



DEFENSE INFORMATION SYSTEMS AGENCY

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

10 Jan 13

MEMORANDUM FOR DISTRIBUTION

SUBJECT: Joint Interoperability Certification of the Amcom Software, Inc. Computer Telephony Integration (CTI) Cisco and Avaya Smart Console Workstation with Release 4.9-0

References: (a) DoD Directive 4630.05, "Interoperability and Supportability of Information Technology (IT) and National Security Systems (NSS)," 5 May 2004
(b) Department of Defense Instruction 8100.04, "DoD Unified Capabilities (UC)," 9 December 2010
(c) through (e), see Enclosure 1

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

2. The Amcom Software, Inc. Computer Telephony Integration (CTI), Cisco and Avaya Smart Console Workstation with Release 4.9-0 is hereinafter referred to as the System Under Test (SUT). The SUT meets all of its critical interoperability requirements and is therefore certified for joint use within the Defense Information Systems Network (DISN) as a Customer Premise Equipment (CPE) specifically with any Cisco Unified Communications Manager (CUCM) Local Session Controller (LSC) or Avaya Aura Communication Manager (CM) switch with the Avaya Application Enablement (AE) Services listed on the Unified Capabilities (UC) Approved Product List (APL). The SUT met the critical interoperability requirements set forth in Reference (c), using test procedures derived from Reference (d). No other configurations, features, or functions, except those cited within this memorandum, are certified by JITC. 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 JITC, review of the vendor's Letters of Compliance (LoC), and DISA Certifying Authority (CA) Recommendation of the Information Assurance (IA) configuration. Interoperability testing was conducted by JITC, Fort Huachuca, Arizona, from 10 through 20 September 2012. Review of the vendor's LoC was completed on 5 September 2012. The DISA CA provided a positive Recommendation on 21 December 2012 based on the security testing completed by DISA-led IA test teams and published in a separate report, Reference (e). The acquiring agency or site will be responsible for the DoD Information Assurance Certification and Accreditation Process (DIACAP) accreditation. Enclosure 2 documents the test results and describes the tested network and system configurations including specified patch releases.

4. The interface, Capability Requirement (CR) and Functional Requirement (FR), and component status of the SUT are listed in Tables 1 and 2. The threshold CR/FRs for CPE are established by Section 5.2.1.2 of Reference (c) and were used to evaluate the interoperability of the SUT. Enclosure 3 provides a detailed list of the interface, capability, and functional requirements.

Table 1. SUT Interface Interoperability Status

Interface	Critical	UCR Reference	Threshold CR/FR ¹	Status
10Base-X	Yes	5.3.2.4.2	1-4	Certified ^{2,3}
100Base-X	Yes	5.3.2.4.2	1-4	Certified ³
1000Base-X	No	5.3.2.4.2	1-4	Certified ³
2-Wire Analog (GR-506-CORE)	No	5.3.2.31.4.3.1	1, 2, 4	Not Tested
T1 ISDN PRI NI 1/2	No	5.3.2.31.4.8	1, 2, 4	Not Tested
T1 Line Side Loop Start	No	GR-506-CORE	1, 2, 4	Not Tested

NOTES:

- The annotation of 'required' refers to a high-level requirement category. The applicability of each sub-requirement is provided in Enclosure 3. The system under test does not need to provide conditional interfaces. However, if an interface is provided, it must function according to the specified requirements in order to be certified.
- The SUT supports 10Base-X, but the vendor does not recommend its use due to the speed limitations. This is noted in the SUT deployment guide.
- The SUT IP interface is certified with any Cisco Unified Communications Manager or Avaya Aura Communication Manager switch that is listed on the UC APL.

LEGEND:

APL	Approved Products List	Mbps	Megabits per second
CR	Capability Requirement	NI 1/2	National ISDN Standard 1 or 2
FR	Functional Requirement	PRI	Primary Rate Interface
GR	Generic Requirement	SUT	System Under Test
GR-506	LSSGR: Signaling for Analog Interfaces	T1	Digital Transmission Link Level 1 (1.544 Mbps)
IP	Internet Protocol	UC	Unified Capabilities
ISDN	Integrated Services Digital Network	UCR	Unified Capabilities Requirements
LSSGR	Local Access and Transport Area (LATA) Switching Systems Generic Requirements		

Table 2. SUT CRs and FRs Status

CR/FR ID	Capability/Function	Applicability ¹	UCR Reference	Status
1	Product Interface Requirements			
	Interfaces to LSC	Required	5.3.2.4.2	Met
2	Customer Premise Equipment Requirements			
	MLPP in accordance with requirements listed in section 5.3.2.3.31.3	Conditional	5.2.1.2(1)	Met
	FCC Part 15/Part 68 and ACTA	Required	5.2.1.2(2)	Met
	Auto Answer mode settable to more than the equivalency of 4 ROUTINE rings	Conditional	5.2.1.2(3)	Met
	MLPP precedence call alerting	Conditional	5.2.1.2(4)	Met
	DTMF Outpulsing in accordance with GR-506-CORE	Conditional	5.2.1.2(5)	Met
	If configuration management and/or fault management are/is provided by the CPE device so that it can be managed by the ADIMSS or other management systems, the management information shall be provided by one or more serial or Ethernet interfaces.	Conditional	5.2.1.2(8)	Met

Table 2. SUT CRs and FRs Status (continued)

