DEFENSE INFORMATION SYSTEMS AGENCY
P. O. BOX 4502
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IN REPLY REFER TO: Joint Interoperability Test Command (JTE) **31 Mar 10**

MEMORANDUM FOR DISTRIBUTION

Subject: Special Interoperability Test Certification of the T-Metrics, Inc. (TM)-2000, Consolidated Answering System Version 5.0

References: (a) DoD Directive 4630.5, "Interoperability and Supportability of Information Technology (IT) and National Security Systems (NSS)," 5 May 2004
(b) CJCSI 6212.01D, "Interoperability and Supportability of Information Technology and National Security Systems," 8 March 2006
(c) through (e), see Enclosure 1

1. References (a) and (b) establish the Defense Information Systems Agency, Joint Interoperability Test Command (JITC), as the responsible organization for interoperability test certification.

2. The TM-2000 Consolidated Answering System version 5.0 is hereinafter referred to as the System Under Test (SUT). The SUT consists of a consolidated answering center enclave and at least one remote base enclave. The SUT meets all of the critical interoperability requirements and is certified for joint use within the Defense Switched Network (DSN) as a Centralized Attendant System. The SUT is certified specifically with the following switching systems listed in Table 1 that are listed on the Unified Capabilities (UC) Approved Product List (APL) with their associated interfaces. The SUT meets the critical interoperability requirements for centralized attendant services set forth in Reference (c) and testing was conducted using test procedures derived from Reference (d). No other configurations, features, or functions, except those cited within this report, are certified by the JITC. This certification expires upon changes that affect interoperability, but no later than three years from the date of this memorandum.

Table 1. SUT Certified Switching System Configurations

Consolidated Answering Center Enclave		
Switch Name (See note 1.)	**Software Release**	**Certified Interfaces**
Nortel CS2100, MSL-100	Any Software Release listed on the UC APL	- Digital Meridian 5316 Business Line
Remote Base Enclaves		
Switch Name (See note 1.)	**Software Release**	**Certified Interfaces**
Nortel CS2100, MSL-100	Any Software Release listed on the UC APL	- Proprietary Analog Meridian Services Attendant Console Interface - Digital Meridian 5316 Business Line
Nortel DSN CS1000M-Single Group, DSN CS1000M-Multi Group, DSN M1 Option 61C, and DSN M1 Option 81C	Any Software Release listed on the UC APL	- 2 Wire Analog - Digital Meridian 2616 Business Line

Table 1. SUT Certified Switching System Configurations (continued)

Remote Base Enclaves (continued)		
Switch Name (See note 1.)	**Software Release**	**Certified Interfaces**
Avaya S8700, **S8710**, and S8720	Any Software Release listed on the UC APL	- Digital 6416 Business Line
Alcatel-Lucent 5ESS, CDX and VCDX	Any Software Release listed on the UC APL	- ISDN BRI (5E Custom) - Analog
IP WAN Transport Interface		
Interface		**Remarks**
IEEE 802.3u 100 Mbps Fast Ethernet		See note 2.

NOTES:
1 Those switching systems bolded and underlined were tested specifically with the SUT by JITC. The other switching systems were not tested with the SUT; however, these systems were previously tested and certified by JITC with the same interfaces, and JITC analysis determined them to be functionally identical for interoperability certification purposes and they are also certified with the SUT.
2 This interface is certified with both the SUT Remote Base Enclave and Consolidated Answering Center Enclave and is not optional. This interface is not required to support IPv6 in accordance with Reference (e).

LEGEND:

5E	5ESS	IPv6	Internet Protocol version 6
5ESS	Class 5 Electronic Switching System	ISDN	Integrated Services Digital Network
802.3u	Standard for carrier sense multiple access with collision detection at 100 Mbps	JITC	Joint Interoperability Test Command
		M1	Meridian 1
APL	Approved Product List	Mbps	Megabits per second
BRI	Basic Rate Interface	MSL	Meridian Switching Load
CDX	Compact Digital Exchange	SUT	System Under Test
CS	Communication Server	UC	Unified Capabilities
DSN	Defense Switched Network	VCDX	Very Compact Digital Exchange
IEEE	Institute of Electrical and Electronics Engineers	WAN	Wide Area Network
IP	Internet Protocol		

3. This certification is based on interoperability testing conducted by JITC, review of the vendor's Letters of Compliance (LoC), and Defense Information Assurance (IA)/Security Accreditation Working Group (DSAWG) accreditation. Interoperability testing was conducted by JITC at the Global Information Grid Network Test Facility, Fort Huachuca, Arizona, from 2 through 12 September 2008. Review of vendor's LoC was completed on 25 September 2008. The SUT supports the same software, interfaces, and functionality as when it was previously tested. The only difference is that the SUT now supports either Microsoft XP or Microsoft Windows Vista operating system platform. A review of the SUT and comparison with the new requirements in References (c) and (e) was conducted on 15 December 2009 to determine the SUT was certified for interoperability within the DSN without additional interoperability testing. DSAWG granted accreditation on 31 March 2010 based on the security testing completed by DISA-led IA test teams and published in a separate report, Reference (f). The Certification Testing Summary (Enclosure 2) documents the test results and describes the test configuration.

4. The Functional Requirements used to evaluate the interoperability of the SUT and the interoperability statuses are indicated in Table 2.

Table 2. SUT Functional Requirements and Interoperability Status

Interface(s)	Critical	Certified	Functional Requirements	Met	UCR Sections
Consolidated Answering Center Enclave: Nortel Meridian Services Attendant Console Analog Interface with Meridian 5316 Proprietary Digital Line (CS2100)	No[1]	Yes	Precedence and Preemption (R)	Yes	5.2.1.2.1
			Call Display (R)	Yes	5.2.1.2.2
			Class of Service Override (R)	Yes	5.2.1.2.3
Remote Base Enclave: Nortel Meridian 2616 Proprietary Digital Line with 2-Wire Analog Line (CS1000M)[2]	No[1]	Yes	Busy Override and Busy Verification (R)	Yes	5.2.1.2.4
			Night Service (R)	Yes	5.2.1.2.5
Remote Base Enclave: Alcatel-Lucent ISDN BRI 5ECustom Line (5ESS) with 2-Wire Analog Line[3]	No[1]	Yes	Automatic Recall of Attendant (R)	Yes	5.2.1.2.6
			Calls in Queue to the Attendant (R)	Yes	5.2.1.2.7
Remote Base Enclave: Nortel Meridian 5316 Proprietary Digital Line with 2-Wire Analog Line (CS2100)[4]	No[1]	Yes	Release To Pivot for Operator Services (R)	Yes	5.2.1.2.8
IEEE 802.3u 100BaseT Ethernet[5]	No[1]	Yes	Security (R)	See note 6.	3.2.3, 3.2.5, and 5.4.6.1

NOTES:
1 The UCR does not specify a minimum required interface for a centralized attendant.
2 These two SUT interfaces are certified with the SUT when the SUT Remote Base Enclave includes the following switches on the UC APL: Nortel DSN CS1000M-Single Group, DSN CS1000M-Multi Group, DSN M1 Option 61C, and DSN M1 Option 81C. Furthermore, this remote base enclave and associated interfaces are optional.
3 These two SUT interfaces are certified with the SUT when the SUT Remote Base Enclave includes the following switches on the UC APL: Alcatel-Lucent 5ESS, CDX, and VCDX. Furthermore, this remote base enclave and associated interfaces are optional.
4 These two SUT interfaces are certified with the SUT when the SUT Remote Base Enclave includes the following switches on the UC APL: Nortel CS2100 and MSL-100. Furthermore, this remote base enclave and associated interfaces are optional.
5 This interface is certified with both the SUT Remote Base Enclave and Consolidated Answering Center Enclave and is not optional. This interface is not required to support IPv6 in accordance with Reference (e).
6 Security is tested by DISA-led Information Assurance test teams and published in a separate report, Reference (f).

