



## DEFENSE INFORMATION SYSTEMS AGENCY

P. O. BOX 4502  
ARLINGTON, VIRGINIA 22204-4502

IN REPLY  
REFER TO: Joint Interoperability Test Command (JTE)

**10 Feb 10**

### MEMORANDUM FOR DISTRIBUTION

**SUBJECT:** Special Interoperability Test Certification of Professional Computing Resources, Inc., COMIT with Software Release 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 6212.01E, "Interoperability and Supportability of Information Technology and National Security Systems," 15 December 2008  
(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 Professional Computing Resources Inc., COMIT with Software Release 5.0 is hereinafter referred to as the system under test (SUT). The SUT met the interface and functional requirements for a Customer Premise Equipment (CPE) telecommunications management system as set forth in Reference (c). The SUT is certified only with specified Nortel and Alcatel-Lucent digital switching systems listed within this document and listed on the Unified Capabilities (UC) Approved Products List (APL). 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.
3. This finding is based on interoperability testing conducted by JITC 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 10 through 21 August 2009. DSAWG grants accreditation based on the security testing completed by DISA-led IA test teams and published in a separate report, Reference (e). DSAWG accreditation was granted on 13 January 2010. The Certification Testing Summary (Enclosure 2) documents the test results and describes the test configuration.
4. The SUT is certified with all software versions of the digital switching systems depicted in Table 1 which are on the UC APL. Functional Requirements used to evaluate the interoperability of the SUT and the interoperability statuses are depicted in Table 2.

**Table 1. SUT Certified Switching System Configurations**

Switch Name (See note.)	Network Management Functions	Interface
Nortel CS2100	Configuration Management and Automated Message Accounting	EIA-232 Serial Asynchronous
Nortel CS1000M, CS1000M-SG, Succession DSN M1 Option 61C, and Succession DSN M1 Option 81C	Configuration Management and Automated Message Accounting	EIA-232 Serial Asynchronous
Nortel CS1000E, CS1000M-Cabinet, CS1000M-Chassis, Succession DSN M1 Option 11C Cabinet, and Succession DSN M1 Option 11C chassis	Configuration Management and Automated Message Accounting	EIA-232 Serial Asynchronous
Alcatel-Lucent 5ESS, CDX	Configuration Management and Automated Message Accounting	IEEE 802.3u Ethernet
Alcatel-Lucent 5ESS VCDX	Configuration Management and Automated Message Accounting	EIA-232 Serial Asynchronous

**NOTE:** The SUT is certified with all software versions of these digital switching systems which are listed on the UC APL with one exception: The SUT is certified with the Nortel CS2100 with the TDM interfaces only. This excludes VoIP end instruments and the MG9K IP Gateway.

**LEGEND:**

5ESS	Class 5 Electronic Switching System	IEEE	Institute of Electrical and Electronics Engineers
802.3u	Standard for carrier sense multiple access with collision detection at 100 Mbps	IP	Internet Protocol
APL	Approved Products List	M1	Meridian 1
CS	Communication Server	Mbps	Megabits per second
CDX	Compact Digital Exchange	MG9K	Media Gateway 9000
DCE	Data Circuit-terminating Equipment	SG	Single Group
DSN	Defense Switched Network	SUT	System Under Test
DTE	Data Terminal Equipment	TDM	Time Division Multiplexing
EIA	Electronic Industries Alliance	UC	Unified Capabilities
EIA-232	Standard for defining the mechanical and electrical characteristics for connecting DTE and DCE data communications devices	VCDX	Very Compact Digital Exchange
		VoIP	Voice over Internet Protocol

**Table 2. SUT Functional Requirements and Interoperability Status**

Interface	Critical	Certified	Functional Requirements	Status	UCR Reference
Serial EIA-232	No <sup>1</sup>	Yes	In accordance with EIA-232 (C)	Met	5.2.8.1
			Configuration Management (Switch Access) (C)	Met	5.2.8.4
			Automated Message Accounting (C)	Met	5.2.8.5
IEEE 802.3u Ethernet	No <sup>1</sup>	Yes	In Accordance with IEEE 802.3u (C)	Met	5.2.8.1
			Configuration Management (Switch Access) (C)	Met	5.2.8.4
			Automated Message Accounting (C)	Met	5.2.8.5
	Yes	Yes	Security (R)	See note 2.	Section 3

**NOTES:**

- The SUT is a CPE device that provides network monitoring functions. Therefore, the SUT interfaces are based on the UCR, section 5.2.8.1. The Network Management interoperability requirement can be met with any of the following interfaces: Ethernet, asynchronous serial, or synchronous serial.
- Security is tested by DISA-led Information Assurance test teams and published in a separate report, Reference (e).