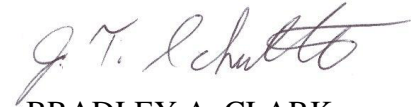
CR/FR ID	Capability/Function	Applicability ¹	UCR Reference	Status																																								
2	Customer Premise Equipment Requirements (continued)																																											
	Calls above ROUTINE placed to the SUT shall divert to a designated Directory Number.	Required	5.3.2.2.1.2.5	Met																																								
3	IPv6 Requirements																																											
	If CPE has an IP interface, the CPE must be IPv6 capable. Use guidance in Table 5.3.5-4 for NA/SS	Required	5.3.5	Met ²																																								
4	Information Assurance																																											
	Security	Required	5.4	Met ³																																								
<p>NOTES:</p> <p>1. The annotation of 'required' refers to a high-level requirement category. The applicability of each sub-requirement is provided in Enclosure 3. The system under test does not need to provide features or capabilities defined by conditional requirements. However, if a capability is provided, it must function according to the specified requirements in order to be certified for that capability.</p> <p>2. Due to limitations in the test architecture IPv6 was unable to be tested across the network; however testing was conducted intra-enclave and compliance with IPv6 specifications was verified with vendor's LoC.</p> <p>3. Information assurance testing is accomplished via DISA-led Information Assurance test teams and published in a separate report, Reference (e).</p> <p>LEGEND:</p> <table border="0"> <tr> <td>ACTA</td> <td>Administrative Council for Terminal Attachments</td> <td>ID</td> <td>Identification</td> </tr> <tr> <td>ADIMSS</td> <td>Advanced Defense Switched Network (DSN) Integrated Management Support System</td> <td>IP</td> <td>Internet Protocol</td> </tr> <tr> <td>CPE</td> <td>Customer Premise Equipment</td> <td>IPv6</td> <td>Internet Protocol version 6</td> </tr> <tr> <td>CR</td> <td>Capability Requirement</td> <td>LSSGR</td> <td>Local Access and Transport Area (LATA) Switching Systems Generic Requirements</td> </tr> <tr> <td>DISA</td> <td>Defense Information Systems Agency</td> <td>LoC</td> <td>Letters of Compliance</td> </tr> <tr> <td>DTMF</td> <td>Dual Tone Multi-Frequency</td> <td>LSC</td> <td>Local Session Controller</td> </tr> <tr> <td>FCC</td> <td>Federal Communications Commission</td> <td>MLPP</td> <td>Multi-Level Precedence and Preemption</td> </tr> <tr> <td>FR</td> <td>Functional Requirement</td> <td>NA/SS</td> <td>Network Appliances and Simple Servers</td> </tr> <tr> <td>GR</td> <td>Generic Requirement</td> <td>SUT</td> <td>System Under Test</td> </tr> <tr> <td>GR-506</td> <td>LSSGR: Signaling for Analog Interfaces</td> <td>UCR</td> <td>Unified Capabilities Requirements</td> </tr> </table>					ACTA	Administrative Council for Terminal Attachments	ID	Identification	ADIMSS	Advanced Defense Switched Network (DSN) Integrated Management Support System	IP	Internet Protocol	CPE	Customer Premise Equipment	IPv6	Internet Protocol version 6	CR	Capability Requirement	LSSGR	Local Access and Transport Area (LATA) Switching Systems Generic Requirements	DISA	Defense Information Systems Agency	LoC	Letters of Compliance	DTMF	Dual Tone Multi-Frequency	LSC	Local Session Controller	FCC	Federal Communications Commission	MLPP	Multi-Level Precedence and Preemption	FR	Functional Requirement	NA/SS	Network Appliances and Simple Servers	GR	Generic Requirement	SUT	System Under Test	GR-506	LSSGR: Signaling for Analog Interfaces	UCR	Unified Capabilities Requirements
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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). Information related to Defense Switched Network (DSN) testing is on the Telecom Switched Services Interoperability (TSSI) website at <http://jitc.fhu.disa.mil/tssi>. Due to the sensitivity of the information, the Information Assurance Accreditation Package (IAAP) that contains the approved configuration and deployment guide must be requested directly through government civilian or uniformed military personnel from the Unified Capabilities Certification Office (UCCO), e-mail: disa.meade.ns.list.unified-capabilities-certification-office@mail.mil.

JITC Memo, JTE, Joint Interoperability Certification of the Amcom Software, Inc. Computer Telephony Integration (CTI) Cisco and Avaya Smart Console Workstation with Release 4.9-0

6. The JITC point of contact is Capt Stéphane Arsenault, DSN 879-5269, commercial (520) 538-5269, FAX DSN 879-4347, or e-mail to Stephane.P.Arsenault.fm@mail.mil. JITC's mailing address is P.O. Box 12798, Fort Huachuca, AZ 85670-2798. The tracking number for the SUT is 1214402.

FOR THE COMMANDER:



for BRADLEY A. CLARK
Acting Chief
Battlespace Communications Portfolio

3 Enclosures a/s

Distribution (electronic mail):

DoD CIO

Joint Staff J-6, JCS

USD(AT&L)

ISG Secretariat, DISA, JTA

U.S. Strategic Command, J665

US Navy, OPNAV N2/N6FP12

US Army, DA-OSA, CIO/G-6 ASA(ALT), SAIS-IOQ

US Air Force, A3CNN/A6CNN

US Marine Corps, MARCORSYSCOM, SIAT, A&CE Division

US Coast Guard, CG-64

DISA/TEMC

DIA, Office of the Acquisition Executive

NSG Interoperability Assessment Team

DOT&E, Netcentric Systems and Naval Warfare

Medical Health Systems, JMIS IV&V

HQUSAISEC, AMSEL-IE-IS

UCCO

ADDITIONAL REFERENCES

- (c) Office of the Assistant Secretary of Defense, "Department of Defense Unified Capabilities Requirements 2008, Change 3," September 2011
- (d) Joint Interoperability Test Command, "Defense Switched Network Generic Switch Test Plan (GSTP), Change 2," 2 October 2006
- (e) Joint Interoperability Test Command, "Information Assurance (IA) Assessment of Amcom Smart Suite – Smart Console Cisco/Avaya Application Enablement Services (AES) Release (Rel.) 4.9-0 (Tracking Number 1214402)," Draft

CERTIFICATION TESTING SUMMARY

1. SYSTEM TITLE. Amcom Software, Inc. Computer Telephony Integration (CTI) Cisco and Avaya Smart Console Workstation with Release 4.9-0; hereinafter referred to as the System Under Test (SUT).

2. SPONSOR. Headquarters United States Army Information Systems Engineering Command (HQUSAISEC), Mr. Steven Pursell, USAISEC ELIE-ISE-ES, Building 53301, Fort Huachuca, Arizona 85613, e-mail: steven.d.pursell.civ@mail.mil.

3. SYSTEM POC. Mr. Robert Erdman, 10400 Yellow Circle Drive, Suite 100, Eden Prairie, Minnesota, 55343, e-mail: berdman@amcomsoft.com.

