# IP Office - Job Aid

## QSIG Centralized INTUITY™ AUDIX®

**Summary**

This document describes the configuration of centralized INTUITY™ AUDIX® for a remote IP Office. Connection between the central PBX and remote IP Office is by QISG over a PRI or H.323 trunk.

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# IP Office QSIG Centralized INTUITY AUDIX

## Introduction

This document describes the configuration of IP Office with voicemail coverage provided by an INTUITY AUDIX at a centralized site for the configurations shown in the following diagrams only. Calls and message waiting updates are transferred by either Primary Rate Interface (PRI) or H.323 trunks between the IP Office and the central PBX.

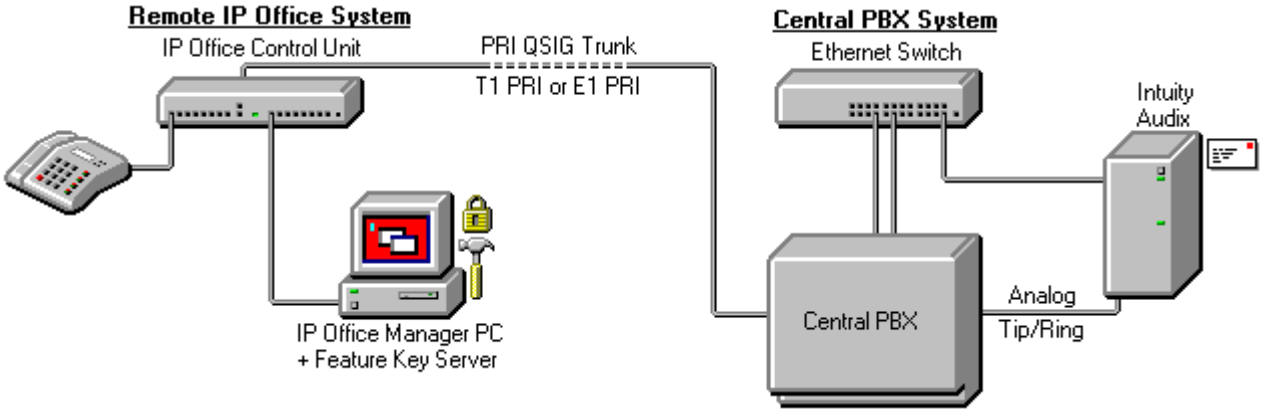



Figure 1: Centralized INTUITY AUDIX using PRI QSIG Trunk

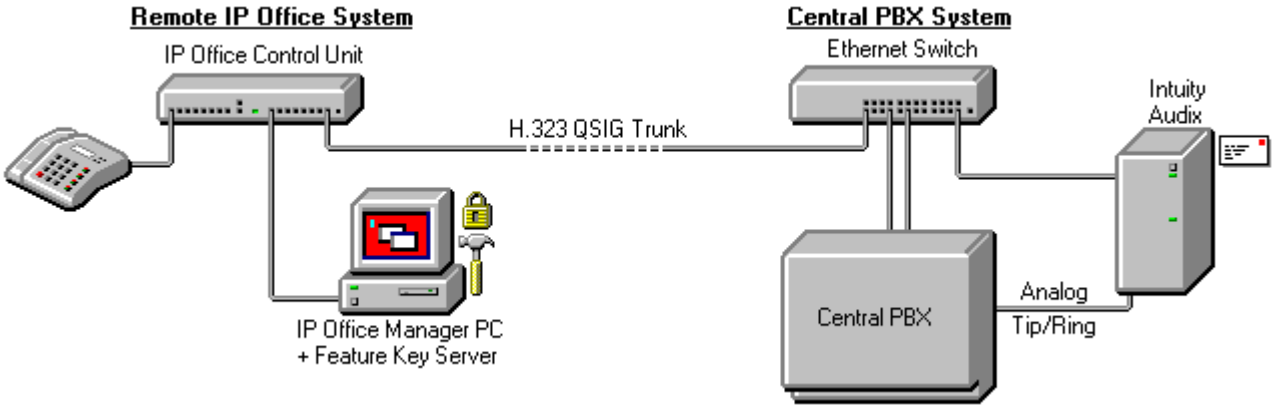



Figure 2: Centralized INTUITY AUDIX using H.323 QSIG Trunk

# Voicemail Features Supported

In this configuration, the IP Office acts simply as a gateway for its extension users to access their AUDIX mailboxes. The features available to users once they access a mailbox are determined by the INTUITY AUDIX system and not the IP Office.

When collecting messages, the user will hear the AUDIX greeting and then be asked to enter the mailbox they want followed by **#**. If calling from their own extension, they can press **#** without entering the mailbox number. They will then be prompted for the mailbox password.

## IP Office Voicemail Features Supported

The following have been tested and are supported for QSIG Centralized AUDIX from IP Office extensions:

**Message Waiting Indication**

- Message Waiting Indication (excluding analog extensions).

**Default System Short Codes:**

- ***17** for voicemail collection.
- ***18** and ***19** for voicemail on and voicemail off.

**DT Port Display Phone Options:**

- Voicemail collection via ●**VOICE** | ●**LISTEN**.
- Message drop via ●**VOICE** | ●**MESSAGE** | *number* | ●**MESSAGE**.
- Leave a message at a busy or unanswered extension by ●**VMAIL**.

**IP/ DS Port Display Phones:**

- Voicemail collection via **MENU** | **MENU** | **Msgs** | **Voice**.
- Message drop via **MENU** | **MENU** | **CALL** | *number* | **VMAIL**.

**Phone Manager:**

- The **Messages** tab in Phone Manager will always display just 1 when the user has messages, regardless of the number of messages. When double-clicked it initiates a call to that mailbox.

## IP Office Voicemail Features Not Supported

The following IP Office voicemail settings are not supported:

- Group mailboxes and all related hunt group voicemail features.
- Voicemail ringback.
- Voicemail email settings.
- Auto-creation of new mailboxes.
- Shortcodes using the VoicemailCollect feature except where indicated.

# Supported Systems

## Central PBX

For details of the central PBX systems which support IP Office QSIG centralized INTUITY AUDIX operation refer to the IP Office 1.3.2 Offer Announcement document.

**Note:**

- The IP600 and Definity One internal INTUITY AUDIX application is not supported for centralized voicemail and must be disabled if the platform is to be used as a Message Center Switch in a centralized voicemail configuration.
- Dialplan size is 3 to 5 digits with AUDIX releases less than R5.1.33 and 3 to 7 digits with AUDIX release R5.1.33 and later paired with MultiVantage software.

The maximum number of systems that may be connected is limited by the maximum number of NCA-TSC (non call associate temporary signaling channels) supported, which is 256.

A minimum of 2 NCA-TSC channels are required per IP Office connection. However the number of NCA-TSC connections is normally configured to be a third of the number of trunk group members.

For example, on an E1 PRI connection, the typical setting for NCA-TSC channels is 10 (one third of the 30 PRI channels). This would therefore only allow a maximum of 25 IP Offices to be connected (assuming no NCA-TSC channels are being used for other connections).

## IP Office

Centralized INTUITY AUDIX for IP Office is supported on the following IP Office systems:

- **Software Required:**
  - **User and Administration Software Suites:** 1.3.2.
  - **Control Unit Core Software:** 1.3(33)
- **Servers required:** Feature Key Server.
- **For PRI Connection:** T1 PRI or E1 PRI Port.
- **For H.323 Connection:** LAN Port.
- **VCM Module:** As follows:
  - If using a PRI connection, the number of VCM channels limits the number of calls between IP Office IP extensions and the central PBX.
  - If using an H.323 connection, the number of VCM channels limits the number of simultaneous calls between IP Office non-IP extensions and the central PBX. IP Office IP extensions only require a VCM channel during call setup.

# Configuration Requirements

The configuration shown in this document is for example only. Its settings are typical only. In addition the menu screens shown may change between different central PBX systems and software versions.

The configuration process shown is for example only. The following should be installed and tested before attempting to run an IP Office in QSIG Centralized INTUITY AUDIX mode:

- **Unique Extension Numbering Plans**
  Extensions numbers on the IP Office and central PBX systems must be unique and of the same length, ideally in unique number ranges.
- **INTUITY AUDIX Installed**
  Check operation of the Intuity Audix for central PBX users.
- **IP Office Feature Key Server Installed**
  The IP Office must have a Feature Key Server PC with Feature key installed.
- **AUDIX Mailboxes Created for IP Office Extensions**
  Mailboxes for the IP Office extensions need to be setup manually.

# 1. Configuring the IP Office

## 1.0 Overview

This section describes the steps required for IP Office configuration.

**Note:** Several of the following processes require the IP Office system to be rebooted and so should be performed outside normal business hours or with warnings to system users.

## 1.1 Entering the AUDIX Voicemail License

Check that the IP Office Feature Key Server is properly installed and active. The PC on which the Feature Key Server software and the hardware Feature Key were installed should be showing a icon in the Systray area.

Right-click on the icon and select **About** to display the Feature Key number. This should match the number against which the AUDIX™ Voicemail licence was issued.

1. Start IP Office Manager and use to receive the configuration.
2. Click on **License** to display the list of existing licenses.
3. Right-click on the displayed list and select **New**.

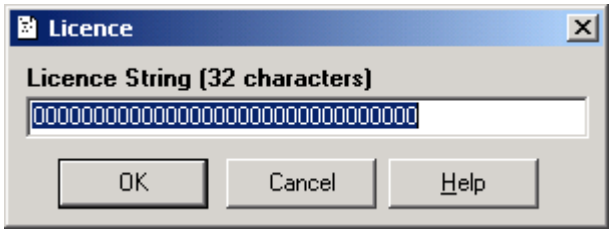



Figure 3: IP Office Licence Key entry.

4. Enter the license key string provided (using cut and paste is possible to avoid keying errors).
5. Use to send the configuration back to the IP Office. Set the **Reboot Mode** to ***Immediate*** or ***When Free*** and click on **OK**.
6. After the IP Office reboots, use to receive its configuration again. Click on **License** and check that the **Status** of the ***AUDIX™ Voicemail*** license is ***Valid***.

# 1.2 IP Office PRI Trunk Configuration

Follow this section only if you are connecting to the central PBX via PRI. This trunk will carry all messaging traffic and may also be used for other voice calls.

- For H.323 Trunk Configuration, go to "1.3 IP Office H.323 Trunk Configuration" on page 11.
- For a US T1 PRI trunk, go to "1.2.2 T1 PRI Trunk" on page 9.

## 1.2.1 E1 PRI Trunk

1. Start IP Office Manager and use to receive the configuration.
2. Click on **Line** to display the list of installed lines.
3. Double-click on the line that will be connected to the central PBX.

