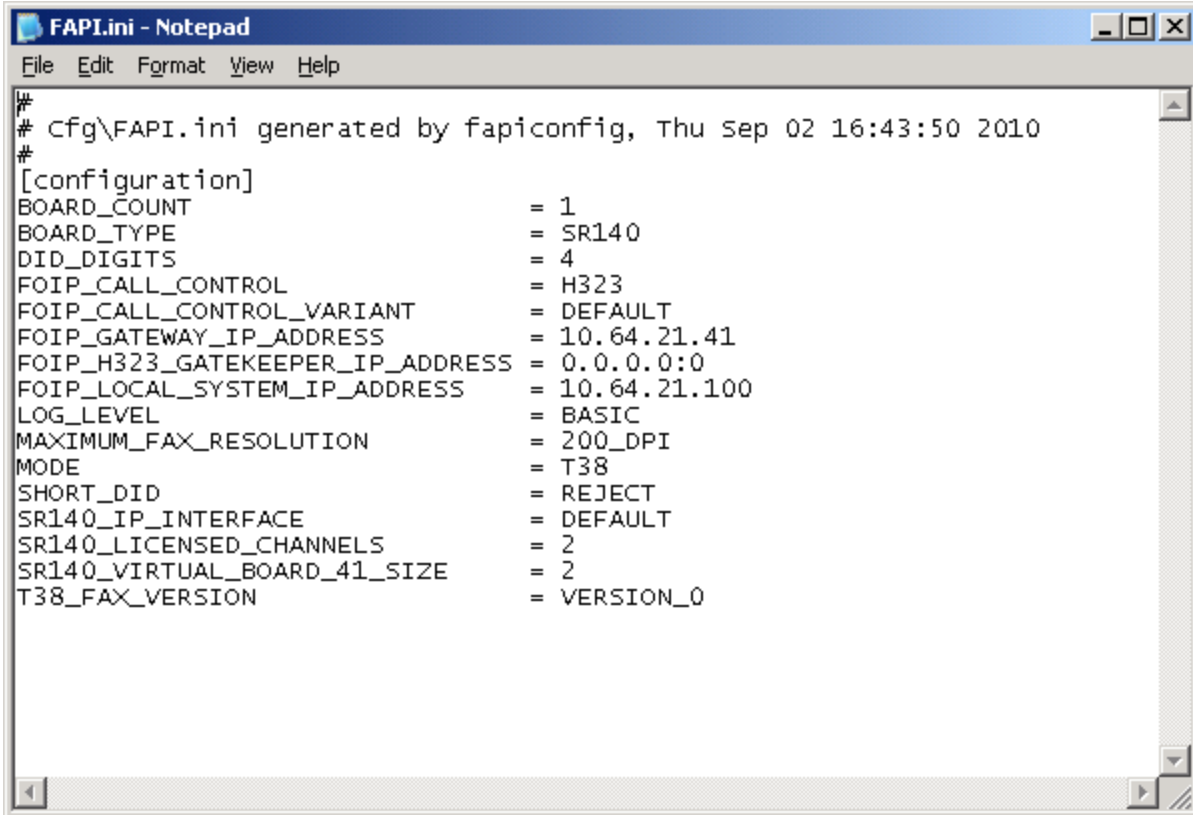
5.1. Administer FAPI.ini

Navigate to the **Cfg** directory to edit the **FAPI.ini** file, as shown below.



The **FAPI.ini** file contains a list of configurable parameters. Enter the following values for the specified fields, and retain the default values for the remaining fields.

