

# Fujitsu F9600ES V11 PBX with CallManager using 2621-T1 PRI DMS-100 Gateway

This application note illustrates connectivity for Fujitsu F9600ES V11 PBX with CallManager using 2621-T1 PRI DMS-100 Gateway.

## Integration Description

Connectivity is achieved by using the Fujitsu DMS-100 PRI protocol. The Fujitsu F9600ES can be configured as either NETWORK or USER side.

The network topology diagram presented in [Figure 1](#) illustrates the test set-up.

## System Components

Cisco Systems equipment:

- Hardware (Cisco 2621 Gateway):  
2MFT T1 Port
- Software: CallManager Release 3.1

PBX hardware and software requirements:

- Hardware:
  - BDTKAA (T-1 Carrier Interface Trunk card A)
  - B2DK2C (T-1 Line Trunk Adapter Card)
- Software: Version E12V11L22

## Feature

Key features supported:

- Calling/Called Number

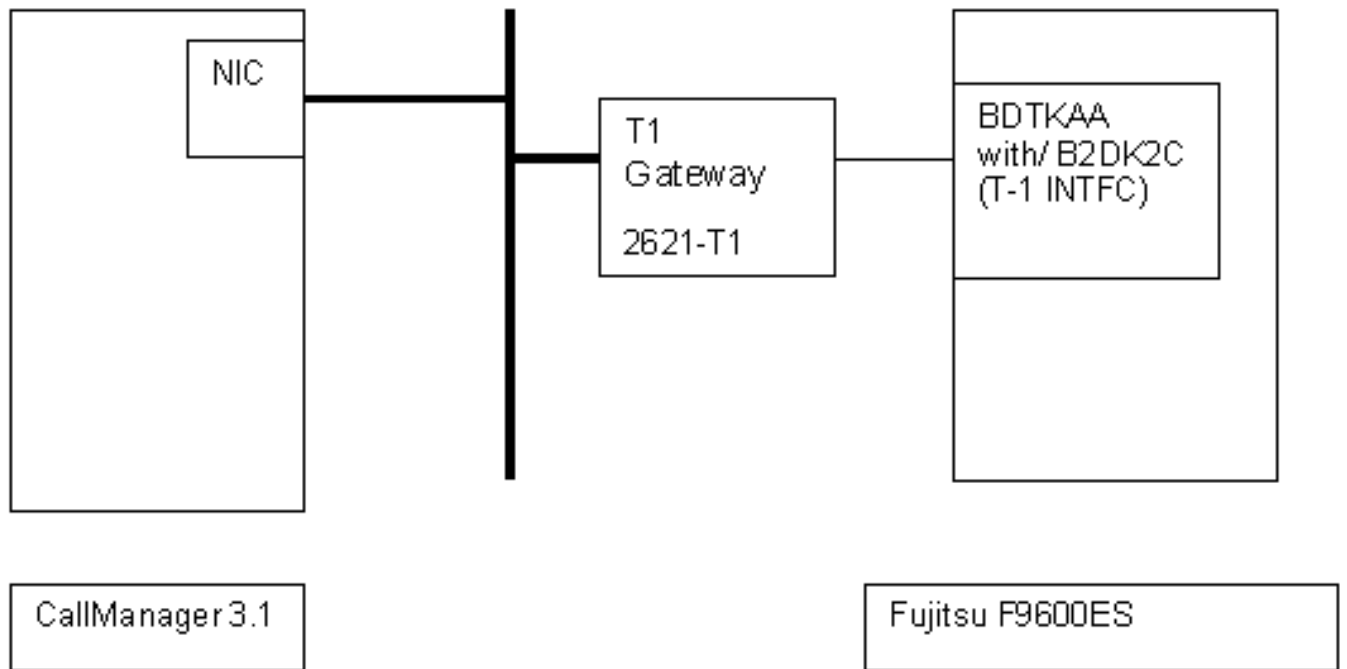
Key features not supported:

- Calling Name
- Connected Name
- Connected Number



## Network Diagram

Figure 1  
Network Test Topology



### Configuring the Fujitsu F9600ES PBX

Configure in the following sequence:

1. ["Configure ISDN Trunk" on page 3](#)
2. ["Class of Service" on page 5](#)
3. ["Trunk Group" on page 5](#)
4. ["Numbering Plan" on page 6](#)
5. ["Change Service Parameters" on page 8](#)
6. ["ARS Code, ARS Routes, ARS Dial Plan" on page 9](#)
7. ["ARS Digit Manipulation" on page 10](#)



