CISCO SYSTEMS

Cisco Unified CallManager Release 5.0 - PBX Interoperability: Avaya Definity G3r PBX to a Cisco 3825 Using FXO with MGCP

Initial Release July 27, 2006

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Introduction

This is an application note for interoperability connectivity between an Avaya Definity G3r PBX and Cisco Unified CallManager 5.0 using a Cisco 3825 with an FXO interface and MGCP call control. A NM-HD-2V and VIC2-2FXO were used for the FXO interface, and the Cisco 3825 was connected to the Cisco Unified CallManager via MGCP.

The network topology diagram (figure 1) shows the test setup. Basic calls were made, and voice path and (loop break) disconnect supervision were checked.

Call preservation was tested by interrupting the IP connection between Cisco Unified CallManager and the Cisco IOS voice gateway (3825) during a call in progress. The call was preserved and disconnect supervision still worked, as evidenced by the FXO going on-hook when the PBX phone hung up. However, the IP phone had to be hung up independently.

Network Topology

Figure 1. Network Topology
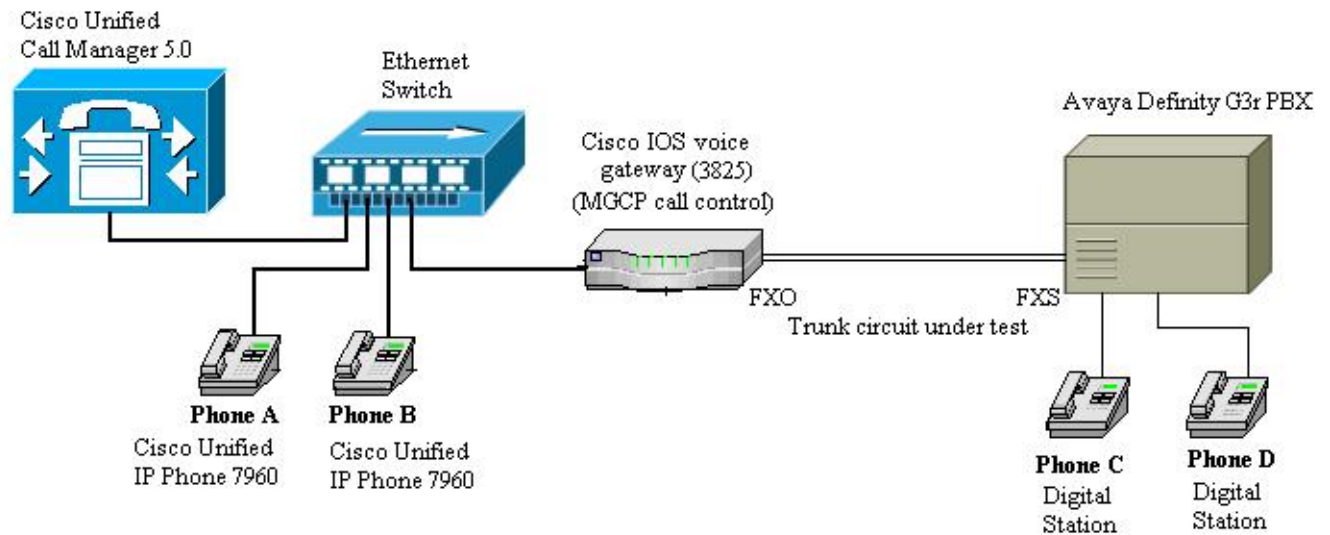
Limitations

For Call Preservation, when the CCM connection is temporarily disabled during a call in progress, the call survives, and disconnect supervision still worked, as evidenced by the FXO going on-hook when the PBX phone hangs up.   However, the IP phone still had to be hung up independently.

System Components

Hardware Requirements

(1) Cisco 3825

(1) Cisco NM-HD-2V

(1) Cisco VIC2-2FXO

(1) Cisco Unified CallManager 5.0

(1) Cisco IP Phone 7960

(1) Avaya Definity G3r, V6

(1) AT&T 8403 digital handset

Software Requirements

Cisco Unified CallManager Release 5.0

Avaya Definitiy Software Release G3V6i.01.0.018.2

Cisco IOS Release 12.4(7.24)T

Cisco IP phone 7960 version 8.0(1.0)

Cisco IP phone 7960 app load P00308000100

Cisco IP phone 7960 boot load PC03M030

Features

Basic Call

Loop Break Disconnect Supervision

Call Preservation

Configuration

Configuring Cisco Unified CallManager 5.0

Figure 2. Version

Figure 3. MGCP gateway

Figure 4. MGCP gateway config - #1 of 2

Gateway Configuration - Microsoft Internet Explorer provided by Cisco Systems, Inc.

