

# Fujitsu F9600ES PBX with CallManager using 6608-T1 PRI DMS-100 Gateway

This application note illustrates connectivity for Fujitsu F9600ES PBX with CallManager using 6608-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 (Gateway): 6608 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
- Calling Name
- Connected Name

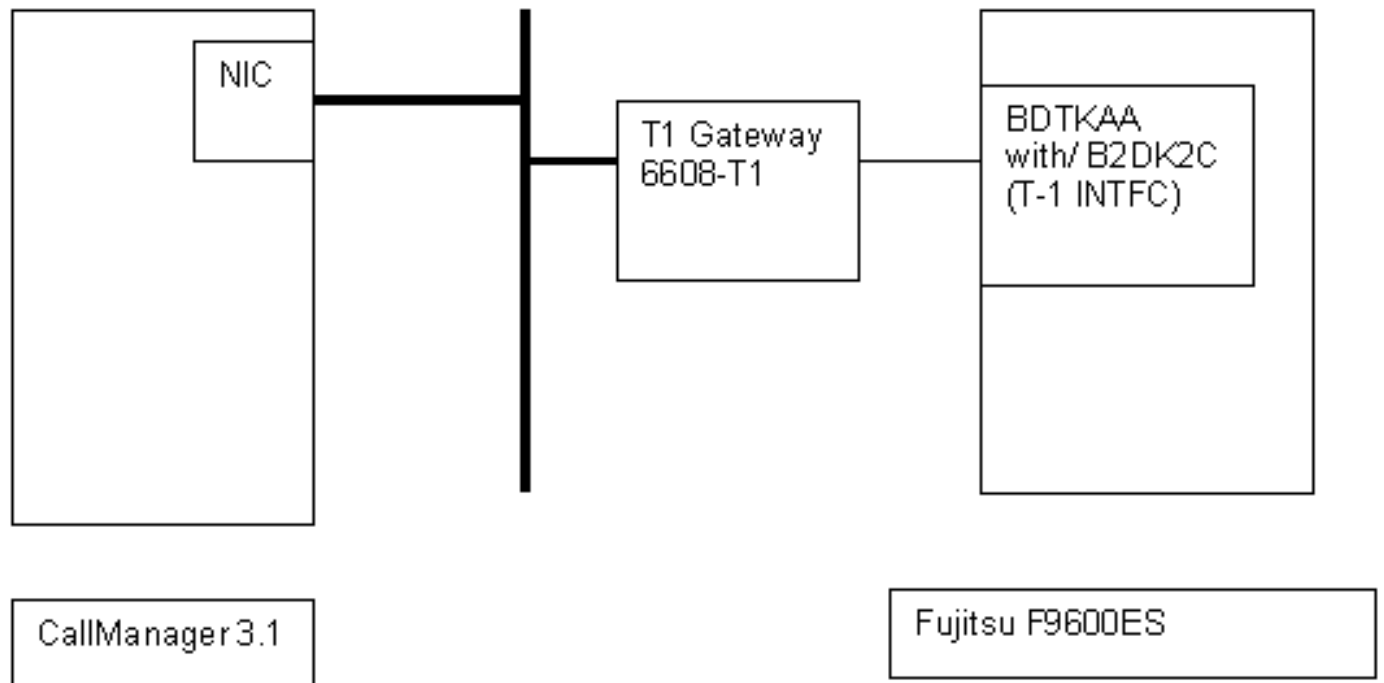
Key features not supported:

- 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

DIS ISTRK,,00002000,00002024 (To Display ISDN Trunk Group)

# ISDN TRUNK ASSIGNMENT LIST # 01-12-18 TUE 11:31 PAGE-001

TNN	TGN	EN	MS	PRTCL	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												
		355	363	365	398	401	404	415	417	422	440	445	458	459	496	498			540	581	591																													
		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	OOO	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	PDN
BM	LA	PP	RP	IP	HF	TT	RB	AH	PS	LT	
	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		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	PTNNO	T0	T1	T2	T3	T4	T5	T6	T7	LARF	CMPF
			CDNFG		TON	NPI	NAMF								
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

### 6608-T1 Gateway Configuration

The screenshot shows the Cisco CallManager Administration web interface. At the top, there is a navigation menu with items: System, Route Plan, Service, Feature, Device, User, Application, and Help. Below the menu is a header banner with the text "Cisco CallManager Administration For Cisco IP Telephony Solutions" and the Cisco Systems logo. The main heading is "Gateway Configuration" in a large, bold, red font. To the right of this heading is a link: "Back to Find/List Gateways".