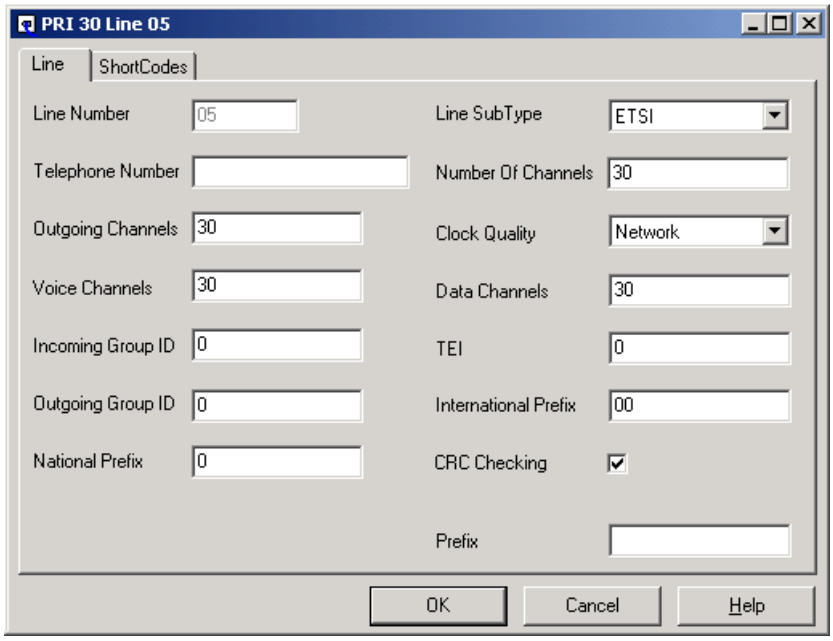



Figure 4: IP Office Licence Key entry.

4. Set the **Line Sub Type** to ***ETSI***.
5. The number of channels must be equal to the number of channels allocated on the central PBX Trunk Group. Additionally if there is multiplexing equipment between the systems, you must only use those channels that will be passed end to end through the multiplexing equipment.
6. Set the **Clock Quality** to ***Network*** if this line is the only synchronous line in the system. Otherwise evaluate the quality of alternative clocking sources and set accordingly.
7. Use to send the configuration back to the IP Office. Set the **Reboot Mode** to ***Immediate*** or ***When Free*** and click on **OK**.
8. Following the reboot, the light associated with the PRI line should come on if the corresponding system has been configured properly and the wiring is correct.

## 1.2.2 T1 PRI Trunk

1. Start IP Office Manager and use to receive the configuration.
2. Click on **Line** to display the list of installed lines.
3. Double-click on the line that will be connected to the central PBX.

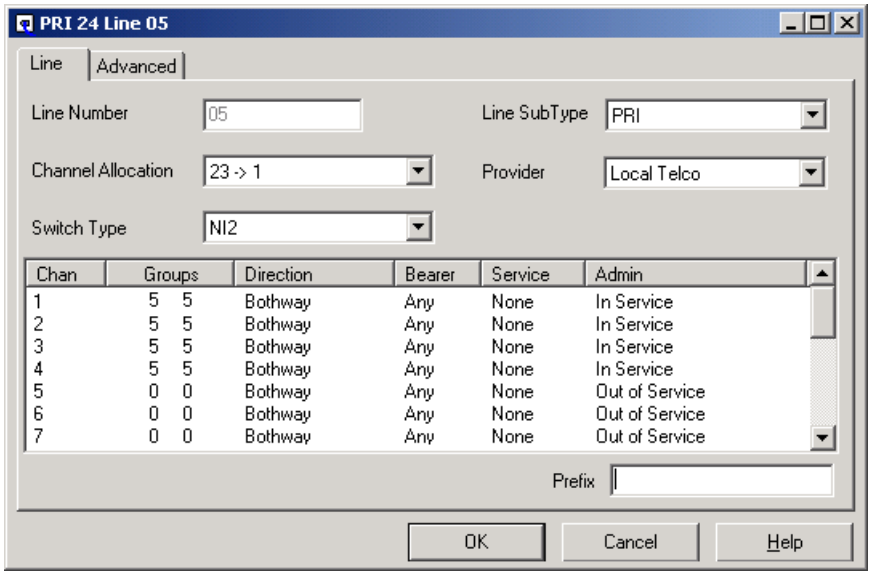



Figure 5: IP Office T1 PRI Line Form

4. Set the **Switch Type** to ***NI2*** (National ISDN-2).
5. The **Channel Allocation** should be the opposite of how the ports appear in the trunk group on the central PBX *(see "2.7 PRI Trunk & Trunk Group" on page 30)*.
6. The number of channels ***In Service*** must be equal to the number of channels allocated on the central PBX Trunk Group. Additionally if there is multiplexing equipment between the systems, you must only use those channels that will be passed end to end through the multiplexing equipment.
7. Use the Shift and Ctrl keys to highlight the channels that will be used. Right-click on the highlighted channels and select **Edit**. Set the **Admin** to ***In Service***. If necessary repeat for the remaining channels and set their **Admin** to ***Out of Service***.

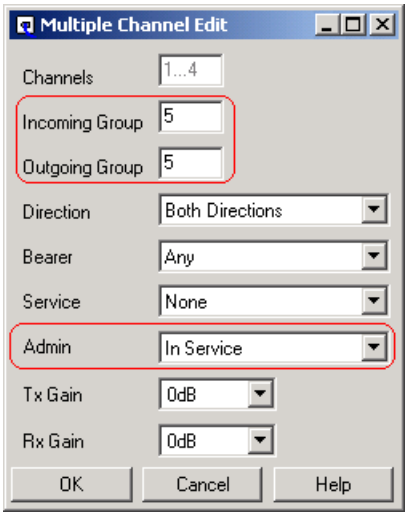



Figure 6: Channel Edit Form (multiple channels)

8. Use the Shift and Ctrl keys to highlight the channels that will be used. Right-click on the highlighted channels and select **Edit**.
   - Set the **Admin** to ***In Service***.
   - Set the **Incoming Group** and **Outgoing Group** to a unique number, ie. one not used by any other IP Office trunk group.
   - Click on OK.
9. Click on the **Advanced** tab.

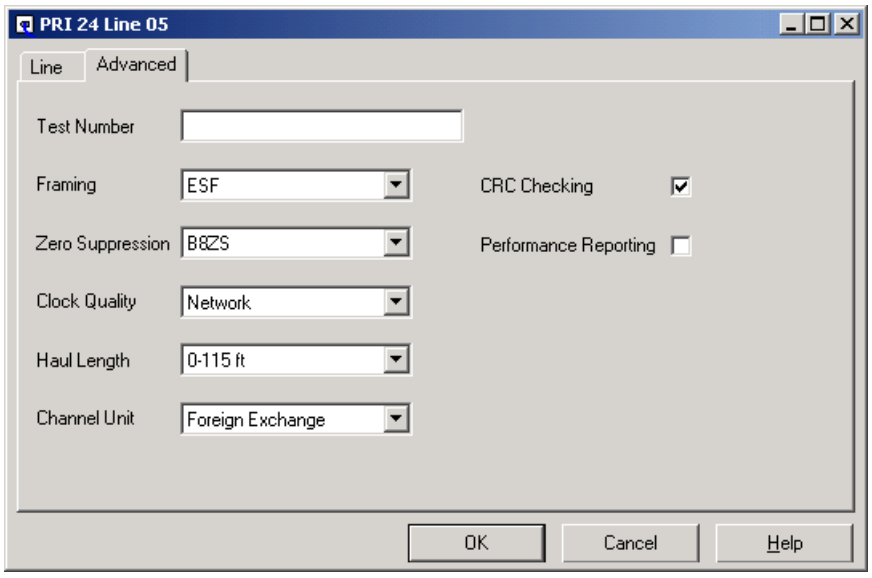



Figure 7: IP Office T1 PRI Line Advanced Tab

10. Ensure that the line **Framing** and **Zero Suppression** settings match those of any multiplexing equipment and/or the central PBX “ds1” form *(see "2.7 PRI Trunk &* Trunk Group*" on page 30)*.
11. If this line is the only synchronous line into the system, set the **Clock Quality** to ***Network*** . Otherwise evaluate the quality of alternative clocking sources and set accordingly.
12. Use to send the configuration back to the IP Office. Set the **Reboot Mode** to ***Immediate*** or ***When Free*** and click on **OK**.
13. Following the reboot, the light associated with the PRI line should come on if the corresponding system has been configured properly and the wiring is correct.

# 1.3 IP Office H.323 Trunk Configuration

Follow this section only if you are connecting to the centralized PBX via an H.323 trunk.

- For PRI Trunk configuration go to "1.2 IP Office PRI Trunk Configuration" on page 8.

1. Start IP Office Manager and use to receive the configuration.
2. Click on **Line** to display the list of installed lines.
3. Right-click on the list and select **New**.

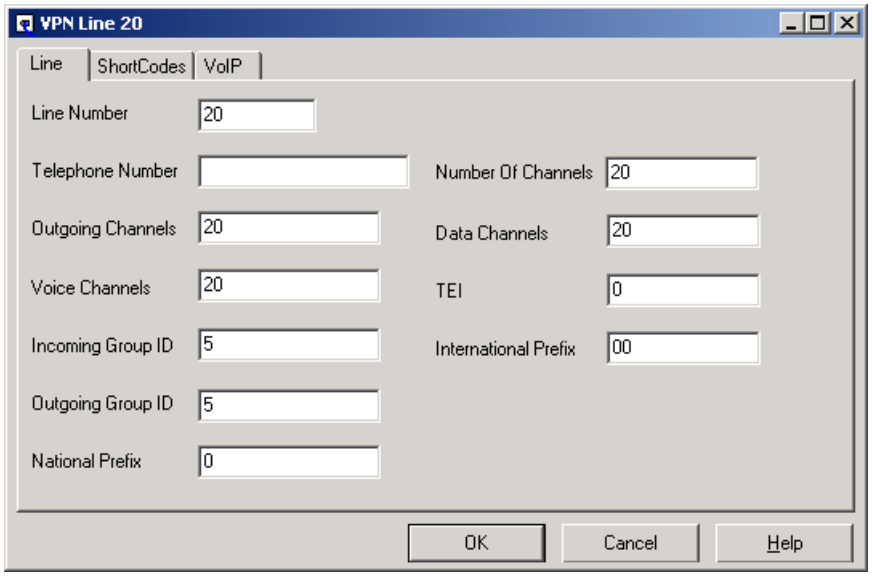



Figure 8: IP Office VPN (H.323) Line Form

4. Set the Line Number to a value that is unique and is unlikely to clash with any line card modules that might be installed in the future. Any value from 20 upwards are recommended.
5. Set the **Incoming Group ID** and **Outgoing Group ID** to a unique number, ie. one not used by any other IP Office trunk group.
6. Set the **Number of Channels**, **Outgoing Channels**, **Data Channels** and **Voice Channels** to equal to the number of channels that will be administered in the central PBX “Trunk” form (see "2.8 H.323 QSIG Trunk Group" on page 33) and is within the bandwidth allocated for voice traffic in your IP network.