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

5. SYSTEM DESCRIPTION. The Amcom Software, Inc. CTI Smart Console Cisco is an adjunct to the Cisco certified IP Phones and it emulates those features and capabilities provide by the phones. The SUT provides telephony operations, for the Cisco Call Manager (CCM) with the Cisco Internet Protocol Contact Center (IPCC) through screen-based interactive functions including automatic screen displays of incoming calls, single button call transfers, conferencing, speed dialing, and other telephony functions. The AMCOM CTI Smart Console Workstation utilizes an encrypted Internet Protocol (IP) connection to the Cisco Unified Call Manager Server. The Windows-based application provides access to database information, messaging, and staff tracking options. The Amcom Software, Inc. CTI Smart Console provides real-time monitoring of call center activity and reporting procedures including call-processing statistics, messaging, and paging activity. Reports may be generated for a particular day, operator, or time-period. No switch management functions are performed through the Amcom Software, Inc. CTI Smart Console interface. The Amcom Software, Inc. CTI Smart Console requests and receives directory data from the AmcomDB server to be used while processing telephone calls. The Amcom Software, Inc. CTI Smart Console Workstation performs database lookups from the AmcomDB server as needed by the Workstation Operator. The Amcom Software, Inc. CTI Smart Console Cisco is certified with any CCM or Cisco Unified Communications Manager (CUCM) that is or was previously listed on the Unified Capabilities (UC) Approved Products List (APL).

The Amcom Software, Inc. CTI Smart Console Application Enablement (AE) Services Workstation is an adjunct to the Avaya certified digital and IP Phones. It emulates those features and capabilities provide by the phones. The SUT uses the Telephony Services Application Programming Interface (TSAPI) to the Avaya AE Services Server. The Amcom Software, Inc. CTI Smart Console AE Services allows a telephone operator to perform telephony functions from a Personal Computer (PC) platform against Avaya Aura Communication Manager (CM) switching platforms with the Avaya AE Services listed on the UC APL. The Amcom Software, Inc. CTI Smart Console Workstation requests and receives directory data from the AmcomDB server to be used while processing telephone calls. The Amcom Software, Inc. CTI Smart Console Workstation

performs database lookups from the AmcomDB server as needed by the Workstation Operator.

The components under test include the Amcom Software, Inc. CTI Smart Consoles, AmcomDB, AmcomSB (optional), and the Vormetric Hardware Security Manager.

AmcomDB: This is the primary database, which houses the database for directory assistance, messaging, and paging independent of a live operator. The system provides the HyperText Transfer Protocol Secure (HTTPS) web-based user access for maintaining the contact database as well as directory assistance, messaging, and paging independent of a live operator. Application services provided by the system are as follows:

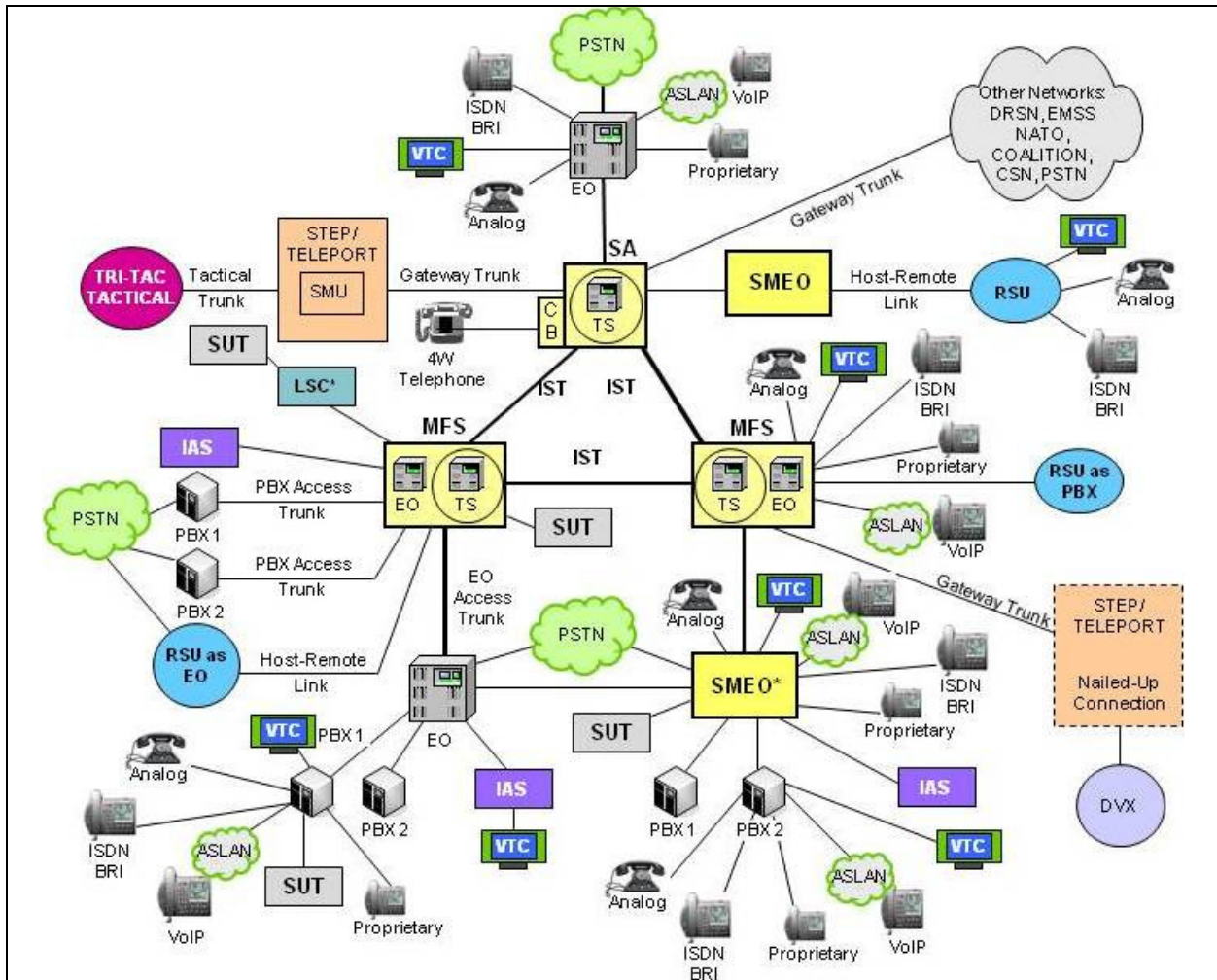
- Smart Center provides authorized users administrative functions to manage the data that the Amcom applications utilize for their services
 - e.Notify provides authorized users administrative functions to create emergency notification templates for use in communications delivery of important information to a group of recipients.
 - Smart Web provides authorized user access to designated directory information about local resources such as a locations published telephone number.
 - ezNotify provides authorized user level access to initiate e.Notify pre-built notification events.
 - Scheduler provides authorized user level access to schedule e.Notify pre-built notification events for automatic activation at a future time.