File Edit View Favorites Tools Help

Back Search Favorites

Address https://172.25.67.178/ccmadmin/gatewayEdit.do?key=09047643-6623-e4ce-e18c-cde361515e57 Go Links

Google Search 125 blocked Check AutoLink AutoFill Options

Module in Slot 0 NM-4VWIC-MBRD

Subunit 0 < None >
Subunit 1 < None >
Subunit 2 VWIC-2MFT-E1   0/2/ 0 E1PRI   0/2/ 1
Subunit 3 < None >

Module in Slot 1 NM-HD-2V
Subunit 0 VIC2-2BRI   1/0/ 0   1/0/ 1
Subunit 1 VIC2-2FXO   1/1/ 0 LS   1/1/ 1 LS

Module in Slot 2 NM-HDV2-2PORT-T1
Subunit 0 VIC2-2FXS   Begin Port 0   2/0/ 0 POTS   2/0/ 1 POTS
Subunit 1 < None >   Begin Port 0

Product Specific Configuration

Global ISDN Switch Type   4ESS
Switchback Timing *   Graceful
Switchback uptime-delay (min)   10
Switchback schedule (hh:mm)   12:00
Type Of DTMF Relay *   Current GW Config

[Save] [Delete] [Reset]   [Add New]

*- indicates required item.

Internet

start   Yah...   2 I...   2 M...   reg...   Micr...   T1-...   unti...   100%   1:42 PM

Figure 5.   MGCP gateway config - #2 of 2

Figure 6. FXO Port Setup - #1 of 2

Figure 7. FXO Port Setup - #2 of 2

Figure 8. Route Patterns

Figure 9. 4008 Route Pattern - #1 of 2

Figure 10. 4008 Route Pattern - #2 of 2

Figure 11. IP Phones

Figure 12. IP phone config – 1 of 5.

Figure 13. IP phone config – 2 of 5.

Figure 14. IP phone config – 3 of 5.

Figure 15. IP phone config – 4 of 5.

Figure 16. IP phone config – 5 of 5.

Configuring the Cisco IOS Voice Gateway (Cisco 3825)

mgcp-3825#

mgcp-3825# **show version**

Cisco IOS Software, 3800 Software (C3825-ENTSERVICES-M), Version 12.4(7.24)T, IE

Technical Support: http://www.cisco.com/techsupport

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Compiled Fri 21-Apr-06 05:02 by prod_rel_team

ROM: System Bootstrap, Version 12.3(11r)T2, RELEASE SOFTWARE (fc1)

mgcp-3825 uptime is 4 hours, 20 minutes

System returned to ROM by power-on

System image file is "flash:c3825-entservices-mz.124-7.24.T"

Cisco 3825 (revision 1.0) with 222208K/39936K bytes of memory.

Processor board ID FTX0925A0ST

2 Gigabit Ethernet interfaces

55 Serial interfaces

1 Serial(sync/async) interface

2 ISDN Basic Rate interfaces

2 Channelized E1/PRI ports

2 Channelized T1/PRI ports

2 Voice FXO interfaces

2 Voice FXS interfaces

DRAM configuration is 64 bits wide with parity enabled.

479K bytes of NVRAM.

125184K bytes of ATA System CompactFlash (Read/Write)

Configuration register is 0x2102

mgcp-3825#**wr t**

Building configuration...

Current configuration : 4483 bytes

!

version 12.4

service timestamps debug datetime msec

service timestamps log datetime msec

no service password-encryption

!

hostname mgcp-3825

!

boot-start-marker

boot system flash:c3825-entservices-mz.124-7.24.T

boot-end-marker

!

card type t1 2 1

logging buffered 100000000 debugging

!

no aaa new-model

!

resource policy

!

