



DEFENSE INFORMATION SYSTEMS AGENCY
JOINT INTEROPERABILITY TEST COMMAND
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IN REPLY
REFER TO: Networks, Transmission and
Integration Division (JTE)

21 October 2003

MEMORANDUM FOR DISTRIBUTION

SUBJECT: Joint Interoperability Test Certification of Avaya DEFINITY G3CSI (ProLogix) and G3C (IP 600 and DEFINITY 1) Digital Switching Systems

References: (a) DOD Directive 4630.5, "Interoperability and Supportability of Information Technology (IT) and National Security Systems (NSS)," 11 January 2002

(b) CJCSI 6212.01B, "Interoperability and Supportability of National Security Systems and Information Technology Systems," 8 May 2000

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

2. The Avaya DEFINITY G3CSI Digital Switching System with Software Release G3V10i.7585.6.0.3 and Release G3V10i.7585.6.0.2 (with software patch 4292), hereafter referred to as the system under test (SUT), met all of its critical interoperability requirements, and is certified as interoperable for joint use within the Defense Switched Network (DSN). The identified test discrepancies shown in enclosure 2 that remained open after software patches were applied and regression testing was completed have an overall minor operational impact. The Avaya DEFINITY G3C digital switching system employs the same software and trunk/line card hardware as the SUT; JITC analysis determined the G3CSI and G3C to be functionally identical for interoperability certification purposes. The SUT was tested and met the critical interoperability requirements for the following DSN switch types: Private Branch Exchange (PBX) 1 and PBX 2. This certification expires upon changes that could affect interoperability, but no later than three years from the date of this memorandum.

3. This finding is based on interoperability testing conducted by the JITC. Testing was conducted at the JITC facility at Ft. Huachuca, AZ. The Certification Testing Summary (enclosure 2) documents the test results and describes the tested network and systems configurations. System interoperability should be verified before deployment in an operational

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environment that varies significantly from the test environment. Table 1 lists the associated software releases covered by this certification.

Table 1. Certified Avaya DEFINITY Software Releases

Software Release	Software Medium	Switch Platform
G3V10i.7585.6.0.3 and G3V10i.7585.6.0.2 (with software patch 4292)	Optical Disk	DEFINITY G3CSI (ProLogix)
G3V10c.7585.6.0.3 and G3V10c.7585.6.0.2 (with software patch 4292)	Optical Disk	DEFINITY G3C (IP 600 & DEFINITY 1)
Note: The software is the same; however, Avaya distinguishes the different mediums and platforms by the 6 th character of the Software Release.		

4. The interoperability summary of the SUT is indicated in table 2. The interoperability status and criticality are listed in table 3, and the Exchange Requirements (ERs) and Functional Requirements (FRs) for the DSN are listed in table 4. The Avaya switch product line offers a Remote Switch Unit capability referred to as the Survivable Remote Processor Expansion Port Network. This product line also offers a Voice over Internet Protocol capability. Preliminary testing was performed on these capabilities, but neither is covered by this certification. This interoperability test status is based upon evaluation of:

- a. The following network interfaces as specified in reference (c): DSN, Defense Red Switch Network Gateway, Tactical Network Gateway, North Atlantic Treaty Organization Gateway, and Public Switched Telecommunications Network or Commercial Network Gateway.
- b. The interface and signaling requirements for trunk/line interfaces, and interoperability ERs and FRs derived from references (d) and (e).
- c. The overall system interoperability performance derived from test procedures listed in reference (f).

Table 2. Avaya DEFINITY G3CSI Digital Switching Systems Interoperability Summary

Network	Critical	Status	Remarks
DSN	Yes	Certified	- VoIP not certified - Certified as PBX1 and PBX2 - RSU not certified - E1 CAS and CDC certified (DISN-E only) - The identified test discrepancies shown in enclosure 2 that remained open have an overall minor operational impact.
Commercial Gateway	No	Certified	
Legend:			
CAS	- Channel Associated Signaling		Mbps - Megabits per second
CDC	- Common Data Channel		PBX1 - Private Branch Exchange 1
DISN-E	- Defense Information System Network Europe		PBX2 - Private Branch Exchange 2
DSN	- Defense Switched Network		RSU - Remote Switching Unit
E1	- European Basic Rate (2.048 Mbps)		VoIP - Voice over Internet Protocol

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Table 3. Interoperability Status

	Trunk Interfaces			
	Interface & Signaling	Critical	Status	Remarks
Defense Switched Network	PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS DTMF	No	Certified	Met all ERs and FRs.
	PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS MFR1	No	Certified	Met all ERs and FRs.
	PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS DP	No	Certified	Met all ERs and FRs.
	PCM-30 E1 CAS HDB3 MFR1	No	Certified	Met all ERs and FRs.
	PCM-24 T1 (B8ZS/ESF) ISDN PRI	Yes	Certified	Met all critical ERs and FRs. Full compliance to the ANSI T1.619a requirement not met. ¹ Operational impact is minor.
	Line Interfaces			
	Interface & Signaling	Critical	Status	Remarks
	Analog E&M Signaling Type I	No	Certified	Met all ERs and FRs.
	TPC ISDN BRI ST and U Interface Q.931	Yes	Certified	Met all critical ERs and FRs. ISDN Supplemental Services ² and full compliance of DSN Announcements ³ not met. Operational impact is minor.
	TPC 2-Wire analog	Yes	Certified	Met all critical ERs and FRs. Full compliance of DSN Announcements ³ not met. Operational impact is minor.
	TPC 2-Wire Digital (Proprietary)	No	Certified	Met all ERs and FRs except for full compliance of DSN Announcements. ³ Operational impact is minor.
	Network Management Interfaces			
	Interface & Signaling	Critical	Status	Remarks
CAT 5 TPC IEEE 802.3 10BaseT Ethernet, TCP/IP	No	Certified	Met all ERs and FRs.	
TPC EIA-232 Asynchronous @ 9.6 kbps	No	Certified	Met all ERs and FRs.	
Commercial Network Gateway	Trunk Interfaces			
	Interface & Signaling	Critical	Status	Remarks
Same Interfaces and Signaling as DSN	No	Certified	See note 4.	
Legend: 10BaseT - Ethernet Based Operation, Twisted Pair AMI - Alternate Mark Inversion ANSI - American National Standards Institute B8ZS - Bipolar Eight Zero Substitution BRI - Basic Rate Interface CAS - Channel Associated Signaling CAT - Category DISN - Defense Information Systems Network DP - Dial Pulse DSN - Defense Switched Network DTMF - Dual Tone Multi-Frequency E1 - European Basic Rate (2.048 Mbps) E&M - Ear and Mouth EIA - Electronic Industries Alliance ERs - Exchange Requirements ESF - Extended Superframe FRs - Functional Requirements GSCR - Generic Switching Center Requirements GSTP - Generic Switch Test Plan HDB3 - High Density Bi-polar Three IEEE - Institute of Electrical and Electronic Engineers, Inc. ISDN - Integrated Services Digital Network kbps - kilobits per second Mbps - Megabits per second MFR1 - Multi-Frequency R1 PCM-24 - Pulse Code Modulation 24 Channels PCM-30 - Pulse Code Modulation 30 Channels PRI - Primary Rate Interface SF - Superframe ST - ISDN BRI Four-Wire Interface SUT - System Under Test T1 - Digital Transmission Link level 1 (1.544 Mbps) TCP/IP - Transmission Control Protocol/Internet Protocol TPC - Twisted Pair Copper U - ISDN BRI Two-Wire Interface				
Notes: 1 The SUT will not allow calls between unlike DSN service domains when resources are available. The SUT meets the minimum requirements defined in reference (g), and full compliance is not required until Oct 2003. The operational impact is minor. 2 ISDN Supplemental Services currently not used in the DISN. The operational impact is none. 3 Met all DSN Announcement requirements except for Isolation Code Announcement. The SUT provides this announcement only for precedence calls above ROUTINE. ROUTINE precedence calls receive a fast busy signal. The operational impact is minor. 4 The certification/compliance of interoperability to commercial networks was satisfied based on the review of the vendor's letter of compliance to requirements identified as the "L" and "V" items listed in appendix E of the GSTP and specified in tables 2-1 through 2-15 of the GSCR.				