7. Click on the **VoIP** tab.

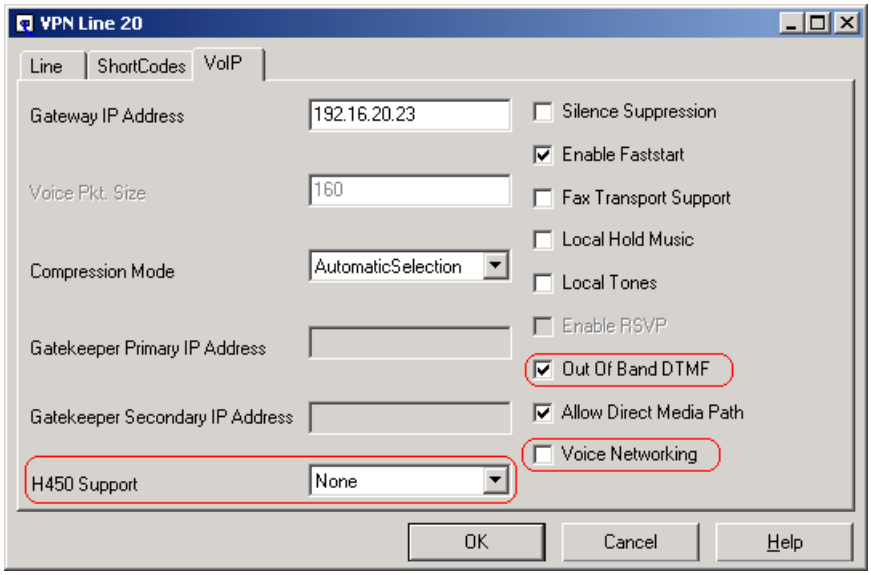



Figure 9: IP Office VPN (H.323) Line Form VoIP Tab

8. In **Gateway IP Address** enter the IP address of the central PBX *(see "2.5.2 PBX IP Addresses" on page 23)*. For most systems this will be the C-LAN address.
9. Tick **Enable FastStart**, **Out of band DTMF**, and **Allow Direct Media Path**.
10. Untick **Fax Transport Support** and **Voice Networking**. Set **H450 Support** to ***None***.
11. Set the **Compression Mode** to ***Automatic Selection***. The mode used is determined by the central PBX's “IP-codec-set” values, see "2.4 H.323 Trunk Compression Codec and Region Settings" on page 22.
12. Click on **OK** to close the line form.
13. Select **IP Route** to display the list of existing routes. Ensure that there is an entry for routing IP packets to the central PBX. To add an entry right-click on the list and select **New**.

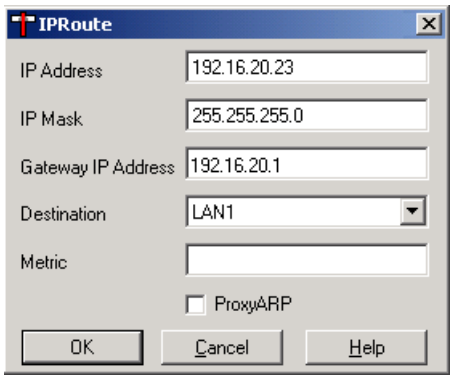



Figure 10: IP Office IP Route Form

- The **IP Address** is the IP Address of the C-LAN *(see "2.5.2 PBX IP Addresses" on page 23)*. The IP Mask and Gateway IP Address should match that setting.
- The Destination in on the same LAN so remains as **LAN1**.

14. Use to send the configuration back to the IP Office. Set the **Reboot Mode** to ***Immediate*** or ***When Free*** and click on **OK**.

# 1.4 IP Office Voicemail Configuration

1. Start IP Office Manager and use to receive the configuration.
2. Double-click on System.
3. In the **System Configuration** form select the **Voicemail** tab.

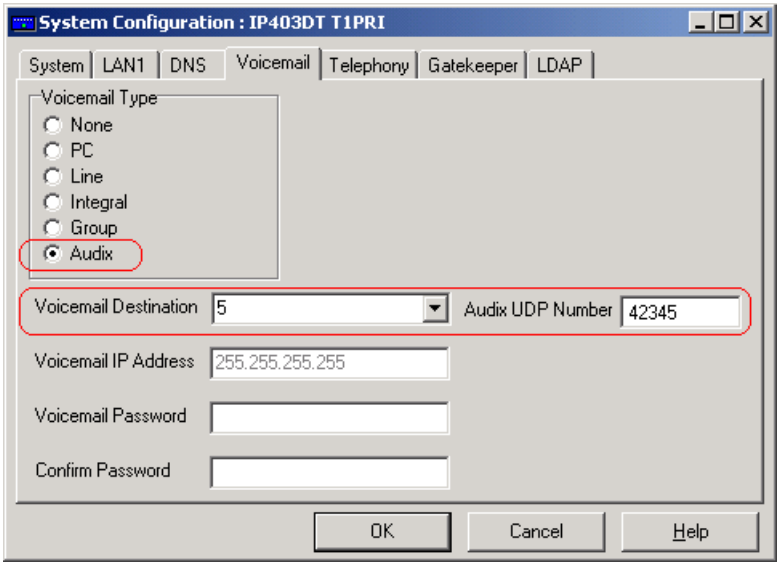



Figure 11: IP Office System Form Voicemail Tab

4. Set the **Voicemail Type** to ***AUDIX***.
5. Set the **Voicemail Destination** to match the **Outgoing Group ID** set for the line or channels connected to the central PBX in the previous sections.
6. In the **AUDIX UDP Number** field enter the central PBX extension of the INTUITY AUDIX hunt group. See "2.6.3 AUDIX Hunt Group Configuration" on page 29.
7. Use to send the configuration back to the IP Office. Set the **Reboot Mode** to ***Immediate*** or ***When Free*** and click on **OK**.

# 1.5 User Voicemail Settings

The only user voicemail setting supported by IP Office when running with QSIG Centralized INTUITY AUDIX is **Voicemail On**. The voicemail features available to a user once they have accessed their AUDIX mailbox are dependant on the AUDIX system and not the IP Office. See "Voicemail Features Supported" on page 4.

By default all users have voicemail on enabled. Users can control this setting themselves using Phone Manager or using the IP Office default system short codes (***18** for voicemail on, ***19** for voicemail off).

1. Start IP Office Manager and use to receive the configuration.
2. Click on **User** to display a list of all IP Office users.
3. To edit a particular user, double-click on their entry in the displayed list and select the **Voicemail** tab.

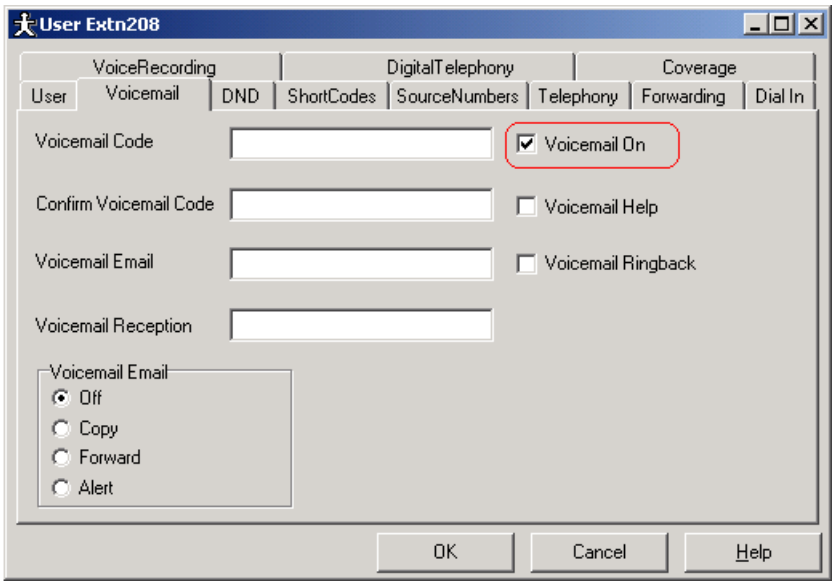



Figure 12: IP Office User Form Voicemail Tab

4. For any users who are not going to have a mailbox on the central PBX, deselect **Voicemail On**.
5. Use to send the configuration back to the IP Office. If only changes to user settings were made, select **Merge Config** and click on **OK**.

# 1.6 Turning Off Hunt Group Voicemail Settings

Mailboxes for IP Office hunt groups are not supported when using QSIG Centralized AUDIX Voicemail. See "Voicemail Features Supported" on page 4.

1. Start IP Office Manager and use to receive the configuration.
2. Click on **Hunt Group** to display a list of existing hunt groups.
3. Double-click on a group and select the **Voicemail** tab.

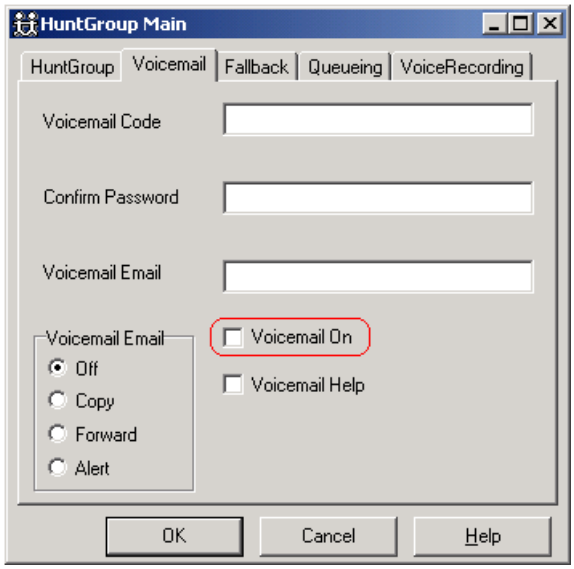



Figure 13: IP Office Hunt Group Form Voicemail Tab

4. Check that **Voicemail On** is not ticked.
5. Click on **OK**.
6. Repeat for all the other hunt groups.
7. Use to send the configuration back to the IP Office. If only changes to hunt group voicemail settings were made, select **Merge Config** and click on **OK**.

# 1.7 Routing Calls from the Central PBX

Incoming calls are routed from the central PBX to the right extension users by creating an Incoming Call Route for each user.

The process below uses the IP Office's MSN Configuration tool to add a batch of new incoming call routes. Route can also be edited and added individually through the **Incoming Call Route** settings.

1. Start IP Office Manager and use to receive the configuration.
2. Select **Tools | MSN Configuration**.

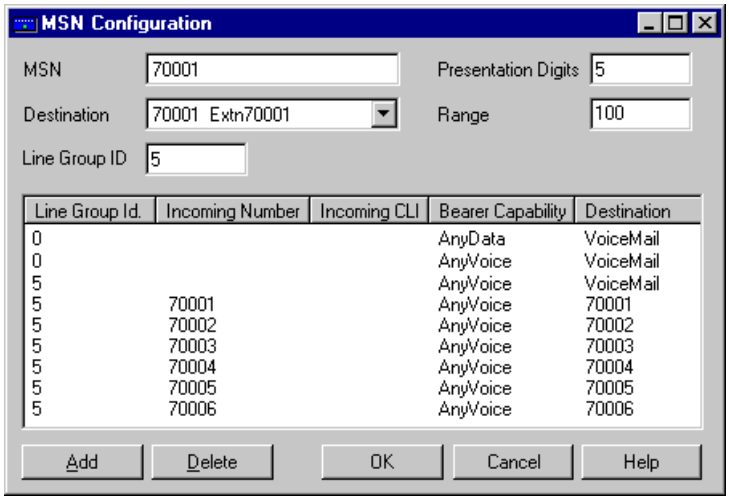



Figure 14: IP Office MSN Configuration Tool

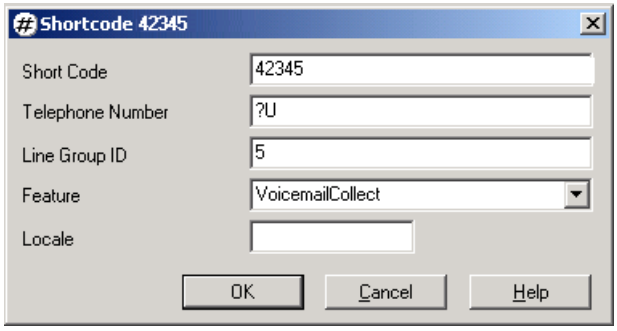
3. In **MSN** enter the extension number of the first IP Office extension.
   - For US T1 PRI trunks, prefix the number with a **-**, eg. ***-70001***.
4. In **Destination** select the same extension again.
5. Set **Presentation Digits** to match the extension number length being used, in this case ***5***.
6. Set the **Range** to the number of extension being supported on the IP Office. Allow for future additions that may be made.
7. In **Line Group ID** enter the Incoming Group number used for the connection to the central PBX.
8. Click on **Add**. An individual entry will be created for each extension in the range specified.
9. Click on **OK**.
10. Click on **Incoming Call Route** to display a list of existing incoming routes. The list will including those just created above by the MSN Configuration tool.
11. Use to send the configuration back to the IP Office. If only changes to incoming call routes were made, select **Merge Config** and click on **OK**.