**LEGEND:**

802.3u	Standard for carrier sense multiple access with collision detection at 100 Mbps	EIA-232	Standard for defining the mechanical and electrical characteristics for connecting DTE and DCE data communications devices
C	Conditional	IEEE	Institute of Electrical and Electronics Engineers
CPE	Customer Premises Equipment	Mbps	Megabits per second
DCE	Data Circuit-terminating Equipment	R	Required
DISA	Defense Information Systems Agency	SUT	System Under Test
DTE	Data Terminal Equipment	UCR	Unified Capabilities Requirements
EIA	Electronic Industries Alliance		

JITC Memo, JTE, Special Interoperability Test Certification of Professional Computing Resources, Inc., COMIT with Software Release 5.0

5. 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 Ms. Anita Bickler, DSN 879-5164, commercial (520) 538-5164, FAX DSN 879-4347, or e-mail to [anita.bickler@disa.mil](mailto:anita.bickler@disa.mil). The JITC's mailing address is P.O. Box 12798, Fort Huachuca, AZ 85670-2798. The tracking number for the SUT is 0901401.

FOR THE COMMANDER:



for RICHARD A. MEADOR  
Chief  
Battlespace Communications Portfolio

2 Enclosures a/s

JITC Memo, JTE, Special Interoperability Test Certification of Professional Computing Resources, Inc., COMIT with Software Release 5.0

Distribution (electronic mail):

Joint Staff J-6

Joint Interoperability Test Command, Liaison, TE3/JT1

Office of Chief of Naval Operations, CNO N6F2

Headquarters U.S. Air Force, Office of Warfighting Integration & CIO, AF/XCIN (A6N)

Department of the Army, Office of the Secretary of the Army, DA-OSA CIO/G-6 ASA (ALT), SAIS-IOQ

U.S. Marine Corps MARCORSSYSCOM, SIAT, MJI Division I

DOT&E, Net-Centric Systems and Naval Warfare

U.S. Coast Guard, CG-64

Defense Intelligence Agency

National Security Agency, DT

Defense Information Systems Agency, TEMC

Office of Assistant Secretary of Defense (NII)/DOD CIO

U.S. Joint Forces Command, Net-Centric Integration, Communication, and Capabilities Division, J68

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) Joint Interoperability Test Command, Memo, "Information Assurance (IA) Assessment of Professional Computing Resources, Inc., COMIT with Software Release 5.0 (Tracking Number 0901401)," 13 January 2010

## **CERTIFICATION TESTING SUMMARY**

**1. SYSTEM TITLE.** Professional Computing Resources, Inc., COMIT with Software Release 5.0; hereinafter referred to as the system under test (SUT).

**2. PROPONENT.** Defense Information Systems Agency - Pacific Command (DISA-PAC) Hawaii Information Transfer System (HITS)/Joint Hawaii Information Transfer System (JHITS).

**3. PROGRAM MANAGER.** Ms. JoAnne Rhoden, NS43, DISA-PAC, 477 Essex Street, Building 77, Pearl Harbor, Hawaii, e-mail: joanne.rhoden@disa.mil.

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

**5. SYSTEM UNDER TEST DESCRIPTION.** The SUT is a network management system that provides organizations and providers the ability to manage, track, audit, and plan enterprise wide communication networks. The SUT can operate on both Time Division Multiplexing- (TDM) and Internet Protocol-(IP) based networks. The system interfaces with a variety of current Department of Defense (DoD) telecommunication switches and network architectures. The SUT is used to simultaneously monitor multiple switching systems in real-time and provide point and click access to Station Message Detail Recording call detail records (Automated Message Accounting). The SUT allows client configurable reports and databases including, but not limited to: help desk, service order processing, inventory, reporting, and billing. The SUT provides a Graphical User Interface (GUI) for maintaining station features, and allows command line maintenance terminal access to the switching systems (Configuration Management).

The SUT performs the basic call accounting services, as well as the following operations:

- Provides complete equipment inventory management by station number.
- Allows the telecommunications department to implement a service/work order processing function to update all SUT databases via a single input. The work order function provides the detail to manage both in-house technicians and vendors.
- The system includes a trouble reporting system. The trouble ticket uses available station information to identify equipment and cable-pair assignments, helping the technician to quickly resolve user problems. The trouble reports maintain the contact information needed to manage in-house technicians and other resources.
- Implements cable inventory for any cable system. The cable inventory module is used by service order and trouble reporting functions to further enhance the management capabilities of the SUT.