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Table 4. Exchange and Functional Requirements

Defense Switched Network	Trunk Interfaces	
	Interface & Signaling	Exchange & Functional Requirements
	PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS DTMF	<ul style="list-style-type: none"> - MLPP - Hotline Services - System Interface <ul style="list-style-type: none"> • Non-secure Voice and Data • Secure Voice and Data (STU-III and STE) • NX56 kbps and NX64 kbps Synchronous Data • Non-secure and Secure FAX • VTC • Alarms - Integrated Services Digital Network (<i>ISDN PRI only</i>) - Attendant Services¹ - System Administration, Measurements, and Service Standards - Y2K (Rollover, Valid and Invalid Dates) - Screening, Zone Restriction, and DSN Access Restriction - Automated Message Accounting - Network Integration - Common Data Channel (<i>T1 and E1 CAS only</i>) - ANSI T1.619a (<i>T1 ISDN PRI</i>)
	PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS MFR1	
	PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS DP	
	PCM-30 E1 CAS HDB3 MFR1	
	PCM-24 T1 B8ZS/ESF ISDN PRI	
	Analog E&M Signaling Type 1	
	Analog E&M Signaling Type 1	
	Line Interfaces	
	Interface & Signaling	Exchange & Functional Requirements
	TPC ISDN BRI ST and U Interface Q.931	<ul style="list-style-type: none"> - MLPP - Hotline Services - ANSI T1.619a - ISDN Supplemental Services - Call Treatments - DSN Announcements - Attendant Services¹ - EKTS - VTC - NX56 kbps and NX64 kbps Synchronous Data - Non-secure Voice and Data - Secure Voice and Data (STE)
	TPC 2-Wire analog	
	TPC 2-Wire Digital and Analog (Proprietary)	
Network Management Interfaces		
Interface & Signaling	Exchange & Functional Requirements	
CAT 5 TPC IEEE 802.3 10BaseT Ethernet, TCP/IP	<ul style="list-style-type: none"> - Automated Message Accounting - Traffic Measurements - Man Machine Language - Alarms 	

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Table 4. Exchange and Functional Requirements (continued)

Defense Switched Network (continued)	Network Management Interfaces	
	Interface & Signaling	Exchange & Functional Requirements
	TPC EIA-232 Asynchronous @ 9.6 kbps	- Automated Message Accounting - Traffic Measurements - Man Machine Language
Commercial Network Gateway	Trunk Interfaces	
	Interface & Signaling	Exchange & Functional Requirements
	Same Interfaces and Signaling as DSN	See note 2.
Legend: 10BaseT - Ethernet Based Operation, Twisted Pair AMI - Alternate Mark Inversion ANSI - American National Standards Institute B8ZS - Bipolar Eight Zero Substitution BRI - Basic Rate Interface CAS - Channel Associated Signaling CAT - Category DP - Dial Pulse DSN - Defense Switched Network DTMF - Dual Tone Multi-Frequency E1 - European Basic Multiplex Rate (2.048 Mbps) E&M - Ear and Mouth EIA - Electronic Industries Alliance EKTS - Electronic Key Telephone Service ESF - Extended Superframe FAX - Facsimile GSCR - Generic Switching Center Requirements GSTP - Generic Switch Test Plan HDB3 - High Density Bi-polar Three IEEE - Institute of Electrical and Electronic Engineers Inc. ISDN - Integrated Services Digital Network kbps - kilobits per second Mbps - Megabits per second MFR1 - Multi-Frequency R1 MLPP - Multi-Level Precedence and Preemption NX56 - Data format is restricted to multiples of 56k NX64 - Data format is restricted to multiples of 64k PCM-24 - Pulse Code Modulation 24 Channels PCM-30 - Pulse Code Modulation 30 Channels PRI - Primary Rate Interface SF - Superframe ST - ISDN BRI Four-Wire Interface STE - Secure Terminal Equipment STU-III - Secure Telephone Unit-III SUT - System Under Test T1 - Digital Transmission Link level 1 (1.544 Mbps) TCP/IP - Transmission Control Protocol/Internet Protocol TPC - Twisted Pair Copper U - ISDN BRI Two-Wire Interface VTC - Video Teleconferencing Y2K - Year 2000		
Notes: 1 SUT meets all the GSCR exchange requirements for attendant services with the following console: Lucent Attendant Console Model 302C. 2 The certification/compliance of interoperability to commercial networks was satisfied based on the review of the vendor's letter of compliance to requirements identified as the "L" and "V" items listed in appendix E of the GSTP and specified in tables 2-1 through 2-15 of the GSCR.		

5. JITC distributes interoperability information via the JITC Electronic Report Distribution (ERD) system -- ERD uses unclassified (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. John Gese, DSN 879-5164 commercial (520) 538-5164, FAX DSN 879-4347 or e-mail to gesej@fhu.disa.mil.

FOR THE COMMANDER:

- 2 Enclosures:
- 1 Additional References
- 2 Certification Testing Summary

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JITC Memo, Networks, Transmission and Integration Division (JTE), Joint Interoperability Test Certification of Avaya DEFINITY G3CSI (ProLogix) and G3C (IP 600 and DEFINITY 1) Digital Switching Systems

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ADDITIONAL REFERENCES

- (c) Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 6215.01B, "Policy for Department of Defense Voice Services," 23 September 2001
- (d) Defense Information Systems Agency (DISA), Joint Interoperability and Engineering Organization (JIEO), Technical Report 8249, "Defense Information Systems Network (DISN) Circuit Switched Subsystem, Defense Switched Network (DSN) Generic Switching Center Requirements (GSCR)," March 1997
- (e) Defense Information Systems Agency (DISA) NS53, Memorandum, "DSN Global Network Requirements for Small End Office and Private Branch Exchange Category of Switches," 18 March 2003
- (f) Joint Interoperability Test Command, "Defense Switched Network Generic Switch Test Plan (GSTP)," 17 June 1999
- (g) Defense Information Systems Agency (DISA) NS53, Memorandum, "DSN Global Network Requirements for Tandem (Standalone), Multifunction, End Office, and Small End Office Switches," 30 January 2003

CERTIFICATION TESTING SUMMARY

- 1. SYSTEM TITLE.** Avaya DEFINITY G3CSI (ProLogix) Digital Switching System with Software Release G3V10i.7585.6.0.3 and Release G3V10i.7585.6.0.2 (with software patch 4292), hereafter referred to as the system under test (SUT).
- 2. PROPONENT.** Defense Information Systems Agency (DISA).
- 3. PROGRAM MANAGER.** Mr. Howard Osman, NS53, Room 5W23, 5275 Leesburg Pike, Falls Church, VA 22041, E-mail: Osmanh@ncr.disa.mil.
- 4. TESTERS.** Joint Interoperability Test Command (JITC), Fort Huachuca, AZ.
- 5. SYSTEM UNDER TEST DESCRIPTION.** The AVAYA DEFINITY G3CSI (ProLogix) Digital Switching System has the maximum capacity of up to 600 ports. It supports a maximum of 500 lines and 400 trunks. As sophisticated as the larger DEFINITY switches, this switch provides call processing, business applications such as voice messaging, shared voice mail, and small call center; networking capabilities; and expert systems for remote diagnostics and self-healing. The Avaya switch product line offers a Remote Switch Unit capability referred to as the Survivable Remote Processor Expansion Port Network. This product line also offers Voice over Internet Protocol capability. Preliminary testing was performed on these capabilities, but neither is covered by this certification. Avaya's product line of digital switches is currently in use within the Defense Switched Network (DSN) providing Small End Office Switch and Private Branch Exchange (PBX) functionality. The Avaya DEFINITY G3CSI (ProLogix) digital switching system was the only switch platform tested by JITC, however, the test results are applicable to the DEFINITY G3C (IP 600 and DEFINTY 1). The Avaya DEFINITY G3C digital switching system employs the same software and trunk/line card hardware as the G3CSI, and JITC analysis determined it to be functionally identical for certification purposes.
- 6. OPERATIONAL ARCHITECTURE.** The Generic Switching Center Requirements operational DSN Architecture is depicted in figure 2-1.

