imagicle

Avaya PBX Configuration

Imagicle Digital Fax interacts with the telephony system through SIP or H.323 protocols using either T.38 or G.711 passthrough modes.

The h.323 configuration is suggested and will be detailed. Remember to enable h.323 in the **Digital Fax â Application Settings â IP Routes** page on the Application Suite.

In the following examples, we are supposing UC Suite server IP address is 192.45.90.15.

Supported Avaya Telephony Platforms

- Avaya Communication Manager: rel.5.2 Service Pack 9 up to rel. 8.0 â H.323
- Avaya Aura rel. 8.x and above â SIP
- Avaya Media Gateway G250, firmware release: 30.18.1
- Avaya IP Office rel 7.x and above

Note: on CM 5.2.1 SP 8 and MG 30.12.1 you must force T.38 for outgoing faxes

Avaya Communication Manager Configuration

In this configuration, Digital Fax directly sends and receives h.323 calls directly from the PBX. It will use t.38 to transport the t.30 fax data.

On the Avaya PBX you must configure an h.323 trunk pointing to the UC Suite server.

1. IP Interfaces

Use the **list ip-interface all** command to identify which IP interfaces are located in which network region. The example below shows the IP interfaces in our test installation. All interfaces in cabinet 01 (port network 1) as indicated in the Slot field are in IP network region 1 as indicated in the **Net Rgn** field.

```
list ip-interface all

                                IP INTERFACES
                                                                          Net
ON Type  Slot  Code Sfx Node Name/      Subnet Mask     Gateway Address Rgn VLAN
                        IP-Address
-- ----  ----  ---- --- --------------- --------------- --------------- --- ----
y MEDPRO 01A02 TN2302   MEDPRO1A        255.255.255.0   192.45.108.1    1   n
                        192.45.108.54
y C-LAN  01A03 TN799  D CLAN1A          255.255.255.0   192.45.108.1    1   n
                        192.45.108.55
y MEDPRO 02A02 TN2302   MEDPRO2A        255.255.255.0   192.45.108.1    2   n
                        192.45.108.56
y C-LAN  02A03 TN799  D CLAN2A          255.255.255.0   192.45.108.1    2   n
                        192.45.108.57
n MEDPRO 01A04 TN2602   MEDPRO1A-2      255.255.255.0   192.45.108.1    1   n
                        192.45.108.58
n MEDPRO 02A04 TN2602   MEDPRO2A-2      255.255.255.0   192.45.108.1    2   n
                        192.45.108.59
```

2. IP Network Region - Region 1

The configuration of the IP network regions (Steps 2 - 5) is assumed to already to be in place but is included here for clarity. In our example, the Avaya S8500 Server, the Avaya G650 Media Gateway comprising port network 1 and all IP endpoints were located

in IP network region 1 using the parameters described below. Use the display **ip-network-region** command to view these settings. The example below shows the values used for the compliance test.

- A descriptive name was entered for the Name field
- **IP-IP Direct Audio** (shuffling) was enabled to allow audio traffic to be sent directly between IP endpoints without using media resources in the Avaya Media Gateway. This was done for both intra-region and inter-region IP-IP Direct Audio. This is the default setting. Shuffling can be further restricted at the trunk level on the **Signaling Group** form
- The **Codec Set** field was set to the IP codec set to be used for calls within this IP network region. In this case, IP codec set 1 was selected
- The default values were used for all other fields.

```
display ip-network-region 1                                     Page   1 of  19
                              IP NETWORK REGION
  Region: 1
Location:         Authoritative Domain:
    Name: PN1
MEDIA PARAMETERS                Intra-region IP-IP Direct Audio: yes
      Codec Set: 1              Inter-region IP-IP Direct Audio: yes
   UDP Port Min: 2048                     IP Audio Hairpinning? n
   UDP Port Max: 3329
DIFFSERV/TOS PARAMETERS                 RTCP Reporting Enabled? y
 Call Control PHB Value: 46      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: 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
```

On Page 3, codec sets are defined for inter-region calls. In the case of the compliance test at site 1, calls from IP network region 1 (src rgn 1) to IP network region 2 (dst rgn 2) used codec set 1. The default values were used for all other fields. At site 2, only one IP network region exists so no inter-region settings were required.

```
display ip-network-region 1                                     Page   3 of  19

                   Inter Network Region Connection Management

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

3. IP Network Region -Region 2

At site 1, IP network region 2 was created in a similar manner as IP network region 1 but with a different name.

```
change ip-network-region 2                                      Page   1 of  19
                              IP NETWORK REGION
  Region: 2
Location:         Authoritative Domain:
    Name: PN2
MEDIA PARAMETERS                Intra-region IP-IP Direct Audio: yes
      Codec Set: 1              Inter-region IP-IP Direct Audio: yes
   UDP Port Min: 2048                     IP Audio Hairpinning? n
   UDP Port Max: 3329
DIFFSERV/TOS PARAMETERS                  RTCP Reporting Enabled? y
 Call Control PHB Value: 46      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: 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. IP network region -Port Network 2

The inter-region codec setting was created similarly:

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

                   Inter Network Region Connection Management

 src dst codec direct   WAN-BW-limits   Video      Intervening      Dyn
 rgn rgn  set   WAN  Units    Total Norm  Prio Shr Regions          CAC IGAR AGL
 2   1    1     y    NoLimit                                           n   all
 2   2    1                                                                 all
```

5. Ip Node Names

Use the **change node-names** command to create a node name that maps to UC Suite server IP address. This node name is used in the configuration of the H.323 trunk signaling group. The example below shows the entry on Avaya Communication Manager at site 1.