no network-clock-participate slot 1

network-clock-participate slot 2

network-clock-participate wic 2

ip cef

!

```
!

!

!

no ip domain lookup

ip domain name yourdomain.com

ip host CM-JUPITER 172.20.33.254

isdn switch-type primary-4ess

voice-card 0

 no dspfarm

!

voice-card 1

 no dspfarm

!

voice-card 2

 dspfarm

!

!

!

!

voice service voip

!

!

!

!

!

!

!

!

!
```

```
!
username cisco privilege 15 secret 5 $1$TLlZ$gLqyL2/PWfRM4KakB2WTb0
!
!
controller E1 0/2/0
 pri-group timeslots 1-31 service mgcp
!
controller E1 0/2/1
!
controller T1 2/0
 framing esf
 linecode b8zs
 ds0-group 9 timeslots 1-24 type e&m-fgd
!
controller T1 2/1
 shutdown
 framing esf
 linecode b8zs
 pri-group timeslots 1-24
!
!
!
!
interface GigabitEthernet0/0
 description $ETH-LAN$$ETH-SW-LAUNCH$$INTF-INFO-GE 0/0$
 ip address 172.20.15.199 255.255.255.0
 duplex auto
 speed auto
 media-type rj45
```

```
!
interface GigabitEthernet0/1
 no ip address
 shutdown
 duplex auto
 speed auto
 media-type rj45
!
interface Serial0/0/0
 no ip address
 shutdown
 clock rate 2000000
!
interface Serial0/2/0:15
 no ip address
 encapsulation hdlc
 isdn switch-type primary-net5
 isdn incoming-voice voice
 isdn bind-l3 ccm-manager
 no cdp enable
!
interface BRI1/0/0
 no ip address
 no ip mroute-cache
 isdn switch-type basic-qsig
 isdn protocol-emulate network
 isdn point-to-point-setup
 isdn layer1-emulate network
 isdn incoming-voice voice
```

```
 isdn T310 120000

 isdn skipsend-idverify

!

interface BRI1/0/1

 no ip address

 isdn switch-type basic-qsig

 isdn point-to-point-setup

!

interface Serial2/1:23

 no ip address

 encapsulation hdlc

 isdn switch-type primary-qsig

 isdn overlap-receiving

 isdn protocol-emulate network

 isdn incoming-voice voice

 isdn T310 120000

 no cdp enable

!

ip route 0.0.0.0 0.0.0.0 GigabitEthernet0/0

!

!

ip http server

ip http authentication local

ip http timeout-policy idle 600 life 86400 requests 10000

ip rtcp report interval 60000

!

!

!

!
```

```
control-plane

!

!

!

voice-port 0/2/0:15

!

voice-port 1/0/0

!

voice-port 1/0/1

!

voice-port 1/1/0

!

voice-port 1/1/1

 dial-type mf

 timing hookflash-out 500

 description CAMA

!

voice-port 2/0/0

!

voice-port 2/0/1

!

voice-port 2/0:9

 timing dialout-delay 300

!

voice-port 2/1:23

!

ccm-manager mgcp

ccm-manager music-on-hold

ccm-manager config server CM-JUPITER
```

ccm-manager config

!

mgcp

mgcp call-agent CM-JUPITER 2427 service-type mgcp version 0.1

mgcp dtmf-relay voip codec all mode out-of-band

mgcp rtp unreachable timeout 1000 action notify

mgcp modem passthrough voip mode nse

mgcp package-capability rtp-package

no mgcp package-capability res-package

mgcp package-capability sst-package

no mgcp package-capability fxr-package

mgcp package-capability pre-package

no mgcp timer receive-rtcp

mgcp sdp simple

mgcp fax t38 inhibit

mgcp rtp payload-type g726r16 static

!

mgcp profile default

!

!

!

dial-peer voice 1 pots

 service mgcpapp

 port 0/2/0:15

!

dial-peer voice 3 pots

 service mgcpapp

 port 2/0/0

!

dial-peer voice 4 pots

 service mgcpapp

 port 2/0/1

!

dial-peer voice 2 pots

 service mgcpapp

 port 1/1/0

!

dial-peer voice 999200 pots

 service mgcpapp

 port 2/0/0

!

dial-peer voice 999201 pots

 service mgcpapp

 port 2/0/1

!

gateway

 timer receive-rtcp 5

 timer receive-rtp 1200

!

sip-ua

!

banner login ^C

Cisco Router and Security Device Manager (SDM) is installed on this device.

This feature requires the one-time use of the username "cisco"

with the password "cisco".