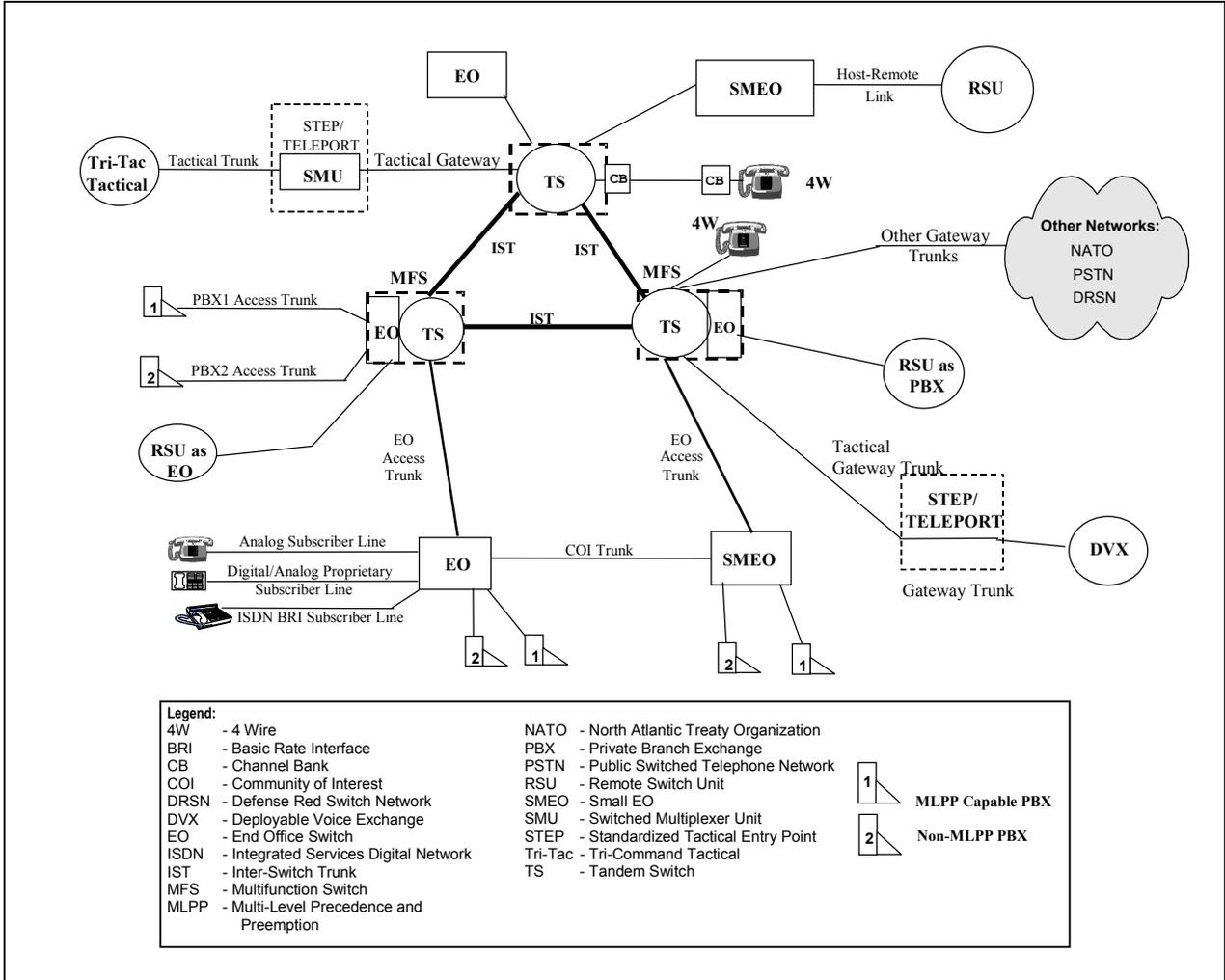


Figure 2-1. DSN Architecture

7. REQUIRED SYSTEM INTERFACES. This interoperability test status is based upon evaluation of the network interfaces as specified in:

a. The Chairman of the Joint Chiefs of Staff (CJCS) policy for Department of Defense voice services requirements for the DSN.

b. Interface and signaling requirements for trunk, line, and network management derived from the Generic Switching Center Requirements (GSCR) document, and the DISA NS53, Memorandum, "DSN Global Network Requirements for Small End Office and Private Branch Exchange Category of Switches," dated 18 March 2003.

c. Interoperability Exchange Requirements (ERs) and Functional Requirements (FRs) derived from the GSCR.

d. The overall system interoperability performance derived from the Generic Switch Test Plan (GSTP).

The ERs and FRs for the DSN network interfaces are indicated in table 2-1. The criticality and certification status of these interfaces can be found in paragraph 11. The test summary can be found in paragraph 11b.

Table 2-1. Exchange and Functional Requirements

	Trunk Interfaces		
	Interface & Signaling	Critical	Exchange and Functional Requirements
Defense Switched Network	PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS DTMF	No	<ul style="list-style-type: none"> - MLPP - Hotline Services - System Interface <ul style="list-style-type: none"> • Non-secure Voice and Data • Secure Voice and Data (STU-III and STE) • NX56 kbps and NX64 kbps Synchronous Data • Non-secure and Secure FAX • VTC • Alarms - Integrated Services Digital Network (ISDN PRI only) - Attendant Services¹ - System Administration, Measurements, and Service Standards - Y2K (Rollover, Valid and Invalid Dates) - Screening, Zone Restriction, and DSN Access Restriction - Automated Message Accounting - Network Integration - Common Data Channel (T1 and E1 CAS only) - ANSI T1.619a (T1 ISDN PRI only)
	PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS MFR1	No	
	PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS DP	No	
	PCM-30 E1 CAS HDB3 MFR1	No	
	PCM-24 T1 B8ZS/ESF ISDN PRI	Yes	
	Analog E&M Signaling Type I	No	

Table 2-1. Exchange and Functional Requirements (continued)

	Line Interfaces		
	Interface & Signaling	Critical	Exchange and Functional Requirements
Defense Switched Network (continued)	TPC ISDN BRI ST and U Interface Q.931	Yes	<ul style="list-style-type: none"> - MLPP - Hotline Services - ANSI T1.619a - ISDN Supplemental Services - Call Treatments - DSN Announcements - Attendant Services¹ - EKTS - VTC - NX56 kbps and NX64 kbps Synchronous Data - Non-secure Voice and Data - Secure Voice and Data (STE)
	TPC 2-Wire analog	Yes	<ul style="list-style-type: none"> - MLPP - Hotline Services - DSN Announcements - Traffic Measurements - Attendant Services¹ - Call Treatments - Non-secure Voice and Data - Non-secure and Secure FAX - Secure Voice and Data (STU-III and STE)
	TPC 2-Wire Digital and Analog (Proprietary)	No	<ul style="list-style-type: none"> - MLPP - Hotline Services - DSN Announcements - Traffic Measurements - Attendant Services¹ - Call Treatments - Non-secure Voice
	Network Management Interfaces		
	Interface & Signaling	Critical	Exchange and Functional Requirements
	CAT 5 TPC IEEE 802.3 10BaseT Ethernet, TCP/IP	No	<ul style="list-style-type: none"> - Automated Message Accounting - Traffic Measurements - Alarms (<i>TCP/IP interface only</i>) - Man Machine Language
TPC EIA-232 Asynchronous @ 9.6 kbps	No		
Commercial Network Gateway	Interface & Signaling	Critical	Exchange and Functional Requirements
	Same Interfaces and Signaling as DSN	Yes	See note 2.