AmcomSB (optional): The failover Database Server provides an automated copy of the AmcomDB primary database to allow for Business Continuity and Disaster Recovery (BCDR) functionality if the AmcomDB system becomes nonoperational. This optional server provides the same functionality of the primary database, AmcomDB.

Vormetric Hardware Security Manager: The Vormetric appliance manages the encryption of the AmcomDB contact database information and maintains the encryption keys, access controls and configuration information.

The Amcom servers are managed directly via an attached Keyboard, Video monitor and Mouse or remotely through a site-provided management workstation.

6. OPERATIONAL ARCHITECTURE. Figure 2-1 depicts the Defense Information Systems Network (DISN) Unified Capabilities notional operational architecture that the SUT may be used in.



NOTE: LSC* in the diagram denotes an Avaya Aura S8800 Communication Manager (CM) or a Cisco CUCM. The SUT is certified specifically with any Avaya Aura CM switch with the Application Enablement Services or Cisco CUCM LSC on the UC APL.

LEGEND:

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

Figure 2-1. DISN Unified Capabilities Notional Operational Architecture

7. INTEROPERABILITY REQUIREMENTS. The interface, Capability Requirements (CR) and Functional Requirements (FR), and other requirements for Customer Premise Equipments (CPEs) are established by Section 5.2.1.2 of Reference (c).

7.1 Interfaces. The SUT uses the interfaces shown in Table 2-1 to connect to the Global Information Grid network. This table shows the physical interfaces supported by the SUT and the associated standards.

Table 2-1. CPE Interface Requirements

Interface	Critical	UCR Reference	Criteria (See note.)																								
10Base-X	Yes	5.3.2.4.2	Support minimum threshold CRs/FRs (1-4) and meet interface criteria for IEEE 802.3i.																								
100Base-X	Yes	5.3.2.4.2	Support minimum threshold CRs/FRs (1-4) and meet interface criteria for IEEE802.3u.																								
1000Base-X	No	5.3.2.4.2	Support minimum threshold CRs/FRs (1-4) and meet interface criteria for IEEE 802.3z or IEEE 802.3ab.																								
2-Wire Analog (GR-506-CORE)	No	5.3.2.31.4.3.1	Support minimum threshold CRs/FRs (1,2,4)																								
T1 ISDN PRI NI 1/2	No	5.3.2.31.4.8	Support minimum threshold CRs/FRs (1,2,4)																								
T1 Line Side Loop Start	No	(GR-506-CORE)	Support minimum threshold CRs/FRs (1,2,4)																								
<p>NOTES: The annotation of 'required' refers to a high-level requirement category. The applicability of each sub-requirement is provided in Enclosure 3. The system under test does not need to provide conditional interfaces. However, if an interface is provided, it must function according to the specified requirements in order to be certified.</p> <p>LEGEND:</p> <table> <tr> <td>802.3ab</td> <td>1000BaseT Gbps Ethernet over twisted pair at 1 Gbps (125 Mbps)</td> <td>FR</td> <td>Functional Requirement</td> </tr> <tr> <td></td> <td></td> <td>Gbps</td> <td>Gigabits per second</td> </tr> <tr> <td>802.3i</td> <td>10BaseT Mbps over twisted pair</td> <td>IEEE</td> <td>Institute of Electrical and Electronics Engineers</td> </tr> <tr> <td>802.3u</td> <td>Standard For Carrier Sense Multiple Access With Collision Detection At 100 Mbps</td> <td>Mbps</td> <td>Megabits per second</td> </tr> <tr> <td></td> <td></td> <td>SUT</td> <td>System Under Test</td> </tr> <tr> <td>CR</td> <td>Capability Requirement</td> <td>UCR</td> <td>Unified Capabilities Requirements</td> </tr> </table>				802.3ab	1000BaseT Gbps Ethernet over twisted pair at 1 Gbps (125 Mbps)	FR	Functional Requirement			Gbps	Gigabits per second	802.3i	10BaseT Mbps over twisted pair	IEEE	Institute of Electrical and Electronics Engineers	802.3u	Standard For Carrier Sense Multiple Access With Collision Detection At 100 Mbps	Mbps	Megabits per second			SUT	System Under Test	CR	Capability Requirement	UCR	Unified Capabilities Requirements
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CR	Capability Requirement	UCR	Unified Capabilities Requirements																								

7.2 CR and FR. CPEs have required and conditional features and capabilities that are established by Section 5.2.1 of the Unified Capabilities Requirement (UCR). The SUT does not need to provide features or capabilities defined by non-critical (conditional) requirements. If they are provided, they must function according to the specified requirements in order to be certified for that capability. The SUT's features and capabilities and its aggregated requirements in accordance with (IAW) the UCR CPE requirements are listed in Table 2-2. Detailed CR/FR requirements are provided in Table 3-1 of Enclosure 3.

Table 2-2. Customer Premise Equipment CRs and FRs

CR/FR ID	Capability/Function	Applicability (See note.)	UCR Reference																																								
1	Product Interface Requirements																																										
	Interfaces to LSC	Required	5.3.2.4.2																																								
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7.3 Information Assurance (IA). Table 2-3 details the IA requirements applicable to the CPE products.

Table 2-3. CPE IA Requirements

Requirement	Applicability (See note.)	UCR Reference	Criteria
General Requirements	Required	5.4.6.2	Detailed requirements and associated criteria for CPE are listed in Reference (e).
Authentication	Required	5.4.6.2.1	
Integrity	Required	5.4.6.2.2	
Confidentiality	Required	5.4.6.2.3	
Non-Repudiation	Required	5.4.6.2.4	
Availability	Required	5.4.6.2.5	
<p>NOTE: The annotation of 'required' refers to a high-level requirement category of IA requirements from the UCR 2008, Change 3, Section 5.4. The detailed IA requirements are included in Reference (e).</p>			

Table 2-3. CPE IA Requirements (continued)

LEGEND:	
CPE	Customer Premises Equipment
IA	Information Assurance
UCR	Unified Capabilities Requirements

7.4 Other. None

8. TEST NETWORK DESCRIPTION. The SUT was tested at JITC, Fort Huachuca, Arizona in a manner and configuration similar to that of a notional operational environment. Testing of the system's required functions and features was conducted using the test configuration depicted in Figures 2-2 and 2-3. Figure 2-2 depicts the SUT with the CUCM. Figure 2-3 depicts the SUT with the Avaya Aura S8800 with CM 6 and AE Services.