The COMIT 5.0 application is comprised of both standard and optional modules running primarily on the COMIT Server, which retrieves and stores all COMIT data in an Oracle database and runs all primary application program modules. A Windows workstation is used for user access to the application running a provided GUI module. The COMIT 5.0 Web Center application module is hosted on a Web Server, accessing data from the COMIT Server database. The SUT consists of PCRGUI/JavaGUI Workstation, COMIT Server, and Web Server.

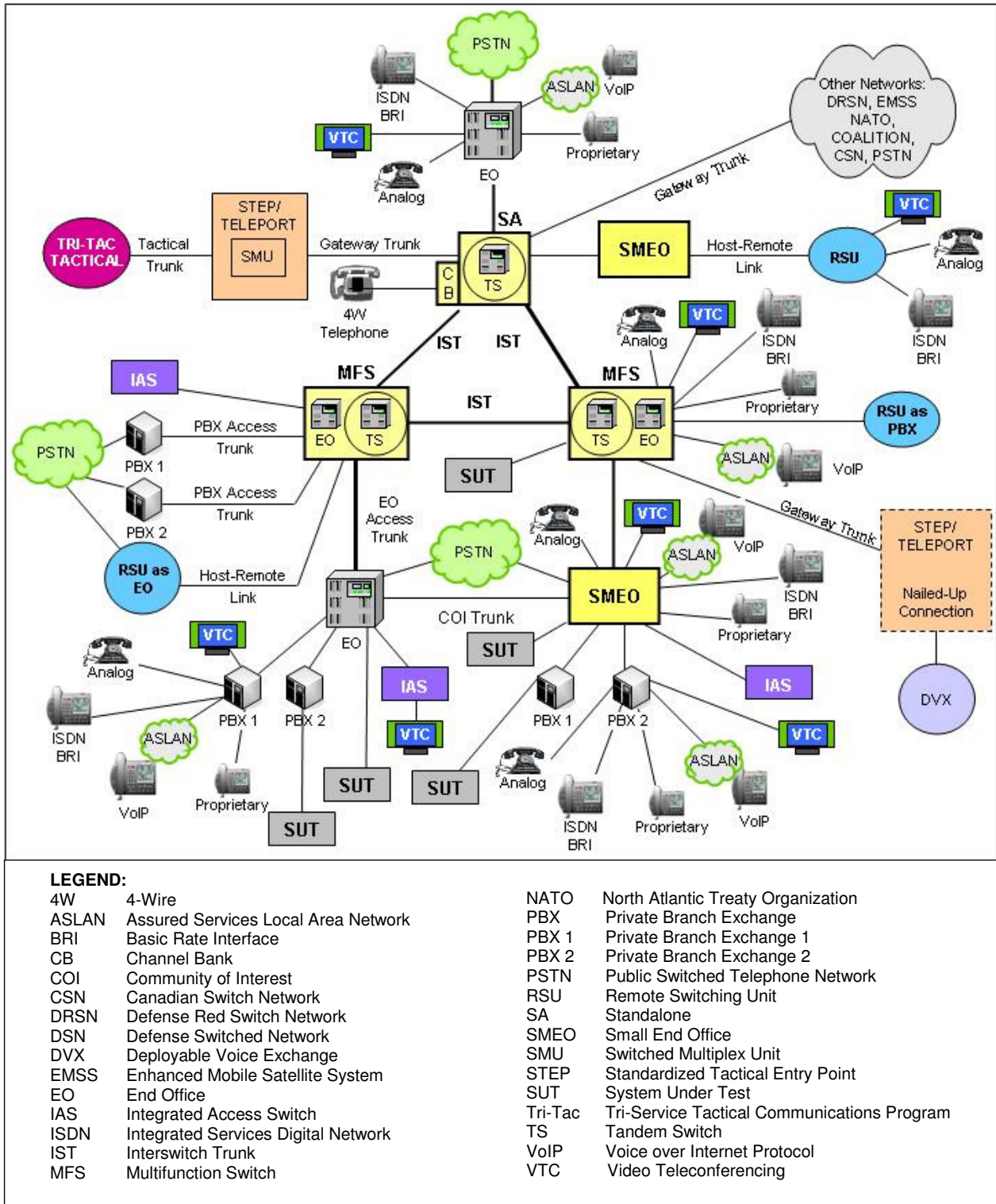
(1) PCRGUI/JavaGUI Workstation. The PCRGUI/JavaGUI Workstation is a standard Windows Personal Computer (PC) running the Windows eXPerience (XP) Service Pack (SP) 3 Operating System (OS). This platform is host to the PCRGUI and JavaGUI COMIT user interface applications. The PCRGUI/JavaGUI Workstation and Web Server are managed through the local keyboard, video, mouse, and local administrator accounts. However, the system as tested used a Keyboard, Video, Mouse (KVM) switch to manage these two devices.