Table 2-1. Exchange and Functional Requirements (continued)

Legend:	
10BaseT	- Ethernet Based Operation, Twisted Pair
AMI	- Alternate Mark Inversion
ANSI	- American National Standards Institute
B8ZS	- Bipolar Eight Zero Substitution
BRI	- Basic Rate Interface
CAS	- Channel Associated Signaling
CAT	- Category
DP	- Dial Pulse
DSN	- Defense Switched Network
DTMF	- Dual Tone Multi-Frequency
E1	- European Basic Rate (2.048 Mbps)
E&M	- Ear and Mouth
EIA	- Electronic Industries Alliance
EKTS	- Electronic Key Telephone Service
ESF	- Extended Superframe
FAX	- Facsimile
GSCR	- Generic Switching Center Requirements
GSTP	- Generic Switch Test Plan
HDB3	- High Density Bi-polar Three
IEEE	- Institute of Electrical and Electronics Engineers, Inc.
ISDN	- Integrated Services Digital Network
kbps	- kilobits per second
Mbps	- Megabits per second
MFR1	- Multi-Frequency R1
MLPP	- Multi-Level Precedence and Preemption
NX56	- Data format is restricted to multiples of 56k
NX64	- Data format is restricted to multiples of 64k
PCM-24	- Pulse Code Modulation 24 Channels
PCM-30	- Pulse Code Modulation 30 Channels
PRI	- Primary Rate Interface
SF	- Superframe
ST	- ISDN BRI Four-Wire Interface
STE	- Secure Terminal Equipment
STU-III	- Secure Telephone Unit III
SUT	- System Under Test
T1	- Digital Transmission Link level 1 (1.544 Mbps)
TCP/IP	- Transmission Control Protocol/Internet Protocol
TPC	- Twisted Pair Copper
U	- ISDN BRI Two-Wire Interface
VTC	- Video Teleconferencing
Y2K	- Year 2000

Notes:

- 1 SUT meets all the GSCR exchange requirements for attendant services with the following console: Lucent Attendant Console Model 302C.
- 2 The certification/compliance of interoperability to commercial networks was satisfied based on the review of the vendor's letter of compliance to requirements identified as the "L" and "V" items listed in appendix E of the GSTP and specified in tables 2-1 through 2-15 of the GSCR.

8. NETWORK DESCRIPTION. The SUT was tested at JITC's Network Engineering and Integration Laboratory in a manner and configuration similar to that of the DSN operational environment. This test was conducted using the three test configurations shown in figures 2-2, 2-3, and 2-4. Testing of the system's required functions and features were conducted using the test configuration depicted in figure 2-2. Network integration testing, which accurately emulates the DSN operational environment, was conducted using the test configuration depicted in figure 2-3, and the Advanced Defense Switched Network Integrated Management Support System network management functions and features were tested using the equipment configuration depicted in figure 2-4.