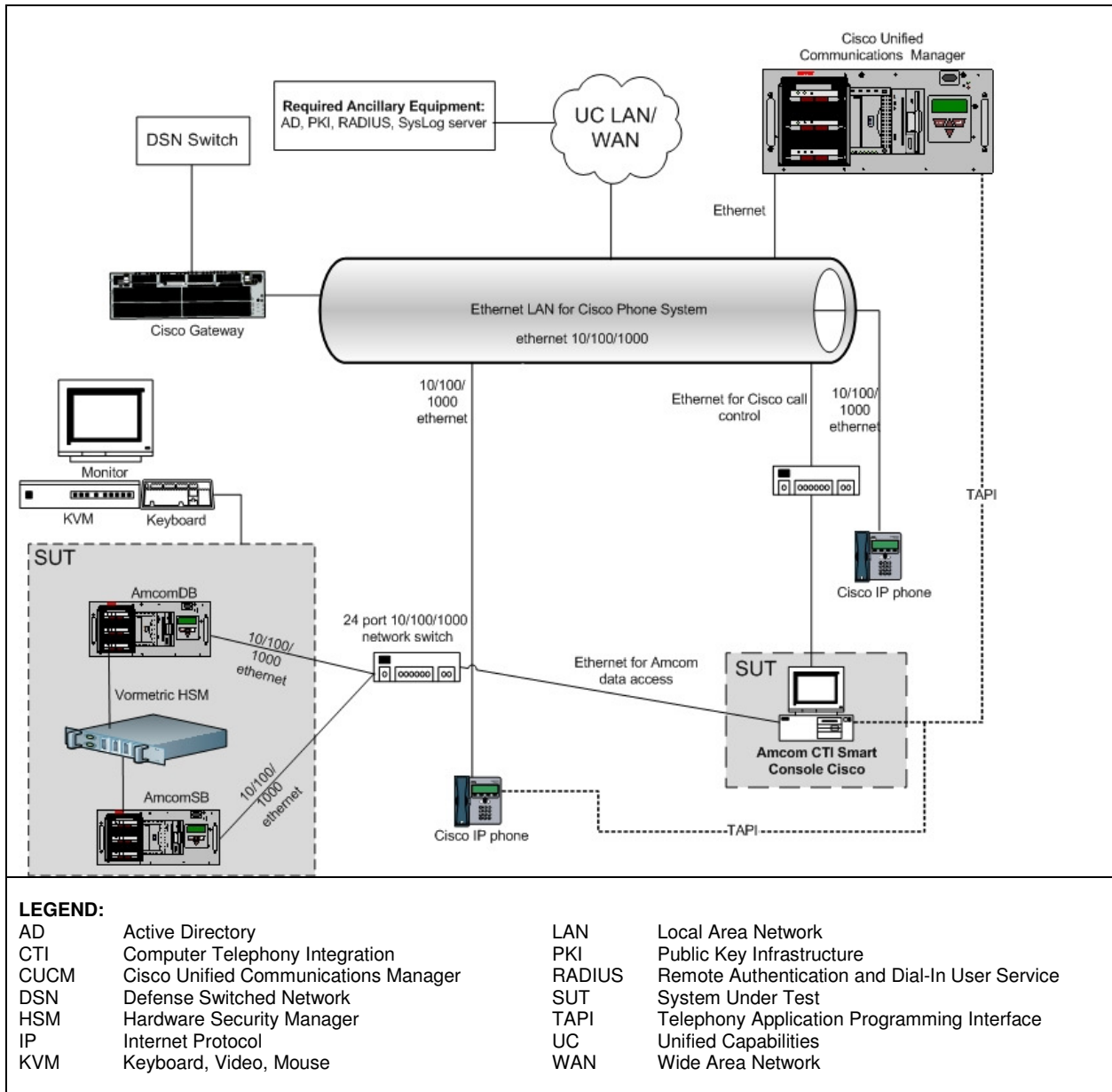


Figure 2-2. Cisco Test Configuration

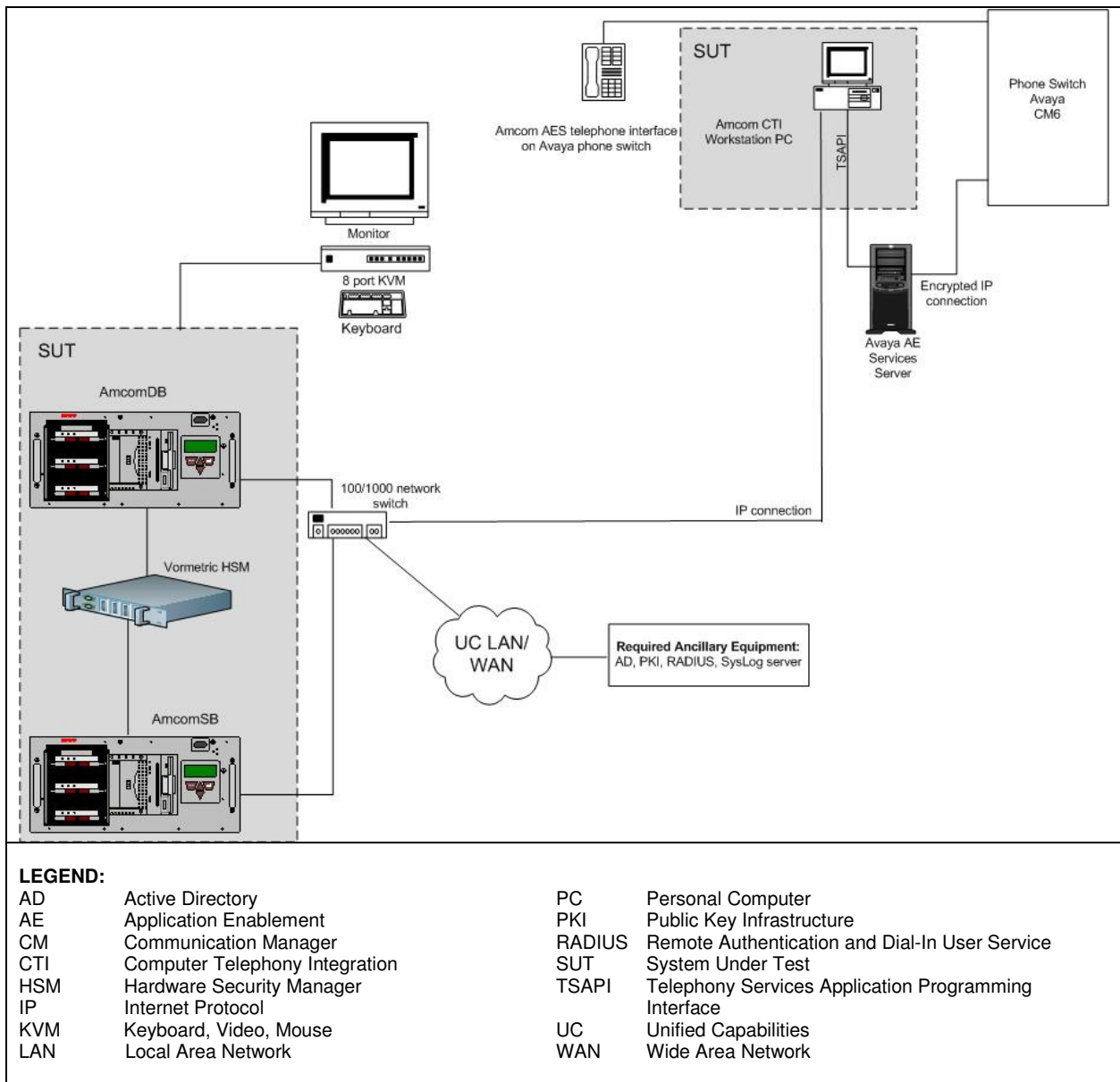


Figure 2-3. Avaya Test Configuration

9. SYSTEM CONFIGURATIONS. Table 2-4 provides the system configurations and hardware and software components tested with the SUT. The SUT was tested in an operationally realistic environment to determine its interoperability capability with UC switches noted in Table 2-4. The SUT is certified specifically with the Cisco CUCM and Avaya Aura CM switch with AE Services listed on the UC APL or the UC APL removal page (end of sale).

Table 2-4. Tested System Configurations

System Name	Software Release	
Cisco CUCM	Release 8.6	
Avaya Aura S8800	Communication Manager (CM) 6.0.1 (00.1.510.1 Service Pack 19391) and Application Enabled Services Release 6.2	
Required Ancillary Equipment (Site-provided)	Active Directory	
	Public Key Infrastructure	
	Remote Authentication Dial-In User Server	
	SysLog Server	
	Monitor, Keyboard, and Mouse (KVM) ¹	
	Management Workstation ^{1,2}	
SUT	Hardware	Software Release
Amcom Software, Inc. CTI, Cisco and Avaya Smart Console Workstation with Release 4.9-0	AmcomDB Primary Database & e.Notify Phone Lines Server (Dell R710)	RedHat Linux Enterprise Linux Server Release 5.8 Oracle Enterprise Database 11.2.0.3, Oracle Enterprise Application Server
	AmcomSB Secondary Database Server (Dell R710)	RedHat Enterprise Linux Server Release 5.8, Oracle Enterprise Database 11.2.0.3
	Vormetric Hardware Security Manager	Linux CentOS5
	Amcom CTI Smart Console Cisco (Site-provided computer ²)	Amcom Smart Console 4.9.0.1
	Amcom CTI Smart Console AE Services CTI Workstation (Site-provided computer ²)	Amcom Smart Console 4.9.0.1
NOTES:		
1. During interoperability testing, the SUT was managed through a KVM. However, the SUT can be managed through either a KVM or a site-provided workstation.		
2. The minimum requirements for a management workstation or CTI Smart Console are a STIG-compliant, CAC-enabled computer with Microsoft Vista or Windows 7 operating system 2GB RAM, 40GB hard drive, Pentium 4 or higher.		
LEGEND:		
AE	Application Enablement	KVM Keyboard, Video, Mouse
CAC	Common Access Card	RAM Random Access Memory
CTI	Computer Telephony Integration	STIG Security Technical Implementation Guide
CUCM	Cisco Unified Communications Manager	SUT System Under Test
GB	Gigabyte	

