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) Basic Operator Services System (BOSS) Workstation and CTI Alcatel-Lucent 8520 and 8528T Integrated Services Digital Network (ISDN) Voice Terminal Hard Consoles 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. CTI BOSS Workstation and CTI Alcatel-Lucent 8520 and 8528T ISDN Voice Terminal Hard Consoles with Release 4.9-0 are 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 System Network (DISN) as an Attendant Console. The BOSS workstation is certified for use specifically with any Avaya Communication Server (CS)2100 that is or has been on the Unified Capabilities (UC) Approved Product List (APL). The Alcatel-Lucent 8520 and 8528T ISDN Voice Terminal Hard Consoles are certified with any Alcatel-Lucent Class 5 Electronic Switching System (5ESS) that is or has been on the UC 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 20 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.

4. The interface, Capability Requirement (CR) and Functional Requirement (FR), and status of the SUT are listed in Tables 1 and 2. The threshold CR/FRs for Attendant Consoles are established by Section 5.3.2 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	No	5.3.2.4.2	1-4	Certified[2]
100Base-X	No	5.3.2.4.2	1-4	Certified
1000Base-X	No	5.3.2.4.2	1-4	Certified
2-Wire Analog Proprietary	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:
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 conditional interfaces. However, if an interface is provided, it must function according to the specified requirements in order to be certified.
2. 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.

LEGEND:

CR	Capability Requirement	Mbps	Megabits per second
FR	Functional Requirement	NI 1/2	National ISDN Standard 1 or 2
GR	Generic Requirement	PRI	Primary Rate Interface
GR-506	LSSGR: Signaling for Analog Interfaces	SUT	System Under Test
IP	Internet Protocol	T1	Digital Transmission Link Level 1 (1.544 Mbps)
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	Not Tested[2]

Table 2. SUT CRs and FRs Status (continued)

CR/FR ID	Capability/Function	Applicability[1]	UCR Reference	Status
2	**Attendant Console Requirements**			
	The attendant console shall be an EI that serves other EIs on the same LSC, MFSS, or WAN SS (when the WAN SS contains an internal LSC). In the MFSS case, the attendant station shall be an EI on the IP side of the MFSS (the SS) and shall serve other EIs on the IP side of the MFSS. Note: In the MFSS case, the RTS Attendant Console is not required to serve DSN EIs that are served by the TDM side of the MFSS (i.e., are served by the DSN MFS). This means that the attendant console is not required to bridge calls between the TDM and IP sides of the MFSS. For example, the attendant console is not required to bridge a call to or from a DSN EI on the MFS with another call to or from another DSN EI on the MFS.	Required	5.3.2.26	Not Tested[2]
	The RTS Attendant Console shall interoperate with PBAS/ASAC as described in • Section 5.3.2.7.2.1, PBAS/ASAC Requirements • Section 5.3.2.2.2.3, ASAC – Open Loop • Section 5.3.4.10, Precedence and Preemption The console shall be able to initiate all levels of RTS precedence calls (i.e., ROUTINE through FLASH-OVERRIDE).	Required	5.3.2.26.1	Not Tested[2]
	The attendant console shall interoperate with MLPP	Required	5.3.2.26.1	Met
	When the attendant console receives a call at Precedence A and the attendant transfers the call to a destination at Precedence B, the resulting call should have the higher precedence between A and B.	Required	5.3.2.26.1	Met
	The attendant console shall provide a visual display of each precedence level and the calling number, for incoming direct dialed calls to the attendant, and diverted calls to the attendant (e.g., calls that reach the attendant through PCD). The AS-SIP trunks and T1.619A PRI trunks support delivery of precedence level and calling number information on incoming calls to LSCs. This means that the precedence level and the calling number should be available to the attendant console, for incoming calls that originate from outside of the LSC.	Required	5.3.2.26.2	Met
	If the LSC, MFSS, or WAN SS supports assignment of a CoS to an individual EI, then the attendant console also shall provide visual display of the calling EI's CoS, for incoming direct dialed calls to the attendant and diverted calls to the attendant. The AS-SIP trunks and T1.619A PRI trunks do not support delivery of CoS information on incoming calls to LSCs. This means that CoS information will not be available to the attendant console for incoming calls that originate from outside of the LSC. The CoS information may be available to the attendant console for calls that originate within the LSC. A similar situation also occurs for : a. Calls where the EI is served by an LSC, but the attendant console is served by a DSN EO or MFS, and b. Calls where the EI is served by a DSN EO, but the attendant console is served by an LSC, MFSS, or WAN SS. Because AS-SIP and T1.619A PRI trunks do not support delivery of CoS information, this information will not be available to DSN Attendant Consoles on calls from EIs, or to attendant consoles on calls from DSN EIs.	Conditional	5.3.2.26.2	Met
	If the LSC, MFSS, or WAN SS supports assignment of a CoS to an individual EI, then this appliance and the attendant console shall give the attendant the ability to override any incoming call's calling party CoS (based on calling area or precedence) on a call-by-call basis. The appliance and the attendant console shall also give the attendant the ability to override any diverting call's calling party CoS (based on calling area or precedence) on a call-by-call basis.	Conditional	5.3.2.26.3	Not Tested[2]