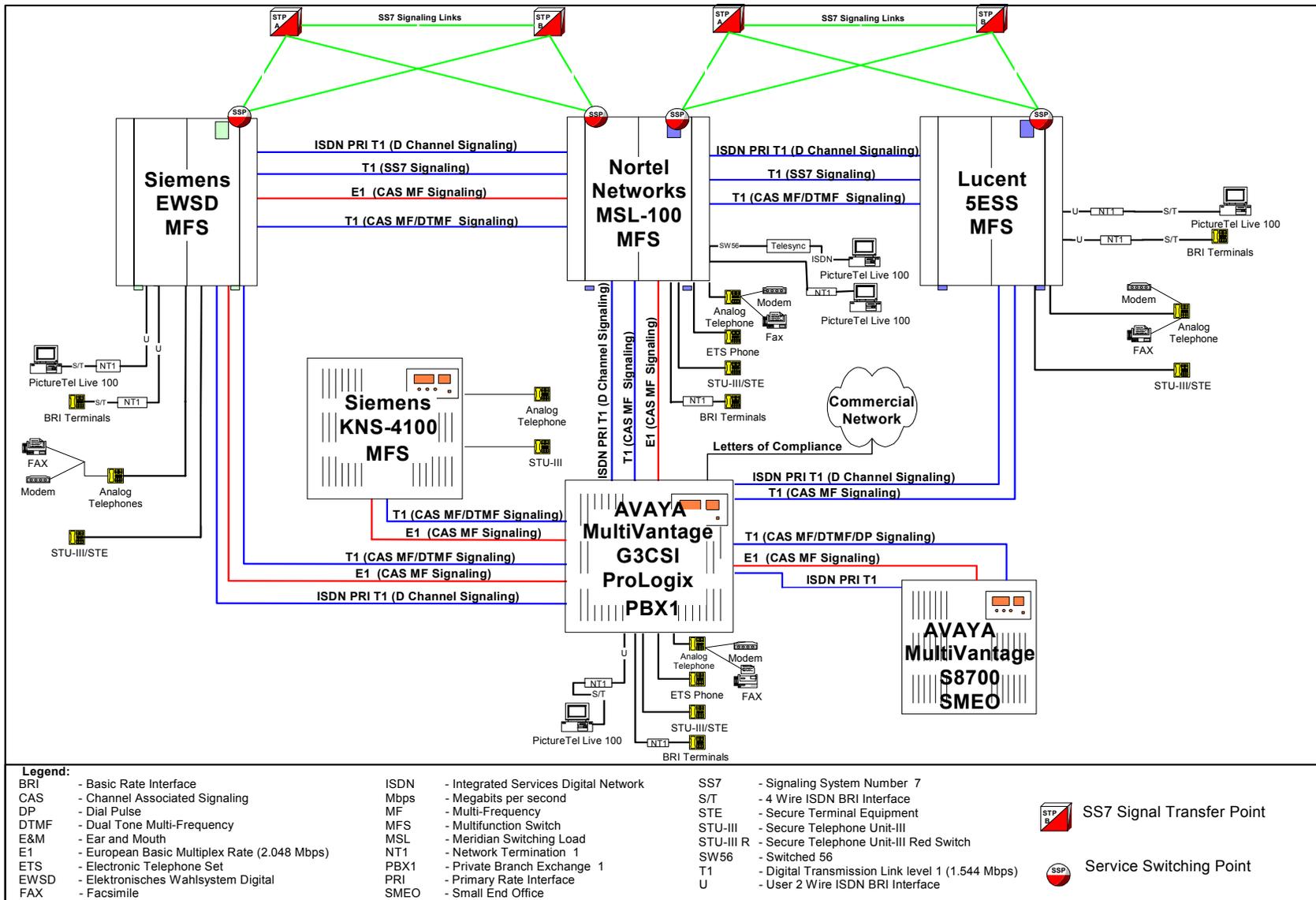


Figure 2-2. Test Configuration

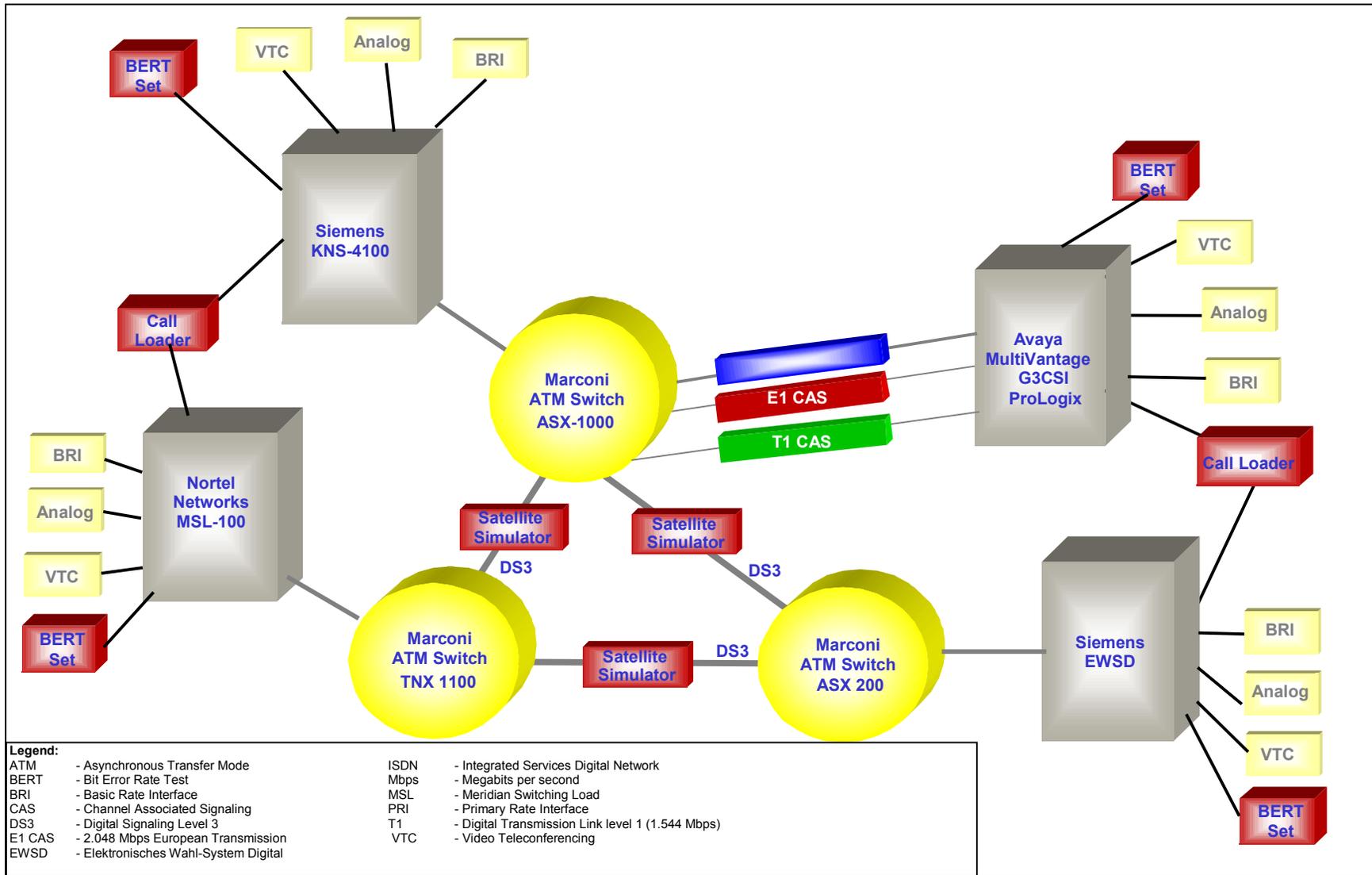


Figure 2-3. Network Integration Test Configuration

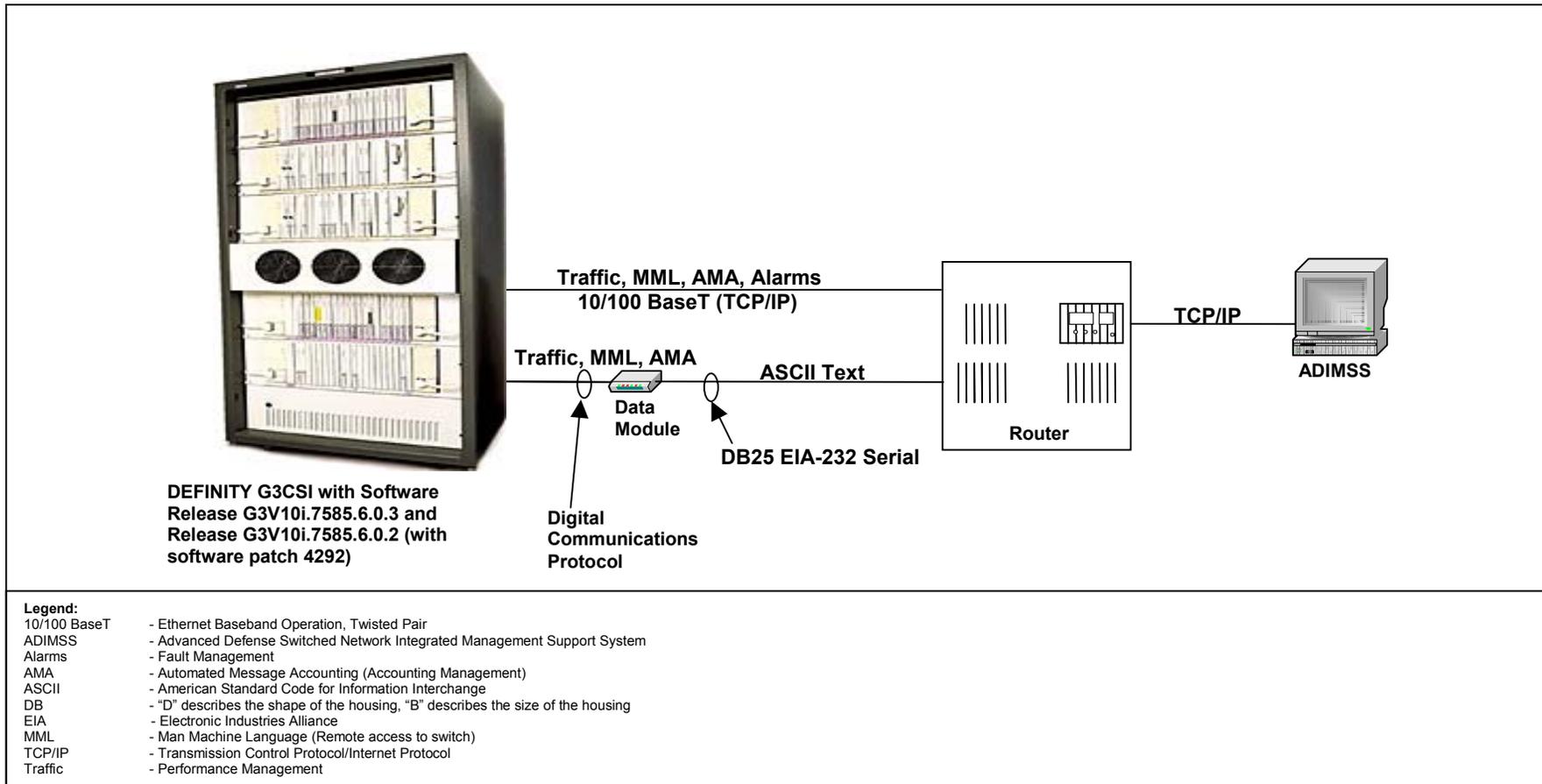


Figure 2-4. DEFINITY G3CSI ADIMSS Network Management System Interface

9. SYSTEM CONFIGURATIONS. Table 2-2 provides the system configurations used in the test.

Table 2-2. Tested System Configurations

System Name	Software Release
Nortel Networks MSL-100	MSL-17
Avaya MultiVantage S8700	R011x.7585.7.0.2
Avaya MultiVantage G3CSI, ProLogix	R011x.7585.7.0.2
Siemens EWSD	19d with Patch Set 32
Siemens KNS-4100	APS4V2.3
Lucent 5ESS	5E15
SMU 96 Tactical Gateway	RD302185
Tekelec STP	23.1
Nortel Networks Broad Band STP	3.0.3.18d
DSS Red Switch	8.03
MARCONI ATM switches	Versions 6.2 and 7.1
Legend: ATM – Asynchronous Transfer Mode CP – Central Processor DSS – Digital Small Switch EWSD – Elektronisches Wahl-System Digital MSL – Meridian Switching Load SMU – Switch Multiplexer Unit STP – Signal Transfer Point	

10. TESTING LIMITATIONS. The DEFINITY G3CSI (ProLogix) digital switching system was the only switch platform tested by JITC; however, the test results are applicable to the DEFINITY G3C (IP 600 and DEFINTY 1). The Avaya DEFINITY G3C digital switching system employs the same software and trunk/line card hardware as the G3CSI, and JITC analysis determined it to be functionally identical for certification purposes.

11. TEST RESULTS. Tables 2-3 through 2-6 synopsize the SUT interface ER and FR status and criticality. The identified test discrepancies shown below denote only those test discrepancies that remained open after software patches were applied and regression testing was completed. A detailed description of these discrepancies can be found in paragraph 11a.