The configuration details for a gateway are displayed:

- Product : Cisco Catalyst 6000 T1 VoIP Gateway
- Gateway : S0/DS1-0@SDA0001C9D93A99
- Device Protocol: Digital Access PRI
- Registration: Registered with Cisco CallManager KLINGON
- IP Address: 10.1.1.108

The status is "Ready". Below this are four buttons: "Update", "Delete", "Reset Gateway", and "Cancel Changes".

Below the buttons are four configuration fields:

- MAC Address\*: 0001C9D93A99
- Description: SDA0001C9D93A99
- Device Pool\*: Default
- Media Resource Group List: < None >

At the bottom right of the page, there is a "Local intranet" icon.



Cisco CallManager 3.1 Administration - Gateway Configuration - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites History

Address <http://kingon/CCMAdmin/gatewayconfig.asp?pkid={409A997F-5E68-4DE6-9365-A65C7431FA3D}&type=1> Go Links

Network Hold Audio Source	< None >
User Hold Audio Source	< None >
Calling Search Space	< None >
Location	< None >
Load Information	
Channel Selection Order*	Top Down
PCM Type*	μ-law
Protocol Side*	User
Caller ID DN	
Calling Party Selection*	Originator
Channel IE Type*	Use Number when 1B
Interface Identifier Present**	<input type="checkbox"/>
Interface Identifier Value**	0
Display IE Delivery	<input checked="" type="checkbox"/>
Redirecting Number IE Delivery	<input checked="" type="checkbox"/>
Delay for first restart (1/8 sec ticks)	32

Done Local intranet



Cisco CallManager 3.1 Administration - Gateway Configuration - Microsoft Internet Explorer

File Edit View Favorites Tools Help


Back Forward Stop Home Search Favorites History Print

Address <http://kingon/CCMAdmin/gatewayconfig.asp?pkid={409A997F-5E68-4DE6-9365-A65C7431FA3D}&type=1> Go Links

Delay between restarts (1/8 sec ticks)	<input type="text" value="4"/>
Num Digits*	<input type="text" value="23"/>
Sig Digits	<input checked="" type="checkbox"/>
Prefix DN	<input type="text"/>
Presentation Bit*	<input type="text" value="Allowed"/>
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"/>
PRI Protocol Type*	<input type="text" value="PRI DMS-100"/>
Send Extra Leading Character In DisplayIE***	<input checked="" type="checkbox"/>
Inhibit restarts at PRI initialization	<input checked="" type="checkbox"/>
Enable status poll	<input type="checkbox"/>
Number of digits to strip*	<input type="text" value="0"/>
Country Code*	<input type="text" value="North America"/>

Done Local intranet



**Product Specific Configuration** 

Clock Reference*	Network
TX-Level CSU*	0dB
FDL Channel*	ATT 54016
Framing*	ESF
Audio Signal Adjustment into IP Network*	NoDbPadding
Audio Signal Adjustment from IP Network*	NoDbPadding
Yellow Alarm*	Bit2
Zero Suppression*	B8ZS

\* indicates required item  
\*\* applicable to DMS-100 protocol only  
\*\*\* may be required to force ringback from some PBXs

[Back to Find/List Gateways](#)

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="S0/DS1-0@SDA0001C9D93A99"/> (Edit)
Route Option	<input checked="" type="radio"/> Route this pattern <input type="radio"/> Block this pattern

Local intranet



Route Pattern*	<input type="text" value="6.XXXXX"/>
Partition	<input type="text" value="&lt; None &gt;"/>
Numbering Plan*	<input type="text" value="North American Numbering Pl"/>
Route Filter	<input type="text" value="&lt; None &gt;"/>
Gateway/Route List*	<input type="text" value="S0/DS1-0@SDA0001C9D93A99"/> (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	<input type="text" value="PreDot"/>
Called Party Transform Mask	<input type="text"/>
Prefix Digits (Outgoing Calls)	<input type="text"/>

\* indicates required item.

## Considerations

### Calling Name and Number feature

When calling from Cisco 7960 IP phone to Fujitsu digital phone, Calling Name and Number are displayed on both phones after the call is answered as expected.

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 displayed "Connected Name" but did not display "Connected Number" 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 CallManager was not sending "Connected Number" information in the connect message back to PBX. Only "Connected Name" was sent in the connect message under the Display IE (0/28) which is an ANSI message format.

