CISCO SYSTEMS

Cisco 3660 Gateway - PBX Interoperability: Inter-Tel Axxess 256 PBX using T1 NI-2 PRI Interfaces with H.323
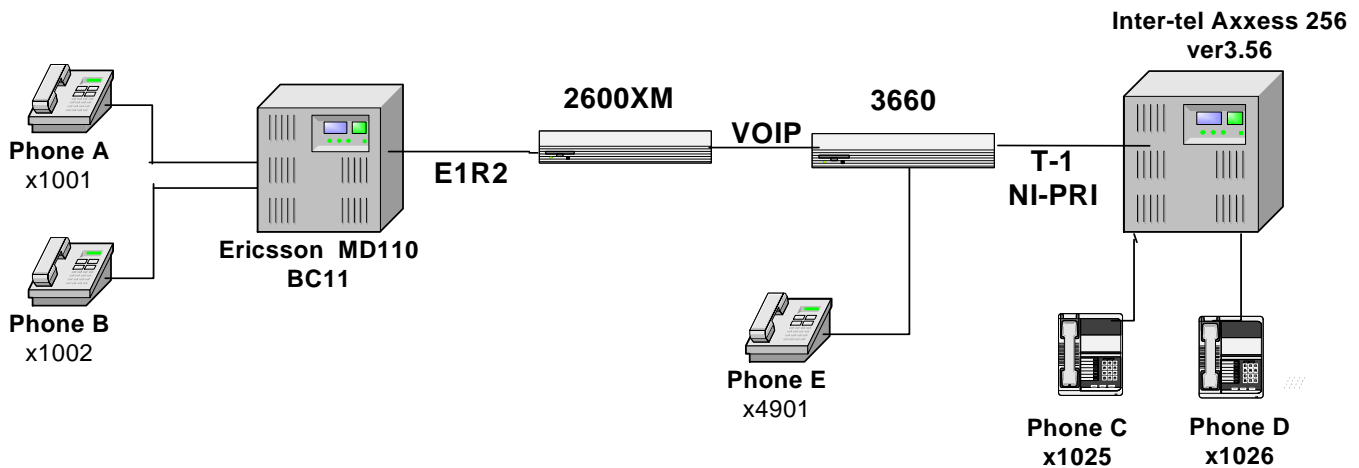
Introduction

This application note describes the interoperability and configuration of the Inter-Tel 256 Axxess PBX and the Cisco 3660 router using T1 Ni-2 interfaces.

The network topology diagram shows the end-to-end interoperability.

Network Topology

Basic Call Setup End-to-End Configuration

Limitations

Calling name is not supported in this configuration.

System Components

Hardware Requirements

Cisco 3660 router with 2MFT-T1 ports

Inter-Tel Axxess 256 v3.56 North American load

Software Requirements

Cisco IOS Software Release 12.2(10b)

Inter-Tel Axxess 256 v3.56 North American load

Features

Features Supported

Calling Number Identification (Ericsson to Inter-tel)

Features Not Supported

Updating Connected Number

Calling/Called Name

Configuration

Configuring the Inter-Tel Axxess PBX

DB Studio - System\Cabinets\01:07 T1 Primary Rate Interface Card

File   Edit   View   Operations   Favorites   Help

- Inter-Tel 5.346
  - System
    - Cabinets
      - Error Thresholds
      - Reference Clock List
      - 01:01 Digital Keyset 16 Card
      - 01:02 Basic Rate Interface - S/T
      - 01:03 Digital Keyset 16 Card
      - 01:04 Uninstalled
      - 01:05 Loop Start Card
      - 01:06 T1 Card
      - 01:07 T1 Primary Rate Interface Card
        - T1 Circuits
        - T1 Diagnostics
        - Timers
        - Call Type
      - 01:08 Central Processor / 256 (PCM)
      - 01:09 Uninstalled
      - 01:10 Uninstalled
      - 01:11 Uninstalled
      - 01:12 Uninstalled
      - 01:13 Uninstalled
      - 01:14 Uninstalled
      - 01:15 Uninstalled
      - 01:16 Not Used
    - Devices and Feature Codes
    - Flags
    - Hunt-Group Related Information
    - Maintenance
    - Numbering Plan
    - Station-Related Information
    - Trunk-Related Information
    - Premium Features
    - Timers and Limits
    - Report Programming
  - Passwords

Name	Value
T1 Circuits	
T1 Diagnostics	
Timers	
Call Type	
Description	
Framing Type	Extended Superframe
Zero Code Suppression	B8ZS
Line Build-Out	0 dB (DSX-1)
Central Office Switch Type	National ISDN 2
CO Provides Progress Tones	No
Connect on Call Proceeding	No
Operator System Access	No