Please change these publicly known initial credentials using SDM or the IOS CLI

Here are the Cisco IOS commands.

username <myuser> privilege 15 secret 0 <mypassword>

no username cisco

Replace <myuser> and <mypassword> with the username and password you want to us

For more information about SDM please follow the instructions in the QUICK STAR

GUIDE for your router or go to http://www.cisco.com/go/sdm

----

^C

!

line con 0

 login local

 stopbits 1

line aux 0

 stopbits 1

line vty 0 4

 privilege level 15

 login local

line vty 5 15

 privilege level 15

 login local

!

scheduler allocate 20000 1000
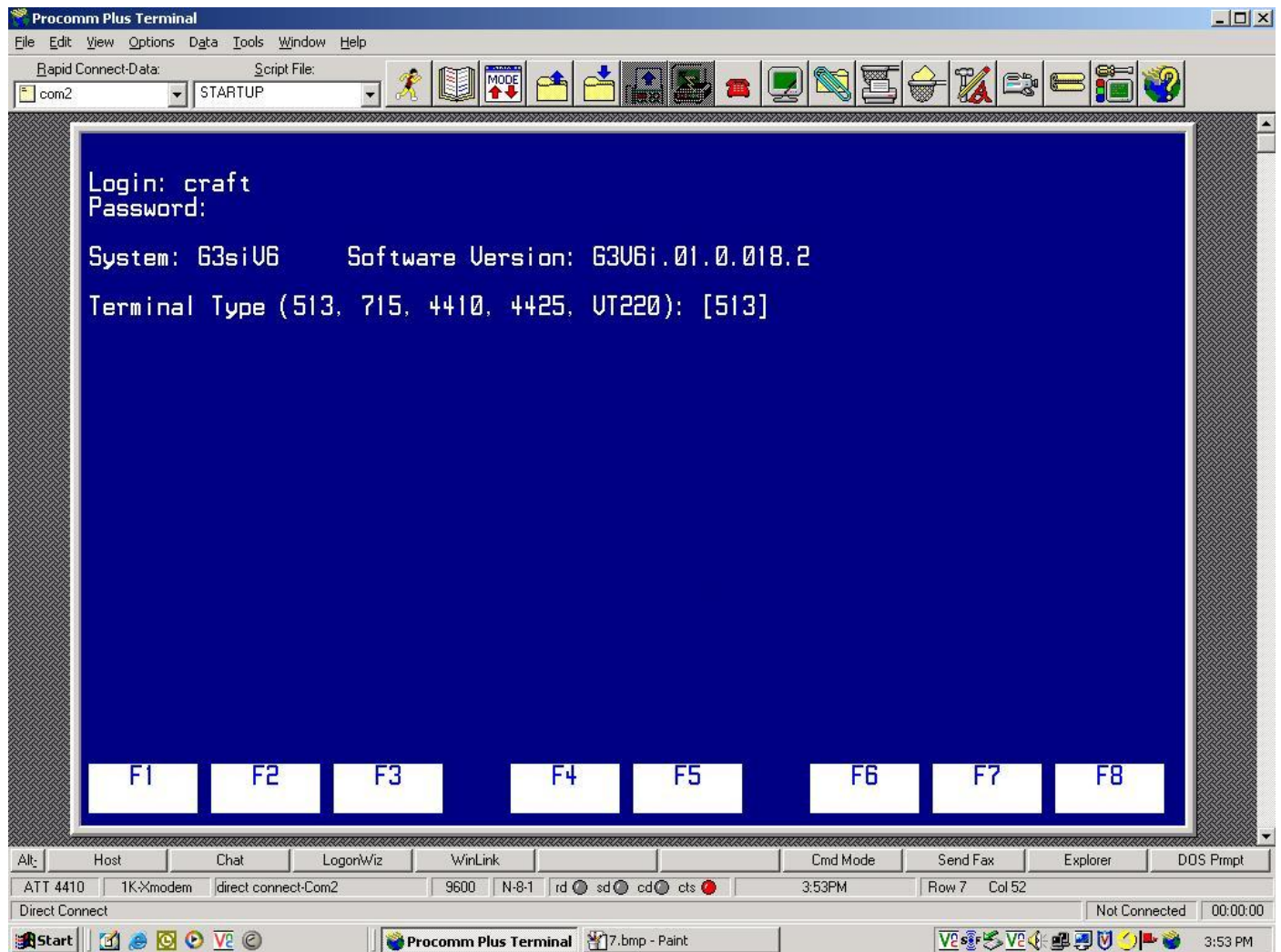
!