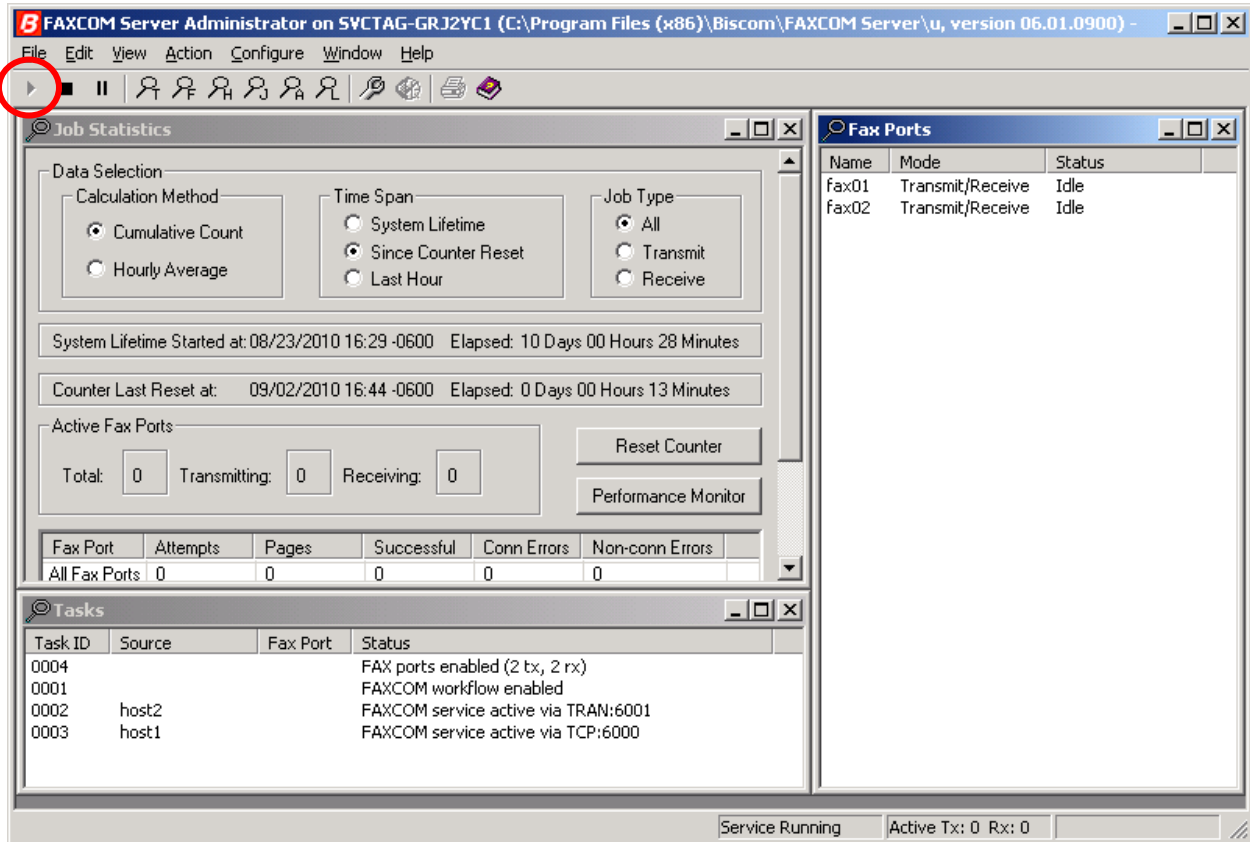
- **FOIP_CALL_CONTROL:** “H323”
- **FOIP_GATEWAY_IP_ADDRESS:** The procr IP address from **Section 4.4**.
- **FOIP_LOCAL_SYSTEM_IP_ADDRESS:** The local FAXCOM Server IP address.



```
FAPI.ini - Notepad
File Edit Format View Help
#
# cfg\FAPI.ini generated by fapiconfig, Thu Sep 02 16:43:50 2010
#
[configuration]
BOARD_COUNT = 1
BOARD_TYPE = SR140
DID_DIGITS = 4
FOIP_CALL_CONTROL = H323
FOIP_CALL_CONTROL_VARIANT = DEFAULT
FOIP_GATEWAY_IP_ADDRESS = 10.64.21.41
FOIP_H323_GATEKEEPER_IP_ADDRESS = 0.0.0.0:0
FOIP_LOCAL_SYSTEM_IP_ADDRESS = 10.64.21.100
LOG_LEVEL = BASIC
MAXIMUM_FAX_RESOLUTION = 200_DPI
MODE = T38
SHORT_DID = REJECT
SR140_IP_INTERFACE = DEFAULT
SR140_LICENSED_CHANNELS = 2
SR140_VIRTUAL_BOARD_41_SIZE = 2
T38_FAX_VERSION = VERSION_0
```

5.2. Start Fax Service

From the Biscom FAXCOM Server, select **Start → All Programs → FAXCOM → FAXCOM Server Administrator**. If the service is not already running, click the “Start or Resume Service” button in the top left corner.



6. General Test Approach and Test Results

6.1. General Test Approach

The feature test cases were performed manually. Intra-site and inter-site fax calls to and from the local Biscom FAXCOM Server were made. The fax calls were sent and received by using the “Send A Test Fax” utility at the local Biscom FAXCOM Server and the analog fax machine at the Remote site. The Biscom FAXCOM Server at the remote site was used for testing simultaneous send/receive of fax calls.