Table 2. SUT CRs and FRs Status (continued)

CR/FR ID	Capability/Function	Applicability[1]	UCR Reference	Status
2	**Attendant Console Requirements (continued)**			
	The appliance and the attendant console shall give the attendant the ability to verify and override a busy line condition. In commercial VoIP networks, attendant verification of a busy line is called Busy Line Verification (BLV), and attendant override of a busy line is called Emergency Interrupt. In the network, support for these BLV and Emergency Interrupt capabilities is • Required when the "busy line" is an UC EI served by the local UC appliance. • Conditional when the "busy line" is an UC EI served by a remote UC appliance. The condition here is that the Attendant's appliance, the remote appliance, and any intermediate appliances all have to support the SIP requirements for BLV and Emergency Interrupt signaling in RFC 3603. In RFC 3603, the "P-DCS-OSPS: BLV" header indicates an attendant's request for BLV, and the "P-DCS-OSPS: EI" header indicates an attendant's request for Emergency Interrupt.	Required	5.3.2.26.4	Met
	If the attendant uses BLV on a called line, and that called line (called EI) is busy, the appliance and the attendant console shall give an audible and visual "called line busy" indication back to the attendant. The appliance and attendant console shall also allow the attendant to request the Emergency Interrupt feature in this case.	Required	5.3.2.26.4	Met
	The appliance and the attendant console shall prevent an attendant from activating BLV or Emergency Interrupt to called lines and called numbers that are located in the commercial network (the PSTN).	Required	5.3.2.26.4	Met
	The appliance and the attendant console shall give the attendant the ability to use Emergency Interrupt to interrupt an existing call on a busy line, and inform the busy user of a new incoming call. The appliance shall provide an override tone to the busy user before the attendant enters the conversation, and they shall repeat the tone periodically for as long as the attendant is connected to the busy user.	Required	5.3.2.26.4	Met
	The appliance shall give selected destination EIs the ability to be exempt from Emergency Interrupt and attendant break-in. In particular, it shall be possible for the appliance to preclude the BLV and Emergency Interrupt services from being applied to selected destination EIs (e.g., EIs that provide secure voice service).	Required	5.3.2.26.4	Met
	The appliance and the attendant console shall have the ability to route all calls that are normally directed to the console to a separate night service deflection number. The night service deflection number shall be a fixed (preconfigured) or manually-selected DN.	Required	5.3.2.26.5	Met
	When an attendant redirects an incoming call to a destination station, and that station is either busy or does not answer the call within a preset time, the appliance and the attendant console shall ensure that calling party on the redirected call is recalled automatically to the console.	Required	5.3.2.26.6	Met
	In this case, the appliance shall ensure that that the "recalled" call is returned to the console that originally processed the call. If that console is busy, the appliance shall ensure that the "recalled" calls are placed into the queue for that console. But if that console is out of service, then the appliance shall ensure that the "recalled" call is routed to another console on that appliance, if another console is available.	Required	5.3.2.26.6	Met
	The appliance and the attendant console shall have the ability to place calls (both directed to the attendant and diverted to the attendant) into a waiting queue. The appliance and the attendant console shall ensure that calls placed in queue to the attendant are retrieved by the attendant in order of their precedence level (i.e., FLASHOVERRIDE first, ROUTINE last) and the longest holding time within that precedence level.	Required	5.3.2.26.7	Met

Table 2. SUT CRs and FRs Status (continued)

CR/FR ID	Capability/Function	Applicability[1]	UCR Reference	Status
2	**Attendant Console Requirements (continued)**			
	The appliance and the attendant console shall ensure that calls in the attendant queue are not lost when a console is placed out of service or has its calls forwarded to a night service deflection number. When the console is placed out of service or forwarded to night service while calls are in queue, the appliance and the console shall be capable of one of the following solutions to ensure that calls are not lost: 1. All the existing calls in the queue shall be forwarded first to a separate DN for the centralized attendant (i.e., a different attendant at a different attendant console), and then on to the night service DN (if the centralized attendant activated night service deflection). 2. All subsequent calls placed to the attendant console shall be forwarded first to the separate DN for the centralized attendant, and then on to the night service DN (if the centralized attendant activated night service deflection). For the existing calls in the queue, the attendant remains at the console and answers all these remaining calls (even though the attendant placed the console out of service or forwarded the console to night service deflection), thereby preventing any of the calls from being lost.	Required	5.3.2.26.7	Met
3	**IPv6 Requirements**			
	If the Attendant Console has an IP interface, the Attendant Console must be IPv6 capable. Use guidance in Table 5.3.5-4 for NA/SS	Required	5.3.5	Met[3]
4	**Information Assurance**			
	Security	Required	5.4	Met[4]

NOTES:
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.
2. The SUT was tested and is certified with legacy Avaya CS2100 and Alcatel-Lucent 5ESS switches only; therefore, those requirements for LSC, WAN SS and MFSS do not apply.
3. 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.
4. Information assurance testing is accomplished via DISA-led Information Assurance test teams and published in a separate report, Reference (e).