end

mgcp-3825#

Configuring the PBX (Avaya G3r)
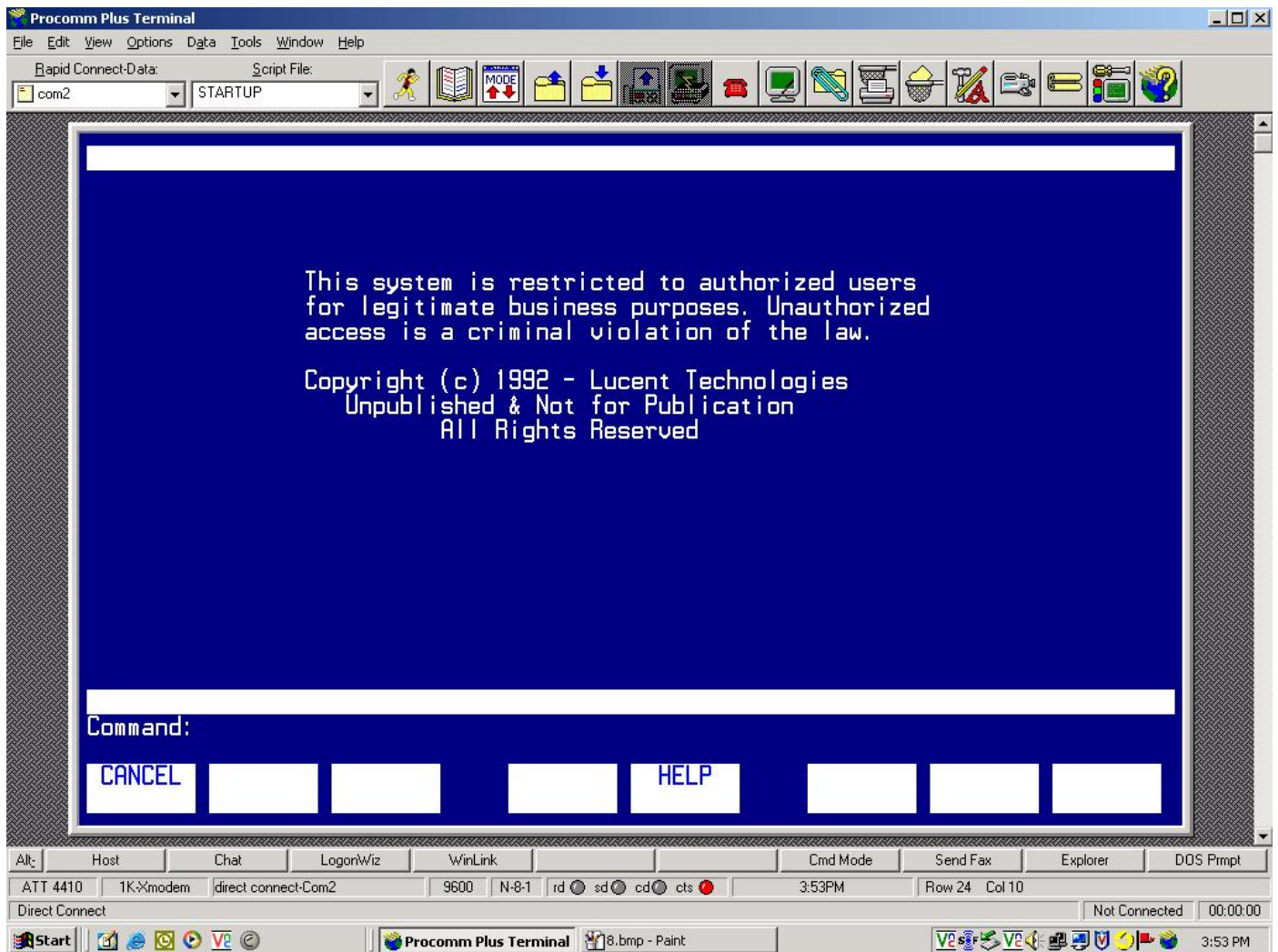

Figure 17.　　Main login screen – 1 of 2

Figure 18. Main login screen – 2 of 2

Figure 19. Digital Station 4008 – 1 of 4
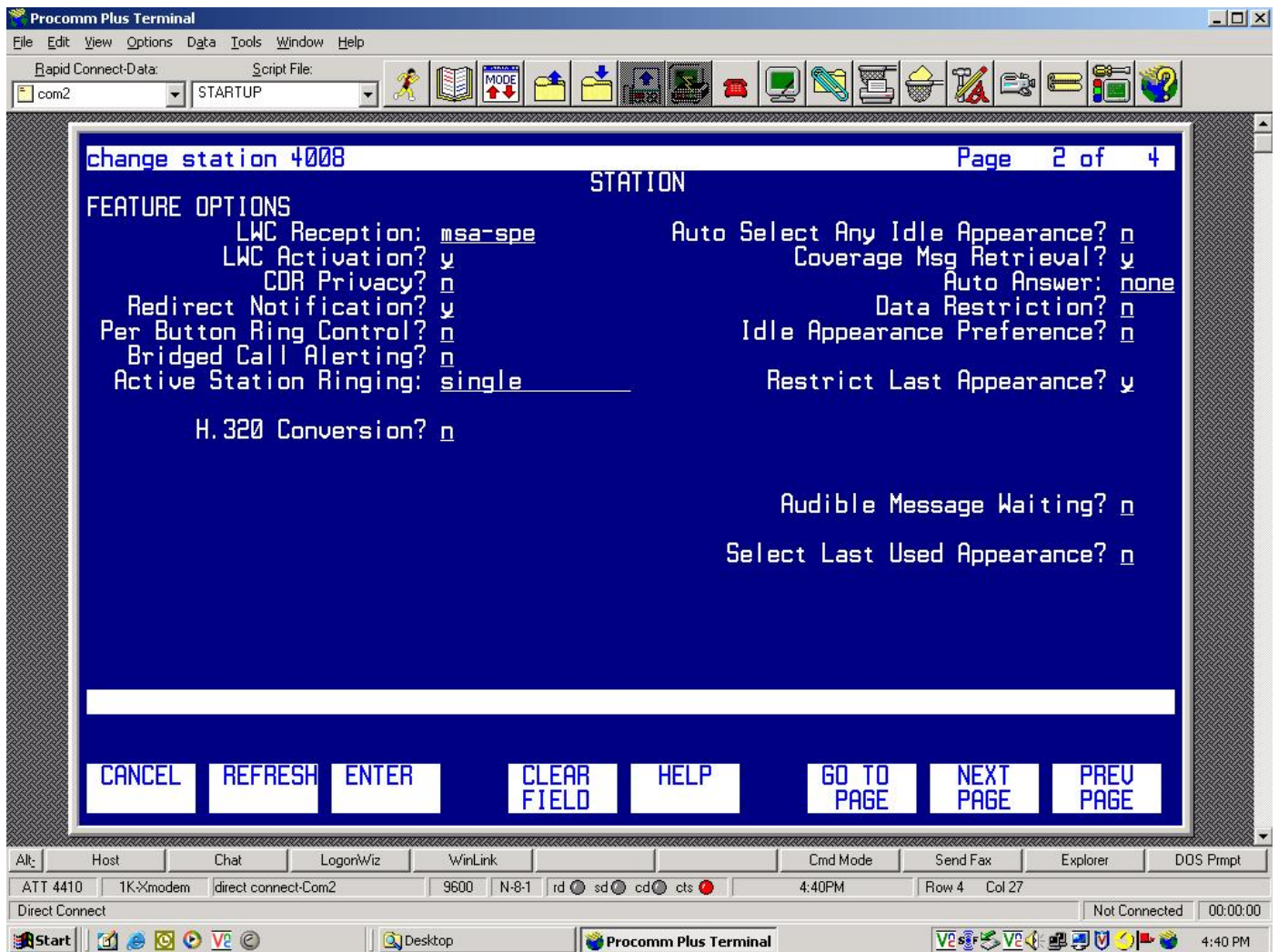
Figure 20. Digital Station 4008 – 2 of 4

Procomm Plus Terminal

File Edit View Options Data Tools Window Help

Rapid Connect-Data: com2   Script File: STARTUP

```
change station 4008                                          Page   3 of   4
                                    STATION
  SITE DATA
          Room: _____                      Headset? n
          Jack: _____                           Speaker? n
         Cable: _____                          Mounting: d
         Floor: _____                   Cord Length: 0
      Building: _____                     Set Color: _____




  ABBREVIATED DIALING
       List1: _____        List2: _____        List3: _____

  BUTTON ASSIGNMENTS
    1: call-appr
    2: call-appr
    3: call-appr




  CANCEL   REFRESH  ENTER           CLEAR    HELP        GO TO    NEXT     PREV
                                    FIELD               PAGE     PAGE     PAGE
```

Alt: Host   Chat   LogonWiz   WinLink   Cmd Mode   Send Fax   Explorer   DOS Prmpt

ATT 4410   1K-Xmodem   direct connect-Com2   9600   N-8-1   rd ○ sd ○ cd ○ cts ●   4:28PM   Row 4   Col 14