(2) COMIT Server. The COMIT Server is a Sun server running the Solaris version 10 OS. This server hosts the COMIT application as well as the Oracle version 11 database. The COMIT application consists of the COMIT runtime engine and several auxiliary programs and scripts, and embodies all the business logic for the application. The Oracle database hosts the data for the COMIT application, as well as accepting encrypted connections from the Web Center application hosted on the Web Server.

The COMIT Server uses a network listener for connections to the PCRGUI/JavaGUI Workstation. The COMIT Server interfaces to various voice switches via a terminal server. The COMIT Server is managed using a serial cable connected to the management port on the Sun server.

(3) Web Server. The Web Server is an Intel X86-64 based server running the Red Hat Enterprise Linux, version 5.3, OS. The COMIT Web Center application module is hosted and run by the installed Apache version 2.2 web server. The web application service has been configured to accept only encrypted Hypertext Transfer Protocol Secure (HTTPS) sessions. The Web Server uses PHP Hypertext Preprocessor (PHP) server-side scripts to query and retrieve data from the Oracle database hosted on the COMIT Server.

**6. OPERATIONAL ARCHITECTURE.** The Generic Switching Center Requirements (GSCR) Defense Switched Network (DSN) architecture in Figure 2-1 depicts the relationship of the SUT to the DSN switches.



**Figure 2-1. DSN Architecture**



**7. REQUIRED SYSTEM INTERFACES.** Requirements specific to the SUT and interoperability results are listed in Table 2-1. These requirements are derived from UCR Interface and Functional Requirements (FRs) verified through JITC testing.

**Table 2-1. SUT Functional Requirements and Interoperability Status**

Interface	Critical	Certified	Functional Requirements	Status	UCR Reference
Serial EIA-232	No <sup>1</sup>	Yes	In accordance with EIA-232 (C)	Met	5.2.8.1
			Configuration Management (Switch Access) (C)	Met	5.2.8.4
			Automated Message Accounting (C)	Met	5.2.8.5
IEEE 802.3u Ethernet	No <sup>1</sup>	Yes	In Accordance with IEEE 802.3u (C)	Met	5.2.8.1
			Configuration Management (Switch Access) (C)	Met	5.2.8.4
			Automated Message Accounting (C)	Met	5.2.8.5
	Yes	Yes	Security (R)	See note 2.	Section 3

**NOTES:**  
1 The SUT is a CPE device that provides network monitoring functions. Therefore, the SUT interfaces are based on the UCR, section 5.2.8.1. The Network Management interoperability requirement can be met with any of the following interfaces: Ethernet, asynchronous serial, or synchronous serial.  
2 Security is tested by DISA-led Information Assurance test teams and published in a separate report, Reference (e).

**LEGEND:**  
802.3u Standard for carrier sense multiple access with collision detection at 100 Mbps  
C Conditional  
CPE Customer Premises Equipment  
DCE Data Circuit-terminating Equipment  
DISA Defense Information Systems Agency  
DTE Data Terminal Equipment  
EIA Electronic Industries Alliance  
EIA-232 Standard for defining the mechanical and electrical characteristics for connecting DTE and DCE data communications devices  
IEEE Institute of Electrical and Electronics Engineers  
Mbps Megabits per second  
R Required  
SUT System Under Test  
UCR Unified Capabilities Requirements