Node 1   Remote AXXESS USA   New Session

File   Edit   View   Operations   Favorites   Help

Extension	Description	Username
9201	Analog lines	ANALOG LIN
9202	T-1 Lines-loop	T-1 LINES
9203	T-1 lines-grd	T-1 LINES
9204	PRI Lines	PRI LINES
9205	E&M Trunks-Imm	E&M
9206	E&M Wink	E&M
9207	E&M delay	E&M
9208	E1-pri	E1
9209	BRI trks	
PP011	Unused CO Trunks	

Tree panel:
- 01:07 T1 Primary Rate Interface Card
  - T1 Circuits
  - T1 Diagnostics
    - Hourly
    - Daily
    - T1 Status
  - Timers
  - Call Type
- 01:08 Central Processor / 256 (PCM)
- 01:09 Uninstalled
- 01:10 Uninstalled
- 01:11 Uninstalled
- 01:12 Uninstalled
- 01:13 Uninstalled
- 01:14 Uninstalled
- 01:15 Uninstalled
- 01:16 Not Used
- Devices and Feature Codes
  - Extension Lists
  - Feature Codes
  - Hunt Groups
  - Page Ports
  - Page Zones
  - Nodes
  - Stations
  - System Serial Ports
  - CO Trunk Groups
  - Node Trunk Groups
  - Trunks
  - Flags
  - Hunt-Group Related Information
  - Maintenance
  - Numbering Plan
  - Station-Related Information
  - Trunk-Related Information
  - Premium Features
  - Timers and Limits
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- Passwords

Node 1   Remote AXXESS USA   New Session

DB Studio - System\Timers and Limits

File   Edit   View   Operations   Favorites   Help

Timers and Limits	Value	Units	Range (Default)
LS/GS IC-CO Disconnect	60	Hundredths	2 - 1000 (60)
LS/GS Inter-ring Silence	60	Tenths	1 - 250 (60)
LS/GS Loop Current Debounce	100	Milliseconds	2 - 500 (100)
LS/GS Outpulse-dial Inter-digit Pause	700	Milliseconds	2 - 1500 (700)
LS/GS Outpulse-dial Inter-pulse Pause	40	Milliseconds	2 - 500 (40)
LS/GS Outpulse-dial Pulse Hold Duration	60	Milliseconds	2 - 500 (60)
LS/GS Ring Frequency - High Boundary	100	Hertz	16 - 1000 (100)
LS/GS Ring Frequency - Low Boundary	15	Hertz	4 - 99 (15)
LS/GS Trunk Ring Detection	5	Tenths	1 - 250 (5)
Message Wait	5	Seconds	1 - 255 (5)
Off-Hook Voice Announce Screening	5	Seconds	1 - 255 (5)
Page	15	Seconds	0 - 255 (15)
Pause Dialing Digit Length	3	Seconds	1 - 15 (3)
Queue Callback	15	Seconds	10 - 255 (15)
Recall	60	Seconds	10 - 255 (60)
Record-A-Call Tone Interval	0	Seconds	0 - 255 (0)
Remote Programming Invalid Extension Failure Limit	3	Failures	0 - 9 (3)
Remote Programming Password Failed Limit	3	Failures	0 - 9 (3)
SL Disconnect Flash Duration	15	Tenths	1 - 250 (15)
SL Hookflash Maximum	12	Tenths	2 - 20 (12)
SL Hookflash Minimum	2	Tenths	1 - 10 (2)
SL Inpulse-dial Inter-digit Pause	300	Milliseconds	2 - 1500 (300)
SL Wait for Disconnect	2	Seconds	1 - 60 (2)
System Forward Advance	15	Seconds	2 - 255 (15)
System Forward Initiate	15	Seconds	2 - 255 (15)
Transfer - Attendant	30	Seconds	10 - 255 (30)
Transfer - Available	20	Seconds	10 - 255 (20)
Transfer - Voice Processor	20	Seconds	10 - 255 (20)
Transfer - Busy	24	Seconds	10 - 255 (24)
Trunk Busy Out	180	Seconds	0 - 65535 (180)
Trunk Key Debounce	3	Seconds	1 - 30 (3)
UCD Station-Monitor Indication Frequency	15	Seconds	1 - 255 (15)
Unsupervised CO	255	Minutes	1 - 255 (5)
Valid Call	15	Seconds	1 - 60 (15)
Voice Mail Dial Delay	5	Tenths	1 - 250 (5)

Tree panel (left):