# 1.8 Routing Calls to the Central PBX

To route calls to the AUDIX Group number to the central PBX, and to route calls to numbers in the central PBX's extension range to the central PBX, two system shortcodes are added.

For this example, to route any calls in the central PBX's range, (five digit numbers starting with 4), to the outgoing trunk group used for the connection to the central PBX (Outgoing Group 5).

1. Start IP Office Manager and use to receive the configuration.
2. Click on **Shortcode** to display a list of existing system shortcodes.
3. Right-click on the list and select **New**.
4. Enter a shortcode similar to the following:




   - **Short Code:** This matches the AUDIX hunt group extension. See "2.6.3 AUDIX Hunt Group Configuration" on page 29.
   - The remaining fields match the normal shortcode for collecting voicemail messages.
5. Click on OK
6. Repeat the step above to add another new shortcode similar to the following:

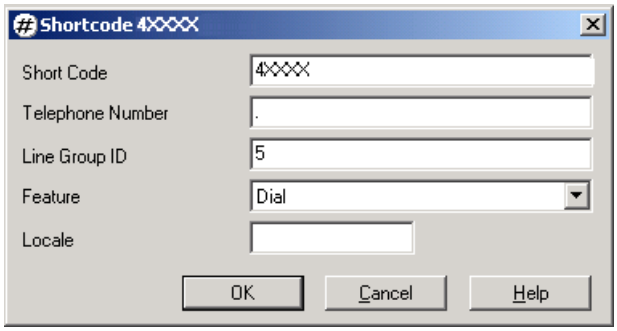



Figure 15: IP Office Shortcode Form

   - The **Short Code** of ***4XXXX*** matches any five-digit dialing beginning with 4 (which matches the extension range on the central PBX in our example configuration).
   - The **Telephone Number** of **.** indicates that the IP Office should output the digits as dialed.
   - The **Line Group ID** should match the Outgoing Group number used for the trunks connected to the central PBX.
   - The **Feature** is ***Dial***.
7. Click on **OK**.
8. If the central PBX also supports any other extension number ranges create shortcodes to match the dialing of those numbers from the IP Office.
9. Use to send the configuration back to the IP Office. If only changes to short codes were made, select **Merge Config** and click on **OK**.

# 2. Configure the Central PBX

## 2.0 Overview

This section describes the configuration of the central PBX. All commands are run from the Central PBX command line interface.

## 2.1 Set the Dial Plan and Node Number

1. Update the PBX dial plan.
   - For R9.5/R10 Systems: Enter ***change dialplan***.

```
change dialplan
                              DIAL PLAN RECORD
                                                    Local Node Number: 1
                                                      ETA Node Number:
             Uniform Dialing Plan: 5-digit       ETA Routing Pattern:
       UDP Extension Search Order: local-extensions-first
FIRST DIGIT TABLE
First                                  Length
Digit  - 1 -       - 2 -       - 3 -       - 4 -       - 5 -       - 6 -
  1: misc
  2:                                                    extension
  3:                                                    extension
  4:                                                    extension
  5:                                                    extension
  6:                                                    extension
  7:                                                    extension
  8:
  9:
  0:
  *:             fac
  #:                         fac
Command:
```

Figure 16: R9.5/R10 change dialplan

   - For MultiVantage Systems: Enter ***change dialplan parameters***.

```
change dialplan parameters                                      Page 1 of 1
                              DIAL PLAN RECORD

                                                    Local Node Number: 1
                                                      ETA Node Number:
                                                  ETA Routing Pattern:
       UDP Extension Search Order: local-extensions-first
```

Figure 17: MultiVantage change dialplan parameters, page 1.

2. The **Local Node Number** should match the **Switch Number** set on the Intuity **Switch Link Administration** form (see "3.1 " on page 39).
   - For MultiVantage Systems: Enter ***change dialplan analysis***.

```
change dialplan analysis                                        Page 1 of 3
                           DIAL PLAN ANALYSIS TABLE
                                                          Percent Full:
5

      Dialed  Total  Call      Dialed  Total  Call      Dialed  Total  Call
      String  Length Enter      String  Length Enter      String  Length
Enter
        10      3    dac         7       5    ext
        11      3    dac         *       2    fac
        12      3    dac         #       3    fac
        13      3    dac
        14      3    fac
        15      3    fac
        16      3    fac
        17      3    fac
        2       5    ext
        3       5    ext
        4       5    ext
        5       5    ext
        6       5    ext
```

Figure 18: MultiVantage change dialplan parameters, page 3

3. Ensure that the extension number ranges required, including those for IP Office users, are shown as extensions.

# 2.2 Customer Option Settings

Commands in this section require a login with special permissions as many of these items require the licenses.

1. On MultiVantage systems: Enter ***display system-parameters offer-options***. Check that the system is configured as a Offer Category “A”, this is required for the QSIG supplementary service features used by centralized voicemail.
2. Enter ***change system-parameters customer-options***.
3. On **Page 1**, check that the capacities shown are sufficient.

```
change system-parameters customer-options                      Page 1 of 9
                            OPTIONAL FEATURES
                                                                 Used
     G3 Version: V10                    Maximum Ports: 500      108
       Location: 1           Maximum XMOBILE Stations: 10       0

IP PORT CAPACITIES
                       Maximum Administered IP Trunks: 150      20
           Maximum Concurrently Registered IP Stations: 200     0
             Maximum Administered Remote Office Trunks: 0       0
Maximum Concurrently Registered Remote Office Stations: 0       0
              Maximum Concurrently Registered IP eCons: 0       0


   Maximum Number of DS1 Boards with Echo Cancellation: 5       0
                                 Maximum VAL Boards: 1       0

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

Figure 19 System-Parameters customer-options, page 1

4. On **Page 2**, set **ARS?** to ***y***.

```
change system-parameters customer-options                   Page   2 of  9
                            OPTIONAL FEATURES

    Abbreviated Dialing Enhanced List? y          Audible Message Waiting? y
                                              Authorization Codes? n
        Analog Trunk Incoming Call ID? y                    CAS Branch? n
 A/D Grp/Sys List Dialing Start at 01? y                      CAS Main? n
Answer Supervision by Call Classifier? y                Change COR by FAC? y
                                  ARS? y Computer Telephony Adjunct Links? n
                ARS/AAR Partitioning? y  Cvg Of Calls Redirected Off-net? n
          ARS/AAR Dialing without FAC? n                     DCS (Basic)? y
          ASAI Link Core Capabilities? n               DCS Call Coverage? y
          ASAI Link Plus Capabilities? n              DCS with Rerouting? y
                                                Digital Loss Plan Modification? y
  Async. Transfer Mode (ATM) Trunking? n                          DS1 MSP? y
                                                DS1 Echo Cancellation? y
                                ATMS? y
                  Attendant Vectoring? y
```

Figure 20: System Parameters customer options, page 2

5. On **Page 3**, set **ISDN-PRI?** to ***y***.

```
change system-parameters customer-options                      Page 3 of  9
                                OPTIONAL FEATURES

  Emergency Access to Attendant? y                       ISDN-BRI Trunks? y
                   Enhanced EC500? n                             ISDN-PRI? y
          Extended Cvg/Fwd Admin? n                  Malicious Call Trace? y
    External Device Alarm Admin? y  Mode Code for Centralized Voice Mail? n
                Flexible Billing? n
  Forced Entry of Account Codes? y              Multifrequency Signaling? y
     Global Call Classification? y  MultimediaAppl.ServerInterface(MASI)? n
             Hospitality (Basic)? y      Multimedia Call Handling (Basic)? n
Hospitality (G3V3 Enhancements)? y   Multimedia Call Handling (Enhanced)? n
                     H.323 Trunks? y
   Integrated SSP Announcements? y         Personal Station Access (PSA)? n
           IP Attendent Consoles? n
                      IP Stations? y
                ISDN Feature Plus? n
  ISDN Network Call Redirection? n
```

Figure 21: System Parameters customer options, page 3

6. On **Page 4**, set **Private Networking?** and **Uniform Dialing Plan?** to ***y***. If present also set **Processor Ethernet?** to ***y***.

```
change system-parameters customer-options                      Page 4 of 9
                                OPTIONAL FEATURES

                                                      Tenant Partitioning? n
                                                Terminal Trans. Init. (TTI)? n
          Processor and System MSP? n                   Time of Day Routing? n
                Private Networking? y                 Uniform Dialing Plan? y
                Processor Ethernet? y           Usage Allocation Enhancements? n
                                                     VAL Full 1-Hour Capacity? y
                      Remote Office? n
      Restrict Call Forward Off Net? y                   Wideband Switching? n
              Secondary Data Module? y                              Wireless? n
              Station and Trunk MSP? n
       Station as Virtual Extension? n

    System Management Data Transfer? n
```

Figure 22: System-parameters customer-options, page 4

7. On **Page 7**, set **Basic Call Setup** and **Basic Supplementary Services** to ***y***.

```
change system-parameters customer-options                      Page  7 of  9
                          QSIG OPTIONAL FEATURES

                                      Basic Call Setup? y
                           Basic Supplementary Services? y
                                  Centralized Attendant? n
                                  Interworking with DCS? n
                  Supplementary Services with Rerouting? n
                          Transfer into QSIG Voice Mail? n
                                    Value-Added (VALU)? n
```

Figure 23: System Parameters, customer options, page 7

# 2.3 System Feature Settings

1. Enter ***change system-parameters features***.
2. On **Page 1** set **Trunk-to-Trunk Transfer** to ***all***.

```
change system-parameters features                              Page 1 of 13
                        FEATURE-RELATED SYSTEM PARAMETERS
                           Self Station Display Enabled? y
                                 Trunk-to-Trunk Transfer: all
Automatic Callback - No Answer Timeout Interval (rings): 3
                     Call Park Timeout Interval (minutes): 10
    Off-Premises Tone Detect Timeout Interval (seconds): 20
                               AAR/ARS Dial Tone Required? y
                                       Music/Tone on Hold: tone
          Music (or Silence) on Transferred Trunk Calls? no
                      DID/Tie/ISDN Intercept Treatment: attd
              Messaging Service Adjunct (MSA) Connected? n
Internal Auto-Answer of Attd-Extended/Transferred Calls: transferred
              Automatic Circuit Assurance (ACA) Enabled? n




         Abbreviated Dial Programming by Assigned Lists? n
   Auto Abbreviated/Delayed Transition Interval (rings): 2
                Protocol for Caller ID Analog Terminals: Bellcore
Display Calling Number for Room to Room Caller ID Calls? n
```

Figure 24: System Parameters Features, page 1

3. On **Page 7** enter the following:
   - Set **Display Connected Name/Number for ISDN DCS Calls?** to ***y***.
   - For **QSIG TSC Extension** enter a valid available extension.
   - Set **MWI - Number of Digits Per Voice Mail Subscriber** to match the extension digit length being used, in this example ***5***.
   - Set **Unknown Numbers Considered Internal for AUDIX?** to ***y***.
   - For **Maximum Length** again enter the extension digit length being used.