### Calling Name Display on Fujitsu

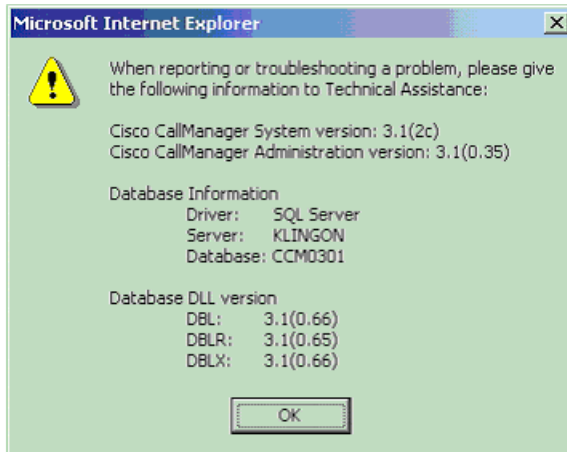
Please note the fact that in order for the Fujitsu phone to display Calling Name, the configuration for the Cisco 7960 IP phone's Internal Caller ID field must contain all upper-case characters or numerals. Fujitsu phone will not display lower-case characters.





## 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)



## Catalyst 6000 Switch Configuration

```
Console> (enable) sh version
WS-C6006 Software, Version NmpSW: 5.5(6a)
Copyright (c) 1995-2001 by Cisco Systems
NMP S/W compiled on Feb 23 2001, 10:23:18
```

```
System Bootstrap Version: 5.3(1)
```

```
Hardware Version: 2.0 Model: WS-C6006 Serial #: TBA04511172
```

```
Mod Port Model Serial # Versions
-----
1 2 WS-X6K-SUP1A-2GE SAD05010NBK Hw : 7.0
Fw : 5.3(1)
Fw1: 5.4(2)
Sw : 5.5(6a)
Sw1: 5.5(6a)
3 48 WS-F6K-PFC SAD05020221 Hw : 1.1
WS-X6348-RJ-45 SAD04420N7B Hw : 1.4
Fw : 5.4(2)
Sw : 5.5(6a)
4 24 WS-F6K-VPWR Hw : 1.0
WS-X6624-FXS SAD050203M8 Hw : 3.0
Fw : 5.4(2)
Sw : 5.5(6a)
HP : A00203010018; DSP : A003H031 (3.3.
35)
5 8 WS-X6608-T1 SAD04400EM0 Hw : 1.1
Fw : 5.4(2)
Sw : 5.5(6a)
HP1: D00403010017; DSP1: D005E031 (3.3.
32)
HP2: D00403010025; DSP2: D005H031 (3.3.
35)
HP3: D00403010025; DSP3: D005H031 (3.3.
35)
HP4: D00403010025; DSP4: D005H031 (3.3.
35)
HP5: D00403010025; DSP5: D005H031 (3.3.
35)
HP6: D00403010025; DSP6: D005H031 (3.3.
35)
HP7: D00403010025; DSP7: D005H031 (3.3.
35)
HP8: D00403010025; DSP8: D005H031 (3.3.
35)
6 8 WS-X6608-E1 SAD04380DW1 Hw : 1.1
Fw : 5.4(2)
Sw : 5.5(6a)
HP1: D00403010025; DSP1: D005H031 (3.3.
35)
HP2: D00403010025; DSP2: D005H031 (3.3.
35)
HP3: D00403010025; DSP3: D005H031 (3.3.
35)
```



```

35) HP4: D00403010025; DSP4: D005H031 (3.3.
35) HP5: D00403010025; DSP5: D005H031 (3.3.
35) HP6: D00403010025; DSP6: D005H031 (3.3.
35) HP7: D00403010025; DSP7: D005H031 (3.3.
35) HP8: D00403010025; DSP8: D005H031 (3.3.

```

Module	DRAM			FLASH			NVRAM		
	Total	Used	Free	Total	Used	Free	Total	Used	Free
1	65408K	37844K	27564K	16384K	11546K	4838K	512K	198K	314K

```

Uptime is 169 days, 3 hours, 49 minutes
Console> (enable)

```

```

Console> (enable) sh module

```

Mod	Slot	Ports	Module-Type	Model	Sub	Status
1	1	2	1000BaseX Supervisor	WS-X6K-SUP1A-2GE	yes	ok
3	3	48	10/100BaseTX Ethernet	WS-X6348-RJ-45	yes	ok
4	4	24	FXS	WS-X6624-FXS	no	ok
5	5	8	T1	WS-X6608-T1	no	ok
6	6	8	E1	WS-X6608-E1	no	ok

```

Mod Module-Name Serial-Num