LEGEND:

5E	5ESS	IEEE	Institute of Electrical and Electronics Engineers
5ESS	Class 5 Electronic Switching System	IPv6	Internet Protocol version 6
100BaseT	100 Mbps (Baseband Operation, Twisted Pair) Ethernet	ISDN	Integrated Services Digital Network
802.3u	Standard for carrier sense multiple access with collision detection at 100 Mbps	M1	Meridian 1
		Mbps	Megabits per second
A	Appendix	MSL	Meridian Switching Load
APL	Approved Products List	R	Required
BRI	Basic Rate Interface	SUT	System Under Test
CDX	Compact Digital Exchange	UC	Unified Capabilities
CS	Communication Server	UCR	Unified Capabilities Requirements
DISA	Defense Information Systems Agency	VCDX	Very Compact Digital Exchange
DSN	Defense Switched Network		

5. No detailed test report was developed in accordance with the Program Manager's request. JITC distributes interoperability information via the JITC Electronic Report Distribution (ERD) system, which uses Unclassified-But-Sensitive Internet Protocol Router Network (NIPRNet) e-mail. More comprehensive interoperability status information is available via the JITC System Tracking Program (STP). The STP is accessible by .mil/.gov users on the NIPRNet at https://stp.fhu.disa.mil. Test reports, lessons learned, and related testing documents and references are on the JITC Joint Interoperability Tool (JIT) at http://jit.fhu.disa.mil (NIPRNet),

or http://199.208.204.125 (SIPRNet). Information related to DSN testing is on the Telecom Switched Services Interoperability (TSSI) website at http://jitc.fhu.disa.mil/tssi.

6. The JITC point of contact is Mr. Joseph Roby, DSN 879-0507, commercial (520) 538-0507, FAX DSN 879-4347, or e-mail to joseph.roby@disa.mil. The JITC's mailing address is P.O. Box 12798, Fort Huachuca, AZ 85670-2798. The tracking number for the SUT is 0923903.

FOR THE COMMANDER:

2 Enclosures a/s

for RICHARD A. MEADOR
Chief
Battlespace Communications Portfolio

Distribution (electronic mail):
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Defense Information Systems Agency, GS23

ADDITIONAL REFERENCES

(c) Office of the Assistant Secretary of Defense, "Department of Defense Unified Capabilities Requirements 2008," 22 January 2009

(d) Joint Interoperability Test Command, "Defense Switched Network Generic Switch Test Plan (GSTP), Change 2," 2 October 2006

(e) Office of the Secretary of Defense, "Interim Unified Capabilities (UC) IPv6 Rules of Engagement (ROE)," 31 July 2009

(f) Joint Interoperability Test Command, "Information Assurance (IA) Assessment of T-Metrics, Inc. (TM)-2000, Consolidated Answering System Version 5.0 (Tracking Number 0923903)," 31 March 2010

CERTIFICATION TESTING SUMMARY

1. SYSTEM TITLE. The T-Metrics, Inc (TM)-2000 Consolidated Answering System Version 5.0 is hereinafter referred to as the System Under Test (SUT).

2. PROPONENT. United States Air Force, Headquarters, Air Education and Training Command (HQ AETC).

3. PROGRAM MANAGER. Ricky Rider, A6OI, 61 Main Circle, Suite 2, Randolph Air Force Base, Texas, 78150 e-mail: ricky.rider@randolph.af.mil.

4. TESTER. Joint Interoperability Test Command (JITC), Fort Huachuca, Arizona.

5. SYSTEM UNDER TEST DESCRIPTION. The SUT consists of a consolidated answering center enclave and at least one of the optional remote base enclaves with their respective attendant consoles. The SUT communicates between the consolidated answering center enclave and any one of the optional remote base enclaves via Internet Protocol (IP). The SUT offers a centralized attendant capability for remote bases. These calls are forwarded automatically to one centralized location. The centralized attendant can provide information assistance or transfer a user back to their respective originating switch avoiding an incoming and outgoing toll call. This functionality is called Release to Pivot. The SUT allows calls at remote locations to be serviced by live agents at a consolidated (or central) location. Because calls could be transferred by the agents at the centralized location, this system is designed so that operator assistance calls placed at the remote bases are automatically forwarded to the consolidated location. The system at the remote base separates the elements of the original call into its audio component and its signaling component. The audio path is then connected from the remote base to the consolidated answering center via the Defense Switched Network (DSN), and the signaling component is connected from the remote base to the consolidated base using the Department of Defense (DoD) IP network.

The SUT is certified specifically with the following switching systems listed in Table 2-1 that are also listed on the Unified Capabilities (UC) Approved Product List (APL) with their associated interfaces.

Table 2-1. SUT Certified Switching System Configurations

Consolidated Answering Center Enclave		
Switch Name (See note 1.)	**Software Release**	**Certified Interfaces**
Nortel CS2100, MSL-100	Any Software Release listed on the UC APL	- Digital Meridian 5316 Business Line
Remote Base Enclaves		
Switch Name (See note 1.)	**Software Release**	**Certified Interfaces**
Nortel CS2100, MSL-100	Any Software Release listed on the UC APL	- Proprietary Analog Meridian Services Attendant Console Interface - Digital Meridian 5316 Business Line
Nortel DSN CS1000M-Single Group, DSN CS1000M-Multi Group, DSN M1 Option 61C, and DSN M1 Option 81C	Any Software Release listed on the UC APL	- 2 Wire Analog - Digital Meridian 2616 Business Line

Table 2-1. SUT Certified Switching System Configurations (continued)

Remote Base Enclaves (continued)		
Switch Name (See note 1.)	**Software Release**	**Certified Interfaces**
Avaya S8700, **S8710**, and S8720	Any Software Release listed on the UC APL	- Digital 6416 Business Line
Alcatel-Lucent 5ESS, CDX and VCDX	Any Software Release listed on the UC APL	- ISDN BRI (5E Custom) - Analog
IP WAN Transport Interface		
Interface		**Remarks**
IEEE 802.3u 100 Mbps Fast Ethernet		See note 2.