```
change system-parameters features                              Page 7 of 13
                        FEATURE-RELATED SYSTEM PARAMETERS

ISDN PARAMETERS

 Send Non-ISDN Trunk Group Name as Connected Name? n
 Display Connected Name/Number for ISDN DCS Calls? y
       Send ISDN Trunk Group Name on Tandem Calls? n


                                 QSIG TSC Extension: 34999
 MWI - Number of Digits Per Voice Mail Subscriber: 5
                                   Feature Plus Ext:
                              National CPN Prefix: 0
                         International CPN Prefix: 00
                        Pass Prefixed CPN to ASAI? y
    Unknown Numbers Considered Internal for AUDIX? y       Maximum Length: 5
              USNI Calling Name for Outgoing Calls? y
                Path Replacement with Measurements? y
                     QSIG Path Replacement Extension:
            Path Replace While in Queue/Vectoring? n
```

Figure 25: System-parameters features page 7

# 2.4 H.323 Trunk Compression Codec and Region Settings

- For non-H.323 connections go straight to .

1. Enter ***change ip-codec-set 1*** to enter the codec to be used between the IP Office and the central PBX.

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

                          IP Codec Set

    Codec Set: 1

    Audio      Silence      Frames   Packet
    Codec      Suppression  Per Pkt  Size(ms)
 1: G.711MU         n          2        20
 2:
 3:
 4:
 5:
 6:
 7:
```

Figure 26: IP Codec Set

- There must be at least one entry that corresponds to the **Compression Mode** set on the IP Office (see "1.3 IP Office H.323 Trunk Configuration" on page 11).
- When the IP Office is set to ***Automatic Selection***, it supports (in order of preference); G.729, G.723-6.3K, G.11 (MU or A law as appropriate).

2. Enter ***change ip-network region 1*** to check the network region settings.

```
change ip-network-region 1                                    Page  1 of  2
                              IP Network Region

      Region: 1
        Name: Domain 1

Audio Parameters                  Direct IP-IP Audio Connections? y
   Codec Set: 1                             IP Audio Hairpinning? n
    Location:
  UDP Port Range                                      RTCP Enabled? y
         Min: 49000               RTCP Monitor Server Parameters
         Max: 65535                Use Default Server Parameters? y

DiffServ/TOS Parameters
 Call Control PHB Value: 34
   VoIP Media PHB Value: 46
          BBE PHB Value: 43       Resource Reservation Parameters
                                                     RSVP Enabled? n
             802.1p/Q Enabled? n
```

Figure 27: ip-network-region

# 2.5 General IP Address Settings

## 2.5.1 AUDIX IP Address

1. Enter ***change node-names audix-msa***.

```
change node-names audix-msa
                                AUDIX-MSA NODE NAMES

      AUDIX™ Names    IP Address          MSA Names     IP Address
      IAaudix        192.16 .200.25      msa              .   .   .
```

Figure 28: Node-Names AUDIX

- Check that **IP Address** matches the one set on the INTUITY™ AUDIX *(see "3.1 AUDIX IP Address" on page 39)*.
- Check that a name identifying the INTUITY AUDIX System is entered.

## 2.5.2 PBX IP Addresses

Note: The settings for an IP interface cannot be changed is the interface is currently enabled. It may be necessary to go to Step 2 first in order to disable the interface prior to making changes.

1. Enter ***change node-names ip*.**

```
change node-names ip
                                IP NODE NAMES
    Name              IP Address
IP600-Clan           192.16 .20 .23
IP600-Medpro         192.16 .20 .24
IPoffice             192.16 .50 .2
default              0   .0   .0   .0
```

Figure 29: IP600 or S8100/G600 node-names IP

- Enter the endpoint IP addresses according to the following table:

| | **H.323 to IP Office** | **PRI to IP Office** |
|---|---|---|
| **IP600 or G600** | C-LAN, Medpro and IPOffice | C-LAN card |

- Depending on the PBX system as above, the C-LAN or Processor IP address is the IP address that the INTUITY AUDIX connects to for signaling *(see "*3.2 AUDIX Switch Link Administration*" on page 40)*.

2. Enter ***change ip-interfaces*** to enable the PBX interfaces, assign a network region and add a gateway address for routing, if necessary.

```
Change ip-interfaces                                          Page  1 of 6

                                  IP INTERFACES

Enable                                                                  Net
Eth Pt Enter   Slot  Code Sfx Node Name    Subnet Mask    Gateway Address
Rgn
   y   C-LAN  01A04 TN799  C IP600-Clan   255.255.255.0  192.16 .20.1    1
   y   MEDPRO 01A05 TN2302   IP600-Medpro 255.255.255.0  192.16 .20.1    1
   n                                      255.255.255.0     .   .   .
   n                                      255.255.255.0     .   .   .
   n                                      255.255.255.0     .   .   .
   n                                      255.255.255.0     .   .   .
   n                                      255.255.255.0     .   .   .
   n                                      255.255.255.0     .   .   .
   n                                      255.255.255.0     .   .   .
   n                                      255.255.255.0     .   .   .
   n                                      255.255.255.0     .   .   .
   n                                      255.255.255.0     .   .   .
   n                                      255.255.255.0     .   .   .
   n                                      255.255.255.0     .   .   .
   n                                      255.255.255.0     .   .   .
```

Figure 30: IP Interfaces

3. Enter ***add data-module ext*** or ***change data-module ext***, where **ext** is a valid dial plan extension to ensure there is a data-module associated with the C-LAN port.

```
Change data-module 20000
                                DATA MODULE

  Data Extension: 20000           Name: clan ip 1a04
            Enter: ethernet
            Port: 01A0417
            Link: 1



Network uses 1's for Broadcast Addresses? y
```

Figure 31 data-module

4. Enter a **Link** number. This will be used when assigning TCP channels for the Intuity-PBX signaling communication *(See Step 6 below)*.
5. Enter **change ethernet-options** and check that the C-LAN card ethernet interface is enabled.

```
change ethernet-options

                                ETHERNET OPTIONS

Enable
Eth Pt Enter   Slot   Code   Sfx    Auto     Speed     Duplex
   y   C-LAN  01A04  TN799   C      n       10Mbps    Half
   y   MEDPRO 01A05  TN2302         y
```

Figure 32 Ethernet Options

6. Enter ***change communication-interface processor-channels***. to configure the TCP connections for the INTUITY AUDIX.

```
change communication-interface processor-channels              Page  1 of 8
                         PROCESSOR CHANNEL ASSIGNMENT
Proc                   Gtwy      Interface          Destination   Session  Mach
Chan Enable   Appl.    To  Mode Link/Chan       Node     Port  Local/Remote ID
  1:   y    audix          s    1   5002  IAaudix      0      1      1      1
  2:   y    qsig-mwi       s    1   6002  IAaudix      0      2      1      2
  3:   n                                              0
  4:   n                                              0
  5:   n                                              0
  6:   n                                              0
  7:   n                                              0
  8:   n                                              0
  9:   n                                              0
 10:   n                                              0
 11:   n                                              0
 12:   n                                              0
 13:   n                                              0
 14:   n                                              0
 15:   n                                              0
 16:   n                                              0
```

Figure 33: Processor Channel Assignment

7. As shown above, one processor channel is assigned to the AUDIX application for exchanging call related information and for sending message waiting updates to the central PBX. The second processor channel handles message waiting updates to the IP Office.
   - The **Proc Chan**, **Session Local** and **Mach ID** settings should all be the same.
   - The **Machine ID** field is also used to match entries in the **change isdn mwi-prefixes** form *(see "2.5.3 Set the ISDN Message Waiting Prefixes" on page 26)* and so should be unique.
   - In the **Link** column enter the link number from the data-module form *(See Step 4 previous)*.
   - Enter the audix node name from the *node-names audix-msa* form administered previously *(See "2.5.1 AUDIX IP Address" on page 23)*.
   - The **Chan** numbers should match the **TCP Port** number set on the INTUITY AUDIX *(see "3.1 " on page 39)*. Channel numbers start at 5002 for AUDIX application comms and 6002 for QSIG-MWI comms.
   - Leave the **Destination Port** as ***0***.
   - Once the entries are made, set **Enable** for each to **y**.

## 2.5.3 Set the ISDN Message Waiting Prefixes

This section defines a prefix that will be added to Message Waiting Indication (MWI) calls. This is necessary to route MWI calls through Automatic Alternate Routing which removes the prefix and send the MWI calls to the correct trunk group for the IP Office *(see 2.9 Call Routing" on page 36)*.

1. Enter ***change isdn mwi-prefixes.***

```
change isdn mwi-prefixes
             MESSAGE WAITING INDICATION SUBSCRIBER NUMBER PREFIXES

 Machine Inserted     Routing  AUDIX    Machine Inserted     Routing AUDIX
   ID    Digits       Digits   Mach ID    ID    Digits       Digits  Mach ID

    1:                                    11:
    2:                *877     1          12:
    3:                                    13:
    4:                                    14:
    5:                                    15:
    6:                                    16:
    7:                                    17:
    8:                                    18:
    9:                                    19:
   10:                                    20:
```

Figure 34: ISDN Message Waiting prefixes

- Choose the **Machine ID** used for **qsig-mwi** on the ***communication-interface processor-channels*** form *(see "2.5.2 PBX IP Addresses" on page 23)*.
- Enter the **Routing Digits** to prefix to the extension number in message waiting update messages. In this configuration, the message waiting updates come with the 5 digit IP Office extension of the form “7xxxx” as this is the numbering used in the INTUITY AUDIX mailboxes. Since there must be an entry in this form, the prefix “***877”** was chosen. "*8” is the Automatic Alternate Routing access code set on the feature access-codes screen. The remaining number becomes of the form “777-xxxx”.
- An alternate method to the above, would be to enter just the Automatic Alternate Routing access code in the **Routing Digits** column and the remaining digits in the **Inserted Digits** column. For the example above this would mean entering ***8** in the **Routing Digits** column and **77** in the **Inserted Digits** column. This method may be necessary if the number of digits required exceeds those that can be entered in the **Routing Digits** column.
- For **AUDIX Mach ID** enter the **AUDIX™ Number** as set in the Intuity **Switch Link Administration** form *(see "3.1 " on page 39)*.

2. Enter **change isdn private numbering**. This configuration passes identification numbers in level 0 format (as extensions). If these numbers were to be passed in RNX-XXXX format, the appropriate code for the PBX to prefix would be entered in the **Level 1 Code** field. RNX-XXX is a private numbering plan format where RNX originally corresponded to a particular PBX.

```
change isdn private-numbering

                        ISDN NUMBERING - PRIVATE FORMAT

             Network Level: 0              PBX Identifier:
              Level 2 Code:                Deleted Digits: 0
              Level 1 Code:
```

Figure 35: ISDN private-numbering

# 2.6 INTUITY AUDIX Hunt Group and Analog Port Configuration

This section describes the configuration of the analog ports associated with the INTUITY AUDIX System.