Table 2. SUT CRs and FRs Status (continued)

LEGEND:

5ESS	Class 5 Electronic Switching System	MFSS	Multifunction Soft Switch
ASAC	Assured Services Admission Control	MLPP	Multi-Level Precedence and Preemption
AS-SIP	Assured Services-Session Initiation Protocol	NA/SS	Network Appliances and Simple Servers
BLV	Busy Line Verification	PBAS	Precedence Based Assured Service
CoS	Class of Service	PCD	Precedence Call Diversion
CR	Capability Requirement	PRI	Primary Rate Interface
CS	Communication Server	PSTN	Public Switched Telephone Network
DN	Directory Number	RFC	Request for Comments
DSN	Defense Switched Network	RTS	Real Time Services
EI	End Instrument	SS	Soft Switch
EO	End Office	SS7	Signaling System 7
FR	Functional Requirement	SUT	System Under Test
ID	Identification	T1.619a	SS7 and ISDN MLPP Signaling Standard for T1
IP	Internet Protocol	TDM	Time Division Multiplexing
IPv6	Internet Protocol version 6	UC	Unified Capabilities
ISDN	Integrated Services Digital Network	UCR	Unified Capabilities Requirements
LSC	Local Session Controller	VoIP	Voice over Internet Protocol
MFS	Multifunction Switch	WAN SS	Wide Area Network Soft Switch

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.

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 1216501.

FOR THE COMMANDER:

3 Enclosures a/s

for BRADLEY A. CLARK
Acting Chief
Battlespace Communications Portfolio

JITC Memo, JTE, Joint Interoperability Certification of the Amcom Software, Inc. Computer Telephony Integration (CTI) Basic Operator Services System (BOSS) Workstation and CTI Alcatel-Lucent's 8520 and 8528T Integrated Services Digital Network (ISDN) Voice Terminal Hard Consoles with Release 4.9-0

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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 Basic Operator Services System (BOSS)/Class 5 Electronic Switching System (5ESS) Release (Rel.) 4.9-0 (Tracking Number 1216501)," Draft

CERTIFICATION TESTING SUMMARY

1. SYSTEM TITLE. Amcom Software, Inc. Computer Telephony Integration (CTI) Basic Operator Services System (BOSS) Workstation and CTI Alcatel-Lucent 8520 and 8528T Integrated Services Digital Network (ISDN) Voice Terminal Hard Consoles, 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 BOSS is a Personal Computer (PC)-based platform, which emulates the NT4X09AG Meridian Services Attendant Console (MSAC) hard console for the Avaya Communication Server (CS)2100 and Meridian Switching Load (MSL)-100 digital switching systems. The SUT can be used in either a single or multiple console configuration, with or in lieu of the MSAC console. The SUT PC includes the BOSS software and phone server software running on the Microsoft Windows 7 Operating System. The SUT also includes an adjunct component called the BOSS Console, which connects the switch, an operator headset, and the operator PC. The Amcom BOSS Console MSAC replacement connects to the telephone switch over the same proprietary digital connection as the original NT4X09AG hard console. The Amcom BOSS Console connects to the PC via a non-routable direct cross-connect Ethernet cable. Telephone functions are performed from the PC Smart Console application. 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 Amcom Software, Inc. CTI Smart Console Class 5 Electronic Switching System (5ESS) CTI Workstation utilizes an Avaya 8528T or 8520 telephone set. The SUT was tested with the 8528T telephone set; however, JITC analysis determined the 8520 is functionally identical for interoperability certification purposes and is, therefore, also certified with the SUT. The Avaya 8528T connects to the Alcatel-Lucent 5ESS switching platform on an Avaya Basic Rate Interface (BRI) ISDN connection, the 8528T telephone set connects to the PC via a direct RS-232 serial connection. The Amcom Software, Inc. CTI Smart Console allows a telephone operator to perform telephony functions from a PC platform against 5ESS switching platforms. Telephone functions may be initiated directly on the Avaya 8528T telephone set or on the PC Smart Console application. 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 BOSS, Alcatel-Lucent 8528T ISDN Voice Terminal Hard Console, 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:

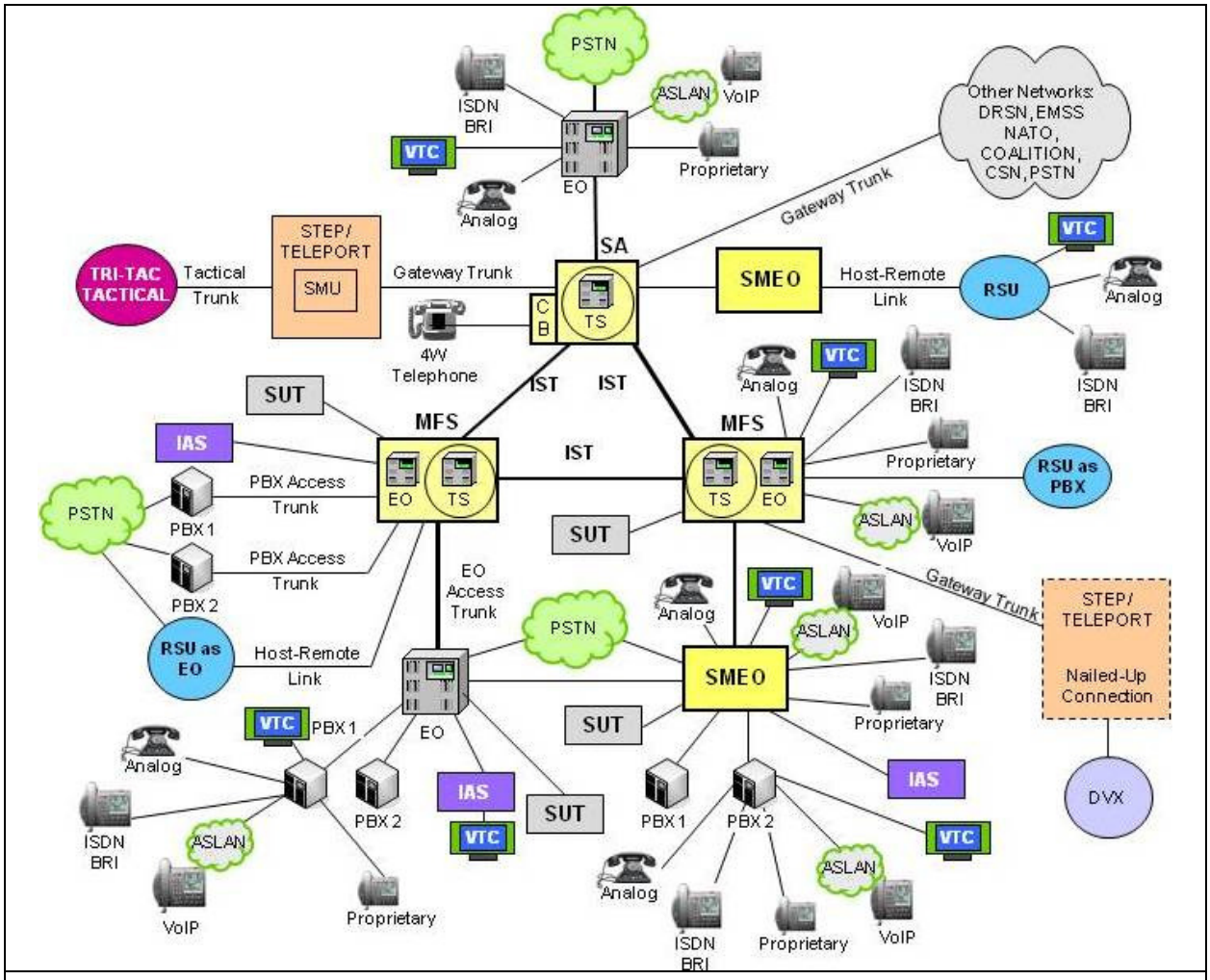
- Smart Center provides authorized users administrative functions to manage the data that the Amcom applications utilize for their services
- e.Notify provides authorized users administrative functions to create emergency notification templates for use in communications delivery of important information 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 System Network (DISN) Unified Capabilities notional operational architecture that the SUT may be used in.



NOTE: The SUT is certified with any Avaya CS2100 or Alcatel-Lucent Class 5 Electronic Switching System on the UC APL.

LEGEND:

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

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 Attendant Consoles are established by Section 5.3.2 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. Attendant Console Interface Requirements

Interface	Critical	UCR Reference	Criteria
10Base-X	No	5.3.2.4.2	Support minimum threshold CRs/FRs (1-4) and meet interface criteria for IEEE 802.3i.
100Base-X	No	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)

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.

LEGEND:

802.3ab	1000BaseT Gbps Ethernet over twisted pair at 1 Gbps (125 Mbps)	FR	Functional Requirement
802.3i	10BaseT Mbps over twisted pair	Gbps	Gigabits per second
802.3u	Standard For Carrier Sense Multiple Access With Collision Detection At 100 Mbps	IEEE	Institute of Electrical and Electronics Engineers
CR	Capability Requirement	Mbps	Megabits per second
		SUT	System Under Test
		UCR	Unified Capabilities Requirements

7.2 CR and FR. Attendant Consoles have required and conditional features and capabilities that are established by Section 5.2.1 of the Unified Capabilities Requirements (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 Attendant Console requirements are listed in Table 2-2. Detailed CR/FR requirements are provided in Table 3-1 of Enclosure 3.