### Configure ISDN Trunk

# ISDN TRUNK ASSIGNMENT LIST #

01-12-18 TUE 11:31 PAGE-001

TNN	TGN	EN	MS	PRCL	QDID	FNA	SUBDID	DID	UNA	RSS	RSASG
					USPID		TID				
0	170	00002000	1	6							
0	171	00002002			-	-	ALL	ALL	-	-	-
0	171	00002003			-	-	ALL	ALL	-	-	-
0	171	00002004			-	-	ALL	ALL	-	-	-
0	171	00002005			-	-	ALL	ALL	-	-	-
0	171	00002006			-	-	ALL	ALL	-	-	-
0	171	00002007			-	-	ALL	ALL	-	-	-
0	171	00002008			-	-	ALL	ALL	-	-	-
0	171	00002009			-	-	ALL	ALL	-	-	-
0	171	00002010			-	-	ALL	ALL	-	-	-
0	171	00002011			-	-	ALL	ALL	-	-	-
0	171	00002012			-	-	ALL	ALL	-	-	-
0	171	00002013			-	-	ALL	ALL	-	-	-
0	171	00002014			-	-	ALL	ALL	-	-	-
0	171	00002015			-	-	ALL	ALL	-	-	-
0	171	00002016			-	-	ALL	ALL	-	-	-
0	171	00002017			-	-	ALL	ALL	-	-	-
0	171	00002018			-	-	ALL	ALL	-	-	-
0	171	00002019			-	-	ALL	ALL	-	-	-
0	171	00002020			-	-	ALL	ALL	-	-	-
0	171	00002021			-	-	ALL	ALL	-	-	-
0	171	00002022			-	-	ALL	ALL	-	-	-
0	171	00002023			-	-	ALL	ALL	-	-	-
0	171	00002024			-	-	ALL	ALL	-	-	-

END 01-12-18 TUE 11:32 (CISCO LAB ES R13)



DIS ISINF,170,171(To Display Trunk Group Information)

# ISDN TRUNK INFORMATION LIST # 01-12-18 TUE 11:32 PAGE-001

# ONE-INTERFACE #

< D-CHANNEL >

TNN	TGN	EN	MS	PRTCL
0	170	00002000	1	DMS100

< B-CHANNEL >

TNN	TGN	EN	QDID	FNA	SUBDID	DID	UNA	RSS	RSASG	TYP	NSF
0	171	00002002	-	-	ALL	ALL	-	-	-	MUL	0
0	171	00002003	-	-	ALL	ALL	-	-	-	MUL	0
0	171	00002004	-	-	ALL	ALL	-	-	-	MUL	0
0	171	00002005	-	-	ALL	ALL	-	-	-	MUL	0
0	171	00002006	-	-	ALL	ALL	-	-	-	MUL	0
0	171	00002007	-	-	ALL	ALL	-	-	-	MUL	0
0	171	00002008	-	-	ALL	ALL	-	-	-	MUL	0
0	171	00002009	-	-	ALL	ALL	-	-	-	MUL	0
0	171	00002010	-	-	ALL	ALL	-	-	-	MUL	0
0	171	00002011	-	-	ALL	ALL	-	-	-	MUL	0
0	171	00002012	-	-	ALL	ALL	-	-	-	MUL	0
0	171	00002013	-	-	ALL	ALL	-	-	-	MUL	0
0	171	00002014	-	-	ALL	ALL	-	-	-	MUL	0
0	171	00002015	-	-	ALL	ALL	-	-	-	MUL	0
0	171	00002016	-	-	ALL	ALL	-	-	-	MUL	0
0	171	00002017	-	-	ALL	ALL	-	-	-	MUL	0
0	171	00002018	-	-	ALL	ALL	-	-	-	MUL	0
0	171	00002019	-	-	ALL	ALL	-	-	-	MUL	0
0	171	00002020	-	-	ALL	ALL	-	-	-	MUL	0
0	171	00002021	-	-	ALL	ALL	-	-	-	MUL	0
0	171	00002022	-	-	ALL	ALL	-	-	-	MUL	0
0	171	00002023	-	-	ALL	ALL	-	-	-	MUL	0
0	171	00002024	-	-	ALL	ALL	-	-	-	MUL	0

< CBC GROUP TGN >

PILOT MTGN - NSF MTGN - NSF MTGN - NSF MTGN - NSF

NONE

END 01-12-18 TUE 11:32 (CISCO LAB ES R13)



### Class of Service

DIS COSF,,1,1(To Display Class of Service Features)

# COS CHECK TABLE LIST # 01-12-18 TUE 11:33 PAGE-001

TNN	COS	-----AVAILABLE FEATURE NUMBER (FNO)-----															
0	1	70	71	72	75	76	130	135	138	302	304	318	335	339	348	354	
		355	363	365	398	401	404	415	417	422	440	445	458	459	496	498	
		540	581	591													

END 01-12-18 TUE 11:33 (CISCO LAB ES R13)

### Trunk Group

DIS TG,170,171,1(To Display Trunk Group Information)

# TRUNK GROUP DATA LIST # 01-12-18 TUE 11:33 PAGE-001

TGN	TYP	TID	TNN	SPC	AKI	COF	TLT	DGN	RGN	COS	RSM	FRL	TRS	HNT	NAME	
	AKW	AKR	AKB	RGT	AOT	GRD	REL	HKS	AFT	SHK	RHK	OPR			DMF	
	MIN	PRE	MAK	BRK	DGT	PST	PBO	PBF	COP	PGT					MID	
	PAC	MBC	STG	DT	IAS	DTS	ABS	DTK	OC	NOC	PTF	TCS	TCR	TDT	VCM	OGF
	CRC															
	NSF	NSFFG	PRMFF	PRMFV	CDNFG	TON	NPI									
170	5	37	0	4	0	0	0	1	1	1	1	1	0	0		
	0	0	0	0	0	0	0	0	0	0	0					0
	0	0	0	0	0	0	0	0	0	0						0
	28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	0	0	0	0	0	0	0	0	0							
171	5	38	0	5	0	0	0	0	0	1	1	1	0	1		
	0	0	0	0	0	0	0	0	0	0	0					0
	0	0	0	0	0	0	0	0	0	0						0
	28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	0	0	0	0	0	0	0	0	0							