- PP011
- Node Trunk Groups
- Trunks
- Flags
- Hunt-Group Related Information
- Maintenance
- Numbering Plan
  - Area Flags
  - Classes of Service
  - Device Baseline Extensions
  - Dial Rules
  - Emergency
  - Facility Groups
  - Home Area Codes
  - Route Groups
  - Toll Strings
  - User Groups
- Station-Related Information
- Trunk-Related Information
  - Call Routing Tables
    - 1
    - 2
    - 3
    - 4
    - 5
    - 6
    - 7
    - 8
    - 9
    - 10
    - 11
    - 12
    - 13
    - 14
    - 15
  - Premium Features
  - Timers and Limits
- Report Programming
- Passwords

Node 1   Remote AXXESS USA   New Session

DB Studio - System\Timers and Limits

File   Edit   View   Operations   Favorites   Help

Tree (left panel):
- PP011
- Node Trunk Groups
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  - Dial Rules
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  - Facility Groups
  - Home Area Codes
  - Route Groups
  - Toll Strings
  - User Groups
- Station-Related Information
- Trunk-Related Information
  - Call Routing Tables
    - 1
    - 2
    - 3
    - 4
    - 5
    - 6
    - 7
    - 8
    - 9
    - 10
    - 11
    - 12
    - 13
    - 14
    - 15
  - Premium Features
  - Timers and Limits
  - Report Programming
- Passwords

Timers and Limits	Value	Units	Range (Default)
Abandoned Call	10	Minutes	1 - 255 (10)
Agent Help Tone Interval	0	Seconds	0 - 1000 (0)
Background Keyset Update Date and Time	360	Minutes	60 - 360 (360)
Busyout Switch Timeout	60	Seconds	10 - 10000 (60)
Camp-On	3	Seconds	1 - 255 (3)
Camp-On Tone	15	Seconds	5 - 255 (15)
CO Reseize	3	Seconds	1 - 15 (3)
Dial Initiation	15	Seconds	5 - 30 (15)
DID Disconnect Recognition	150	Milliseconds	2 - 500 (150)
DID Inpulse-dial Inter-digit Pause	240	Milliseconds	2 - 500 (240)
DID Off-hook Debounce	10	Milliseconds	2 - 500 (10)
DID On-hook Debounce	12	Milliseconds	2 - 500 (12)
DID Post-Seize Delay	64	Milliseconds	2 - 500 (64)
DID Post-Signal Delay	30	Milliseconds	2 - 500 (30)
DID Pre-Signal Delay	100	Milliseconds	2 - 500 (100)
DID Ready Timeout	4000	Milliseconds	2 - 65000 (4000)
DID Seizure Recognition	30	Milliseconds	2 - 500 (30)
DID Signal-Hold	200	Milliseconds	2 - 500 (200)
DISA Invalid Extension Failure Limit	3	Failures	0 - 9 (3)
DISA Security Code Failure Limit	3	Failures	0 - 9 (3)
Disconnect Wait After Dialing	20	Seconds	1 - 60 (20)
DKTS Alternate Transient Display Timer	10	Tenths	1 - 255 (10)
DKTS Secondary Extension Key Alerting Tone	6	Seconds	1 - 1000 (6)
DTMF Digit Duration/Pause	60	Milliseconds	30 - 255 (60)
E&M Answer Recognition	4500	Milliseconds	2 - 20000 (4500)
E&M Dial Delay	70	Milliseconds	2 - 500 (70)
E&M Dial Delay Hold	140	Milliseconds	2 - 500 (140)
E&M Dialing Wait After Hookflash	3000	Milliseconds	2 - 20000 (3000)
E&M Disconnect Flash Duration	15000	Milliseconds	2 - 40000 (15000)
E&M Disconnect Recognition	1500	Milliseconds	2 - 10000 (1500)
E&M False Signal Debounce	50	Milliseconds	2 - 500 (50)
E&M Handshake Timeout	5000	Milliseconds	2 - 20000 (5000)
E&M Hookflash Duration	600	Milliseconds	2 - 10000 (600)
E&M Hookflash Recognition	300	Milliseconds	2 - 10000 (300)
E&M Inpulse-dial Inter-digit Pause Recognition	300	Milliseconds	2 - 10000 (300)
E&M Off-hook Debounce	10	Milliseconds	2 - 500 (10)