Table 2-3. Defense Switched Network Trunk Interface and Exchange Requirements

Interface & Signaling	Interface Status	Exchange and Functional Requirements	Test Discrepancies	GSTP Para (s)	GSCR Para (s)	Critical Yes/No	ER/FR Status
PCM-24 T1 CAS (B8ZS/ESF) (AMI/SF) DTMF	Certified	MLPP	No	II-2.2	2.2.1, 5.3.4.3 through 4.9	Yes	Met
		Hotline Services	No	II-3.2	21.3.10	No	Met
		System Interface (Alarms, non-secure voice and data, secure voice and data, FAX, VTC)	No	II-4.2	10.1 through 10.12	Yes	Met
		Attendant Services	No	II-7.2	2.1.3	No	Met ¹
		System Administration, Measurements, and Service Standards	No	II-8.2	9.1 through 9.5	Yes	Met
		Y2K (Rollover, Valid, Invalid) Dates	No	II-9.2, II-10.2, II-11.2	9.1	Yes	Met
		Screening, Zone Restriction, and DSN Access Restriction	No	II-12.2	5.3.4	Yes	Met
		AMA	No	II-14.2	8.1	No	Met
		Network Integration	No	II-20.2	10	No	Met
		CDC	No	II-24.2	See Note	No	Met ²

Table 2-3. Defense Switched Network Trunk Interface and Exchange Requirements (continued)

Interface & Signaling	Interface Status	Exchange and Functional Requirements	Test Discrepancies	GSTP Para (s)	GSCR Para (s)	Critical Yes/No	ER/FR Status
PCM-24 T1 CAS (B8ZS/ESF) (AMI/SF) MFR1	Certified	MLPP	No	II-2.2	2.2.1, 5.3.4.3 through 4.9	Yes	Met
		Hotline Services	No	II-3.2	21.3.10	No	Met
		System Interface (Alarms, non-secure voice and data, secure voice and data, FAX, VTC)	No	II-4.2	10.1 through 10.12	Yes	Met
		Attendant Services	No	II-7.2	2.1.3	No	Met ¹
		System Administration, Measurements, and Service Standards	No	II-8.2	9.1 through 9.5	Yes	Met
		Y2K (Rollover, Valid, Invalid) Dates	No	II-9.2, II-10.2, II-11.2	9.1	Yes	Met
		Screening, Zone Restriction, and DSN Access Restriction	No	II-12.2	5.3.4	Yes	Met
		AMA	No	II-14.2	8.1	No	Met
		Network Integration	No	II-20.2	10	No	Met
		CDC	No	II-24.2	See note 2	No	Met ²

Table 2-3. Defense Switched Network Trunk Interface and Exchange Requirements (continued)

Interface & Signaling	Interface Status	Exchange and Functional Requirements	Test Discrepancies	GSTP Para (s)	GSCR Para (s)	Critical Yes/No	ER/FR Status
PCM-24 T1 CAS (B8ZS/ESF) (AMI/SF) DP	Certified	MLPP	No	II-2.2	2.2.1, 5.3.4.3 through 4.9	Yes	Met
		Hotline Services	No	II-3.2	21.3.10	No	Met
		System Interface (Alarms, non-secure voice and data, secure voice and data, FAX, VTC)	No	II-4.2	10.1 through 10.12	Yes	Met
		Attendant Services	No	II-7.2	2.1.3	No	Met ¹
		System Administration, Measurements, and Service Standards	No	II-8.2	9.1 through 9.5	Yes	Met
		Y2K (Rollover, Valid, Invalid) Dates	No	II-9.2, II-10.2, II-11.2	9.1	Yes	Met
		Screening, Zone Restriction, and DSN Access Restriction	No	II-12.2	5.3.4	Yes	Met
		AMA	No	II-14.2	8.1	No	Met
		Network Integration	No	II-20.2	10	No	Met
		CDC	No	II-24.2	See Note	No	Met ²

Table 2-3. Defense Switched Network Trunk Interface and Exchange Requirements (continued)

Interface & Signaling	Interface Status	Exchange and Functional Requirements	Test Discrepancies	GSTP Para (s)	GSCR Para (s)	Critical Yes/No	ER/FR Status
PCM-30 E1 CAS HDB3 MFR1	Certified	MLPP	No	II-2.2	2.2.1, 5.3.4.3 through 4.9	Yes	Met
		Hotline Services	No	II-3.2	21.3.10	No	Met
		System Interface (Alarms, non-secure voice and data, secure voice and data, FAX, VTC)	No	II-4.2	10.1 through 10.12	Yes	Met
		Attendant Services	No	II-7.2	2.1.3	No	Met ¹
		System Administration, Measurements, and Service Standards	No	II-8.2	9.1 through 9.5	Yes	Met
		Y2K (Rollover, Valid, Invalid) Dates	No	II-9.2, II-10.2, II-11.2	9.1	Yes	Met
		Screening, Zone Restriction, and DSN Access Restriction	No	II-12.2	5.3.4	Yes	Met
		AMA	No	II-14.2	8.1	No	Met
		Network Integration	No	II-20.2	10	No	Met
		CDC	No	II-24.2	See Note	No	Met ²

Table 2-3. Defense Switched Network Trunk Interface and Exchange Requirements (continued)

Interface & Signaling	Interface Status	Exchange and Functional Requirements	Test Discrepancies	GSTP Para (s)	GSCR Para (s)	Critical Yes/No	ER/FR Status
PCM-24 T1 CCS (B8ZS/ESF) ISDN	Certified	MLPP	No	II-2.2	2.2.1, 5.3.4.3 through 4.9	Yes	Met
		Hotline Services	No	II-3.2	21.3.10	No	Met
		System Interface (Alarms, non-secure voice and data, secure voice and data, FAX, VTC)	No	II-4.2	10.1 through 10.12	Yes	Met
		ISDN	No	II-6.2	6.6, 21.1, 21.2, 21.3	Yes	Met
		Attendant Services	No	II-7.2	2.1.3	No	Met ¹
		System Administration, Measurements, and Service Standards	No	II-8.2	9.1 through 9.5	Yes	Met
		Y2K (Rollover, Valid, Invalid) Dates	No	II-9.2, II-10.2, II-11.2	9.1	Yes	Met
		Screening, Zone Restriction, and DSN Access Restriction	No	II-12.2	5.3.4	Yes	Met
		AMA	No	II-14.2	8.1	No	Met
		Network Integration	No	II-20.2	10	No	Met
		ANSI T1.619a	Yes	II-6.2	21.3.1	Yes	Met ³

Table 2-3. Defense Switched Network Trunk Interface and Exchange Requirements (continued)

Interface & Signaling	Interface Status	Exchange and Functional Requirements	Test Discrepancies	GSTP Para (s)	GSCR Para (s)	Critical Yes/No	ER/FR Status
Analog E&M Signaling Type I	Certified	MLPP	No	II-2.2	2.2.1, 5.3.4.3 through 4.9	Yes	Met
		Hotline Services	No	II-3.2	21.3.10	No	Met
		System Interface (Alarms, non-secure voice and data, secure voice and data, FAX, VTC)	No	II-4.2	10.1 through 10.12	Yes	Met
		Attendant Services	No	II-7.2	2.1.3	No	Met ¹
		System Administration, Measurements, and Service Standards	No	II-8.2	9.1 through 9.5	Yes	Met
		Y2K (Rollover, Valid, Invalid) Dates	No	II-9.2, II-10.2, II-11.2	9.1	Yes	Met
		Screening, Zone Restriction, and DSN Access Restriction	No	II-12.2	5.3.4	Yes	Met
		AMA	No	II-14.2	8.1	No	Met
		Network Integration	No	II-20.2	10	No	Met

Table 2-3. Defense Switched Network Trunk Interface and Exchange Requirements (continued)

Legend:		
AMA - Automated Message Accounting	E1 - European Basic Multiplex Rate (2.048 Mbps)	Mbps - Megabits per second
AMI - Alternate Mark Inversion	E&M - Ear and Mouth	MFR1 - Multi-Frequency R1
ANSI - American National Standards Institute	ER - Exchange Requirements	MLPP - Multi-Level Precedence and Preemption
B8ZS - Bipolar Eight Zero Substitution	ESF - Extended Superframe	PCM-24 - Pulse Code Modulation 24 Channels
CAS - Channel Associated Signaling	FAX - Facsimile	PCM-30 - Pulse Code Modulation 30 Channels
CCS - Common Channel Signaling	FR - Functional Requirements	SF - Superframe
CDC - Common Data Channel	GSCR - Generic Switching Center Requirements	SUT - System Under Test
DISN - Defense Information Systems Network	GSTP - Generic Switch Test Plan	T1 - Digital Transmission Link level 1 (1.544 Mbps)
DP - Dial Pulse	HDB3 - High Density Bi-Polar Three	VTC - Video Teleconferencing
DSN - Defense Switched Network	ISDN - Integrated Services Digital Network	Y2K - Year 2000
DTMF - Dual Tone Multiple-Frequency		
Notes:		
1 SUT meets all the GSCR exchange requirements for attendant services with the following console: Lucent Attendant Console Model 302C.		
2 CDC is a requirement only for DISN-Europe. Switches that have a requirement to interface to the DSN European KNS-4100 switches must be capable of passing CDC traffic transparently.		
3 The SUT will not allow calls between unlike DSN service domains when resources are available. The Avaya SUT meets the minimum requirements defined in reference (g), and full compliance is not required until Oct 2003. The operational impact is minor.		