Table 2-2. Attendant Console CRs and FRs

CR/FR ID	Capability/Function	Applicability[1]	UCR Reference
1	**Product Interface Requirements**		
	Interfaces to LSC	Required	5.3.2.4.2
2	**Attendant Console Requirements**		
	The attendant console shall be an EI that serves other EIs on the same LSC, MFSS, or WAN SS (when the WAN SS contains an internal LSC). In the MFSS case, the attendant station shall be an EI on the IP side of the MFSS (the SS) and shall serve other EIs on the IP side of the MFSS. Note: In the MFSS case, the RTS Attendant Console is not required to serve DSN EIs that are served by the TDM side of the MFSS (i.e., are served by the DSN MFS). This means that the attendant console is not required to bridge calls between the TDM and IP sides of the MFSS. For example, the attendant console is not required to bridge a call to or from a DSN EI on the MFS with another call to or from another DSN EI on the MFS.	Required	5.3.2.26
	The RTS Attendant Console shall interoperate with PBAS/ASAC as described in • Section 5.3.2.7.2.1, PBAS/ASAC Requirements • Section 5.3.2.2.2.3, ASAC – Open Loop • Section 5.3.4.10, Precedence and Preemption The console shall be able to initiate all levels of RTS precedence calls (i.e., ROUTINE through FLASH-OVERRIDE).	Required	5.3.2.26.1
	The attendant console shall interoperate with MLPP	Required	5.3.2.26.1
	When the attendant console receives a call at Precedence A and the attendant transfers the call to a destination at Precedence B, the resulting call should have the higher precedence between A and B.	Required	5.3.2.26.1
	The attendant console shall provide a visual display of each precedence level and the calling number, for incoming direct dialed calls to the attendant, and diverted calls to the attendant (e.g., calls that reach the attendant through PCD). The AS-SIP trunks and T1.619A PRI trunks support delivery of precedence level and calling number information on incoming calls to LSCs. This means that the precedence level and the calling number should be available to the attendant console, for incoming calls that originate from outside of the LSC.	Required	5.3.2.26.2
	If the LSC, MFSS, or WAN SS supports assignment of a CoS to an individual EI, then the attendant console also shall provide visual display of the calling EI's CoS, for incoming direct dialed calls to the attendant and diverted calls to the attendant. The AS-SIP trunks and T1.619A PRI trunks do not support delivery of CoS information on incoming calls to LSCs. This means that CoS information will not be available to the attendant console for incoming calls that originate from outside of the LSC. The CoS information may be available to the attendant console for calls that originate within the LSC. A similar situation also occurs for : a. Calls where the EI is served by an LSC, but the attendant console is served by a DSN EO or MFS, and b. Calls where the EI is served by a DSN EO, but the attendant console is served by an LSC, MFSS, or WAN SS. Because AS-SIP and T1.619A PRI trunks do not support delivery of CoS information, this information will not be available to DSN Attendant Consoles on calls from EIs, or to attendant consoles on calls from DSN EIs.	Conditional	5.3.2.26.2

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

CR/FR ID	Capability/Function	Applicability[1]	UCR Reference
2	**Attendant Console Requirements (continued)**		
	If the LSC, MFSS, or WAN SS supports assignment of a CoS to an individual EI, then this appliance and the attendant console shall give the attendant the ability to override any incoming call's calling party CoS (based on calling area or precedence) on a call-by-call basis. The appliance and the attendant console shall also give the attendant the ability to override any diverting call's calling party CoS (based on calling area or precedence) on a call-by-call basis.	Conditional	5.3.2.26.3
	The appliance and the attendant console shall give the attendant the ability to verify and override a busy line condition. In commercial VoIP networks, attendant verification of a busy line is called Busy Line Verification (BLV), and attendant override of a busy line is called Emergency Interrupt. In the network, support for these BLV and Emergency Interrupt capabilities is • Required when the "busy line" is an UC EI served by the local UC appliance. • Conditional when the "busy line" is an UC EI served by a remote UC appliance. The condition here is that the Attendant's appliance, the remote appliance, and any intermediate appliances all have to support the SIP requirements for BLV and Emergency Interrupt signaling in RFC 3603. In RFC 3603, the "P-DCS-OSPS: BLV" header indicates an attendant's request for BLV, and the "P-DCS-OSPS: EI" header indicates an attendant's request for Emergency Interrupt.	Required	5.3.2.26.4
	If the attendant uses BLV on a called line, and that called line (called EI) is busy, the appliance and the attendant console shall give an audible and visual "called line busy" indication back to the attendant. The appliance and attendant console shall also allow the attendant to request the Emergency Interrupt feature in this case.	Required	5.3.2.26.4
	The appliance and the attendant console shall prevent an attendant from activating BLV or Emergency Interrupt to called lines and called numbers that are located in the commercial network (the PSTN).	Required	5.3.2.26.4
	The appliance and the attendant console shall give the attendant the ability to use Emergency Interrupt to interrupt an existing call on a busy line, and inform the busy user of a new incoming call. The appliance shall provide an override tone to the busy user before the attendant enters the conversation, and they shall repeat the tone periodically for as long as the attendant is connected to the busy user.	Required	5.3.2.26.4
	The appliance shall give selected destination EIs the ability to be exempt from Emergency Interrupt and attendant break-in. In particular, it shall be possible for the appliance to preclude the BLV and Emergency Interrupt services from being applied to selected destination EIs (e.g., EIs that provide secure voice service).	Required	5.3.2.26.4
	The appliance and the attendant console shall have the ability to route all calls that are normally directed to the console to a separate night service deflection number. The night service deflection number shall be a fixed (preconfigured) or manually-selected DN.	Required	5.3.2.26.5
	When an attendant redirects an incoming call to a destination station, and that station is either busy or does not answer the call within a preset time, the appliance and the attendant console shall ensure that calling party on the redirected call is recalled automatically to the console.	Required	5.3.2.26.6
	In this case, the appliance shall ensure that that the "recalled" call is returned to the console that originally processed the call. If that console is busy, the appliance shall ensure that the "recalled" calls are placed into the queue for that console. But if that console is out of service, then the appliance shall ensure that the "recalled" call is routed to another console on that appliance, if another console is available.	Required	5.3.2.26.6
	The appliance and the attendant console shall have the ability to place calls (both directed to the attendant and diverted to the attendant) into a waiting queue. The appliance and the attendant console shall ensure that calls placed in queue to the attendant are retrieved by the attendant in order of their precedence level (i.e., FLASHOVERRIDE first, ROUTINE last) and the longest holding time within that precedence level.	Required	5.3.2.26.7