**Table 2-2. SUT Certified Switching System Configurations**

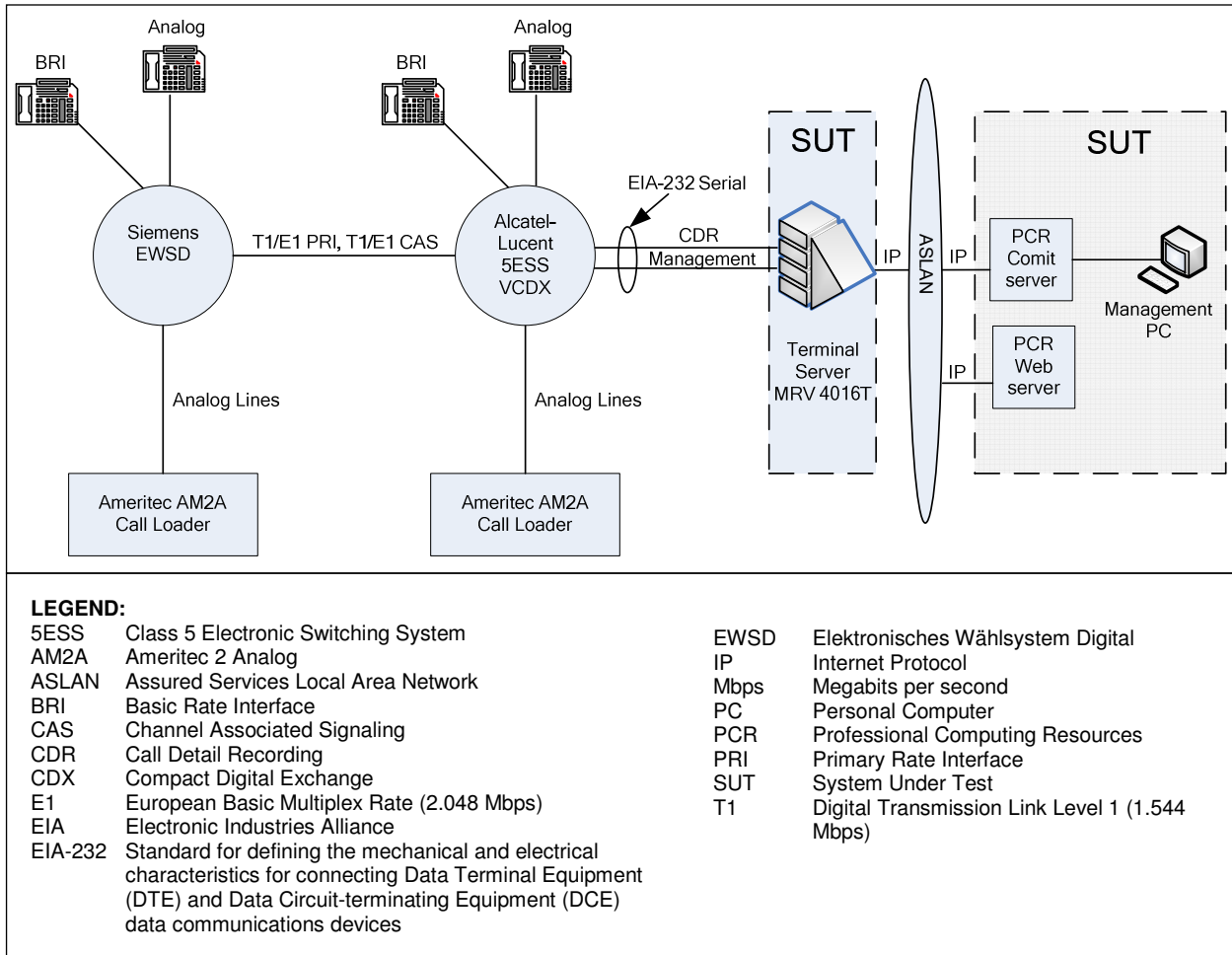
Switch Name (See note.)	Network Management Functions	Interface
Nortel CS2100	Configuration Management and Automated Message Accounting	EIA-232 Serial Asynchronous
Nortel CS1000M, CS1000M-SG, Succession DSN M1 Option 61C, and Succession DSN M1 Option 81C	Configuration Management and Automated Message Accounting	EIA-232 Serial Asynchronous
Nortel CS1000E, CS1000M-Cabinet, CS1000M-Chassis, Succession DSN M1 Option 11C Cabinet, and Succession DSN M1 Option 11C chassis	Configuration Management and Automated Message Accounting	EIA-232 Serial Asynchronous
Alcatel-Lucent 5ESS, CDX	Configuration Management and Automated Message Accounting	IEEE 802.3u Ethernet
Alcatel-Lucent 5ESS VCDX	Configuration Management and Automated Message Accounting	EIA-232 Serial Asynchronous

**NOTE:** The SUT is certified with all software versions of these digital switching systems which are listed on the UC APL with one exception: The SUT is certified with the Nortel CS2100 with the TDM interfaces only. This excludes VoIP end instruments and the MG9K IP Gateway.