Table 2-4. Defense Switched Network Line Interface and Exchange Requirements

Interface & Signaling	Interface Status	Exchange and Functional Requirements	Test Discrepancies	GSTP Para (s)	GSCR Para (s)	Critical Yes/No	ER/FR Status
TPC, ISDN BRI ST and U, Q.931	Certified	MLPP	No	II-2.2	2.2.1, 5.3.4	Yes	Met
		Hotline Services	No	II-3.2	21.3.10	No	Met
		ANSI T1.619a	Yes	II-6.2	21.3.1	Yes	Met ¹
		ISDN Supplemental Services	Yes	II-6.2	21.3	No	Not Met ²
		Attendant Services	No	II-7.2	2.1.3	No	Met ³
		Call Treatments	No	II-15.2	5.2.1.1, 5.2.2.1	Yes	Met
		DSN Announcements	Yes	II-19.2	5.6	Yes	Met ⁴
		Electronic Key Telephone Service	Yes	II-25.5	21.2	No	Met
2 Wire Analog, TPC	Certified	MLPP	No	II-2.2	2.2.1, 5.3.4	Yes	Met
		Hotline Services	No	II-3.2	21.3.10	No	Met
		Attendant Services	No	II-7.2	2.1.3	No	Met ³
		Call Treatments	No	II-15.2	5.2.1.1, 5.2.2.1	Yes	Met
		DSN Announcements	Yes	II-19.2	5.6	Yes	Met ⁴

Table 2-4. Defense Switched Network Line Interface and Exchange Requirements (continued)

Interface & Signaling	Interface Status	Exchange and Functional Requirements	Test Discrepancies	GSTP Para (s)	GSCR Para (s)	Critical Yes/No	ER/FR Status
2 Wire Proprietary Digital	Certified	MLPP	No	II-2.2	2.2.1, 5.3.4	Yes	Met
		Hotline Services	No	II-3.2	21.3.10	No	Met
		Attendant Services	No	II-7.2	2.1.3	No	Met ³
		Call Treatments	No	II-15.2	5.2.1.1, 5.2.2.1	Yes	Met
		DSN Announcements	Yes	II-19.2	5.6	Yes	Met ⁴

Legend:

- ANSI - American National Standards Institute
- BRI - Basic Rate Interface
- DSN - Defense Switched Network
- DISN - Defense Information Systems Network
- ER - Exchange Requirements
- FR - Functional Requirements
- GSCR - Generic Switching Center Requirements
- GSTP - Generic Switch Test Plan
- ISDN - Integrated Services Digital Network
- MLPP - Multi-Level Precedence and Preemption
- ST - ISDN BRI 4 -Wire Interface
- SUT - System Under Test
- TPC - Twisted Pair Copper
- U - ISDN BRI 2- Wire Interface

Notes:

- 1 The SUT will not allow calls between unlike DSN service domains when resources are available. The SUT meets the minimum requirements defined in reference (g), and full compliance is not required until Oct 2003. The operational impact is minor.
- 2 ISDN Supplemental Services currently not used in the DISN. The operational impact is none.
- 3 SUT meets all the GSCR exchange requirements for attendant services with the following console: Lucent Attendant Console Model 302C.
- 4 Met all DSN Announcement requirements except for Isolation Code Announcement. The SUT provides this announcement only for precedence calls above ROUTINE. ROUTINE precedence calls receive a fast busy signal. The operational impact is minor.

Table 2-5. Defense Switched Network, Network Management Interface and Exchange Requirements

Interface & Signaling	Interface Status	Exchange and Functional Requirements	Test Discrepancies	GSTP Para (s)	GSCR Para (s)	Critical Yes/No	ER/FR Status
CAT 5 TPC, IEEE 802.3 10BaseT Ethernet, TCP/IP	Certified	Alarms	No	II-23.2	2.1.10, 16.1	No	Met
		AMA	No	II-23.2	2.1.10, 16.1	No	Met
		Traffic Measurements	No	II-23.2	2.1.10, 16.1	No	Met
		MML	No	II-23.2	2.1.10, 16.1	No	Met
TPC EIA-232 Asynchronous @ 9.6 kpbs	Certified	AMA	No	II-23.2	2.1.10, 16.1	No	Met
		Traffic Measurements	No	II-23.2	2.1.10, 16.1	No	Met
		MML	No	II-23.2	2.1.10, 16.1	No	Met
Legend: 10BaseT - 10 megabits per second Ethernet twisted pair AMA - Automated Message Accounting CAT - Category 5 cable (rated @ 100 megahertz of bandwidth) ER - Exchange Requirements EIA - Electronic Industries Alliance FR - Functional Requirements GSCR - Generic Switching Center Requirements GSTP - Generic Switch Test Plan IEEE - Institute of Electrical and Electronic Engineers Inc. kpbs - kilobits per second MML - Man Machine Language TPC - Twisted Pair Copper TCP/IP - Transmission Control Protocol/Internet Protocol							

Table 2-6. Commercial Network Gateway Interface and Exchange Requirements

Interface & Signaling	Interface Status	Exchange and Functional Requirements	Test Discrepancies	GSTP Para (s)	GSCR Para (s)	Critical Yes/No	ER/FR Status
Same Interfaces and Signaling as DSN	Certified	See Note	No	See Note	See Note	No	Met
<p>Legend: DSN - Defense Switched Network ER - Exchange Requirements FR - Functional Requirements GSCR - Generic Switching Center Requirements GSTP - Generic Switch Test Plan Note: The certification/compliance of interoperability to commercial networks was satisfied based on the review of the vendor's letter of compliance to requirements identified as the "L" and "V" items listed in appendix E of the GSTP specified in tables 2-1 through 2-15 of the GSCR.</p>							

a. Discussion

(1) **DSN.** All critical interface ERs and FRs for DSN were met. The following minor exceptions are noted:

(a) The SUT will not allow calls between unlike DSN service domains when resources are available. The Avaya DEFINITY G3CSI meets the minimum requirements defined in reference (g), and full compliance is not required until October 2003. The operational impact is minor.

(b) The SUT does not support the following unique Integrated Services Digital Network (ISDN) Basic Rate Interface (BRI) Supplemental Services as specified in the respective GSCR paragraphs listed below. There are currently no switches in the DISN that support ISDN BRI Supplemental Services. The operational impact is none.

- Conference Calling. GSCR Para. 21.3.2
- User-to-User Signaling. GSCR Para. 21.3.3
- Call Hold. GSCR Para. 21.3.4
- Call Waiting. GSCR Para. 21.3.5
- Normal Call Transfer. GSCR Para. 21.3.6
- Explicit Call Transfer. GSCR Para. 21.3.7
- ISDN Call Deflection. GSCR Para. 21.3.8
- Preset Conference Calling. GSCR Para. 21.3.11

(c) The SUT does not support the Isolation Code Announcement (ICA) for ROUTINE precedence calls. ROUTINE precedence calls receive a fast busy tone rather than the required ICA. The ICA is received by calls above ROUTINE precedence. The operational impact is minor.

(2) **Commercial Gateway.** The certification/compliance of interoperability to commercial networks was satisfied based on the review of the vendor's letter of compliance to requirements identified as the "L" and "V" items listed in appendix E of the GSTP, specified in tables 2-1 through 2-15 of the GSCR, with minor exceptions. Exceptions were reviewed and assessed by the DISA, Network Services (NS) 53, the Development and Operational Engineering Department, and determined to have a minor operational impact.

b. Test Summary. The Avaya DEFINITY G3CSI (ProLogix) and G3C (IP 600 and DEFINITY 1) Digital Switching Systems with Software Release G3V10i.7585.6.0.3 and Release G3V10i.7585.6.0.2 (with software patch 4292) are certified for joint use in the DISN as a PBX1 in accordance with the requirements set forth in the GSCR and the DISA NS53 Memorandum, "DSN Global Network Requirements for Small End Office and Private Branch Exchange Category of Switches" dated 18 March 2003. Minor discrepancies identified during testing will have no

adverse operational impact. The interoperability summary and status to include criticality for each interface is shown in tables 2-7 and 2-8.