Direct Connect   Not Connected   00:00:00

Start Procomm Plus Terminal   4008b.bmp - Paint   4:28 PM

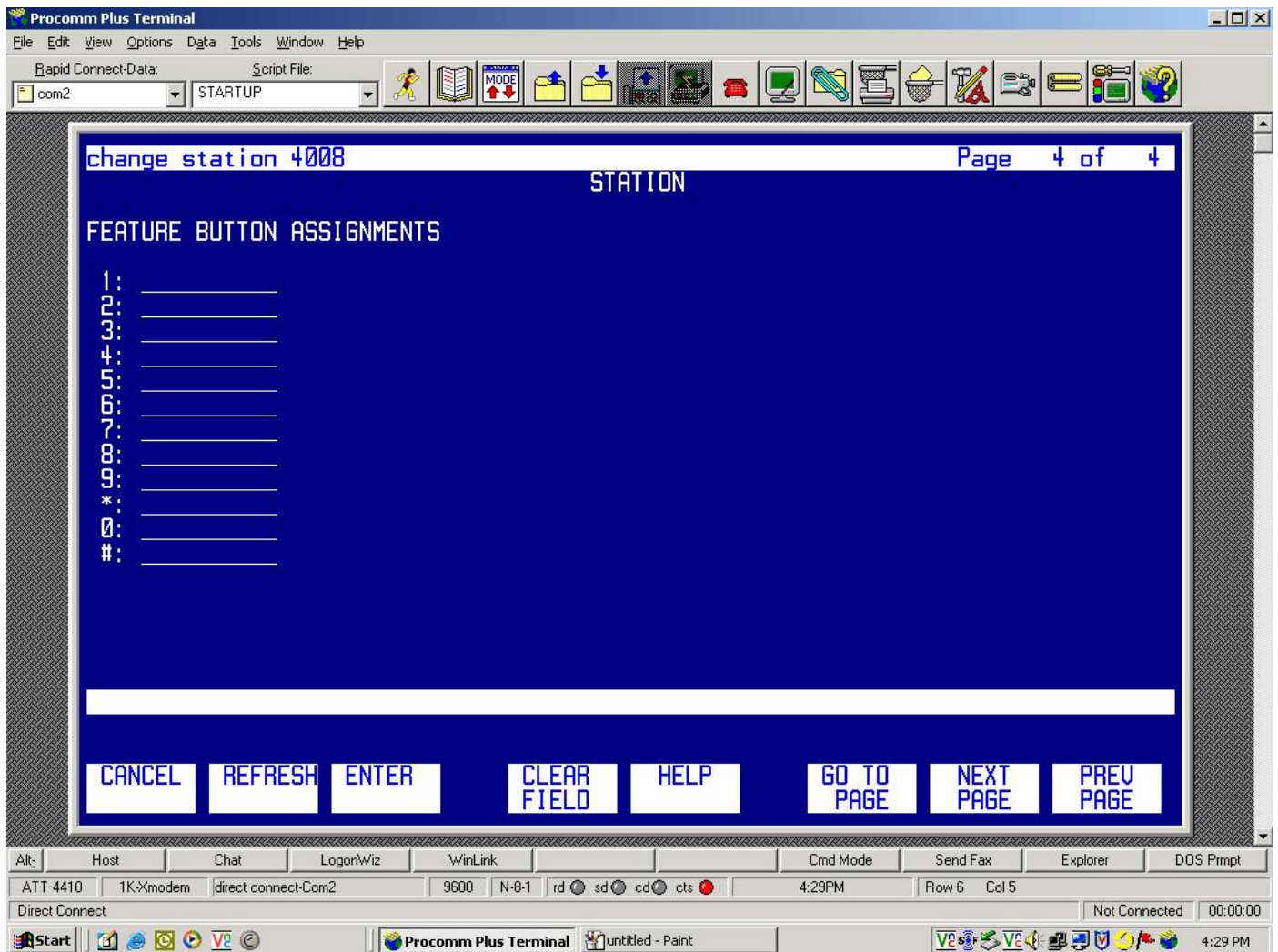**Figure 21.**   Digital Station 4008 – 3 of 4