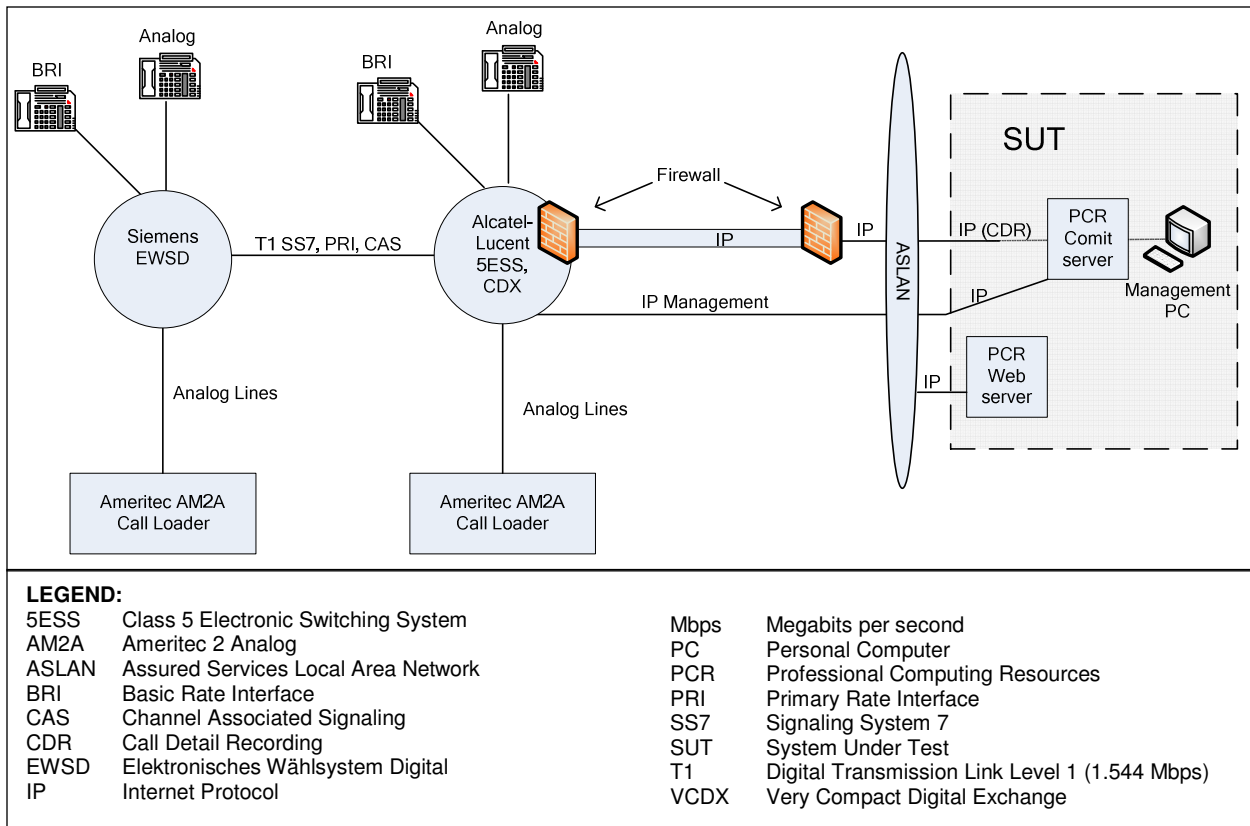
**Table 2-2. SUT Certified Switching System Configurations (continued)**

<b>LEGEND:</b>			
5ESS	Class 5 Electronic Switching System	IEEE	Institute of Electrical and Electronics Engineers
802.3u	Standard for carrier sense multiple access with collision detection at 100 Mbps	IP	Internet Protocol
APL	Approved Products List	M1	Meridian 1
CS	Communication Server	Mbps	Megabits per second
CDX	Compact Digital Exchange	MG9K	Media Gateway 9000
DCE	Data Circuit-terminating Equipment	SG	Single Group
DSN	Defense Switched Network	SUT	System Under Test
DTE	Data Terminal Equipment	TDM	Time Division Multiplexing
EIA	Electronic Industries Alliance	UC	Unified Capabilities
EIA-232	Standard for defining the mechanical and electrical characteristics for connecting DTE and DCE data communications devices	VCDX	Very Compact Digital Exchange
		VoIP	Voice over Internet Protocol