NOTES:

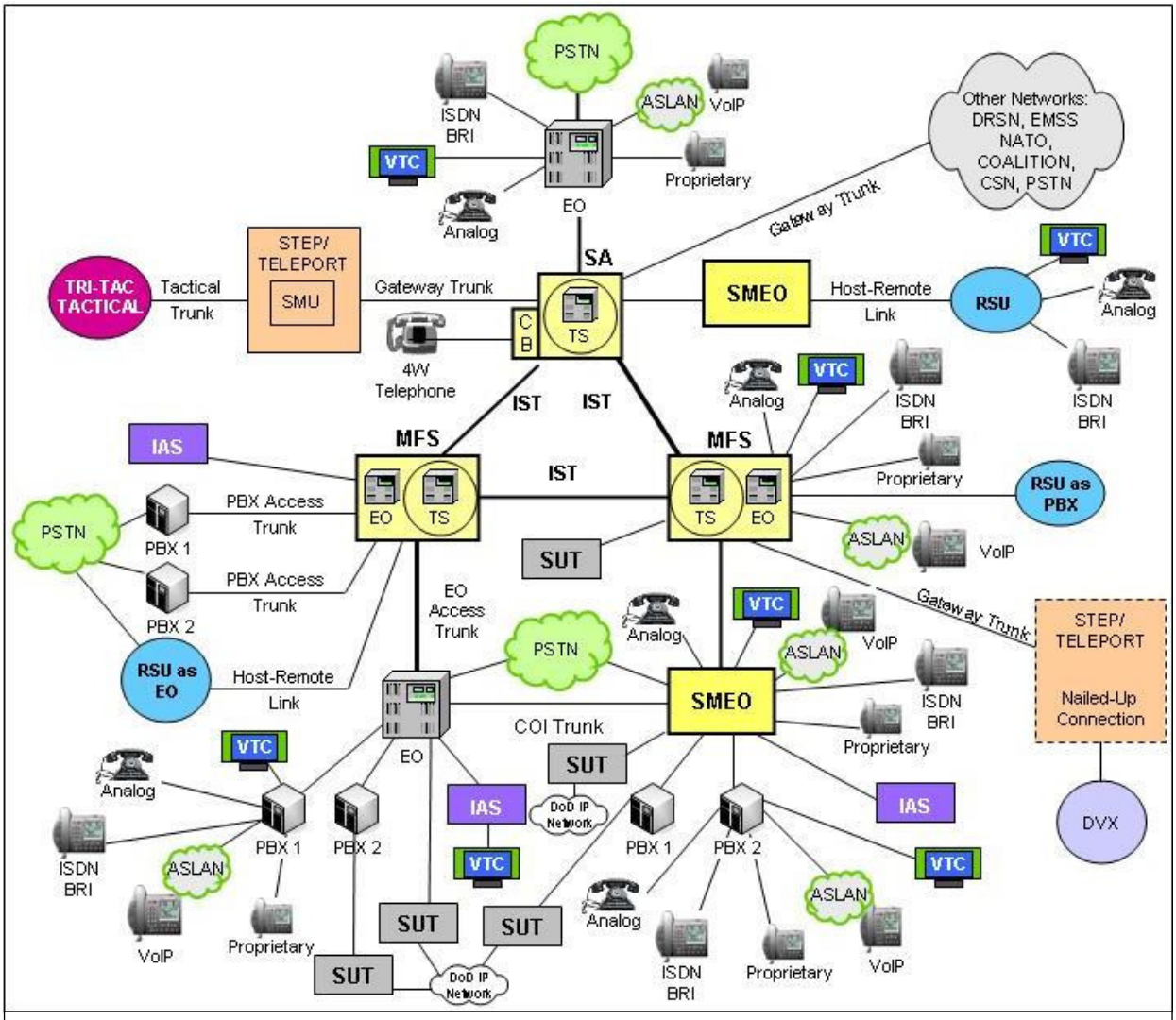
1 Those switching systems bolded and underlined were tested specifically with the SUT by JITC. The other switching systems were not tested with the SUT; however, these systems were previously tested and certified by JITC with the same interfaces, and JITC analysis determined them to be functionally identical for interoperability certification purposes and they are also certified with the SUT.

2 This interface is certified with both the SUT Remote Base Enclave and Consolidated Answering Center Enclave and is not optional. This interface is not required to support IPv6 in accordance with Reference (e).

LEGEND:

5E	5ESS	IPv6	Internet Protocol version 6
5ESS	Class 5 Electronic Switching System	ISDN	Integrated Services Digital Network
802.3u	Standard for carrier sense multiple access with collision detection at 100 Mbps	JITC	Joint Interoperability Test Command
		M1	Meridian 1
APL	Approved Product List	Mbps	Megabits per second
BRI	Basic Rate Interface	MSL	Meridian Switching Load
CDX	Compact Digital Exchange	SUT	System Under Test
CS	Communication Server	UC	Unified Capabilities
DSN	Defense Switched Network	VCDX	Very Compact Digital Exchange
IEEE	Institute of Electrical and Electronics Engineers	WAN	Wide Area Network
IP	Internet Protocol		

6. OPERATIONAL ARCHITECTURE. The Unified Capabilities Requirements (UCR) DSN architecture in Figure 2-1 depicts the relationship of the SUT to the DSN switches.



LEGEND:

4W	4-Wire
ASLAN	Assured Services Local Area Network
BRI	Basic Rate Interface
CB	Channel Bank
COI	Community of Interest
CSN	Canadian Switch Network
DoD	Department of Defense
DRSN	Defense Red Switch Network
DSN	Defense Switched Network
DVX	Deployable Voice Exchange
EMSS	Enhanced Mobile Satellite System
EO	End Office
IAS	Integrated Access Switch
IP	Internet Protocol
ISDN	Integrated Services Digital Network
IST	Interswitch Trunk
MFS	Multifunction Switch
NATO	North Atlantic Treaty Organization
PBX	Private Branch Exchange
PBX 1	Private Branch Exchange 1
PBX 2	Private Branch Exchange 2
PSTN	Public Switched Telephone Network
RSU	Remote Switching Unit
SA	Standalone
SMEO	Small End Office
SMU	Switched Multiplex Unit
STEP	Standardized Tactical Entry Point
SUT	System Under Test
Tri-Tac	Tri-Service Tactical Communications Program
TS	Tandem Switch
VoIP	Voice over Internet Protocol
VTC	Video Teleconferencing

Figure 2-1. DSN Architecture

7. REQUIRED SYSTEM INTERFACES. Requirements specific to the SUT and interoperability results are listed in Table 2-2. These requirements are derived from the UCR Interface and Functional Requirements and were verified through JITC testing.

Table 2-2. SUT Functional Requirements and Interoperability Status

Interface(s)	Critical	Certified	Functional Requirements	Met	UCR Sections
Consolidated Answering Center Enclave: Nortel Meridian Services Attendant Console Analog Interface with Meridian 5316 Proprietary Digital Line (CS2100)	No[1]	Yes	Precedence and Preemption (R)	Yes	5.2.1.2.1
			Call Display (R)	Yes	5.2.1.2.2
			Class of Service Override (R)	Yes	5.2.1.2.3
Remote Base Enclave: Nortel Meridian 2616 Proprietary Digital Line with 2-Wire Analog Line (CS1000M)[2]	No[1]	Yes	Busy Override and Busy Verification (R)	Yes	5.2.1.2.4
			Night Service (R)	Yes	5.2.1.2.5
Remote Base Enclave: Alcatel-Lucent ISDN BRI 5ECustom Line (5ESS) with 2-Wire Analog Line[3]	No[1]	Yes	Automatic Recall of Attendant (R)	Yes	5.2.1.2.6
			Calls in Queue to the Attendant (R)	Yes	5.2.1.2.7
Remote Base Enclave: Nortel Meridian 5316 Proprietary Digital Line with 2-Wire Analog Line (CS2100)[4]	No[1]	Yes	Release To Pivot for Operator Services (R)	Yes	5.2.1.2.8
IEEE 802.3u 100BaseT Ethernet[5]	No[1]	Yes	Security (R)	See note 6.	3.2.3, 3.2.5, and 5.4.6.1