## 2.6.1 AUDIX Port Class of Restriction and Service Setup

1. Enter ***change cor <no>***, where ***<no>*** is a Class of Restriction number not already used, in this configuration **21** was used.

```
change cor 21                                                Page  1 of  4
                              CLASS OF RESTRICTION

                COR Number: 21
           COR Description: AUDIX™ ports

                       FRL: 0                                APLT? y
  Can Be Service Observed? n          Calling Party Restriction: none
Can Be A Service Observer? n           Called Party Restriction: none
        Time of Day Chart: 1       Forced Entry of Account Codes? n
         Priority Queuing? n                Direct Agent Calling? n
     Restriction Override: none       Facility Access Trunk Test? n
     Restricted Call List? n                  Can Change Coverage? n

            Access to MCT? y            Fully Restricted Service? n
Group II Category For MFC: 7            Hear VDN of Origin Annc.? n
         Send ANI for MFE? n             Add/Remove Agent Skills? n
            MF ANI Prefix:              Automatic Charge Display? n
Hear System Music on Hold? y   PASTE (Display PBX Data on Phone)? n
                         Can Be Picked Up By Directed Call Pickup? n
                                    Can Use Directed Call Pickup? n
                                    Group Controlled Restriction: inactive
```

Figure 36: class of restriction, page 1

- Ensure that **Calling Party Restriction** and **Called Party Restriction** are set to ***none***.

2. Enter ***change cos***.

```
change cos
                                CLASS OF SERVICE

                            0  1  2  3  4  5  6  7  8  9 10 11 12 13 14 15

 Auto Callback              n  y  y  n  y  n  y  n  y  n  y  n  y  n  y  n
 Call Fwd-All Calls         n  y  n  y  y  n  n  y  y  n  n  y  y  n  n  y
 Data Privacy               n  y  n  n  n  y  y  y  y  n  n  n  n  y  y  y
 Priority Calling           n  y  n  n  n  n  n  n  n  y  y  y  y  y  y  y
 Console Permissions        n  n  n  n  n  n  n  n  n  n  n  n  n  n  n  n
 Off-hook Alert             n  n  n  n  n  n  n  n  n  n  n  n  n  n  n  n
 Client Room                n  n  n  n  n  n  n  n  n  n  n  n  n  n  n  n
 Restrict Call Fwd-Off Net  y  y  y  y  y  n  y  y  y  y  y  y  y  y  y  y
 Call Forwarding Busy/DA    n  n  n  n  n  n  n  n  n  n  n  n  n  n  n  n
 Personal Station Access (PSA)n  n  n  n  n  n  n  n  n  n  n  n  n  n  n  n
 Extended Forwarding All    n  n  n  n  n  n  n  n  n  n  n  n  n  n  n  n
 Extended Forwarding B/DA   n  n  n  n  n  n  n  n  n  n  n  n  n  n  n  n
 Trk-to-Trk Transfer Override n  n  n  n  n  n  n  n  n  n  n  n  n  n  n  n
 QSIG Call Offer Originations n  n  n  n  n  y  n  n  n  n  n  n  n  n  n  n
```

Figure 37: Class of Service

3. Select a Class of Service to use with the AUDIX ports. Typically Class of Service 5 is used and has the following default settings:
   - Set **Data Privacy** to ***y***.
   - Set **Restrict Call Fwd-Off Net** to ***n***.
   - Set **QSIG Call Offer Originations** to ***y***.

## 2.6.2 AUDIX Port Station Configuration

1. Enter ***add station <ext>*** or ***change station <ext>*** where ***<ext>*** is the extension number of the first station in the INTUITY AUDIX hunt group.
   - The extensions administered here must match the corresponding extensions administered in INTUITY AUDIX in its "Voice Equipment" menu.
2. On **Page 1** set the **Type** to **2500**. Set the **COR** and **COS** to the values setup in the previously section.

```
change station 42309                                        Page  1 of  3
                                    STATION

Extension: 42309                       Lock Messages? n          BCC: 0
     Type: 2500                        Security Code:             TN: 1
     Port: 01A1001                   Coverage Path 1:            COR: 21
     Name: Iaudix-42309              Coverage Path 2:            COS: 5
                                     Hunt-to Station:          Tests? n

STATION OPTIONS
             Loss Group: 1                  Message Waiting Indicator: none
    Off Premises Station? n




                                                  Remote Office Phone? n
```

Figure 38: Station Form, page 1

3. On **Page 2** set the following fields as shown.

```
change station 42309                                        Page  2 of  3
                                    STATION
FEATURE OPTIONS
           LWC Reception: audix
          LWC Activation? n                    Coverage Msg Retrieval? n
  LWC Log External Calls? n                                Auto Answer: none
            CDR Privacy? n                           Data Restriction? n
   Redirect Notification? y                  Call Waiting Indication? n
 Per Button Ring Control? n               Att. Call Waiting Indication? n
   Bridged Call Alerting? n                   Distinctive Audible Alert? n
        Switchhook Flash? y                         Adjunct Supervision? y
    Ignore Rotary Digits? n
        H.320 Conversion? n       Per Station CPN - Send Calling Number? n
       Service Link Mode: as-needed
         Multimedia Mode: basic                  Audible Message Waiting? n
    MWI Served User Enter:

                                               Coverage After Forwarding? s

                                          Direct IP-IP Audio Connections? y
  Emergency Location Ext: 42309                     IP Audio Hairpinning? y
```

Figure 39: Station Form, Page 2

4. Use the duplicate station command to repeat for any other stations that will be in the INTUITY AUDIX hunt group.

## 2.6.3 AUDIX Hunt Group Configuration

1. Enter ***add*** or ***change hunt-group <group>*** where ***<group>*** is the hunt group number to be used for INTUITY AUDIX coverage.
2. On **Page 1** set the following:

```
change hunt-group 99                                          Page  1 of 10
                                   HUNT GROUP

           Group Number: 99                                 ACD? n
             Group Name: Audix-VoiceMail                  Queue? y
        Group Extension: 42345                          Vector? n
             Group Enter: ucd-mia                  Coverage Path:
                      TN: 1          Night Service Destination:
                     COR: 21                    MM Early Answer? n
          Security Code:
    ISDN Caller Display: grp-name

           Queue Length: 6
 Calls Warning Threshold:      Port:
  Time Warning Threshold:      Port:
```

Figure 40: Hunt-group, page 1

- Set the **Group Enter** to ***ucd-mia***.
- Set the **COR** to match that setup in the previous section.
- Set the **Queue Length** to match the number of analogue ports connected to the AUDIX™.
- Set the **Group Extension** to a valid extension number. This acts as the extension dialed to collect messages. It is entered as the **AUDIX UDP** on the IP Office *(see "1.4 IP Office Voicemail Configuration" on page 13)*.

3. On **Page 2** set **Message Center** to ***audix*** and **Calling Party Number to INTUITY AUDIX** to ***y***. (Note: The form may have fewer fields).

```
change hunt-group 99                                          Page 2 of 60
                                   HUNT GROUP

                           Message Center: audix

                Message Center AUDIX Name: IAaudix

                                   Primary? y
   Calling Party Number to INTUITY AUDIX? y
                              LWC Reception: none
                                 AUDIX Name: IAaudix
                     Messaging Server Name:

             First Announcement Extension:          Delay (sec):
```

Figure 41: MultiVantage Huntgroup, page 2

4. On **Page 3** add the AUDIX port stations configured in the previous section into the hunt group list.

```
Change hunt-group 99                                          Page  3 of 10
                                   HUNT GROUP
         Group Number: 99     Group Extension: 42345    Group Enter: ucd-mia
 Member Range Allowed: 1 - 200        Administered Members (min/max): 1  /1
                                           Total Administered Members: 1
GROUP MEMBER ASSIGNMENTS
      Ext   Name                                Ext   Name
  1 : 42309 Iaudix-42309                  14 :
  2 :                                     15 :
  3 :                                     16 :
  4 :                                     17 :
  5 :                                     18 :
  6 :                                     19 :
  7 :                                     20 :
  8 :                                     21 :
  9 :                                     22 :
 10 :                                     23 :
 11 :                                     24 :
 12 :                                     25 :
 13 :                                     26 :
  At End of Member List
```

Figure 42: Hunt-group, page 3

# 2.7 PRI Trunk & Trunk Group

This section describes the configuration steps to establish a PRI trunk group to the IP Office supporting the QSIG protocol.

- **If using H.323 Trunk connection go to "2.8 H.323 QSIG Trunk Group" on page 33.**

## 2.7.1 PRI Trunk Configuration

1. Enter ***add*** or ***change ds1 <CCCSS>***, where ***<CCCSS>*** is the carrier shelf and slot position of the DS1 circuit pack that will be connected to the IP Office.

```
change ds1 01a09                                              Page  1 of  2
                                DS1 CIRCUIT PACK

            Location: 01A09                          Name: IPOffice-QSIG
           Bit Rate: 1.544                    Line Coding: b8zs
   Line Compensation: 1                       Framing Mode: esf
      Signaling Mode: isdn-pri
             Connect: pbx                         Interface: network
CentreVu Long Timers? n                    Country Protocol: 1
Interworking Message: PROGress             Protocol Version: b
Interface Companding: mulaw                            CRC? n
           Idle Code: 11111111
                                DCP/Analog Bearer Capability: 3.1kHz


      Slip Detection? n                Near-end CSU Enter: other

   Echo Cancellation? n
```

Figure 43: DS1, page 1

- Make sure that the **Bit Rate**, **Line Coding** and **Framing Mode** match the IP Office Server PRI line Advanced tab settings *(see "1.2 IP Office PRI Trunk Configuration" on page 8)*.
- Set **Connect** to ***pbx***.
- Set **Interface** to ***Network***.
- Set **Country Protocol** to ***1***.
- Set **Protocol Version** to ***b*** for US ISDN-2.

```
change ds1 01a09                                              Page  2 of  2
                                DS1 CIRCUIT PACK

 ESF DATA LINK OPTIONS

                     Network Management Protocol: tabs
 Send ANSI-T1.403 One-Second Performance Reports? n
                              Far-end CSU Address: b
```

Figure 44: DS1, page 2

## 2.7.2 PRI Trunk Group Configuration

1. Enter ***add*** or ***change trunk group <group>*** where ***<group>*** is a chosen trunk group number for the IP Office connection.
2. On **Page 1**, set the **Supplementary Service Protocol** to ***b*** and leave the **Numbering Format** blank.

```
change trunk-group 7                                          Page  1 of 10
                                TRUNK GROUP

Group Number: 7                     Group Enter: isdn          CDR Reports: y
  Group Name: IPOFFICE QSIG PRI           COR: 21      TN: 1       TAC: 107
   Direction: two-way        Outgoing Display? y     Carrier Medium: PRI/BRI
 Dial Access? y                Busy Threshold: 99          Night Service:
Queue Length: 99
Service Enter: tie                   Auth Code? n        TestCall ITC: rest
                         Far End Test Line No:
TestCall BCC: 4
TRUNK PARAMETERS
        Codeset to Send Display: 6    Codeset to Send National IEs: 6
       Max Message Size to Send: 260  Charge Advice: none
 Supplementary Service Protocol: b    Digit Handling (in/out): enbloc/enbloc

            Trunk Hunt: ascend                       QSIG Value-Added? n
                                                   Digital Loss Group: 13
Calling Number - Delete:     Insert:                 Numbering Format:
              Bit Rate: 1200         Synchronization: async    Duplex: full
 Disconnect Supervision - In? y  Out? y
 Answer Supervision Timeout: 0
```