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

CR/FR ID	Capability/Function	Applicability[1]	UCR Reference
	Attendant Console Requirements (continued)		
2	The appliance and the attendant console shall ensure that calls in the attendant queue are not lost when a console is placed out of service or has its calls forwarded to a night service deflection number. When the console is placed out of service or forwarded to night service while calls are in queue, the appliance and the console shall be capable of one of the following solutions to ensure that calls are not lost: 1. All the existing calls in the queue shall be forwarded first to a separate DN for the centralized attendant (i.e., a different attendant at a different attendant console), and then on to the night service DN (if the centralized attendant activated night service deflection). 2. All subsequent calls placed to the attendant console shall be forwarded first to the separate DN for the centralized attendant, and then on to the night service DN (if the centralized attendant activated night service deflection). For the existing calls in the queue, the attendant remains at the console and answers all these remaining calls (even though the attendant placed the console out of service or forwarded the console to night service deflection), thereby preventing any of the calls from being lost.	Required	5.3.2.26.7
3	**IPv6 Requirements**		
	If the Attendant Console has an IP interface, the Attendant Console must be IPv6 capable. Use guidance in Table 5.3.5-4 for NA/SS	Required	5.3.5
4	**Information Assurance**		
	Security	Required	5.4

NOTE: The annotation of 'required' refers to a high-level requirement category. The applicability of each sub-requirement is provided in Enclosure 3.

LEGEND:

ASAC	Assured Services Admission Control	MLPP	Multi-Level Precedence and Preemption
AS-SIP	Assured Services-Session Initiation Protocol	NA/SS	Network Appliances and Simple Servers
BLV	Busy Line Verification	PBAS	Precedence Based Assured Service
CoS	Class of Service	PCD	Precedence Call Diversion
CR	Capability Requirement	PRI	Primary Rate Interface
DN	Directory Number	PSTN	Public Switched Telephone Network
DSN	Defense Switched Network	RFC	Request for Comments
EI	End Instrument	RTS	Real Time Services
EO	End Office	SS	Soft Switch
FR	Functional Requirement	SS7	Signaling System 7
ID	Identification	SUT	System Under Test
IP	Internet Protocol	T1.619a	SS7 and ISDN MLPP Signaling Standard for T1
IPv6	Internet Protocol version 6	TDM	Time Division Multiplexing
ISDN	Integrated Services Digital Network	UC	Unified Capabilities
LSC	Local Session Controller	UCR	Unified Capabilities Requirements
MFS	Multifunction Switch	VoIP	Voice over Internet Protocol
MFSS	Multifunction Soft Switch	WAN SS	Wide Area Network Soft Switch