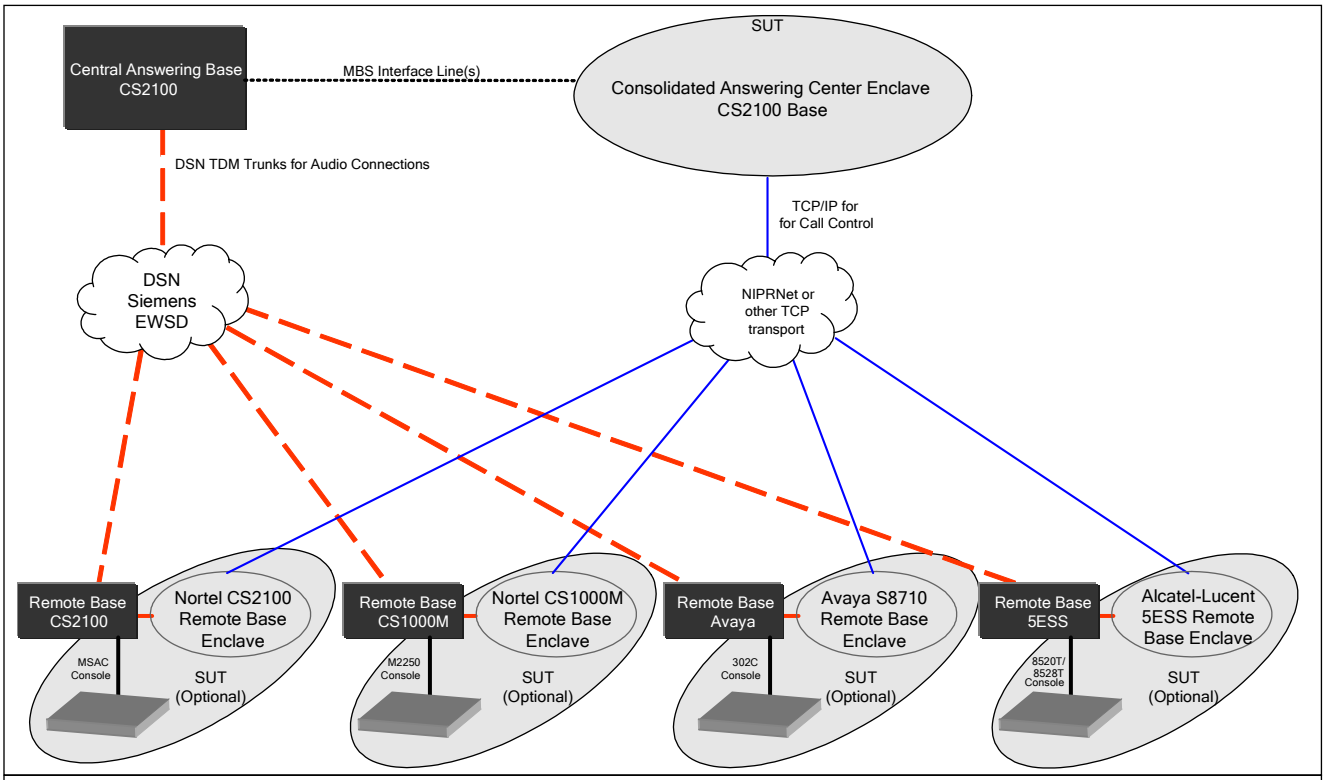
NOTES:
1 The UCR does not specify a minimum required interface for a centralized attendant.
2 These two SUT interfaces are certified with the SUT when the SUT Remote Base Enclave includes the following switches on the UC APL: Nortel DSN CS1000M-Single Group, DSN CS1000M-Multi Group, DSN M1 Option 61C, and DSN M1 Option 81C. Furthermore, this remote base enclave and associated interfaces are optional.
3 These two SUT interfaces are certified with the SUT when the SUT Remote Base Enclave includes the following switches on the UC APL: Alcatel-Lucent 5ESS, CDX, and VCDX. Furthermore, this remote base enclave and associated interfaces are optional.
4 These two SUT interfaces are certified with the SUT when the SUT Remote Base Enclave includes the following switches on the UC APL: Nortel CS2100 and MSL-100. Furthermore, this remote base enclave and associated interfaces are optional.
5 This interface is certified with both the SUT Remote Base Enclave and Consolidated Answering Center Enclave and is not optional. This interface is not required to support IPv6 in accordance with Reference (e).
6 Security is tested by DISA-led Information Assurance test teams and published in a separate report, Reference (f).

LEGEND:

5E	5ESS	DSN	Defense Switched Network
5ESS	Class 5 Electronic Switching System	IEEE	Institute of Electrical and Electronics Engineers
100BaseT	100 Mbps (Baseband Operation, Twisted Pair) Ethernet	IPv6	Internet Protocol version 6
		ISDN	Integrated Services Digital Network
802.3u	Standard for carrier sense multiple access with collision detection at 100 Mbps	M1	Meridian 1
		Mbps	Megabits per second
A	Appendix	MSL	Meridian Switching Load
APL	Approved Products List	R	Required
BRI	Basic Rate Interface	SUT	System Under Test
CDX	Compact Digital Exchange	UC	Unified Capabilities
CS	Communication Server	UCR	Unified Capabilities Requirements
DISA	Defense Information Systems Agency	VCDX	Very Compact Digital Exchange

8. TEST NETWORK DESCRIPTION. The SUT was tested at JITC's Global Information Grid Network Test Facility in a manner and configuration similar to that of the DSN operational environment. Testing the system's required functions and features

was conducted using the test configuration depicted in Figures 2-2 through Figures 2-7. Figure 2-2 depicts a high-level diagram for the SUT consolidated answering system. Figure 2-3 depicts the Nortel CS2100 consolidated answering center enclave. Figure 2-4 depicts the Nortel CS2100 remote base enclave. Figure 2-5 depicts the Nortel CS1000M remote base enclave. Figure 2-6 depicts the Alcatel-Lucent 5ESS remote base enclave. Figure 2-7 depicts the Avaya S8710 remote base enclave.