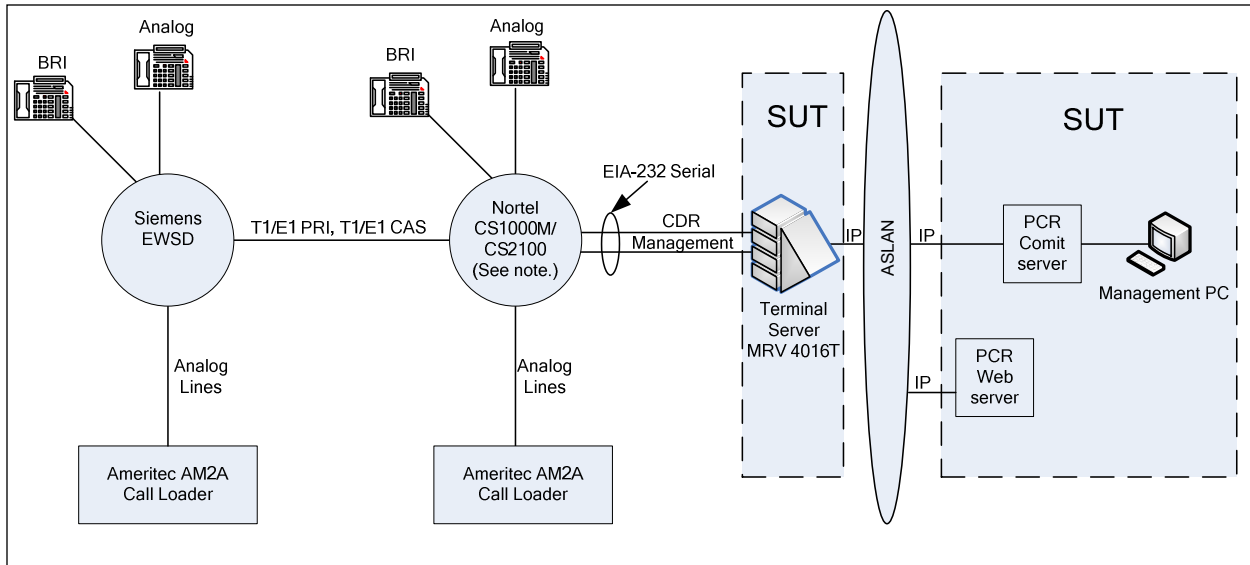
**8. TEST NETWORK DESCRIPTION.** The SUT was tested at JITC's Global Information Grid Network Test Facility in a manner and configuration similar to that of the DSN operational environment. Testing the system's required functions and features was conducted using the test configurations depicted in Figures 2-2 through 2-4. Figure 2-2 depicts the Alcatel-Lucent Class 5 Electronic Switching System (5ESS) Very Compact Digital Exchange (VCDX) serial interface test configuration. Figure 2-3 depicts Alcatel-Lucent 5ESS and Compact Digital Exchange (CDX) IP interface test configuration. Figure 2-4 depicts the Nortel Communication Server (CS)2100 and CS1000M serial interface test configuration.



**Figure 2-2. SUT Serial Interface Test Configuration with the Alcatel-Lucent 5ESS VCDX**



**Figure 2-3. SUT IP Interface Test Configuration with the Alcatel-Lucent 5ESS and CDX**



**NOTE:** The SUT is certified with all software versions of these digital switching systems which are listed on the UC APL with one exception: The SUT is certified with the Nortel CS2100 with the TDM interfaces only. This excludes VoIP end instruments and the MG9K IP Gateway.

**LEGEND:**

AM2A	Ameritec 2 Analog	EWSD	Elektronisches Wählsystem Digital
ASLAN	Assured Services Local Area Network	IP	Internet Protocol
BRI	Basic Rate Interface	Mbps	Megabits per second
CAS	Channel Associated Signaling	MG9K	Media Gateway 9000
CDR	Call Detail Recording	PC	Personal Computer
CS	Communication Server	PCR	Professional Computing Resources
E1	European Basic Multiplex Rate (2.048 Mbps)	PRI	Primary Rate Interface
EIA	Electronic Industries Alliance	SUT	System Under Test
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	T1	Digital Transmission Link Level 1 (1.544 Mbps)
		TDM	Time Division Multiplexing
		VoIP	Voice over Internet Protocol

**Figure 2-4. SUT Serial Interface Test Configuration with the Nortel CS2100 and CS1000M**

**9. SYSTEM CONFIGURATIONS.** Table 2-2 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 2-2. Table 2-2 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 in Table 2-3 which are on the Unified Capabilities (UC) Approved Products List (APL).