12. TEST AND ANALYSIS REPORT. No detailed test report was developed per the Program Manager’s request. JITC distributes interoperability information via the JITC Electronic Report Distribution (ERD) system -- ERD uses unclassified (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>.

Table 2-7. MultiVantage G3CSI Digital Switching Systems Interoperability Summary

Network	Status	Remarks
DSN	Certified	- VoIP not certified - Certified as PBX1 and PBX2 - RSU not certified - E1 CAS and CDC certified (DISN-E only) - The identified test discrepancies shown in enclosure 2 that remained open have an overall minor operational impact.
Commercial Gateway	Certified	
Legend: CAS - Channel Associated Signaling Mbps - Megabits per second CDC - Common Data Channel PBX - Private Branch Exchange DISN-E - Defense Information System Network Europe RSU - Remote Switching Unit DSN - Defense Switched Network VoIP - Voice over Internet Protocol E1 - European Basic Rate (2.048 Mbps)		

Table 2-8. Interoperability Status

	Trunk Interfaces			
	Interface & Signaling	Critical	Status	Remarks
	Defense Switched Network	PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS DTMF	No	Certified
PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS MFR1		No	Certified	Met all ERs and FRs.
PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS DP		No	Certified	Met all ERs and FRs.
PCM-30 E1 CAS HDB3 MFR1		No	Certified	Met all ERs and FRs.
PCM-24 T1 (B8ZS/ESF) ISDN PRI		Yes	Certified	Met all critical ERs and FRs. The following non-critical ER was not met: Full compliance to ANSI T1.619a requirement. ¹ Operational impact is minor.
Analog E&M Signaling Type I		No	Certified	Met all ERs and FRs.
Line Interfaces				
Interface & Signaling	Critical	Status	Remarks	
TPC ISDN BRI ST and U Interface Q.931	Yes	Certified	Met all critical ERs and FRs. The following non-critical ERs and FRs were not met: Full compliance to ANSI T1.619a requirement ¹ ISDN Supplemental Services ² and full compliance of DSN Announcements. ³ Operational impact is minor.	

Table 2-8. Interoperability Status (continued)

Defense Switched Network (continued)	Line Interfaces (continued)																																					
	Interface & Signaling	Critical	Status	Remarks																																		
	TPC 2-Wire analog	Yes	Certified	Met all critical ERs and FRs. The following non-critical ER was not met: Full compliance of DSN Announcements. ³ Operational impact is minor.																																		
	TPC 2-Wire Digital (Proprietary)	No	Certified	Met all critical ERs and FRs. The following non-critical ER was not met: Full compliance of DSN Announcements. ³ Operational impact is minor.																																		
	Network Management Interfaces																																					
Interface & Signaling	Critical	Status	Remarks																																			
CAT 5 TPC IEEE 802.3 10BaseT Ethernet, TCP/IP	Yes	Certified	Met all ERs and FRs.																																			
TPC EIA-232 Asynchronous @ 9.6 kbps	Yes	Certified	Met all ERs and FRs.																																			
Commercial Network Gateway	Trunk Interfaces																																					
	Interface & Signaling	Critical	Status	Remarks																																		
	Same Interfaces and Signaling as DSN	Yes	Certified	See note 4.																																		
<p>Legend:</p> <table border="0"> <tr> <td>AMI - Alternate Mark Inversion</td> <td>GSTP - Generic Switch Test Plan</td> </tr> <tr> <td>ANSI - American National Standards Institute</td> <td>HDB3 - High Density Bi-polar Three</td> </tr> <tr> <td>B8ZS - Bipolar Eight Zero Substitution</td> <td>IEEE - Institute of Electrical and Electronic Engineers Inc.</td> </tr> <tr> <td>BRI - Basic Rate Interface</td> <td>ISDN - Integrated Services Digital Network</td> </tr> <tr> <td>CAS - Channel Associated Signaling</td> <td>kbps - kilobits per second</td> </tr> <tr> <td>CAT - Category</td> <td>Mbps - Megabits per second</td> </tr> <tr> <td>DP - Dial Pulse</td> <td>MFR1 - Multi-Frequency R1</td> </tr> <tr> <td>DISN - Defense Information Systems Network</td> <td>PCM-24 - Pulse Code Modulation 24 Channels</td> </tr> <tr> <td>DSN - Defense Switched Network</td> <td>PCM-30 - Pulse Code Modulation 30 Channels</td> </tr> <tr> <td>DTMF - Dual Tone Multi-Frequency</td> <td>PRI - Primary Rate Interface</td> </tr> <tr> <td>E1 - European Basic Multiplex Rate (2.048 Mbps)</td> <td>SF - Superframe</td> </tr> <tr> <td>E&M - Ear and Mouth</td> <td>ST - ISDN BRI Four-Wire Interface</td> </tr> <tr> <td>EIA - Electronic Industries Alliance</td> <td>SUT - System Under Test</td> </tr> <tr> <td>ERs - Exchange Requirements</td> <td>T1 - Digital Transmission Link level 1 (1.544 Mbps)</td> </tr> <tr> <td>ESF - Extended Superframe</td> <td>TPC - Twisted Pair Copper</td> </tr> <tr> <td>FRs - Functional Requirements</td> <td>TCP/IP - Transmission Control Protocol/Internet Protocol</td> </tr> <tr> <td>GSCR - Generic Switching Center Requirements</td> <td>U - ISDN BRI Two-Wire Interface</td> </tr> </table> <p>Notes:</p> <ol style="list-style-type: none"> The SUT will not allow calls between unlike DSN service domains when resources are available. The SUT meets the minimum requirements for ANSI T1.619a in reference (g), and full compliance is not required until Oct 2003. The operational impact is minor. ISDN Supplemental Services currently not used in the DISN. The operational impact is none. Met all DSN Announcement requirements except for Isolation Code Announcement. The SUT provides this announcement only for precedence calls above ROUTINE. ROUTINE precedence calls receive a fast busy signal. The certification/compliance of interoperability to commercial networks was satisfied based on the review of the vendor's letter of compliance to requirements identified as the "L" and "V" items listed in appendix E of the GSTP and specified in tables 2-1 through 2-15 of the GSCR. 					AMI - Alternate Mark Inversion	GSTP - Generic Switch Test Plan	ANSI - American National Standards Institute	HDB3 - High Density Bi-polar Three	B8ZS - Bipolar Eight Zero Substitution	IEEE - Institute of Electrical and Electronic Engineers Inc.	BRI - Basic Rate Interface	ISDN - Integrated Services Digital Network	CAS - Channel Associated Signaling	kbps - kilobits per second	CAT - Category	Mbps - Megabits per second	DP - Dial Pulse	MFR1 - Multi-Frequency R1	DISN - Defense Information Systems Network	PCM-24 - Pulse Code Modulation 24 Channels	DSN - Defense Switched Network	PCM-30 - Pulse Code Modulation 30 Channels	DTMF - Dual Tone Multi-Frequency	PRI - Primary Rate Interface	E1 - European Basic Multiplex Rate (2.048 Mbps)	SF - Superframe	E&M - Ear and Mouth	ST - ISDN BRI Four-Wire Interface	EIA - Electronic Industries Alliance	SUT - System Under Test	ERs - Exchange Requirements	T1 - Digital Transmission Link level 1 (1.544 Mbps)	ESF - Extended Superframe	TPC - Twisted Pair Copper	FRs - Functional Requirements	TCP/IP - Transmission Control Protocol/Internet Protocol	GSCR - Generic Switching Center Requirements	U - ISDN BRI Two-Wire Interface
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DISN - Defense Information Systems Network	PCM-24 - Pulse Code Modulation 24 Channels																																					
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