```

Mod	Module-Name	Serial-Num
1		SAD05010NBK
3		SAD04420N7B
4		SAD050203M8
5		SAD04400EM0
6		SAD04380DW1

```

Mod MAC-Address(es) Hw Fw Sw

```

Mod	MAC-Address(es)	Hw	Fw	Sw
1	00-04-c0-f8-42-02 to 00-04-c0-f8-42-03 00-04-c0-f8-42-00 to 00-04-c0-f8-42-01 00-04-9b-f0-78-00 to 00-04-9b-f0-7b-ff	7.0	5.3(1)	5.5(6a)
3	00-02-fc-20-5e-50 to 00-02-fc-20-5e-7f	1.4	5.4(2)	5.5(6a)
4	00-03-32-ba-2e-35	3.0	5.4(2)	5.5(6a)
5	00-01-c9-d9-3a-98 to 00-01-c9-d9-3a-9f	1.1	5.4(2)	5.5(6a)
6	00-01-c9-d8-63-3e to 00-01-c9-d8-63-45	1.1	5.4(2)	5.5(6a)

```

Mod Sub-Type Sub-Model Sub-Serial Sub-Hw

```

Mod	Sub-Type	Sub-Model	Sub-Serial	Sub-Hw
1	L3 Switching Engine	WS-F6K-PFC	SAD05020221	1.1
3	Inline Power Module	WS-F6K-VPWR		1.0

```

Console> (enable)

```

```

Console> (enable) sh port 5

```



Port	Name	Status	Vlan	Duplex	Speed	Type
5/1		enabled	1	full	-	unknown
5/2		connected	1	full	1.544	T1
5/3		notconnect	1	full	1.544	T1
5/4		notconnect	1	full	1.544	T1
5/5		notconnect	1	full	1.544	T1
5/6		notconnect	1	full	1.544	T1
5/7		notconnect	1	full	1.544	T1
5/8		notconnect	1	full	1.544	T1

Port	DHCP	MAC-Address	IP-Address	Subnet-Mask
5/1	enable	00-01-c9-d9-3a-98	10.1.1.107	255.255.255.0
5/2	enable	00-01-c9-d9-3a-99	10.1.1.108	255.255.255.0
5/3	enable	00-01-c9-d9-3a-9a	10.1.1.109	255.255.255.0
5/4	enable	00-01-c9-d9-3a-9b	10.1.1.110	255.255.255.0
5/5	enable	00-01-c9-d9-3a-9c	10.1.1.111	255.255.255.0
5/6	enable	00-01-c9-d9-3a-9d	10.1.1.112	255.255.255.0
5/7	enable	00-01-c9-d9-3a-9e	10.1.1.113	255.255.255.0
5/8	enable	00-01-c9-d9-3a-9f	10.1.1.114	255.255.255.0

Port	Call-Manager(s)	DHCP-Server	TFTP-Server	Gateway
5/1	-	10.1.1.2	10.1.1.2	10.1.1.7
5/2	10.1.1.2	10.1.1.2	10.1.1.2	10.1.1.7
5/3	10.1.1.2	10.1.1.2	10.1.1.2	10.1.1.7
5/4	10.1.1.2	10.1.1.2	10.1.1.2	10.1.1.7
5/5	10.1.1.2	10.1.1.2	10.1.1.2	10.1.1.7
5/6	10.1.1.2	10.1.1.2	10.1.1.2	10.1.1.7
5/7	10.1.1.2	10.1.1.2	10.1.1.2	10.1.1.7
5/8	10.1.1.2	10.1.1.2	10.1.1.2	10.1.1.7

Port	DNS-Server(s)	Domain
5/1	-	-
5/2	-	-
5/3	-	-
5/4	-	-
5/5	-	-
5/6	-	-
5/7	-	-
5/8	-	-

Port	CallManagerState	DSP-Type
5/1	notregistered	C549
5/2	registered	C549
5/3	registered	C549
5/4	registered	C549
5/5	registered	C549
5/6	registered	C549
5/7	registered	C549
5/8	registered	C549