10. TESTING LIMITATIONS. Due to limitations in the test architecture, IPv6 was unable to be tested end-to-end inter-enclave. The SUT was; however, tested intra-enclave and the vendor submitted an IPv6 Letter of Compliance (LoC).

11. INTEROPERABILITY EVALUATION RESULTS. The SUT meets the critical interoperability requirements for a CPE in accordance with UCR 2008, Change 3, section 5.2.1.2, and is certified for joint use with other network infrastructure products listed on the UC APL. Additional discussion regarding specific testing results is located in subsequent paragraphs.

11.1 Interfaces. The interface status of the SUT is provided in Table 2-5.

Table 2-5. SUT Interface Interoperability Status

Interface	Critical	UCR Reference	Threshold CR/FR ¹	Status
10Base-X	Yes	5.3.2.4.2	1-4	Certified ^{2, 3}
100Base-X	Yes	5.3.2.4.2	1-4	Certified ³
1000Base-X	No	5.3.2.4.2	1-4	Certified ³
2-Wire Analog (GR-506-CORE)	No	5.3.2.31.4.3.1	1, 2, 4	Not Tested
T1 ISDN PRI NI 1/2	No	5.3.2.31.4.8	1, 2, 4	Not Tested
T1 Line Side Loop Start	No	(GR-506-CORE)	1, 2, 4	Not Tested

NOTES:

- The annotation of 'required' refers to a high-level requirement category. The applicability of each sub-requirement is provided in Enclosure 3. The system under test does not need to provide conditional interfaces. However, if an interface is provided, it must function according to the specified requirements in order to be certified.
- The SUT was tested with 10Base-X, but the vendor does not recommend its use due to the speed limitations. This is noted in the SUT deployment guide.
- The SUT IP interface is certified with any Cisco Unified Communications Manager or Avaya Aura Communication Manager switch that is listed on the UC APL.

LEGEND:

APL	Approved Products List	Mbps	Megabits per second
CR	Capability Requirement	NI 1/2	National ISDN Standard 1 or 2
FR	Functional Requirement	PRI	Primary Rate Interface
GR	Generic Requirement	SUT	System Under Test
GR-506	LSSGR: Signaling for Analog Interfaces	T1	Digital Transmission Link Level 1 (1.544 Mbps)
IP	Internet Protocol	UC	Unified Capabilities
ISDN	Integrated Services Digital Network	UCR	Unified Capabilities Requirements
LSSGR	Local Access and Transport Area (LATA) Switching Systems Generic Requirements		

11.2 CR and FR. The SUT CR and FR status is depicted in Table 2-6. Detailed CR/FR requirements are provided in Enclosure 3, Table 3-1.