Node 1   Remote AXXESS USA   New Session

Configuring the Cisco 3660 Router

```
Router# show running-config
Building configuration...

Current configuration : 3942 bytes
!
version 12.2
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname 3660-A
!
boot system tftp c3660-jsx-mz_122-10b.bin 10.1.1.100
!
voice-card 4
!
ip subnet-zero
!
!
no ip domain-lookup
!
isdn switch-type primary-qsig
call rsvp-sync
!
voice service voip
 fax protocol t38 ls-redundancy 0 hs-redundancy 0
!
!
!
!
!
fax interface-type fax-mail
mta receive maximum-recipients 0
!
controller T1 4/0
 framing esf
 clock source internal
 linecode b8zs
 pri-group timeslots 1-24
!
controller T1 4/1
 framing esf
 clock source internal
 linecode b8zs
 pri-group timeslots 1-24
!
translation-rule 10
 Rule 1 4000 1002 ANY unknown
 Rule 2 4001 1001 ANY unknown
!
!
!
interface FastEthernet0/0
 ip address 10.1.1.205 255.255.255.0
 ip accounting output-packets
 duplex auto
 speed auto
!
interface Ethernet1/0
 ip address 10.10.10.200 255.255.255.0
 ip accounting output-packets
```

```
 half-duplex
!
interface Serial1/0
 no ip address
 shutdown
 no fair-queue
!
interface TokenRing1/0
 no ip address
 shutdown
 ring-speed 16
!
interface ATM3/0
 no ip address
 atm vc-per-vp 256
 no atm ilmi-keepalive
 scrambling-payload
 impedance 120-ohm
!
interface ATM3/0.1 point-to-point
 ip address 192.168.50.2 255.255.255.0
 pvc 10/1
  encapsulation aal5snap
 !
!
interface ATM3/1
 no ip address
 shutdown
 atm vc-per-vp 256
 no atm ilmi-keepalive
 scrambling-payload
 impedance 120-ohm
!
interface ATM3/2
 no ip address
 shutdown
 atm vc-per-vp 256
 no atm ilmi-keepalive
 scrambling-payload
 impedance 120-ohm
!
interface ATM3/3
 no ip address
 shutdown
 atm vc-per-vp 256
 no atm ilmi-keepalive
 scrambling-payload
 impedance 120-ohm
!
interface Serial4/0:23
 no ip address
 no logging event link-status
 isdn switch-type primary-ni
 isdn protocol-emulate network
 isdn incoming-voice voice
 no cdp enable
!
interface Serial4/1:23
 no ip address
 no logging event link-status
 isdn switch-type primary-ni
 isdn protocol-emulate network
 isdn incoming-voice voice
 no cdp enable
```

```
!
interface BRI5/0
 no ip address
 isdn switch-type basic-ni
 isdn incoming-voice voice
!
interface BRI5/1
 no ip address
 isdn switch-type basic-5ess
 isdn layer1-emulate network
 isdn spid1 4085273334
 isdn incoming-voice voice
 isdn skipsend-idverify
!
interface Group-Async1
 physical-layer async
 ip address negotiated
 encapsulation ppp
 dialer in-band
 dialer string 2000X123456789012345678901234567
 dialer-group 5
!
router eigrp 1
 network 10.0.0.0
 no auto-summary
 no eigrp log-neighbor-changes
!
ip classless
no ip http server
ip pim bidir-enable
!
dialer-list 5 protocol ip permit
!
snmp-server manager
!
voice-port 2/0/0
!
voice-port 2/0/1
!
voice-port 2/1/0
!
voice-port 2/1/1
!
voice-port 4/0:23
!
voice-port 4/1:23
!
voice-port 5/0/0
!
voice-port 5/0/1
!
dial-peer cor custom
!
!
!
dial-peer voice 7 voip
 destination-pattern 3900
 session target ipv4:10.1.1.204
!
dial-peer voice 4900 pots
 destination-pattern 4900
 port 2/0/0
 forward-digits all
!
```

```
dial-peer voice 4901 pots
 destination-pattern 4901
 no digit-strip
 port 2/0/1
 forward-digits all
!
dial-peer voice 212 voip
 destination-pattern 60.
 session target ipv4:10.1.1.199
 codec g711alaw
!
dial-peer voice 205 pots
 destination-pattern 500.
 direct-inward-dial
 forward-digits all
!
dial-peer voice 305 voip
 destination-pattern 500.
 session target ipv4:10.1.1.227
!
dial-peer voice 110 voip
 destination-pattern 4000
 translate-outgoing called 10
 session target ipv4:10.1.1.227
!
dial-peer voice 1002 pots
 destination-pattern 1025
 direct-inward-dial
 port 4/1:23
 forward-digits all
!
dial-peer voice 111 voip
 destination-pattern 4001
 translate-outgoing called 10
 session target ipv4:10.1.1.227
!
dial-peer voice 1001 pots
 destination-pattern 1026
 direct-inward-dial
 port 4/1:23
 forward-digits all
!
!
gatekeeper
 shutdown
!
!
line con 0
 exec-timeout 0 0
line aux 0
line vty 0 4
 exec-timeout 0 0
 password cisco
 login
```

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