END 01-12-18 TUE 11:33 (CISCO LAB ES R13)



### Numbering Plan

DIS NP,,1(To Display Numbering Plan)

# NUMBERING PLAN LIST # 01-12-18 TUE 11:33 PAGE-001

TTID= 1

DIGIT	EDL	FNO	TGN	TGX	AJC	RDD	DOC	TTN	DN	SVN
0	1	40						0		
3	4	591	191			1	1			
40	4	25	0		2			0		
41	4	25	0		2			0		
70	30	540	171		2	4		0		
71	30	581	181			2		0		
72	6	591	150			2	1			
73	30	581	128			2		0		
74	30	581	129			2		0		
75	30	517	140			2	2			
9	30	301	0			1		0		
*11	3	72	0					0		
*20	7	138	0			3		0		
*21	3	415	0					0		
*51	3	72	0					0		
*70	5	398	0		1			0		
*71	5	398	0		1			0		
*72	5	398	0		1			0		
*73	5	398	0		1			0		
*74	5	398	0		1			0		
#67	4	401	0					0		
D3D	7	138	0			3		0		
D88	30	304	0			3		0		

END 01-12-18 TUE 11:33 (CISCO LAB ES R13)

DIS MLDT,,4101,4102 (To Display Multi-line Digital Stations)

# MLDT ASSIGNMENT LIST # 01-12-18 TUE 11:34 PAGE-001

DN( EN )	TYPE	RSM	FRL	COS	OT	USG	SPDL	PD	HSC	KA	
BM	LA	PP	RP	IP	HF	TT	RB	AH	PS	LT	PDN
	NAME	AMPT									
4101(00080802)		3	1	1	1	0	0	2	3	1	
0		1	1	1	1	1	1	1	1	0	0
	'MADRAS'	0									
4102(00080804)		3	1	1	1	0	0	0	3	1	
0		1	1	1	1	1	1	1	1	0	0
	'TIKA MASALA'	0									



END 01-12-18 TUE 11:34 (CISCO LAB ES R13)

DIS MLDT,,4101,4102(To Display Multi-line Digital Stations)

# MLDT ASSIGNMENT LIST #

01-12-18 TUE 11:34 PAGE-001

DN( EN )	TYPE	RSM	FRL	COS	OT	USG	SPDL	PD	HSC	KA	
BM	LA	PP	RP	IP	HF	TT	RB	AH	PS	LT	PDN
	NAME	AMPT									
4101(00080802)		3	1	1	1	0	0	2	3	1	
0		1	1	1	1	1	1	1	1	0	0
	'MADRAS'		0								
4102(00080804)		3	1	1	1	0	0	0	3	1	
0		1	1	1	1	1	1	1	1	0	0
	'TIKA MASALA'		0								

END 01-12-18 TUE 11:34 (CISCO LAB ES R13)



## Change Service Parameters

DIS SVP,2,116,116(To enable Calling Line Identification sending to Public ISDN)

```
# SERVICE LIST #                                01-12-18 TUE 11:34 PAGE-001

TYPE = 2 ( SVSDT )

      ID-----DATA    ID-----DATA    ID-----DATA    ID-----DATA    ID-----DATA
116          1

END 01-12-18 TUE 11:34 (CISCO LAB ES R13)
```

DIS SVP,2,218,218(To provide Calling Party Number to Public ISDN)

```
# SERVICE LIST #                                01-12-18 TUE 11:34 PAGE-001

TYPE = 2 ( SVSDT )

      ID-----DATA    ID-----DATA    ID-----DATA    ID-----DATA    ID-----DATA
218          1

END 01-12-18 TUE 11:34 (CISCO LAB ES R13)
```

DIS SVP,2,242,242(To provide ISDN Name Display over Public Network)

```
# SERVICE LIST #                                01-12-18 TUE 11:34 PAGE-001

TYPE = 2 ( SVSDT )

      ID-----DATA    ID-----DATA    ID-----DATA    ID-----DATA    ID-----DATA
242          1

END 01-12-18 TUE 11:34 (CISCO LAB ES R13)
```

DIS SVP,2,180,180(To provide DMS100 Network Name Display)

```
# SERVICE LIST #                                01-12-18 TUE 11:34 PAGE-001

TYPE = 2 ( SVSDT )

      ID-----DATA    ID-----DATA    ID-----DATA    ID-----DATA    ID-----DATA
180          1

END 01-12-18 TUE 11:34 (CISCO LAB ES R13)
```





**ARS Code, ARS Routes, ARS Dial Plan**

DIS ARSC(To Display ARS Code)