Port	NoiseRegen	NonLinearProcessing
------	------------	---------------------

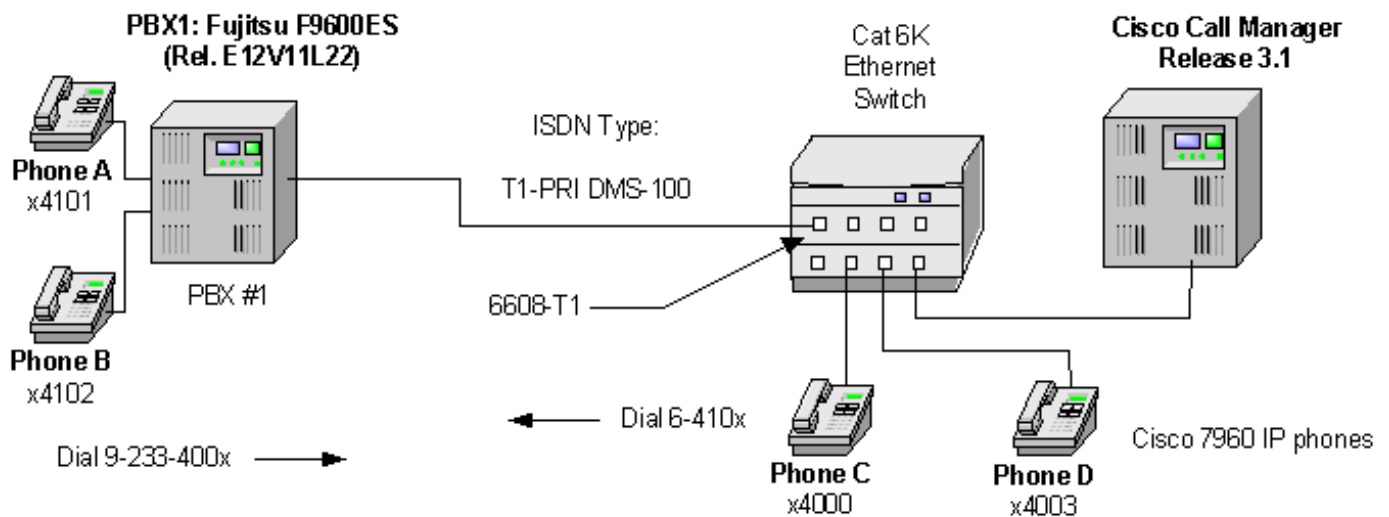


```
5/1 - -
5/2 enabled enabled
5/3 enabled enabled
5/4 enabled enabled
5/5 enabled enabled
5/6 enabled enabled
5/7 enabled enabled
5/8 enabled enabled
Console> (enable)
```

### Test Configuration

Figure 2  
Test Topology

## Basic Call Setup End-to-End Configuration



As shown in the diagram above, a Fujitsu F9600ES PBX was connected via an ISDN T1 PRI link to a Cisco 6608-T1 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 6608-T1 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/6608-T1 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 6608-T1 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 6608-T1 Gateway with ISDN protocol type setting of PRI DMS-100 supports both protocol sides by selecting “Network/User” in the protocol side field when configuring the Gateway via CallManager.

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 1

Test configuration:

- PBX1 configured as PRI DMS-100, emulates Network
- Cisco 6608-T1 Gateway configured as PRI DMS-100, emulates User

Table 1 Test Setup 1 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
<b>Phone A to Phone C</b>	Yes	Yes	Yes	No <sup>1</sup>	Yes	<sup>2</sup>
<b>Phone C to Phone A</b>	Yes	Yes	Yes	Yes	Yes	

1. CallManager is not sending "Connected Number" information in the connect message back to PBX

2. In order for the Fujitsu phone to display "Calling Name", the configuration for the Cisco 7960 IP phone's Internal Caller ID field must contain all upper-case characters or numerals. Fujitsu phone will not display lower-case characters.

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
<b>Phone C to Phone A Xfr to Phone B</b>	Yes	Yes	No	No	No	
<b>Phone A to Phone C Xfr to Phone D</b>	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) No	(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. "Connec ted Number" updated at orig. side?	Final dest. "Connec ted Name" updated at orig. side?	Notes
Phone C to Phone A fwd to Phone B	Yes	Yes	Yes	No	No	No	Yes	
Phone A to Phone C fwd to Phone D	Yes	Yes	Yes	No	No	No	Yes	

Test Setup 2

Test configuration:

- PBX1 configured as PRI DMS-100, emulates User
- Cisco 6608-T1 Gateway configured as PRI DMS-100, emulates Network

Table 6 Test Setup 2 Switch and Gateway Settings

Fujitsu F9600ES Switch-type / Protocol-side Setting	Cisco 6608-T1 ISDN protocol-type/ Protocol-side Setting
DMS100 / Slave	PRI DMS-100/Network

The test results are identical as in "Test Setup 1" on page 22. Refer to the tables in "Test Setup 1" on page 22 for details.







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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