Figure 22. Digital Station 4008 – 4 of 4

Figure 23. Analog Station 4009 – 1 of 3
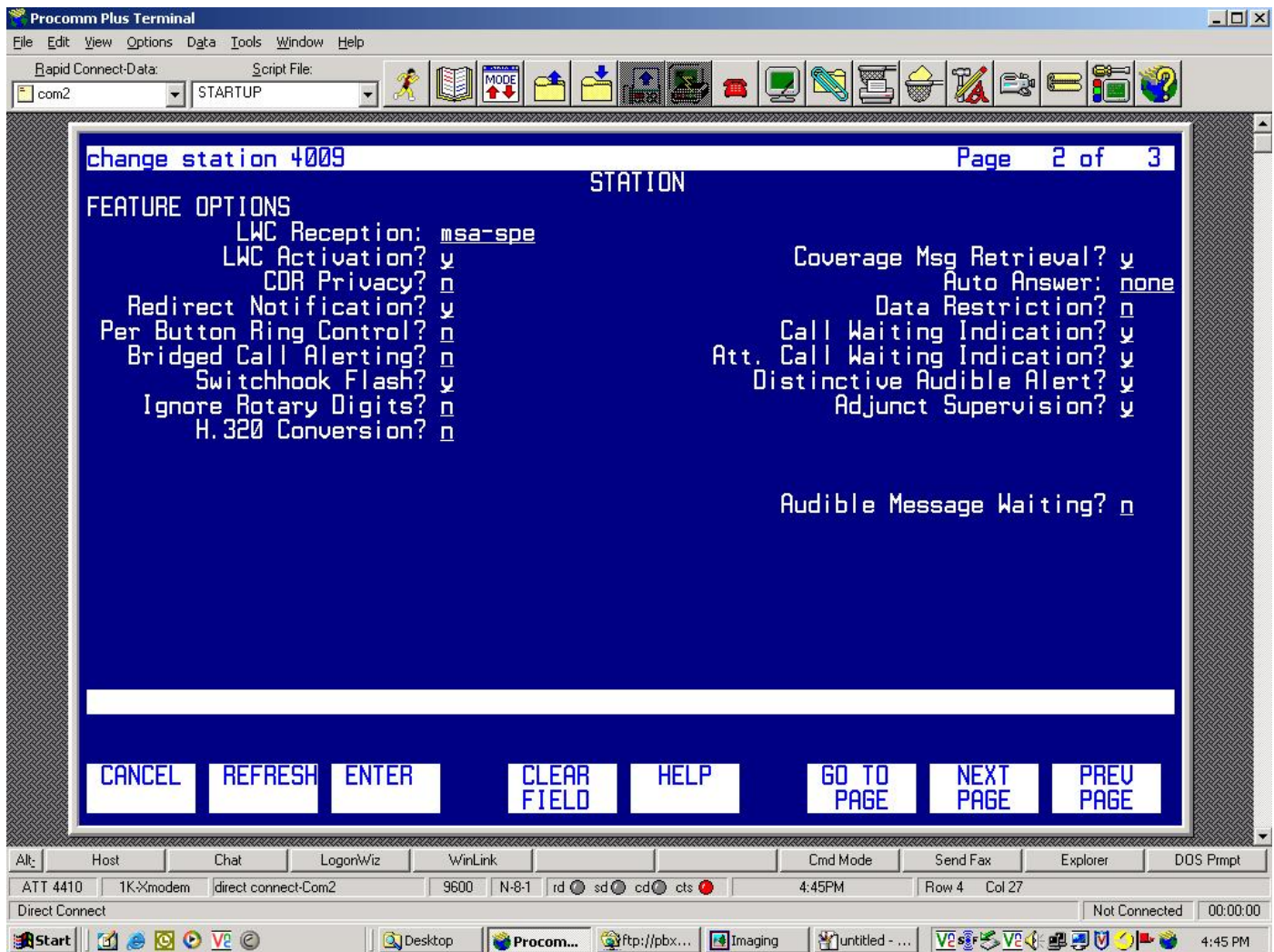
Figure 24. Analog Station 4009 – 2 of 3

Figure 25. Analog Station 4009 – 3 of 3

Acronyms

Acronym	Definitions
BRI	Basic Rate ISDN
CAMA	Centralized Automatic Message Accounting
CAS	Channel Associated Signaling
CO	Central Office
FGD	Feature Group "D"
FXO	Foreign Exchange – Office
FXS	Foreign Exchange – Station
IOS	Internetworking Operating System
MCID	Malicious Caller ID
MGCP	Media Gateway Control Protocol
MoH	Music on Hold
MWI	Message Waiting Indication
PBX	Private Branch Exchange
PRI	Primary Rate ISDN
PSAP	Public Service Access Point
SIP	Session Initiation Protocol
ToH	Tone on Hold

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