# ARS CODE NUMBER LIST # 01-12-18 TUE 11:35 PAGE-001

CDNID	DS---ARSTB			DS---ARSTB		
ACDN(1)	2	1	3	1	4	1
	5	1	6	1	7	1
	8	1	9	1		
OCDN(2)	2	2	3	2	4	2
	5	2	6	2	7	2
	8	2	9	2		

END 01-12-18 TUE 11:35 (CISCO LAB ES R13)

DIS ARSR(To Display ARS Routes)

# ARS ROUTE TABLE LIST # 01-12-18 TUE 11:35 PAGE-001

ARSTB (NARSTB)	TNN	POS	TGN	FRL CDNFG	PTNNO TON	T0 NPI	T1 NAMF	T2	T3	T4	T5	T6	T7	LARF	CMPF
2	0	1	171	0	2	*	*	*	*	*	*	*	*		
				0	0	0	1								
10	0	1	0	0	0	*	*	*	*	*	*	*	*		

END 01-12-18 TUE 11:35 (CISCO LAB ES R13)

DIS ARSDP(To Display ARS Dial Plan)

# ARS RDG QADP LIST # 01-12-18 TUE 11:35 PAGE-001

ARSDG	ARSRG	QADP		
1	0	0		
CICF	OTPF	TOTPF	IOTPF	DFDSLO
1	1	1	1	3

END 01-12-18 TUE 11:35 (CISCO LAB ES R13)



## ARS Digit Manipulation

DIS ARSDM(To Display ARS Digit Manipulation)

# ARS DIGIT MANIPULATION PATTERN LIST # 01-12-18 TUE 11:35 PAGE-001

PTNNO	PRDEL	-----PRADG-----	PSDEL	-----PSADG-----	ACPOS	ADPN	SP
0	0		0		0	0	
1	0		1	0	0	0	
2	3		0	0	0	0	
7	0		7	0	0	0	
11	3		0		0	0	

END 01-12-18 TUE 11:35 (CISCO LAB ES R13)

DIS MCLKS(To Display Main Clock Source/Status)

# MAIN CLOCK STATUS DISPLAY # 01-12-18 TUE 11:34

< OPERATION STATUS >

MCLK #0 \*

IN 0

< ALARM STATUS >

MCLK #0 NORMAL

IN 0 TROUBLE

END 01-12-18 TUE 11:34 (CISCO LAB ES R13)



## Cisco CallManager Configuration

### H.323 (Cisco 2621) Gateway Configuration

The screenshot shows the Cisco CallManager Administration web interface in Microsoft Internet Explorer. The browser's address bar shows the URL: `n/CCMAdmin/gatewayconfig.asp?pkid={E014BCF6-F6EA-48AA-A39B-C7E3082EED18}&Status=US&Action=Update&Type=17`. The page title is "Cisco CallManager 3.1 Administration - Gateway Configuration". The navigation menu includes "System", "Route Plan", "Service", "Feature", "Device", "User", "Application", and "Help". The main content area displays the "Gateway Configuration" page for an H.323 Gateway. The configuration details are as follows:

Product	H.323 Gateway
Gateway	10.1.1.129
Device Protocol	H.225
Registration	Unknown
IP Address	10.1.1.129

Status: Update completed.

Buttons: Update, Delete, Reset Gateway, Cancel Changes

Form fields:

Device Name*	10.1.1.129
Description	Cisco H.323 Gateway
Device Pool*	Default
Media Resource Group List	< None >

At the bottom of the browser window, a status bar indicates "Reset succeeded." and the connection is identified as "Local Intranet".



Network Hold Audio Source	< None >
User Hold Audio Source	< None >
Calling Search Space	< None >
Location	< None >
Caller ID DN	
Calling Party Selection*	Originator
Presentation Bit*	Allowed
Display IE Delivery	<input checked="" type="checkbox"/>
Gatekeeper Name	< None >
Media Termination Point Required	<input type="checkbox"/>
Num Digits*	23
Sig Digits	<input type="checkbox"/>
Prefix DN	
Run H225D On Every Node	<input checked="" type="checkbox"/>
Called party IE number type unknown*	Cisco CallManager

Restart succeeded. Local intranet



<b>Required</b>	
Num Digits*	<input type="text" value="23"/>
Sig Digits	<input type="checkbox"/>
Prefix DN	<input type="text"/>
Run H225D On Every Node	<input checked="" type="checkbox"/>
Called party IE number type unknown*	<input type="text" value="Cisco CallManager"/>
Calling party IE number type unknown*	<input type="text" value="Cisco CallManager"/>
Called Numbering Plan*	<input type="text" value="Cisco CallManager"/>
Calling Numbering Plan*	<input type="text" value="Cisco CallManager"/>
* indicates required item	
<a href="#">Back to Find/List Gateways</a>	

Restart succeeded. Local intranet



## Route Pattern Configuration

System Route Plan Service Feature Device User Application Help

**Cisco CallManager Administration**  
For Cisco IP Telephony Solutions

CISCO SYSTEMS

### Route Pattern Configuration

[Add a New Route Pattern](#)  
[Back to Find/List Route Patterns](#)