Figure 45: Trunk Group, page 1

3. On **Page 2**, set the items as shown below. The **NCA-TSC Trunk Member** is set after adding group members later in this process.

```
change trunk-group 7                                          Page  2 of 10
TRUNK FEATURES
          ACA Assignment? n           Measured: none     Wideband Support? n
                                Internal Alert? n       Maintenance Tests? y
                              Data Restriction? n    NCA-TSC Trunk Member: 1
                                     Send Name: y     Send Calling Number: y
            Used for DCS? n             Hop Dgt? y
   Suppress # Outpulsing? n    Numbering Format: private
Outgoing Channel ID Encoding: preferred   UUI IE Treatment: service-provider

                                            Replace Restricted Numbers? n
                                           Replace Unavailable Numbers? n
                                    Send Called/Busy/Connected Number: y

             Send UUI IE? y
               Send UCID? n
 Send Codeset 6/7 LAI IE? y                       Ds1 Echo Cancellation? n
                                                    Modify Reroute Number? n
 Path Replacement with Retention? y

                           Network (Japan) Needs Connect Before Disconnect? n
```

Figure 46: Trunk Group, page 2

## 2.7.3 PRI Signaling Group Configuration

1. Enter ***change*** or ***add signaling group <group>*** where ***<group>*** is a chosen free signaling group number.

```
change signaling-group 7
                                SIGNALING GROUP

 Group Number: 7          Group Enter: isdn-pri
                Associated Signaling? y          Max number of NCA TSC: 10
                   Primary D-Channel: 01A0924     Max number of CA TSC: 10
                                                 Trunk Group for NCA TSC: 7
    runk Group for Channel Selection: 7       X-Mobility/Wireless Enter:
NONE
      Supplementary Service Protocol: b          Network Call Transfer? n
```

Figure 47: Signaling-group

- Set the **Maximum Number of NCA TSC** to a value equal to 2 or higher. Non-Call Associated Temporary Signaling Connections are used for message waiting updates to the IP Office Server. Typically this is set to one third of the number of channels provided by the trunk connection.
- Set the **Maximum Number of CA TSC** to the same value.
- Set **Supplementary Service Protocol** to ***b*** for QSIG.
- Set **Trunk Group for NCA TSC** to the trunk group setup in the previous step.

## 2.7.4 Adding the PRI Trunk Group Members

1. Enter ***change trunk group <group>*** again.
2. On **Page 4**, enter each port (channel) on the trunk connected to the IP Office.

```
change trunk-group 7                                          Page  4 of 10
                                  TRUNK GROUP
                                       Administered Members (min/max):   1/23
GROUP MEMBER ASSIGNMENTS                   Total Administered Members:  23

       Port    Code Sfx Name        Night            Sig Grp
  1: 01A0901  TN464  G                                 7
  2: 01A0902  TN464  G                                 7
  3: 01A0903  TN464  G                                 7
  4: 01A0904  TN464  G                                 7
  5: 01A0905  TN464  G                                 7
  6: 01A0906  TN464  G                                 7
  7: 01A0907  TN464  G                                 7
  8: 01A0908  TN464  G                                 7
  9: 01A0909  TN464  G                                 7
 10: 01A0910  TN464  G                                 7
 11: 01A0911  TN464  G                                 7
 12: 01A0912  TN464  G                                 7
 13: 01A0913  TN464  G                                 7
 14: 01A0914  TN464  G                                 7
 15: 01A0915  TN464  G                                 7
```

Figure 48: Trunk Group Members

- For **Sig Grp** enter the signaling group setup in the previous section.
- Ensure that the ports entered match those on the IP Office line form but in reverse order of channel allocation *(see "1.2 IP Office PRI Trunk Configuration" on page 8)*.

3. On **Page 2** set **Non-Call Associated Trunk Member** to any member of this trunk group.

# 2.8 H.323 QSIG Trunk Group

This section describes the configuration steps to establish an H.323 QSIG trunk group to the IP Office.

- **If PRI trunks are to be used, go to "1.2 IP Office PRI Trunk Configuration" on page 8.**

## 2.8.1 H.323 Trunk Group Configuration

1. Enter ***add*** or ***change trunk group <group>*** where ***<group>*** is a chosen trunk group number for the IP Office connection.
2. On **Page 1** set **Supplementary Service Protocol** to ***b*** and leave the **Numbering Format** blank.

```
 change trunk-group 7                                          Page 1 of 22
                                TRUNK GROUP

Group Number: 7                     Group Enter: isdn        CDR Reports: y
  Group Name: H.323 to IP Office          COR: 21      TN: 1       TAC: 107
   Direction: two-way        Outgoing Display? y        Carrier Medium: IP
 Dial Access? y                Busy Threshold: 255      Night Service:
Queue Length: 1
Service Enter: tie                    Auth Code? n           estCall ITC:
rest
                          Far End Test Line No:
TestCall BCC: 4
TRUNK PARAMETERS
         Codeset to Send Display: 6   Codeset to Send National IEs: 6
        Max Message Size to Send: 260 Charge Advice: none
  Supplementary Service Protocol: b   Digit Handling (in/out): enbloc/enbloc

           Trunk Hunt: ascend
                                                  Digital Loss Group: 13
Calling Number - Delete:     Insert:                Numbering Format:
             Bit Rate: 1200         Synchronization: async    Duplex: full
 Disconnect Supervision - In? y  Out? y
 Answer Supervision Timeout: 0
```

Figure 49: Trunk Group, page 1

3. On **Page 2** set the items as shown below. The **NCA-TSC Trunk Member** will be set after adding group members later in this process.

```
change trunk-group 7                                          Page 2 of 22
TRUNK FEATURES
          ACA Assignment? n           Measured: none     Wideband Support? n
                                Internal Alert? n       Maintenance Tests? y
                              Data Restriction? n    NCA-TSC Trunk Member: 1
                                     Send Name: y     Send Calling Number: y
            Used for DCS? n            Hop Dgt? y
   Suppress # Outpulsing? n   Numbering Format: private
 Outgoing Channel ID Encoding: preferred  UUI IE Treatment: service-provider

                                            Replace Restricted Numbers? n
                                           Replace Unavailable Numbers? n
                                                 Send Connected Number: y

             Send UUI IE? y
               Send UCID? n
 Send Codeset 6/7 LAI IE? y

 Path Replacement with Retention? y

                          Network (Japan) Needs Connect Before Disconnect? n
```

Figure 50: Trunk Group, page 2

## 2.8.2 H.323 Signalling Group Creation

1. Enter ***change*** or ***add signaling group <group>*** where ***<group>*** is a chosen free signaling group number.

```
change signaling-group 7                                      Page 1 of  1
                              SIGNALING GROUP

 Group Number: 7              Group Enter: h.323
                            Remote Office? n        Max number of NCA TSC: 10
                                                      Max number of CA TSC: 10
                                                   Trunk Group for NCA TSC: 7
       Trunk Group for Channel Selection: 7
          Supplementary Service Protocol: b


        Near-end Node Name: procr           Far-end Node Name: IPOffice
     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
                                          Bypass If IP Threshold Exceeded? n

                                         Direct IP-IP Audio Connections? n
                                                   IP Audio Hairpinning? n
                                      Interworking Message: PROGress
```

Figure 51: Signaling-group

- Set the **Maximum Number of NCA TSC** to a value equal to 2 or higher. Non-Call Associated Temporary Signaling Connections are used for message waiting updates to the IP Office Server. Typically this is set to one third of the number of channels provided by the trunk connection.
- Set the **Maximum Number of CA TSC** to the same value.
- Set **Supplementary Service Protocol** to ***b*** for QSIG.
- Set **Trunk Group for NCA TSA** to the trunk group setup in the previous step.
- The **Near-end Node Name** and **Far-end Node Name** must match the node-names ip form entries *(see "2.5.2 PBX IP Addresses" on page 23)*.
- For the **Near-end Node Name** enter the C-LAN name.
- For the **Far-end Node Name** enter the name used for the IP Office address.

## 2.8.3 Add the H.323 Trunk Group Members

1. Enter ***change trunk group <group>*** again.
2. On **Page 6**, set each **Port** as ***IP***. After the form is submitted, each IP entry is automatically replaced with a virtual port number as shown. The signaling group for each member should be the group you established in the previous step.

```
change trunk-group 7                                          Page  6 of 22
                                  TRUNK GROUP
                                       Administered Members (min/max):   1/20
GROUP MEMBER ASSIGNMENTS                   Total Administered Members:  20

       Port    Code Sfx Name        Night            Sig Grp
  1: T00001                                           7
  2: T00002                                           7
  3: T00003                                           7
  4: T00004                                           7
  5: T00005                                           7
  6: T00006                                           7
  7: T00007                                           7
  8: T00008                                           7
  9: T00009                                           7
 10: T00010                                           7
 11: T00011                                           7
 12: T00012                                           7
 13: T00013                                           7
 14: T00014                                           7
 15: T00015                                           7
```

Figure 52: Trunk Group Membership

3. Ensure that the number of ports entered matches the number of channels on the IP Office VPN line form *(see "1.3 IP Office H.323 Trunk Configuration" on page 11)*.
4. On **Page 2** set **Non-Call Associated Trunk Member** to any member of the trunk group.

# 2.9 Call Routing

To configure uniform dial plan routing to routing calls over this trunk group though Automatic Alternate Routing (AAR), it is necessary to ensure that the IP Office extension number range (in this case from 7xxxx) are routed through Automated Alternate Routing, with a unique three-digit prefix (in this case 777).

1. Open the Uniform Dialing Plan. In this example configuration the plan for extension numbers begins with 7.
   - **R9.5/R10:** Enter ***change udp 7***.

```
change udp 7                                                    Page 1 of 2
                              UNIFORM DIALING PLAN
                                Ext Codes: 7ddxx



                              Ext Code: 7xxxx Enter: AARCode 777

dd   Enter       dd   Enter       dd   Enter       dd   Enter       dd
Enter

0x:            1x:            2x:            3x:             4x:

00:            10:            20:            30: UDPCode 730 40: UDPCode 740
01:            11:            21:            31: UDPCode 730 41: UDPCode 740
02:            12:            22:            32: UDPCode 730 42: UDPCode 740
03:            13:            23:            33: UDPCode 730 43: UDPCode 740
04:            14:            24:            34: UDPCode 730 44: UDPCode 740
05:            15:            25:            35: UDPCode 735 45: UDPCode 745
06:            16:            26:            36: UDPCode 735 46: UDPCode 745
07:            17:            27:            37: UDPCode 735 47: UDPCode 745
08:            18:            28:            38: UDPCode 735 48: UDPCode 745
09:            19:            29:            39: UDPCode 735 49: UDPCode 745
```

Figure 53: IP600 change udp

   - **MulitiVantage:** Enter ***change uniform-dialplan 7***.

```
 change uniform-dialplan 7                                        Page 1 of 2
                       UNIFORM DIAL PLAN TABLE
                                                          Percent Full: 0

Matching         Insert          Node  Matching        Insert           Node
Pattern  Len Del Digits Net Conv Num   Pattern  Len Del Digits Net Conv Num
7         5   1   777   aar  n                                        n
                             n                                        n
                             n                                        n
                             n                                        n
                             n                                        n
                             n                                        n
                             n                                        n
                             n                                        n
                             n                                        n
                             n                                        n
                             n                                        n
                             n                                        n
                             n                                        n
                             n                                        n
                             n                                        n
                             n                                        n
```

Figure 54: MultiVantage change uniform-dialplan

2. Enter ***change aar analysis 7***, where 7 is the first digit of the 7-digit AAR number to route.

```
change aar analysis 7                                          Page 1 of 2
                          AAR DIGIT ANALYSIS TABLE
                                                        Percent Full:  5

        Dialed           Total     Route    Call   Node  ANI
        String          Min  Max  Pattern   Enter  Num   Reqd
   7                    7    7     254      aar           n
   777                  7    7     7        lev0          n
```

Figure 55: change aar analysis

- In this example all 7 digit AAR calls beginning with **777** to **Route Pattern 7** are being routed, which will be setup in the next step. These 777 numbers are created by the **isdn mwi-prefixes** form *(see "2.5.3 Set the ISDN Message Waiting Prefixes" on page 26)*.
- Ensure that **Call Enter** is set to **lev0**.