Table 2-6. SUT CR and FR Status

CR/FR ID	Capability/Function	Applicability ¹	UCR Reference	Status
1	Product Interface Requirements			
	Interfaces to LSC	Required	5.3.2.4.2	Met
2	Customer Premise Equipment Requirements			
	MLPP in accordance with requirements listed in section 5.3.2.3.31.3	Conditional	5.2.1.2(1)	Met
	FCC Part 15/Part 68 and ACTA	Required	5.2.1.2(2)	Met
	Auto Answer mode settable to more than the equivalency of 4 ROUTINE rings	Conditional	5.2.12(3)	Met
	MLPP precedence call alerting	Conditional	5.2.1.2(4)	Met
	DTMF Outpulsing in accordance with GR-506-CORE	Conditional	5.2.1.2(5)	Met
	If configuration management and/or fault management are/is provided by the CPE device so that it can be managed by the ADIMSS or other management systems, the management information shall be provided by one or more serial or Ethernet interfaces.	Conditional	5.2.1.2(8)	Met
Calls above ROUTINE placed to the SUT shall divert to a designated Directory Number.	Required	5.3.2.2.2.1.2.5	Met	

Table 2-6. SUT CRs and FRs Status (continued)

CR/FR ID	Capability/Function	Applicability ¹	UCR Reference	Status
3	IPv6 Requirements			
	If CPE has an IP interface, the CPE must be IPv6 capable. Use guidance in Table 5.3.5-4 for NA/SS	Required	5.3.5	Met ²
4	Information Assurance			
	Security	Required	5.4	Met ³

NOTES:

- The annotation of 'required' refers to a high-level requirement category. The applicability of each sub-requirement is provided in Enclosure 3. The system under test does not need to provide features or capabilities defined by conditional requirements. However, if a capability is provided, it must function according to the specified requirements in order to be certified for that capability.
- Due to limitations in the test architecture IPv6 was unable to be tested across the network; however testing was conducted intra-enclave and compliance with IPv6 specifications was verified with vendor's LoC.
- Information assurance testing is accomplished via DISA-led Information Assurance test teams and published in a separate report, Reference (e).

LEGEND:

ACTA	Administrative Council for Terminal Attachments	ID	Identification
ADIMSS	Advanced Defense Switched Network (DSN) Integrated Management Support System	IP	Internet Protocol
CPE	Customer Premise Equipment	IPv6	Internet Protocol version 6
CR	Capability Requirement	LSSGR	Local Access and Transport Area (LATA) Switching Systems Generic Requirements
DISA	Defense Information Systems Agency	LoC	Letters of Compliance
DTMF	Dual Tone Multi-Frequency	LSC	Local Session Controller
FCC	Federal Communications Commission	MLPP	Multi-Level Precedence and Preemption
FR	Functional Requirement	NA/SS	Network Appliances and Simple Servers
GR	Generic Requirement	SUT	System Under Test
GR-506	LSSGR: Signaling for Analog Interfaces	UCR	Unified Capabilities Requirements

a. Product Interface Requirements. The UCR 2008, Change 3, section 5.3.2.4.2, states the physical interfaces between an LSC and its appliances shall be a 10/100/1000BaseT interfaces. The SUT interface shall support auto-negotiation even when the Institute of Electrical and Electronics Engineers (IEEE) 802.3 standard has it defined as optional. This applies to 10/100/1000-T Ethernet standards; i.e., IEEE, Ethernet Standard 802.3, 1993; or IEEE, Fast Ethernet Standard 802.3u, 1995; and IEEE, Gigabit Ethernet Standard 802.3ab, 1999. The SUT met the requirements for the 10/100BaseT interfaces through both testing and the vendor's LoC. Although the SUT supports the 10BaseT interface, the vendor does not recommend its use due to the speed limitations. This is noted in the SUT deployment guide.

b. CPE Requirements

(1) The UCR 2008, Change 3, paragraph 5.2.1.2(1), states that all Customer Premise Equipment (CPE) devices that support Multilevel Precedence and Preemption (MLPP) shall do so in accordance with the requirements listed in Section 5.3.2.31.3, and shall not affect the Defense Switched Network (DSN) interface features and functions associated with line supervision and control. The SUT, as a CPE, is required to divert all precedence calls above ROUTINE placed to the CPE to a designated directory number (DN) in accordance with UCR 2008, Change 3, paragraph

5.3.2.2.2.1.2.5. The SUT met this requirement with testing by routing all calls above ROUTINE to an alternate DN.

(2) The UCR 2008, Change 3, paragraph 5.2.1.2(2), states that all DSN CPE, as a minimum, must meet the requirements of Part 15 and Part 68 of the Federal Communications Commission (FCC) Rules and Regulations and the Administrative Council for Terminal Attachments (ACTA). The SUT met this requirement with the vendor's LoC.

(3) The UCR 2008, Change 3, paragraph 5.2.1.2(3), states that a device(s) that supports autoanswer shall have an autoanswer mode feature allowing the autoanswer mode to be set to a time more than the equivalency of four ROUTINE precedence ring intervals in accordance with Section 5.3.2.31.3, before "answer" supervision is provided. The SUT met this requirement with testing. The SUT has the ability to adjust the auto-answer between 15-45 seconds.

(4) The UCR 2008, Change 3, paragraph 5.2.1.2(4), states that devices that are required to support precedence calls above ROUTINE precedence, shall respond properly to an incoming alerting (ringing) precedence call cadence as described in UCR, section 5.3.2.6.1.1.1. The SUT diverts all calls above ROUTINE to a designated DN, which meets the requirement.

(5) The UCR 2008, Change 3, paragraph 5.2.1.2(5), states that a device(s) that can "out dial" Dual Tone Multi-Frequency (DTMF) and/or Dial Pulse (DP) digits (automatic and/or manual) shall comply with the requirements as specified in Telcordia Technologies GR-506-CORE, *LSSGR: Signaling for Analog Interfaces*, Issue 1, June 1996, paragraph 10 and be capable of outpulsing and interpretation of DTMF digits on outgoing or two-way trunks as specified in Telcordia Technologies GR-506-CORE, *LSSGR: Signaling for Analog Interfaces*, Issue 1, June 1996, paragraph 15, and Table 5.2.1.2-1. This requirement was met by the SUT with testing and vendor's LoC. The SUT does not support DP.