**Route Pattern: 6.XXXX**  
Status: Ready  
Note: Any update to this route pattern automatically resets the associated gateway/route list

#### Pattern Definition

Route Pattern*	<input type="text" value="6.XXXX"/>
Partition	<input type="text" value="&lt; None &gt;"/>
Numbering Plan*	<input type="text" value="North American Numbering Plan"/>
Route Filter	<input type="text" value="&lt; None &gt;"/>
Gateway/Route List*	<input type="text" value="10.1.1.129"/> <a href="#">(Edit)</a>
Route Option	<input checked="" type="radio"/> Route this pattern <input type="radio"/> Block this pattern

Local intranet



Partition	< None >
Numbering Plan*	North American Numbering Plk
Route Filter	< None >
Gateway/Route List*	10.1.1.129 (Edit)
Route Option	<input checked="" type="radio"/> Route this pattern <input type="radio"/> Block this pattern
<input checked="" type="checkbox"/> Provide Outside Dial Tone	<input type="checkbox"/> Urgent Priority
<b>Calling Party Transformations</b>	
<input type="checkbox"/> Use Calling Party's External Phone Number Mask	
Calling Party Transform Mask	<input type="text"/>
Prefix Digits (Outgoing Calls)	<input type="text"/>
<b>Called Party Transformations</b>	
Discard Digits	PreDot
Called Party Transform Mask	<input type="text"/>
Prefix Digits (Outgoing Calls)	<input type="text"/>

\* indicates required item.

## Considerations

### User/Network Settings

The Cisco 2621 router with ISDN switch type setting of primary-DMS-100 supports "User" protocol side only by using the `isdn protocol-emulate user` command. Therefore the Fujitsu PBX must be set to emulate Network side.

### Calling Name and Number feature

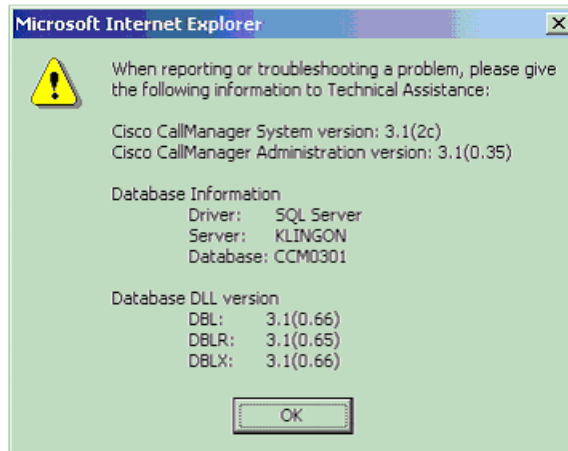
When calling from Cisco 7960 IP phone to Fujitsu digital phone, Calling Number is displayed on both phones after the call is answered. "Calling Name" however is not displayed on either phone even though the Cisco Gateway was sending both Calling Name and Number in the SETUP message.

When calling from Fujitsu digital phone to Cisco 7960 IP phone, IP phone displays Connected Name and Number after the call is answered. Fujitsu phone however did not get updated when the call is answered. It displays the numbers being dialed instead (i.e. Access code + 7 digit number). It was verified using ISDN protocol analyzer that the Cisco Gateway was not sending "Connected Number" or "Connected Name" information in the connect message back to PBX.



## Appendix A

### Cisco CallManager Software Release



### Fujitsu F9600ES Software release

DIS SOFT(To Display PBX Software Version)

01-12-18 TUE 11:31

\*\*\* SERVICE SOFTWARE LIST \*\*\*

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LICENSED MATERIAL PROGRAM PROPERTY OF FUJITSU

LPE23924 E12V11L22 C00 000314 INSTALLED

NAME	TYPE	E/V
BASCP/D120	360507-D	E12V11
ATTBS	BASIC--D	V08
IIRCBS	360561-D	V06
IBRSBS	360562-D	V01
IPCH0S	360599-D	V01
IPREBS	360600-D	V01
IPEH0S	360601-D	V01
QSIGBS	360974-D	V02

END 01-12-18 TUE 11:31 (CISCO LAB ES R13)





## Cisco 2621 Router Configuration

```
2621_B#sh version
Cisco Internetwork Operating System Software
IOS (tm) C2600 Software (C2600-JS-M), Version 12.2(3.5)T, MAINTENANCE INTERIM S
SOFTWARE
TAC Support: http://www.cisco.com/tac
Copyright (c) 1986-2001 by cisco Systems, Inc.
Compiled Fri 03-Aug-01 22:45 by ccai
Image text-base: 0x80008088, data-base: 0x81631DD8

ROM: System Bootstrap, Version 12.1(3r)T2, RELEASE SOFTWARE (fc1)

2621_B uptime is 1 hour, 1 minute
System returned to ROM by power-on
System image file is "flash:c2600-js-mz.122-3.5.T"

cisco 2621 (MPC860) processor (revision 0x200) with 56320K/9216K bytes of memory
.
Processor board ID JAD051516TX (503811939)
M860 processor: part number 0, mask 49
Bridging software.
X.25 software, Version 3.0.0.
SuperLAT software (copyright 1990 by Meridian Technology Corp).
TN3270 Emulation software.
Primary Rate ISDN software, Version 1.1.
2 FastEthernet/IEEE 802.3 interface(s)
24 Serial network interface(s)
2 Channelized T1/PRI port(s)
32K bytes of non-volatile configuration memory.
16384K bytes of processor board System flash (Read/Write)

Configuration register is 0x2102
2621_B#
```