7.3 Information Assurance (IA). Table 2-3 details the IA requirements applicable to the Attendant Consoles.

Table 2-3. Attendant Console IA Requirements

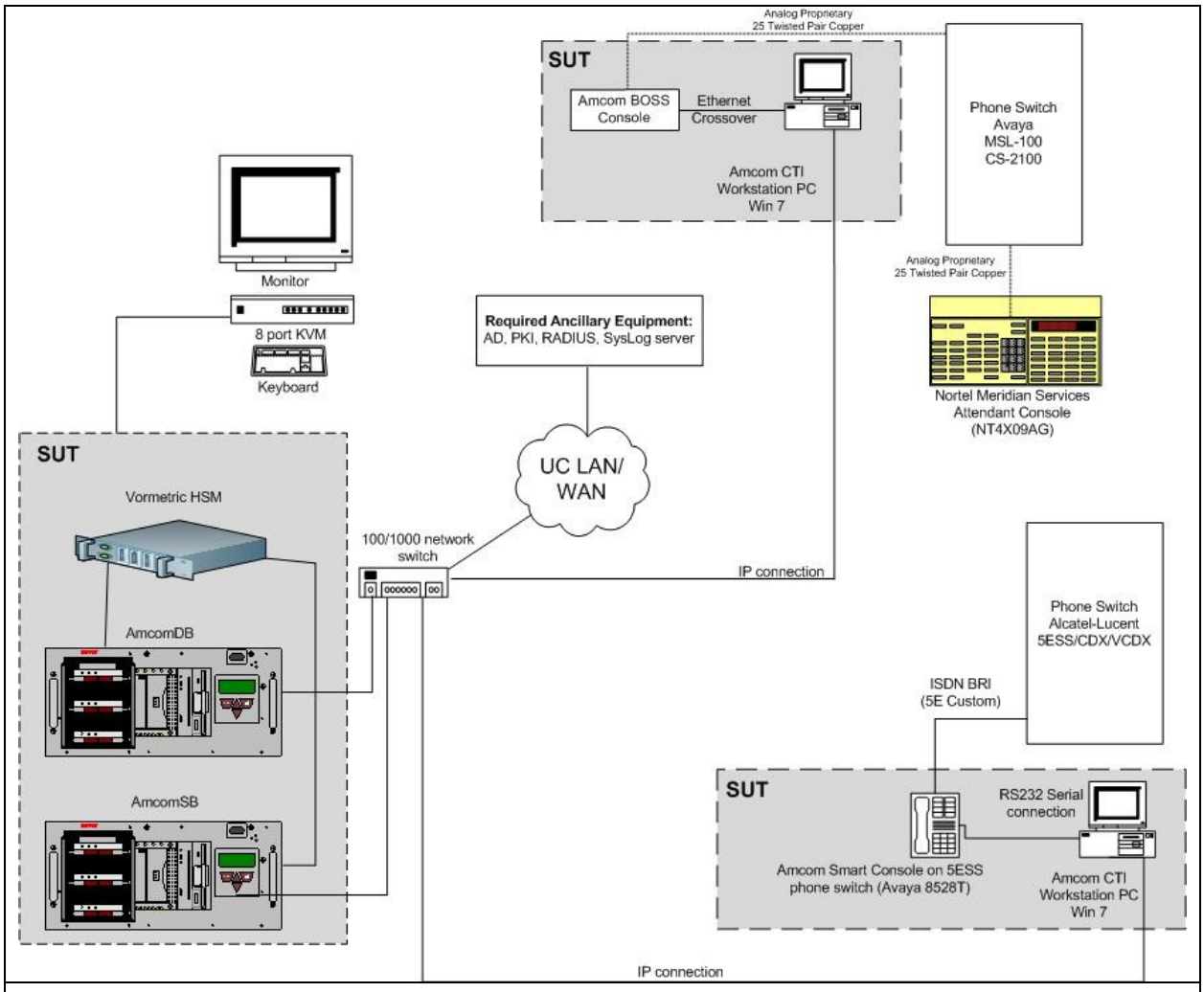
Requirement	Applicability (See note.)	UCR Reference	Criteria
General Requirements	Required	5.4.6.2	Detailed requirements and associated criteria for Attendant Consoles are listed in Reference (e).
Authentication	Required	5.4.6.2.1	
Integrity	Required	5.4.6.2.2	
Confidentiality	Required	5.4.6.2.3	
Non-Repudiation	Required	5.4.6.2.4	
Availability	Required	5.4.6.2.5	

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).

LEGEND:
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 Figure 2-2.



LEGEND:

5ESS	Class 5 Electronic Switching System	LAN	Local Area Network
AD	Active Directory	MSAC	Meridian Services Attendant Console
BOSS	Basic Operator Services System	MSL	Meridian Switching Load
BRI	Basic Rate Interface	PC	Personal Computer
CDX	Compact Digital Exchange	PKI	Public Key Infrastructure
CTI	Computer Telephony Integration	RADIUS	Remote Authentication Dial-In User Service
HSM	Hardware Security Manager	SUT	System Under Test
IP	Internet Protocol	UC	Unified Capabilities
ISDN	Integrated Services Digital Network	VCDX	Very Compact Digital Exchange
KVM	Keyboard, Video, Mouse	WAN	Wide Area Network

Figure 2-2. SUT 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 Defense Switched Network (DSN) switches noted in Table 2-4.