3. Enter **change route pattern <*x*>** where **<*x*>** is the **Route Pattern** chosen to send the IP Office calls to the proper trunk group in **change aar analysis form** above.

```
change route-pattern 7
                           Pattern Number: 7

   Grp. FRL NPA Pfx Hop Toll No.  Inserted                          DCS/ IXC
   No.          Mrk Lmt List Del  Digits                          QSIG
                             Dgts                                 Intw
 1: 7    0                    3   7                                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 BAND No. Numbering LAR
    0 1 2 3 4 W     Request                              Dgts Format
                                                      Subaddress
 1: y y y y y n  y as-needed 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
```

Figure 56: change route-pattern

- Set the **Grp No.** to the trunk group number created for the connection to the IP Office *(see "2.7 PRI Trunk &* Trunk Group*" on page 30 or "2.8 H.323 QSIG Trunk Group" on page 33)*.
- The earlier routing has created a 7 digit number from the original 5 digits. To restore the original 5 digit number set **No. Del Dgts** to **3** to delete the first 3 digits and **Inserted Digits** to ***7*** to reinsert the original leading digit.
- Set the **TSC** value to ***y*** on the lower half of the form for the line associated with the routed trunk group. This enables use of this route pattern for the message waiting updates to IP Office.

# 2.10 Resetting the System

The changes made so far should allow calls between extensions on the IP Office and the central PBX. It should also, following INTUITY AUDIX configuration (see "3. INTUITY AUDIX Configuration" on page 39), allow voicemail mailboxes to be accessed and message waiting lamps to be lit.

If these feature are not working, in addition to checking the configuration, we recommend a **reset system 4** is applied.

# 3. INTUITY AUDIX Configuration

## 3.0 Overview

This section provides minimal configuration guidance. Refer to INTUITY AUDIX documentation for general INTUITY AUDIX guidance.

Steps to configure the INTUITY AUDIX include:

- Administer the Switch Interface
  - TCP/IP
  - Voice Ports
- Change the machine specific information
- Add subscribers (mailboxes)

This document assumes the user has the proper login and password. Most steps start at the INTUITY AUDIX Main Menu. The Main Menu for R5.1 is pictured below.

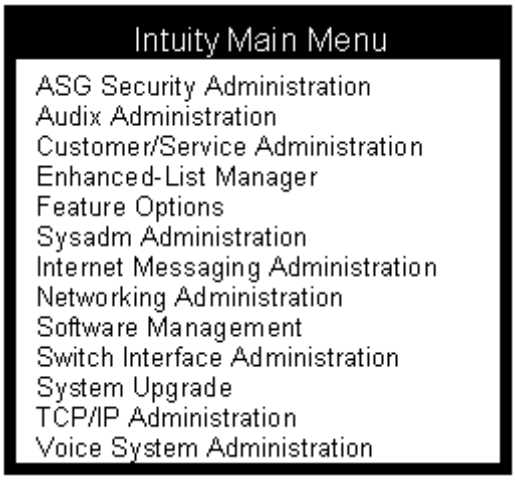



Figure 57: Intuity R5.1 Main Menu

## 3.1 AUDIX IP Address

The IP Address assigned to the INTUITY AUDIX must match the IP Address set on the **change node-names audix** form (see "2.5.1 AUDIX IP Address" on page 23).

1. From the Intuity Main Menu:
   - **R4.4:** Select **Networking Administration** and then **TCP/IP Administration**.
   - **R5.1:** Select **TCP/IP Administration** and then **Network Addressing**.

# 3.2 AUDIX Switch Link Administration

1. From the **Intuity Main Menu** select **Switch Interface Administration.**
2. Select **Call Data Interface Administration | Switch Link Administration**.

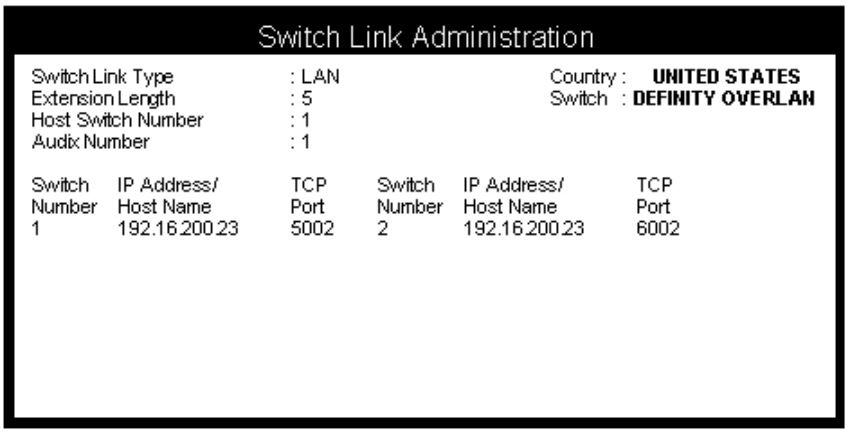



Figure 58: Intuity Switch Link Administration Form

3. Verify that the extension length is consistent with the dialplan set on the central PBX and IP Office.
4. The **Host Switch Number** must match the **Local Node Number** of the central PBX's set in its **change dialplan** form *(see "2.1 Set the Dial Plan and Node Number" on page 18)*.
5. The **AUDIX Number** must match the AUDIX Number used in the central PBX's **change isdn mwi-prefixes** form *(see "2.5.3 Set the ISDN Message Waiting Prefixes" on page 26)*.
6. With this form the client end of two TCP connections to the central PBX are established.
   - The first is for call signaling for calls that come to the INTUITY AUDIX (e.g., coverage calls) and message waiting indication updates for the central PBX.
   - The second is for forwarding Message Waiting Indications through the central PBX to the remote IP Office.
   - In both cases the **IP Address/Host Name** field is the IP Address of the C-LAN *(see "2.5.2 PBX IP Addresses" on page 23)*.
   - The TCP ports selected for each must match those on the central PBX's ***communication-interface processor-channels*** form *(see Step 6 of "2.5.2 PBX IP Addresses" on page 23)*.

# 3.3 Setting the System Time Zone

In order to ensure correct announcement of when messages were left, the INTUITY AUDIX must be aware of the time zone applicable to each switch it is supporting.

1. Check the current settings using the **change switch-time-zone** command.

```
 change switch-time-zone                                          Page 1 of 1
                              SWITCH TIME ZONE

Switch      Time      Daylight          Switch      Time      Daylight
Number      Zone      Savings?          Number      Zone      Savings

 1:          0          n                2:          0          n
 3:          0          n                4:          0          n
 5:          0          n                6:          5          y
 7:          5          y                8:          5          y
 9:          5          y               10:          5          y
11:          5          y               12:          5          y
13:          5          y               14:          5          y
15:          5          y               16:          5          y
17:          5          y               18:          5          y
19:          5          y               20:          5          y

                              Host Switch:   1
```

Figure 59: change switch time zone

2. The **Time Zone** column indicates the number of hours offset from GMT (UTC) to allow for each switch.

# 3.4 Testing the AUDIX/Central PBX Connection

1. From the **Intuity Main Menu**, select **Customer/Services Administration | Diagnostics | Switch Link Diagnostics | Link Diagnostics**.
2. Verify that the window displays the status of both the Link and the Session as “UP”.
3. Otherwise check through the administration procedures so far.
4. Follow the procedures in the Intuity Messaging Solutions documentation and ensure that each port is administered with the extension of the corresponding port that it will be wired to on the central PBX. INTUITY AUDIX requires a voice port administered for each simultaneous call that it will participate in.
5. From the **Intuity Main Menu**, select **AUDIX Administration**.
6. Enter ***change machine*** and the prompt. If necessary update the extension information to reflect the IP Office extensions covered. The extension length must match the dial plan being used on the central PBX and the IP Office.
   - If this form is changed, follow the procedures to stop and restart the INTUITY AUDIX Application to ensure that the changes take effect.
7. If features are not working, in addition to checking the configuration, we recommend you stop and restart the INTUITY AUDIX Application.

# 3.5 Adding Mailboxes for IP Office Users

For each IP Office user for who wants a voicemail mailbox, a mailbox needs to be added manually.

1. From the prompt, enter **add subscriber <*ext*>** where **<*ext*>** is the IP Office user's extension number.

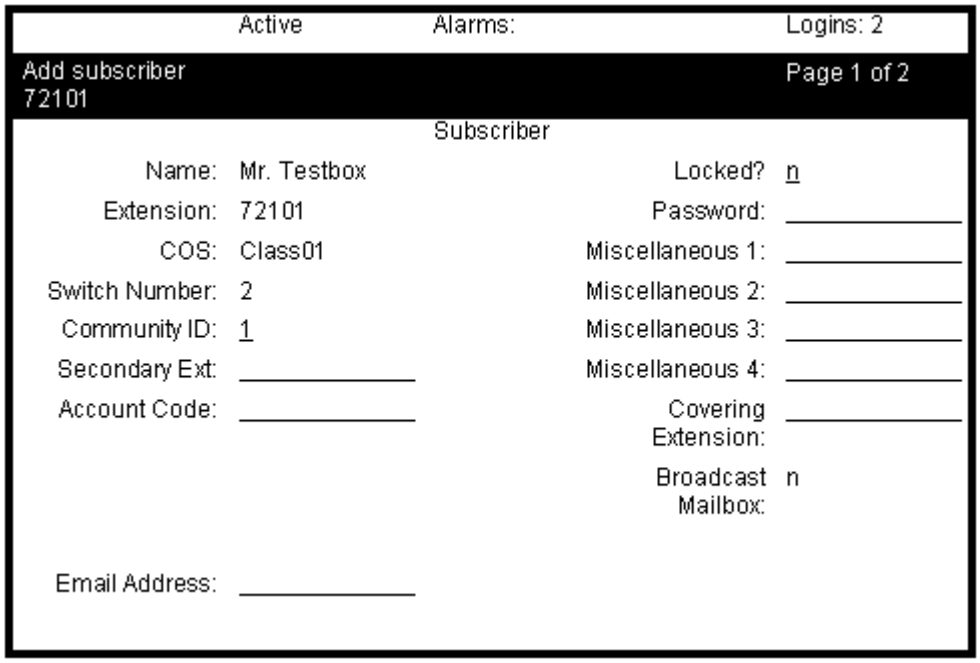



Figure 60: INTUITY AUDIX Add Subscriber Form

2. In the **Add subscriber** form, ensure that the **Switch Number** matches the switch number for the IP Office used on the Intuity AUDIX Switch Link Administration Form *(see "*3.2 AUDIX Switch Link Administration*" on page 40)*.

Avaya
Sterling Court
15 - 21 Mundells
Welwyn Garden City
Hertfordshire
AL7 1LZ
England

Tel: +44 (0) 1707 392200
Fax: +44 (0) 1707 376933

Email: contact@avaya.com
Web: http://www.avaya.com