The serviceability test cases were performed manually by disconnecting/reconnecting the Ethernet cables and stop/start the fax service on the Biscom FAXCOM Server.

6.2. Test Results

All test cases were executed. The one observation noted from the compliance test is that for inter-site fax calls over the H.323 trunks, the media shuffling for the H.323 trunk between the two sites has to be turned off.

7. Verification Steps

This section provides the tests that can be performed to verify proper configuration of Communication Manager and the Biscom FAXCOM Server.

7.1. Verify Avaya Aura™ Communication Manager

On Communication Manager, verify the status of the H.323 signaling group by using the “status signaling-group n” command, where “n” is the signaling group number administered in **Section 4.5**. Verify that the signaling group is “in-service” as indicated in the **Group State** field shown below.

```
status signaling-group 13
                        STATUS SIGNALING GROUP

      Group ID: 13                Active NCA-TSC Count: 0
      Group Type: h.323           Active CA-TSC Count: 0

Group State: in-service
```

Verify the status of the local H.323 trunk group by using the “status trunk n” command, where “n” is the trunk group number administered in **Section 4.6**. Verify that all trunks are in the “in-service/idle” state as shown below.

```
status trunk 13
                                                    Page 1

                        TRUNK GROUP STATUS

Member   Port      Service State      Mtce Connected Ports
                               Busy

0013/001 T00377   in-service/idle    no
0013/002 T00378   in-service/idle    no
0013/003 T00379   in-service/idle    no
0013/004 T00380   in-service/idle    no
0013/005 T00381   in-service/idle    no
0013/006 T00382   in-service/idle    no
0013/007 T00383   in-service/idle    no
0013/008 T00384   in-service/idle    no
0013/009 T00385   in-service/idle    no
0013/010 T00386   in-service/idle    no
0013/011 T00387   in-service/idle    no
0013/012 T00388   in-service/idle    no
0013/013 T00389   in-service/idle    no
0013/014 T00390   in-service/idle    no
```


7.2. Verify Biscom FAXCOM Server

From the Biscom FAXCOM Server, select **Start** → **All Programs** → **FAXCOM** → **FAXCOM Server Administrator**. The **FAXCOM Server Administrator** screen is displayed, as shown below. Verify that the status of all configured ports is “Idle”. During compliance testing, two fax ports were pre-configured on the FAXCOM Server.

The screenshot displays the FAXCOM Server Administrator application window. The title bar reads "FAXCOM Server Administrator on SVCTAG-GRJ2YC1 (C:\Program Files (x86)\Biscom\FAXCOM Server\u, version 06.01.0900)". The interface includes a menu bar (File, Edit, View, Action, Configure, Window, Help) and a toolbar with various icons. The main area is divided into several sections:

- Job Statistics:** Contains "Data Selection" with options for Calculation Method (Cumulative Count, Hourly Average), Time Span (System Lifetime, Since Counter Reset, Last Hour), and Job Type (All, Transmit, Receive). It also shows system and counter reset times, active fax port counts (Total: 0, Transmitting: 0, Receiving: 0), and a table for Fax Port statistics.
- Fax Ports:** A table with columns Name, Mode, and Status. Two ports are listed: fax01 and fax02, both in "Transmit/Receive" mode and "Idle" status. The "Idle" status for both ports is circled in red.
- Tasks:** A table with columns Task ID, Source, Fax Port, and Status. It lists four tasks related to enabling fax ports and services.

At the bottom of the window, a status bar indicates "Service Running" and "Active Tx: 0 Rx: 0".

Name	Mode	Status
fax01	Transmit/Receive	Idle
fax02	Transmit/Receive	Idle

Task ID	Source	Fax Port	Status
0004			FAX ports enabled (2 tx, 2 rx)
0001			FAXCOM workflow enabled
0002	host2		FAXCOM service active via TRAN:6001
0003	host1		FAXCOM service active via TCP:6000

8. Conclusion

These Application Notes describe the configuration steps required for Biscom FAXCOM Server to successfully interoperate with Avaya Aura™ Communication Manager using H.323 trunks. All feature and serviceability test cases were completed.

9. Additional References

This section references the product documentation relevant to these Application Notes.

1. *Administering Avaya Aura™ Communication Manager*, Document 03-300509, Issue 6.0, Release 6.0, August 2010, available at <http://support.avaya.com>.
2. *FAXCOM Server Administrator's Guide*, February 2010 Revised Edition, available from Biscom Technical Support.
3. *KB Avaya 20100518*, Knowledge Base article under “SR140 Avaya 6.x”, available from Biscom Technical Support.

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