**Table 2-2. Tested System Configurations**

System Name	Hardware/Software Release		
Nokia-Siemens EWSD	Release 19d, Patch Set 46		
Alcatel-Lucent 5ESS/CDX/VCDX	5E16.2 Broadcast Warning Message (BWM) 08-0010		
Nortel CS2100	Succession Enterprise (SE) 09		
Nortel CS1000M	5.0		
PCR COMIT Rel. 5.0	Hardware	Software/Firmware	
	PCRGUI/JavaGUI Workstation (Management PC)	Windows XP SP3	
		JRE 1.6	
		COMIT JavaGUI 1.19	
		COMIT PCRGUI 1.19	
	COMIT Server	Solaris 10 (5.10)	
		Oracle 11.1.0.7	
		COMIT 5.0	
	Web Server	Red Hat Enterprise Linux 5.3	
		Apache Web Server 2.2.3	
Perl 5.8.8-18/Mod-Perl 2.0.4-6			
PHP 5.1.6-23/PHP Pear 1.4.9-4			
MRV In-Reach LX-4016T - Console server	COMIT WebCenter 5.0	5.3.2	
<b>LEGEND:</b>			
5ESS	Class 5 Electronic Switching System	PC	Personal Computer
CDX	Compact Digital Exchange	PCR	Professional Computing Resources
CS	Communication Server	SP	Service Pack
EWSD	Elektronisches Wählsystem Digital	VCDX	Very Compact Digital Exchange
GUI	Graphical User Interface	XP	Experience
JRE	Java Runtime Environment		

**10. TEST LIMITATIONS.** None.

**11. TEST RESULTS**

**a. Discussion.** The SUT was tested using the test configurations shown in Figures 2-2 through 2-4. A bulk call loader was configured to generate call traffic via the Nortel CS2100 and Alcatel-Lucent 5ESS switches. The SUT was then used to poll the respective Call Detail Recording (CDR) records, parse the data, and then display it in a GUI or save it to a file. The CDR data was adequately polled by the SUT with no noted interoperability problems. The SUT adequately polled line features and configurations using the respective switches command lines when logged-in to the switch without any disruption of local changes on the maintenance terminal. The requirements listed in the UCR, section 5.2.8, are detailed as Network Management (NM) requirements for DSN switches. The SUT was tested with these requirements as the NM system connected to the DSN switches.

(1) In accordance with the UCR, section 5.2.8.1, DSN switching systems shall provide DSN NM data to the Advanced DSN Integrated Management Support System (ADIMSS) via one of the three following physical interfaces: Ethernet, serial asynchronous (Electronic Industries Alliance [EIA]-232, or serial synchronous International Telecommunication Union - Telecommunication Standardization Sector [ITU-T] X.25. The SUT, as a telecommunications management system, met all critical interoperability certification requirements for physical interfaces with Ethernet and EIA-232.

(2) In accordance with the UCR, section 5.2.8.4, Configuration Management in a switching system shall be in accordance with Telcordia Technologies GR-472-CORE, Network Element Configuration Management, Revision 2, Feb. 1999, Section 4. The SUT met all critical interoperability requirements for Configuration Management by connecting to the switching systems remotely and emulating their local maintenance terminals.

(3) In accordance with the UCR, section 5.2.8.5, the Automated Message Accounting (AMA) process in a switching system provides usage related data to perform customer billing and CDR. The SUT met all critical interoperability requirements for AMA by collecting and storing CDR data on the database server.

(4) In accordance with the UCR, Table 5.3.1-3, Operational Administration and Maintenance (OAM) IP packets shall be tagged with a Differentiated Services Code Point (DSCP) value of 16 to 23. Using the WireShark IP capture tool to capture DSCP tagging within the SUT enclave between the MRV, COMIT Server, and Web Server, it was determined that the SUT tagged the OAM packets at 0 which does not meet this requirement. However, this discrepancy was reviewed by DISA and was adjudicated as having a minor operational impact.

**b. Test Summary.** The SUT met the interface and functional requirements for a Customer Premise Equipment (CPE) telecommunications management system as set forth in Reference (c). The SUT is certified specifically with switching systems and their respective interfaces listed in Table 2-3.

**12. TESTS 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 TSSI website at <http://jitc.fhu.disa.mil/tssi>.