---

```
2621_B#sh diag
Slot 0:
  C2621 2FE Mainboard Port adapter, 2 ports
  Port adapter is analyzed
  Port adapter insertion time unknown
  EEPROM contents at hardware discovery:
  Hardware Revision      : 2.0
  PCB Serial Number      : JAD051516TX (503811939)
  Part Number            : 73-3200-08
  RMA History             : 00
  RMA Number             : 0-0-0-0
  Board Revision         : A0
  Deviation Number       : 0-21249
  EEPROM format version 4
  EEPROM contents (hex):
    0x00: 04 FF 40 00 A2 41 02 00 C1 17 4A 41 44 30 35 31
    0x10: 35 31 36 54 58 20 28 35 30 33 38 31 31 39 33 39
    0x20: 29 82 49 0C 80 08 04 00 81 00 00 00 00 42 41 30
    0x30: 80 00 00 53 01 FF FF FF FF FF FF FF FF FF FF
```



```
0x40: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0x50: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0x60: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0x70: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
```

Slot 1:

```
High Density Voice Port adapter
Port adapter is analyzed
Port adapter insertion time unknown
EEPROM contents at hardware discovery:
Hardware Revision      : 1.1
Top Assy. Part Number  : 800-03567-01
Board Revision        : F1
Deviation Number      : 0-0
Fab Version           : 02
PCB Serial Number     : JAB05080LU9
RMA Test History      : 00
RMA Number            : 0-0-0-0
RMA History           : 00
EEPROM format version 4
EEPROM contents (hex):
0x00: 04 FF 40 00 CC 41 01 01 C0 46 03 20 00 0D EF 01
0x10: 42 46 31 80 00 00 00 00 02 02 C1 8B 4A 41 42 30
0x20: 35 30 38 30 4C 55 39 03 00 81 00 00 00 00 04 00
0x30: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0x40: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0x50: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0x60: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0x70: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
```

```
VIC Slot 0:
T1 (2 Port) Multi-Flex Trunk WAN Daughter Card
Hardware revision 1.0      Board revision B0
Serial number 21936864    Part number 800-04477-02
Test history 0x0         RMA number 00-00-00
Connector type PCI
EEPROM format version 1
EEPROM contents (hex):
0x20: 01 22 01 00 01 4E BA E0 50 11 7D 02 00 00 00 00
0x30: 58 00 00 00 00 10 12 00 FF FF FF FF FF FF FF FF

HDV firmware: Compiled Fri 23-Mar-01 00:20 by miriyala
HDV memory size 524280 heap free 175065
```

2621\_B#

---

```
2621_B#sh controllers t1 1/0
T1 1/0 is up.
  Applique type is Channelized T1
  Cablelength is long gain36 Odb
  No alarms detected.
  alarm-trigger is not set
  Version info Firmware: 20010710, FPGA: 15
  Framing is ESF, Line Code is B8ZS, Clock Source is Line.
```



```
Data in current interval (158 seconds elapsed):
  0 Line Code Violations, 0 Path Code Violations
  0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
  0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 0 Unavail Secs
2621_B#
```

---

```
2621_B#sh configuration
Using 1861 out of 29688 bytes
!
version 12.2
no parser cache
service timestamps debug datetime msec localtime show-timezone
service timestamps log uptime
no service password-encryption
!
hostname 2621_B
!
no logging buffered
enable password cisco
!
!
!
memory-size iomem 15
voice-card 1
 dspfarm
!
ip subnet-zero
!
!
no ip domain-lookup
!
isdn switch-type primary-ni
!
!
voice class codec 1
 codec preference 1 g729r8
 codec preference 2 g711ulaw
 codec preference 3 g711alaw
!
!
!
!
!
!
controller T1 1/0
 framing esf
 linecode b8zs
 pri-group timeslots 1-24
!
controller T1 1/1
 shutdown
 framing sf
 linecode ami
!
```



```
!  
!  
!  
interface FastEthernet0/0  
  ip address 192.168.100.2 255.255.255.0  
  no ip mroute-cache  
  load-interval 30  
  no keepalive  
  speed auto  
  half-duplex  
!  
interface FastEthernet0/1  
  ip address 10.1.1.129 255.255.255.0  
  no ip mroute-cache  
  duplex auto  
  speed auto  
!  
interface Serial1/0:23  
  no ip address  
  no logging event link-status  
  isdn switch-type primary-dms100  
  isdn incoming-voice voice  
  isdn T321 30000  
  isdn T310 40000  
  no cdp enable  
!  
router rip  
  network 1.0.0.0  
  network 192.168.100.0  
!  
ip classless  
no ip http server  
ip pim bidir-enable  
!  
dialer-list 1 protocol ip permit  
dialer-list 1 protocol ipx permit  
!  
!  
snmp-server packetsize 4096  
snmp-server manager  
tftp-server nvram  
call rsvp-sync  
!  
voice-port 1/0:23  
!  
!  
mgcp profile default  
!  
dial-peer cor custom  
!  
!  
!  
dial-peer voice 1 pots  
  destination-pattern 41..  
  progress_ind alert enable 8[hidden command to get ring-back tone]  
  direct-inward-dial  
  port 1/0:23
```