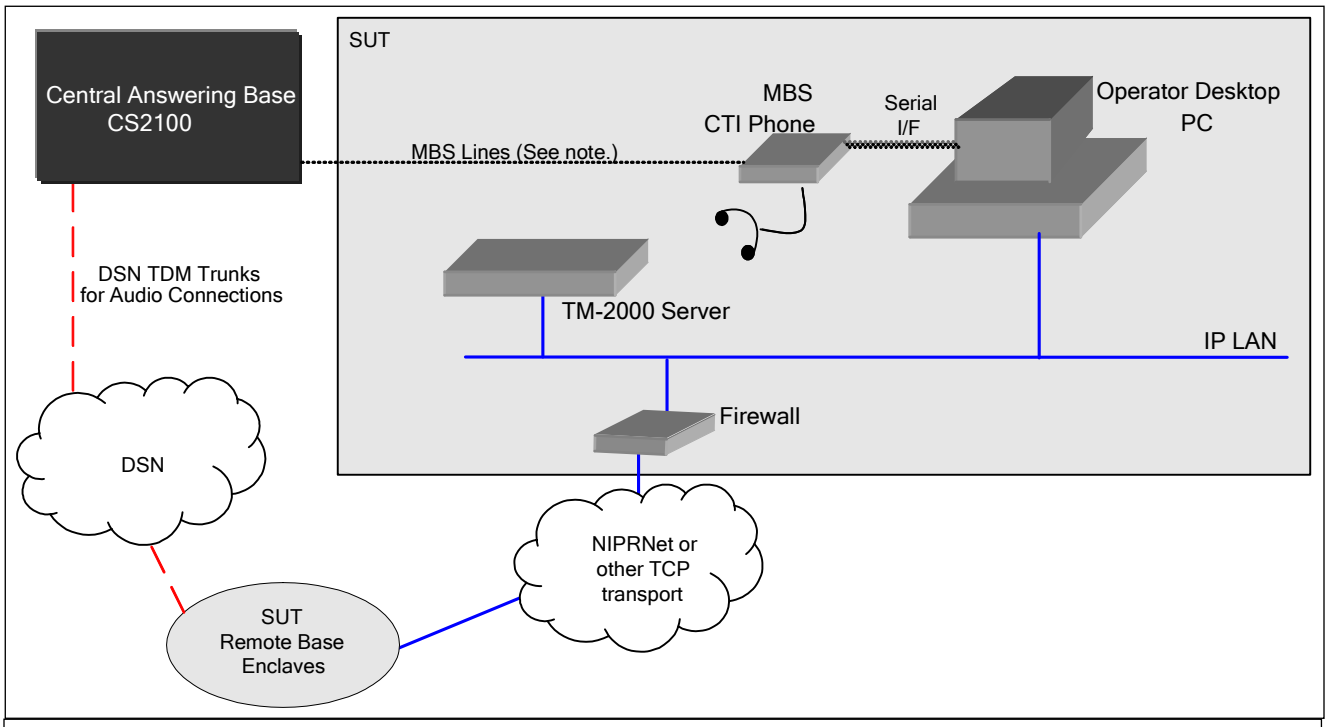


LEGEND:

100BaseT	100 Mbps (Baseband Operation, Twisted Pair) Ethernet
5ESS:	Class 5 Electronic Switching System
BRI	Basic Rate Interface
CAS:	Channel Associated Signaling
CS:	Communication Server
DSN:	Defense Switched Network
EWSD	Elektronisches Wählsystem Digital
IP:	Internet Protocol
Mbps	Megabits per second
MBS:	Meridian Business Set
MSAC:	Meridian Services Attendant Console
NIPRNET	Unclassified-But-Sensitive Internet Protocol Router Network
PRI:	Primary Rate Interface
SS7	Signaling System 7
SUT:	System Under Test
TCP	Transmission Control Protocol
TDM:	Time Division Multiplexing

TDM Trunk Interfaces (CAS, PRI, SS7)
100BaseT Ethernet
TDM lines (analog, BRI, digital, proprietary)
MBS Interface Lines

Figure 2-2. High-Level Diagram for the Consolidated Answering System



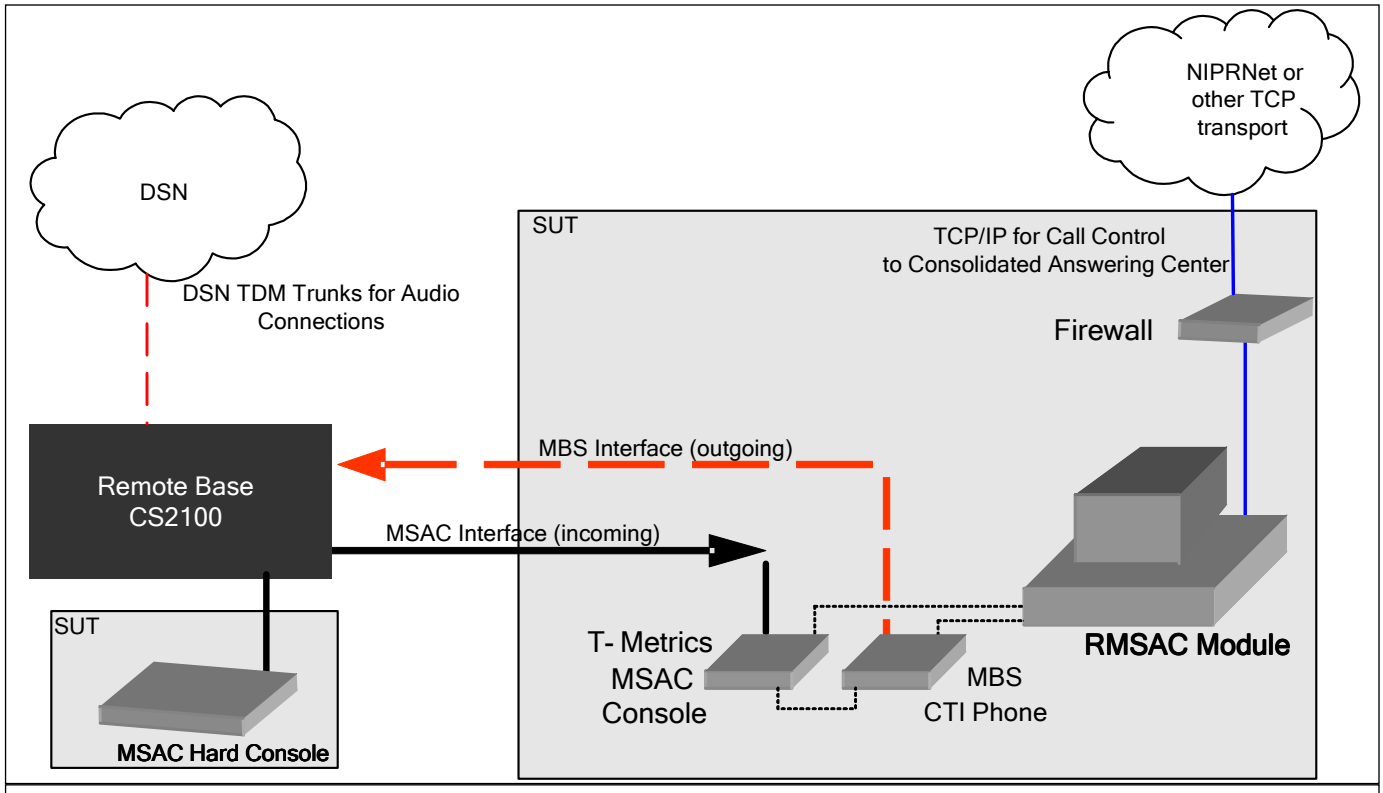
NOTE: The SUT is certified with any number of MBS lines and operator desktop PCs.

LEGEND:

100BaseT	100 Mbps (Baseband Operation, Twisted Pair) Ethernet
CAS	Channel Associated Signaling
CS	Communication Server
CTI	Computer Telephone Interface
DSN	Defense Switched Network
I/F	Intermediate Frequency
IP	Internet Protocol
LAN	Local Area Network
MBS	Meridian Business Set
Mbps	Megabits per second
NIPRNET	Unclassified-But-Sensitive Internet Protocol Router Network
PC	Personal Computer
PRI	Primary Rate Interface
SS7	Signaling System 7
SUT	System Under Test
TCP	Transmission Control Protocol
TDM	Time Division Multiplexing
TM	T-Metrics