```
change node-names ip                                            Page   1 of   2
                                  IP NODE NAMES
    Name              IP Address
CLAN1A              192.45.108.55
CLAN2A              192.45.108.57
CMnorth             192.45.70.2
MEDPRO1A            192.45.108.54
MEDPRO1A-2          192.45.108.58
MEDPRO2A            192.45.108.56
MEDPRO2A-2          192.45.108.59
Fax1                192.45.80.15
SES                 192.45.108.50
default             0.0.0.0
procr               192.45.108.51
```

6. IP Network Map

If the UC Suite server should be located in an IP network region other than the default region of 1, then the region is assigned using the **change ip-network-map** command.

```
change ip-network-map                                          Page   1 of  32
                        IP ADDRESS MAPPING

                                                               Emergency
                                     Subnet                    Location
 From IP Address  (To IP Address   or Mask)  Region    VLAN   Extension
 192.45 .80 .15   192.45 .80 .15              2        n
    .   .   .        .   .   .                           n
```

7. Codecs

Use the **change ip-codec-set** command to verify that G.711A or G.711MU is contained in the codec list.

```
display 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:
```

8. Fax

On Page 2, verify that the **FAX Mode** field is set to t.38-standard. This is necessary to support UC Suite server added to port network 2. The **Modem Mode** field should be set to **off**.

```
change ip-codec-set 1                                          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
```

9. Signaling Group

Use the **add signaling group** command to create a signaling group for use by the H.323 trunk to UC Suite server. For the compliance test at site 1, signaling group 3 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 CLAN circuit pack used to connect to UC Suite server. Node names are defined using the change node-names ip command. For site 2, this node name would map to the IP address of the Avaya Media Server (procr).
- Set the Far-end Node Name to the node name that maps to the IP address of UC Suite server.
- 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 Digital Fax
- Set the Direct IP-IP Audio Connections field to n. This field must be set to **n** for interoperability with Digital Fax
- The default values were used for all other fields.

```
add signaling-group 3                                          Page   1 of   5
                              SIGNALING GROUP

 Group Number: 3              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:
      TSC Supplementary Service Protocol: a
                        T303 Timer(sec): 10

   Near-end Node Name: CLAN2A                Far-end Node Name: Fax1
 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? n
  Link Loss Delay Timer(sec): 90                        IP Audio Hairpinning? n
         Enable Layer 3 Test? n                  Interworking Message: PROGress
 H.323 Outgoing Direct Media? n          DCP/Analog Bearer Capability: 3.1kHz
```

10. Trunk Group

Use the **add trunk group** command to create a trunk group for the H.323 trunk to the UC Suite server. In our example at site 1, trunk group 3 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 3                                                Page   1 of  21
                              TRUNK GROUP

Group Number: 3                   Group Type: isdn          CDR Reports: y
  Group Name: Fax TG                     COR: 1        TN: 1        TAC: *003
   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: 3
                                                 Number of Members: 6
```

On Page 3:

- Set the Send Name field and Send Calling Number field to y. The enables sending calling party name and number to the far end
- Set the Numbering 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 3                                                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
                                             Hold/Unhold Notifications? n
             Send UUI IE? y                Modify Tandem Calling Number? n
               Send UCID? n
 Send Codeset 6/7 LAI IE? y
```

11. Signaling Group - Update

Use the **change signaling-group** command to update the **Trunk Group for Channel Selection** field with the trunk group created in the previous step.

```
change signaling-group 3                                        Page   1 of   5
                              SIGNALING GROUP

 Group Number: 3              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: 3
     TSC Supplementary Service Protocol: a
                        T303 Timer(sec): 10

   Near-end Node Name: CLAN2A                Far-end Node Name: RightFax1
 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? n
  Link Loss Delay Timer(sec): 90                       IP Audio Hairpinning? n
        Enable Layer 3 Test? n                  Interworking Message: PROGress
 H.323 Outgoing Direct Media? n          DCP/Analog Bearer Capability: 3.1kHz
```

12. 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 3. In the example shown below, all calls originating from a 5-digit extension beginning with 2 and routed across any trunk group (Trk Grp column 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: 1
 5  2                                     5           Maximum Entries: 9999
```

13. Route Pattern

Use the **change route-pattern** command to create a route pattern that will route calls to the H.323 trunk that connects to Digital Fax.

The example below shows the route pattern at site 1. A descriptive name was entered for the Pattern Name field. The Grp No field was set to the trunk group created in Step 10. 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.

```
display route-pattern 3                                          Page   1 of   3
                    Pattern Number: 3   Pattern Name: Fax1
                                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: 3    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
```

14. Routing Calls to Digital Fax

Automatic Alternate Routing (AAR) was used to route calls to Digital Fax. Use the **change aar analysis** command to create an entry in the AAR Digit Analysis Table for this purpose. The example below shows entries previously created for site 1 using the **display aar analysis** command. The highlighted entry specifies that numbers that begin with 7 and are 5 digits long, use route pattern 3. Route pattern 3 routes calls to Digital Fax.

```
display aar analysis 0                                          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
    50                    5    5     4        aar          n
    52                    5    5     4        aar          n
    7                     5    5     3        aar          n
```