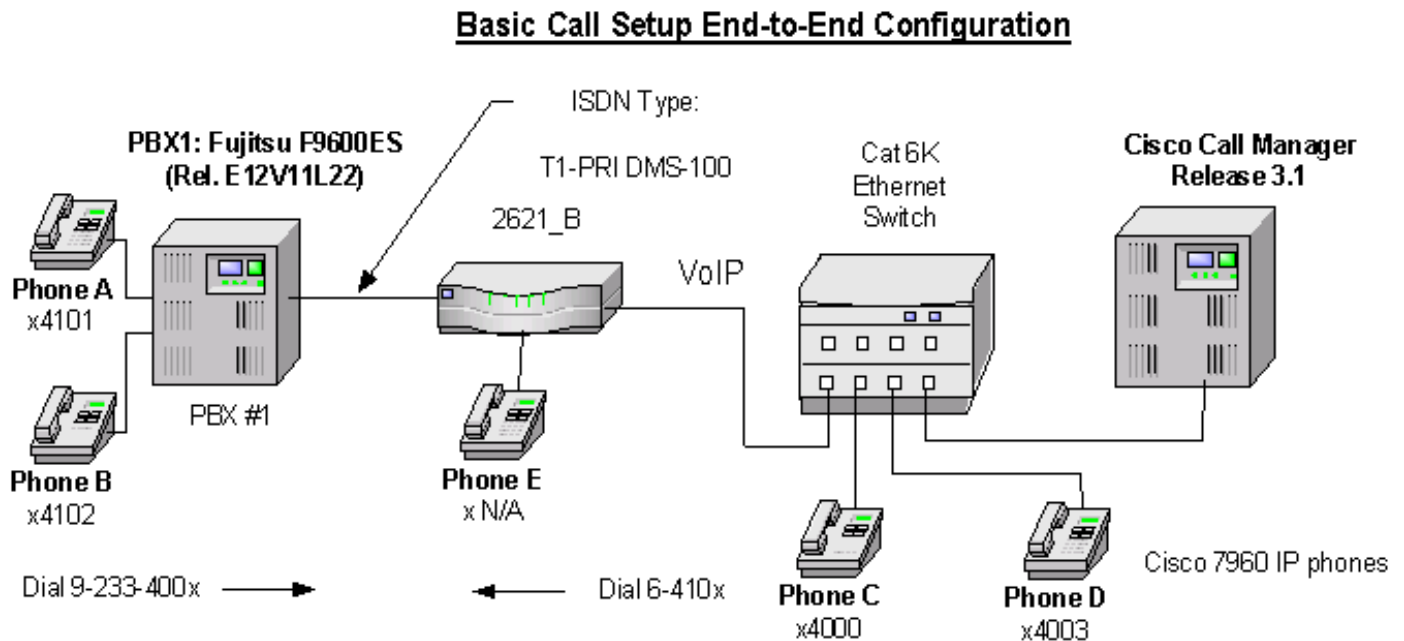
```
prefix 41
!
dial-peer voice 3 voip
 destination-pattern 40..
 progress_ind setup enable 3[required command to get ring-back tone]
 voice-class codec 1
 session target ipv4:10.1.1.2
 dtmf-relay h245-alphanumeric
 ip qos dscp cs5 media
!
!
line con 0
 exec-timeout 0 0
line aux 0
 exec-timeout 0 0
line vty 0 4
 exec-timeout 0 0
 password cisco
 login
line vty 5 15
 exec-timeout 0 0
 login
!
scheduler allocate 3996 1000
!
end

2621_B#
```



## Test Configuration

Figure 2  
Test Topology



As shown in the diagram above, a Fujitsu F9600ES PBX was connected via an ISDN T1 PRI link to a Cisco 2621 Gateway, which in turn, was connected to an Ethernet switch. The interoperability testing involved Layers 1, 2 and 3 on the ISDN PRI link between a Cisco 2621 and the PBX.

### Layer 1 (Physical Layer)

The Fujitsu F9600ES PBX was set for Extended Superframe (ESF) and B8ZS linecoding method. Issue DIS TGDC to display Trunk Group Data Control.

### Layers 2 & 3 (Q.921 and Q.931)

Layer 2 and 3 packet exchanges were monitored using an Acacia Clarinet protocol analyzer, bridged across the PRI link in high impedance mode.

Layer 2 Q.921 packets were monitored to ensure that each PBX/2621 software configuration properly exchanged SABME/UA packets to initialize the ISDN link, and then RR packets were exchanged every 30 seconds.

Layer 3 Q.931 packets were monitored to ensure that the appropriate call setup/teardown packets were exchanged for each configuration, and that the SETUP packets contained the mandatory Information Elements with the necessary details, as well as optional IEs such as Calling Name and Number.