TDM Trunk Interfaces (CAS, PRI, SS7)
100BaseT Ethernet
MBS Interface Lines

Figure 2-3. Nortel CS2100 Consolidated Answering Center Enclave

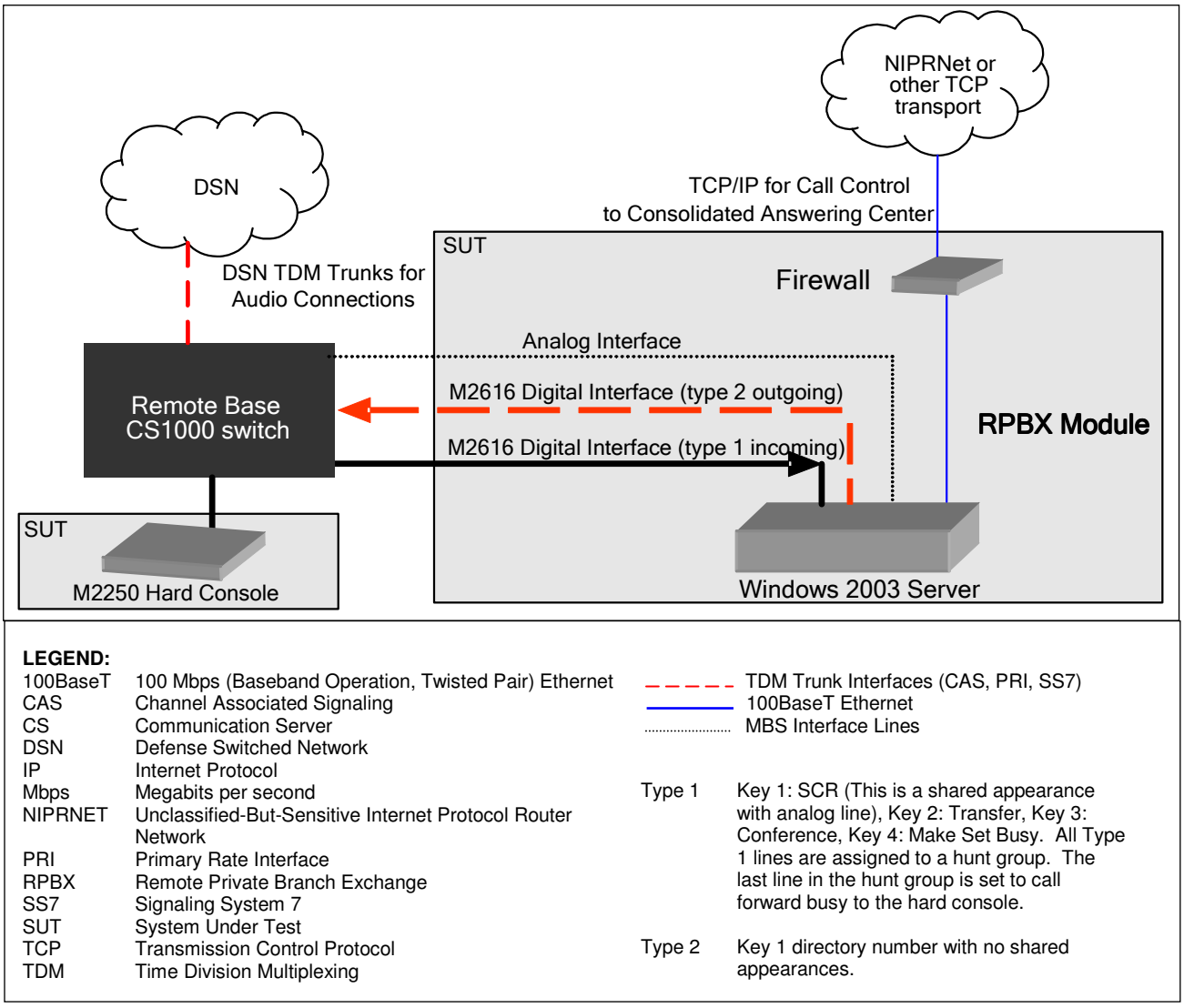


LEGEND:

100BaseT	100 Mbps (Baseband Operation, Twisted Pair) Ethernet
CAS	Channel Associated Signaling
CS	Communication Server
CTI	Computer Telephone Interface
DSN	Defense Switched Network
EIA	Electronic Industries Alliance
EIA-232	Standard for defining the mechanical and electrical characteristics for connecting Data Terminal Equipment (DTE) and Data Circuit-terminating Equipment (DCE) data communications devices
IP	Internet Protocol
MBS	Meridian Business Set
Mbps	Megabits per second
MSAC	Meridian Services Attendant Console
NIPRNET	Unclassified-But-Sensitive Internet Protocol Router Network
PRI	Primary Rate Interface
RMSAC	Remote Meridian Services Attendant Console
SS7	Signaling System 7
SUT	System Under Test
TCP	Transmission Control Protocol
TDM	Time Division Multiplexing

TDM Trunk Interfaces (CAS, PRI, SS7)
100BaseT Ethernet
EIA-232 Serial

Figure 2-4. Nortel CS2100 Remote Base Enclave



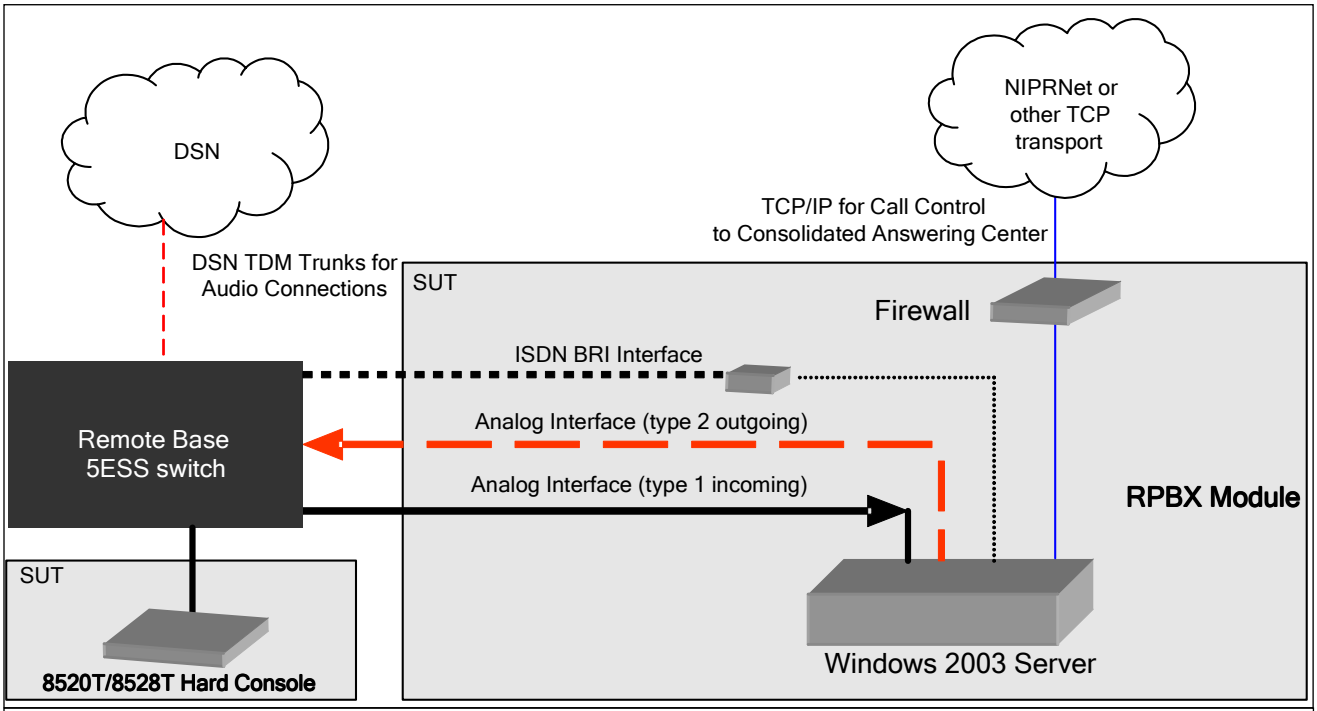
LEGEND:

100BaseT	100 Mbps (Baseband Operation, Twisted Pair) Ethernet
CAS	Channel Associated Signaling
CS	Communication Server
DSN	Defense Switched Network
IP	Internet Protocol
Mbps	Megabits per second
NIPRNET	Unclassified-But-Sensitive Internet Protocol Router Network
PRI	Primary Rate Interface
RPBX	Remote Private Branch Exchange
SS7	Signaling System 7
SUT	System Under Test
TCP	Transmission Control Protocol
TDM	Time Division Multiplexing

– – – – –	TDM Trunk Interfaces (CAS, PRI, SS7)
———	100BaseT Ethernet
.....	MBS Interface Lines

Type 1	Key 1: SCR (This is a shared appearance with analog line), Key 2: Transfer, Key 3: Conference, Key 4: Make Set Busy. All Type 1 lines are assigned to a hunt group. The last line in the hunt group is set to call forward busy to the hard console.
Type 2	Key 1 directory number with no shared appearances.