(6) The UCR 2008, Change 3, paragraph 5.2.1.2(8), states that if Configuration Management and/or Fault Management are/is provided by the CPE device so that it can be managed by the Advanced DSN Integrated Management Support System (ADIMSS) or other management systems, then the management information shall be provided by one or more of the following serial or Ethernet interfaces:

(a) Serial interfaces shall be in accordance with one of the following standards:

- International Telecommunication Union - Telecommunication Standardization Sector (ITU-T) Recommendation V.35
- Telecommunications Industry Association (TIA-232-F)
- Electronic Industries Alliance (EIA)-449-1
- TIA-530-A

- (b) Ethernet interfaces shall be in accordance with IEEE 802.3-2002.

The SUT met this requirement. The SUT was tested using a directly-connected KVM using an Ethernet interface. The SUT can also be managed with a site-provided workstation using an Ethernet interface to the remote management terminal.

(7) Internet Protocol version 6 (IPv6). The UCR 2008, Change 3, section 5.3.5, states that if a CPE has an Internet Protocol (IP) interface, the CPE must be IPv6-capable in accordance with the guidance in Table 5.3.5-4 for NA/SS. Due to limitations in the test architecture IPv6 was unable to be tested across the network; however testing was conducted intra-enclave and compliance with IPv6 specifications was verified with vendor's LoC.

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

11.4 Other. None.

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). Information related to DSN testing is on the Telecom Switched Services Interoperability (TSSI) website at <http://jitc.fhu.disa.mil/tssi>. Due to the sensitivity of the information, the Information Assurance Accreditation Package (IAAP) that contains the approved configuration and deployment guide must be requested directly through government civilian or uniformed military personnel from the Unified Capabilities Certification Office (UCCO), e-mail: disa.meade.ns.list.unified-capabilities-certification-office@mail.mil.

SYSTEM FUNCTIONAL AND CAPABILITY REQUIREMENTS

The Customer Premises Equipment have required and conditional features and capabilities that are established by Section 5.2.1.2 of the Unified Capabilities Requirements (UCR) 2008, Change 3. The System Under Test (SUT) need not provide conditional requirements. If they are provided, they must function according to the specified requirements in order to be certified for that capability. The detailed Functional Requirements (FR) and Capability Requirements (CR) for Customer Premises Equipment are listed in Table 3-1. Detailed Information Assurance (IA) requirements are included in Reference (e) and are not listed below.

Table 3-1. Customer Premises Equipment Capability/Functional Requirements

ID	Requirement	UCR Reference	Required or Conditional
1	All CPE devices that support MLPP shall do so in accordance with the requirements listed in Section 5.3.2.31.3, Multilevel Precedence and Preemption, and shall not affect the DSN interface features and functions associated with line supervision and control.	5.2.1.2(1)	C
2	All DSN CPE, as a minimum, must meet the requirements of Part 15 and Part 68 of the FCC Rules and Regulations, and the Administrative Council for Terminal Attachments (ACTA).	5.2.1.2(2)	R
3	A device(s) that supports autoanswer shall have an "autoanswer" mode feature allowing the autoanswer mode to be set to a "time" more than the equivalency of four ROUTINE precedence ring intervals in accordance with Section 5.3.2.31.3, Multilevel Precedence and Preemption, before "answer" supervision is provided	5.2.1.2(3)	C
4	Devices that are required to support precedence calls above ROUTINE precedence shall respond properly to an incoming alerting (ringing) precedence call cadence as described in Section 5.3.2.6.1.1.1, UC Ringing Tones, Cadences, and Information Signals.	5.2.1.2(4)	C
5	A device(s) that can "out dial" DTMF and/or DP digits (automatic and/or manual) shall comply with the requirements as specified in Telcordia Technologies GR-506-CORE, LSSGR: Signaling for Analog Interfaces, Issue 1, June 1996, paragraph 10 and be capable of outputting and interpretation of DTMF digits on outgoing or two-way trunks as specified in Telcordia Technologies GR-506-CORE, LSSGR: Signaling for Analog Interfaces, Issue 1, June 1996, paragraph 15, and Table 5.2.1.2-1.	5.2.1.2(5)	C
6	Modems and facsimile machines shall be compatible with ITU and Telcordia standards, as applicable	5.2.1.2(6)	C
7	Facsimile devices, as a minimum, shall meet the requirements in accordance with applicable DISR standards.	5.2.1.2(7)	C
8	If Configuration Management and/or Fault Management are/is provided by the CPE device so that it can be managed by the ADIMSS or other management systems, then the management information shall be provided by one or more of the following serial or Ethernet interfaces: a. Serial interfaces shall be in accordance with one of the following standards: (1) ITU-T Recommendation V.35 (2) TIA-232-F (3) EIA-449-1 (4) TIA-530-A b. Ethernet interfaces shall be in accordance with IEEE 802.3-2002.	5.2.1.2(8)	C
9	As a minimum, the 911 and the E911 (tandem) emergency service shall have the capability to "hold" the originating subscriber or caller from releasing the call via the switch supervision interaction for line and trunk control by the "called-party" feature, in accordance with Telcordia Technologies GR-529-CORE. Additionally, the FCC regulations regarding 911 and E911 must be considered.	5.2.1.2(9)	C
10	The Customer Premises Equipment shall meet all of the IPv6 protocol requirements for NA/SS products in Section 5.3.5, IPv6 Requirements, including the requirements in Table 5.3.5-4, UC Network Appliances and Simple Servers (NA/SS).	5.3.5	R
11	Customer Premises Equipment shall meet the Information Assurance requirements of all applicable DISA STIGs.	5.4	R

**Table 3-1. Customer Premises Equipment Capability/Functional Requirements
(continued)**

LEGEND:			
ALI	Automatic Line Identification	IP	Internet Protocol
ACTA	Administrative Council for Terminal Attachments	IPv6	Internet Protocol version 6
B/P/C/S	Base/Post/Camp/Station	IEEE	Institute of Electrical and Electronics Engineers
C	Conditional	NA	Network Appliance
CPE	Customer Premises Equipment	R	Required
DISA	Defense Information Systems Agency	SS	Simple Servers
DP	Dial Pulse	STIGS	Security Technical Implementation Guides
DSN	Defense Switched Network	UC	Unified Capabilities
DTMF	Dual-Tone Multifrequency	UCR	Unified Capabilities Requirements
FCC	Federal Communications Commission		