Telephone calls were made end-to-end in both directions through the Cisco 2621 Gateway, and a check was made to ensure that there was an audio path in both directions for each call.



## User/Network Settings

The Cisco 2621 Gateway with ISDN protocol type setting of primary-DMS-100 supports “User” protocol side only by using the isdn protocol-emulate user command. Therefore the Fujitsu PBX must be set to emulate “Network” side.

The protocol type and protocol side cannot be changed in the “Change” or “Modify” ISDN trunk screens on the Fujitsu PBX EMMML Console. The protocol type and the Master/Slave (or Network/User) settings had to be changed for every test case by deleting and building a new trunk group on the Fujitsu. The Fujitsu “Master” matches up with the Cisco Gateway “User”, and Fujitsu “Slave” matches up with Cisco Gateway “Network”. These settings are specified in the fields [MS] (where 0 = slave and 1 = master); and the [PRTCL] field.

## Appendix B

### Test Results

Testing was performed by Test Engineer(s): Samir Batio, December 20, 2001

### Test Setup

Test configuration:

- PBX1 configured as PRI DMS-100, emulates Network
- Cisco 2621 Gateway configured as PRI DMS-100, emulates User

Table 1 Test Setup Switch and Gateway Settings

Fujitsu F9600ES Switch-type / Protocol-side Setting	Cisco 6608-T1 ISDN Protocol-type/ Protocol-side Setting
DMS100 / Master	PRI DMS-100/User

Table 2 Basic Calls: (Enbloc Sending)

Calls Made	Call Comp?	“ Calling Number” Passed to Final Destination?	“ Calling Name” Passed to Final Destination?	“ Called Number” Passed to Orig. Side?	“ Called Name” Passed to Orig. Side?	Notes
Phone A to Phone C	Yes	Yes	Yes	No	No	1
Phone C to Phone A	Yes	Yes	No	Yes	No	

1. CallManager is not sending “Connected Name” or “Connected Number” information in the connect message back to PBX.



Table 3 Call Transfers: (Supervised Local Transfers)

Calls Made	Call Comp?	Orig. "Calling Number" displayed on Final Dest. phone?	Orig. "Calling Name" displayed on Final Dest. phone?	"Called Number" display on Orig. phone updated after transfer?	"Called Name" display on Orig. phone updated after transfer?	Notes
Phone C to Phone A Xfr to Phone B	Yes	Yes	No	No	No	
Phone A to Phone C Xfr to Phone D	Yes	Yes	Yes	No	No	





Table 4 Call Conferencing (Local)

Calls Made	Call Comp?	" Calling Number" passed to remaining conferee when the conferencing phone drops out?	" Calling Name" passed to remaining conferee when the conferencing phone drops out?	" Connected Number" updated on Orig. Caller phone display when a conferee drops out?	" Connected Name" updated on Orig. Caller phone display when a conferee drops out?	Notes
Phone C to Phone A, Phone A conf Phone B	Yes	(A Drops out) Yes	(A Drops out) Yes	(A Drops out) No	(A Drops out) No	
Phone C to Phone A, Phone C conf Phone D	Yes	(C Drops out) No	(C Drops out) No	(D Drops out) No	(D Drops out) No	
Phone A to Phone C, Phone C conf Phone D	Yes	(C Drops out) No	(C Drops out) No	(C Drops out) No	(C Drops out) No	
Phone A to Phone C, Phone A conf Phone B	Yes	(A Drops out) No	(A Drops out) No	(B Drops out) No	(B Drops out) No	

Table 5 Call Forward (Local)

Calls Made	Call Comp?	Original "Calling Number" passed to Final Dest.?	Original "Calling Name" passed to Final Dest.?	Forwarding "Called Number" passed to Final Dest.?	Forwarding "Called Name" passed to Final Dest.?	Final dest. "Connected Number" updated at orig. side?	Final dest. "Connected Name" updated at orig. side?	Notes
Phone C to Phone A fwd to Phone B	Yes	Yes	No	No	No	No	No	
Phone A to Phone C fwd to Phone D	Yes	Yes	Yes	No	No	No	No	



Corporate Headquarters  
Cisco Systems, Inc.  
170 West Tasman Drive  
San Jose, CA 95134-1706  
USA  
www.cisco.com  
Tel: 408 526-4000  
800 553-NETS (6387)  
Fax: 408 526-4100

European Headquarters  
Cisco Systems International BV  
Haarlerbergpark  
Haarlerbergweg 13-19  
1101 CH Amsterdam  
The Netherlands  
www-europe.cisco.com  
Tel: 31 0 20 357 1000  
Fax: 31 0 20 357 1100

Americas Headquarters  
Cisco Systems, Inc.  
170 West Tasman Drive  
San Jose, CA 95134-1706  
USA  
www.cisco.com  
Tel: 408 526-7660  
Fax: 408 527-0883

Asia Pacific Headquarters  
Cisco Systems, Inc.  
Capital Tower  
168 Robinson Road  
#22-01 to #29-01  
Singapore 068912  
www.cisco.com  
Tel: +65 317 7777  
Fax: +65 317 7799

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