Figure 2-5. Nortel CS1000M Remote Base Enclave



LEGEND:

100BaseT	100 Mbps (Baseband Operation, Twisted Pair) Ethernet
5ESS	Class 5 Electronic Switching System
BRI	Basic Rate Interface
CAS	Channel Associated Signaling
DN	Directory Number
DSN	Defense Switched Network
IP	Internet Protocol
ISDN	Integrated Services Digital Network
Mbps	Megabits per second
NIPRNET	Unclassified-But-Sensitive Internet Protocol Router Network
PRI	Primary Rate Interface
RPBX	Remote Private Branch Exchange
SS7	Signaling System 7
SUT	System Under Test
TCP	Transmission Control Protocol
TDM	Time Division Multiplexing
USB	Universal Serial Bus

TDM Trunk Interfaces (CAS, PRI, SS7)
100BaseT Ethernet
USB IP

Type 1	DN is a shared appearance with the ISDN BRI line. Lines are assigned to a hunt group, and the last number in the hunt group is configured to call forward busy to the hard console. All calls above ROUTINE are routed to the hard console.
Type 2	DN with no shared appearances.

Figure 2-6. Alcatel-Lucent 5ESS Remote Base Enclave

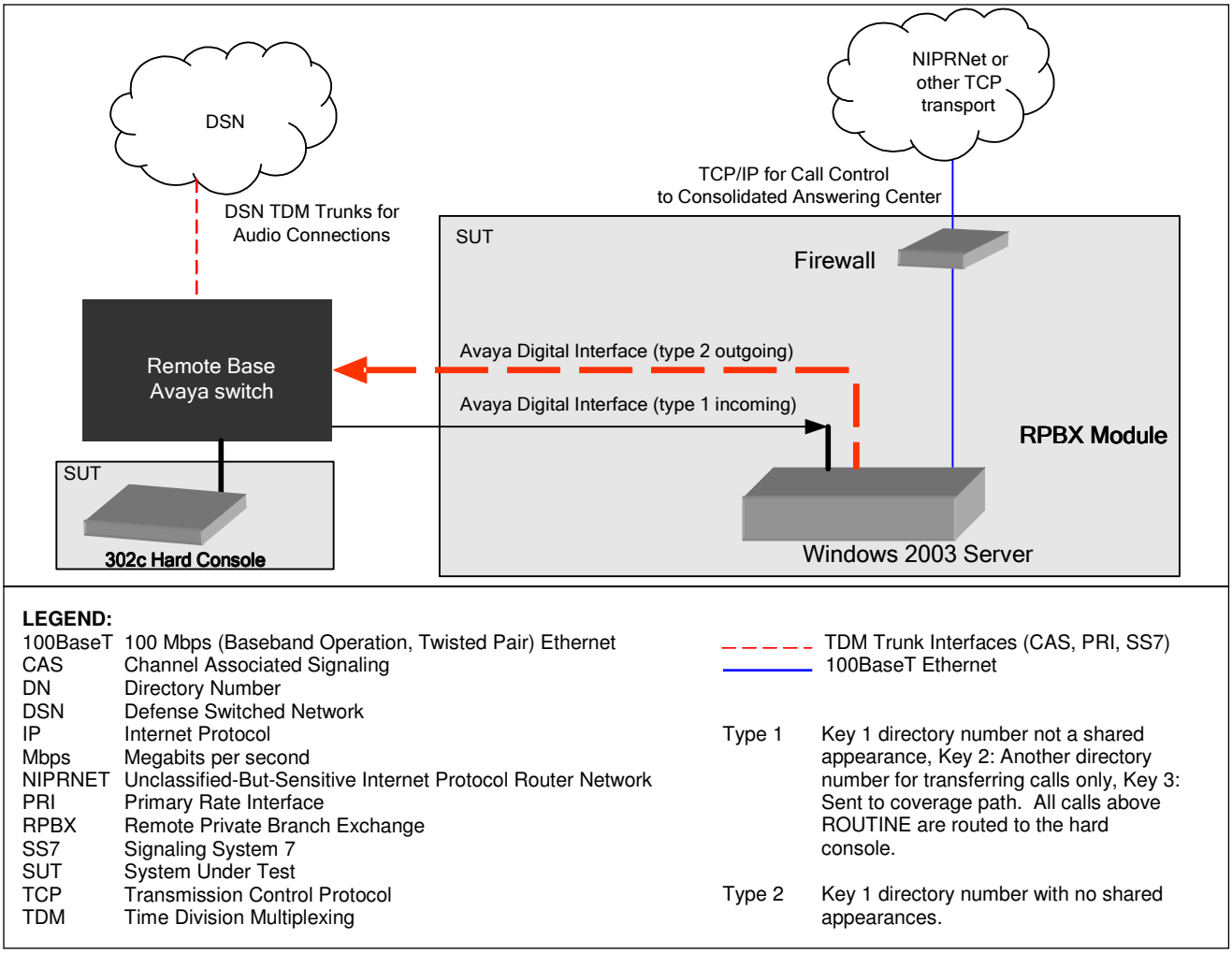


Figure 2-7. Avaya S8710 Remote Base Enclave

9. SYSTEM CONFIGURATIONS. Table 2-3 provides the system configurations, hardware, and software components tested with the SUT. The SUT was tested in an operationally realistic environment to determine interoperability with a complement of DSN switches noted in Table 2-3. Table 2-3 lists the DSN switches which depict the tested configuration and is not intended to identify the only switches that are certified with the SUT. The SUT is certified with switching systems listed on the UC APL that offer the same certified interfaces.

Table 2-3. Tested System Configurations

System Name	Hardware/Software Release
Nortel CS2100	Succession Enterprise (SE) 09.1
Nortel CS1000M	DSN 4.5w
Avaya S8710	4.02 Release 731.7 Patch 14419
Alcatel-Lucent 5ESS	5E16.2 Broadcast Warning Message (BWM) 08-0002
Siemens EWSD	Release 19d with Patch Group 46

Table 2-3. Tested System Configurations (continued)

SUT	Hardware	Card Name / Part Number/ Name	Software/ Firmware
T-Metrics Consolidated Answering System Version 5.0	TM-2000 ACD SuperMicro TM PC Server		Windows 2003 Release 2 Service Pack 2
			ACD Controller v5.0
			Event Server v2.0
			Attachmate Reflection WRQ v6.1.3
			TM-2000 v1.4.2000
			IIS 6.0
			TotalHost v2.12
	RPBX Server	Dialogic D/82	Dialogic System R6.0
		Dialogic D/120	
		XISDN	v117b
		XMBS	Windows 2003 Release 2 Service Pack 2
			Attachmate Reflection WRQ v6.1.3
			TMI DigiModule R4.0
			TotalHost v2.12
	Consolidated Answering Center Agent PC	XMBS	v3.24
			Windows XP Service Pack 3
			IE 7.0
			TMI DigiModule R4.0
			Agent Module v2.0
			CMSAC v6.0
			TotalHost v2.12
			Attachmate Reflection WRQ v6.1.3
	Consolidated Answering Center Agent PC	XMBS	v3.24
			Microsoft Windows Vista Service Pack 2
			IE 7.0
			TMI DigiModule R4.0
			Agent Module v2.0
			CMSAC v6.0
			TotalHost v2.12
			Attachmate Reflection WRQ v6.1.3
	RMSAC Server	XMSAC	v3.24
		XMBS	v2.1
			Microsoft Windows Vista SP 2
			MSAC v6.0
			TMI DigiModule R4.0
			TotalHost v2.12
			Attachmate Reflection WRQ v6.1.3
	ISDN BRI U-Interface Converter		N/A
	Nortel CS2100 MSAC Hard Console		
	Nortel CS1000M M2250 Hard Console		
	Avaya S8710 302C Hard Console		
	Alcatel-Lucent ISDN 8520T, 8528T		8520T with software FP3.2-05/02/94
			8528T with software FP3.6-08/13/96

LEGEND:

5ESS	Class 5 Electronic Switching System
ACD	Automated Call Distributor
CMSAC	Centralized Meridian Services Attendant Console
CS	Communication Server
EWSD	Elektronisches Wählsystem Digital
IE	Internet Explorer
IIS	Internet Information Services
ISDN	Integrated Services Digital Network
MSAC	Meridian Services Attendant Console
N/A	Not Applicable
PC	Personal Computer
RMSAC	Remote Meridian Services Attendant Console
RPBX	Remote Public Branch Exchange
TM	T-Metrics
TMI	T-Metrics Interface
USB	Universal Serial Bus
v	Version
XMBS	External Meridian Business Set
XMSAC	External Meridian Services Attendant Console
XISDN	External ISDN Line Monitor

10. TEST LIMITATIONS. None.

11. TEST RESULTS

a. Discussion

(1) The UCR, section 5.2.1.2.1, states the attendant console shall interoperate with Multi-Level Precedence and Preemption (MLPP) as described in UCR, section 5.2.2. The console shall be able to initiate all levels of precedence calls (i.e., ROUTINE through FLASH-OVERRIDE). The SUT successfully met the requirements for MLPP as described in UCR, section 5.2.2, for the Centralized Attendant. The SUT met this requirement with the remote base enclave hard consoles.

(2) The UCR, section 5.2.1.2.2, states the attendant console shall provide a visual display of the calling number, class of service, and precedence level for incoming direct dialed calls and diverted calls to the attendant. The SUT provided a visual display of the calling number, Class of Service (CoS) and precedence level for incoming direct-dialed calls and diverted calls to the attendant. The SUT met this requirement with the remote base enclave hard consoles.

(3) The UCR, section 5.2.1.2.3, states the attendant shall provide the capability to override any class of service (calling area or precedence) of the calling party on a call-by-call basis. The SUT provided the capability to override any CoS (calling area or precedence) of the calling party on a call-by-call basis. This function is reliant upon the hard console that is already certified with the switches that the SUT was tested against. The SUT met this requirement with the remote base enclave hard consoles.

(4) The UCR, section 5.2.1.2.4, states the attendant shall have the capability to override a busy line condition. If the called line being verified is busy, off-hook supervision shall be given to the attendant performing the busy verification. When a verification code is used, all digits of the code must be dialed before cut-through to the line can be accomplished. Connections to commercial Central Office access lines shall be restricted from busy verification access. The attendant shall have the capability to enter an existing busy line to inform the user of an incoming call. An override tone shall be provided to the busy line prior to the attendant entering the conversation, and the tone shall be repeated periodically as long as the attendant is connected. Selected stations may be classmarked to deny attendant break-in. In particular, it shall be possible to classmark the lines of selected stations (e.g., all data and secure voice) to preclude the busy verification or busy override being applied to the selected station lines. The SUT met this requirement with the remote base enclave hard consoles.

(5) The UCR, section 5.2.1.2.5, states the attendant console shall have the ability to route all calls normally directed to the console to a night service deflection. The night service deflection shall be a fixed or manually selected directory number. The SUT successfully demonstrated the ability to route all calls normally directed to the console to a night service deflection. The night service deflection was a fixed or manually selected directory number. The SUT met this requirement with the remote base enclave hard consoles.

(6) The UCR, section 5.2.1.2.6, states when an attendant extends a call to a station that is busy or does not answer within a preset time, the extended party shall be recalled automatically to the console. Recalls shall be transferred to the console that originally processed the call. If that console is busy, the recall shall be placed into the console queue; but if the console is out of service, the recall shall be routed to another console. When an attendant extended a call to a station that was busy or did not answer within a preset time, the extended party was automatically recalled to the console. If that console was busy, the recall was placed into the console queue; if the console was out of service, the recall was routed to another console. The SUT met this requirement with the remote base enclave hard consoles.

(7) The UCR, section 5.2.1.2.7, states the attendant console shall have the capability to place calls in a waiting queue. Calls placed in queue to the attendant console shall be retrieved by the attendant in order of precedence level (FLASH-OVERRIDE first, ROUTINE last) and longest holding time. Calls in queue shall not be lost when a console is placed out of service or forwarded to night service deflection. When the console is placed out of service or forwarded to night service while calls are in queue the console shall be capable of one of the following solutions: The SUT successfully demonstrated the capability to place calls in a waiting queue. Calls placed in queue to the attendant console were retrieved by the attendant in order of precedence level (FLASH-OVERRIDE first, ROUTINE last) and longest holding time. Calls in queue were not lost when a console was placed out of service or forwarded to night service deflection. When the console was placed out of service or forwarded to night service while calls were in queue, the console was capable of both of the following solutions:

(a) All calls in queue were forwarded first to the centralized attendant, then to night service.

(b) All subsequent calls placed to the attendant console were forwarded first to the centralized attendant and then to night service. The attendant console was able to answer all remaining calls in queue, preventing any calls from being lost.

The SUT met this requirement with the remote base enclave hard consoles.

(8) The UCR, section 5.2.1.2.8, states that a centralized attendant shall have the capability, when a new destination is determined, to have the connection established from the originating switch. The result is that the release switch at the consolidated answering center saves and incoming and outgoing trunk relative to case where the call is forwarded to the new destination. The SUT met this requirement with call control via IP between the consolidated answering enclave and the remote base enclaves.

(9) Security is tested and met by DISA-led Information Assurance test teams and is published in a separate report, Reference (f).

b. Test Summary. The SUT meets all of the critical interoperability requirements and is certified for joint use within the DSN as a Centralized Attendant System. The SUT is certified specifically with the following switching systems listed in Table 2-1 that are listed on the UC APL with their associated interfaces.

12. TEST AND ANALYSIS REPORT. No detailed test report was developed in accordance with the Program Manager's request. JITC distributes interoperability information via the JITC Electronic Report Distribution (ERD) system, which uses Unclassified-But-Sensitive Internet Protocol Router Network (NIPRNet) e-mail. More comprehensive interoperability status information is available via the JITC System Tracking Program (STP). The STP is accessible by .mil/gov users on the NIPRNet at https://stp.fhu.disa.mil. Test reports, lessons learned, and related testing documents and references are on the JITC Joint Interoperability Tool (JIT) at http://jit.fhu.disa.mil (NIPRNet), or http://199.208.204.125 (SIPRNet). Information related to DSN testing is on the Telecom Switched Services Interoperability (TSSI) website at http://jitc.fhu.disa.mil/tssi.