Table 2-4. Tested System Configurations

System Name	Software Release
Alcatel-Lucent 5ESS	5E16.2 Broadcast Warning Message (BWM) 07-0003
Avaya CS2100	Succession Enterprise (SE) 09.1
Avaya Meridian Services Attendant Console (NT4X09AG)	Not Applicable
Alcatel-Lucent 8528T Voice Terminal (Hard Console)	Software ID FP3.6 08/13/96
Alcatel-Lucent 8520 Voice Terminal (Hard Console)	Software ID FP3.2 05/02/94
Required Ancillary Equipment (Site-provided)	Active Directory
	Public Key Infrastructure
	Remote Authentication Dial-In User Service
	SysLog Server
	Monitor, Keyboard, and Mouse (KVM)[1]
	Management Workstation[1, 2]

SUT	Hardware	Software Release
Amcom Software, Inc. CTI BOSS Workstation and CTI Alcatel-Lucent 8520 and 8528T ISDN Voice Terminal Hard Consoles, Release 4.9-0	Vormetric Hardware Security Manager	Linux CentOS5 based closed system
	AmcomDB Primary Database & e.Notify Phone Lines Server (Dell R710)	RedHat Linux Enterprise Linux Server Release 5.8 Oracle Enterprise Database 11gR2, Oracle Enterprise Application Server
	AmcomSB Secondary Database Server (Dell R710)	RedHat Linux Enterprise Linux Server Release 5.8 Oracle Enterprise Database 11gR2, Oracle Enterprise Application Server
	Amcom CTI Workstation PC (Site-provided Dell OptiPlex 760[2])	Windows 7 Oracle Client 11gR2 11.2.0.3.0 CTI version 4.9-0
	BOSS Console	Version 1.0, Revision B

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:

5ESS	Class 5 Electronic Switching System	KVM	Keyboard, Video, Mouse
BOSS	Basic Operator Services System	PC	Personal Computer
CAC	Common Access Card	RAM	Random Access Memory
CTI	Computer Telephony Integration	STIG	Security Technical Implementation Guide
GB	Gigabyte	SUT	System Under Test
ISDN	Integrated Services Digital Network		

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 an Attendant Console 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	No	5.3.2.4.2	1-4	Certified[2]
100Base-X	No	5.3.2.4.2	1-4	Certified
1000Base-X	No	5.3.2.4.2	1-4	Certified
2-Wire Analog Proprietary	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:
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 conditional interfaces. However, if an interface is provided, it must function according to the specified requirements in order to be certified.
2. 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.

LEGEND:

CR	Capability Requirement	Mbps	Megabits per second
FR	Functional Requirement	NI 1/2	National ISDN Standard 1 or 2
GR	Generic Requirement	PRI	Primary Rate Interface
GR-506	LSSGR: Signaling for Analog Interfaces	SUT	System Under Test
IP	Internet Protocol	T1	Digital Transmission Link Level 1 (1.544 Mbps)
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	Not Tested[2]
2	**Attendant Console Requirements**			
	The attendant console shall be an EI that serves other EIs on the same LSC, MFSS, or WAN SS (when the WAN SS contains an internal LSC). In the MFSS case, the attendant station shall be an EI on the IP side of the MFSS (the SS) and shall serve other EIs on the IP side of the MFSS. Note: In the MFSS case, the RTS Attendant Console is not required to serve DSN EIs that are served by the TDM side of the MFSS (i.e., are served by the DSN MFS). This means that the attendant console is not required to bridge calls between the TDM and IP sides of the MFSS. For example, the attendant console is not required to bridge a call to or from a DSN EI on the MFS with another call to or from another DSN EI on the MFS.	Required	5.3.2.26	Not Tested[2]

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

CR/FR ID	Capability/Function	Applicability[1]	UCR Reference	Status
	Attendant Console Requirements (continued)			
	The RTS Attendant Console shall interoperate with PBAS/ASAC as described in • Section 5.3.2.7.2.1, PBAS/ASAC Requirements • Section 5.3.2.2.2.3, ASAC – Open Loop • Section 5.3.4.10, Precedence and Preemption The console shall be able to initiate all levels of RTS precedence calls (i.e., ROUTINE through FLASH-OVERRIDE).	Required	5.3.2.26.1	Not Tested[2]
	The attendant console shall interoperate with MLPP.	Required	5.3.2.26.1	Met
	When the attendant console receives a call at Precedence A and the attendant transfers the call to a destination at Precedence B, the resulting call should have the higher precedence between A and B.	Required	5.3.2.26.1	Met
	The attendant console shall provide a visual display of each precedence level and the calling number, for incoming direct dialed calls to the attendant, and diverted calls to the attendant (e.g., calls that reach the attendant through PCD). The AS-SIP trunks and T1.619A PRI trunks support delivery of precedence level and calling number information on incoming calls to LSCs. This means that the precedence level and the calling number should be available to the attendant console, for incoming calls that originate from outside of the LSC.	Required	5.3.2.26.2	Met
2	If the LSC, MFSS, or WAN SS supports assignment of a CoS to an individual EI, then the attendant console also shall provide visual display of the calling EI's CoS, for incoming direct dialed calls to the attendant and diverted calls to the attendant. The AS-SIP trunks and T1.619A PRI trunks do not support delivery of CoS information on incoming calls to LSCs. This means that CoS information will not be available to the attendant console for incoming calls that originate from outside of the LSC. The CoS information may be available to the attendant console for calls that originate within the LSC. A similar situation also occurs for : a. Calls where the EI is served by an LSC, but the attendant console is served by a DSN EO or MFS, and b. Calls where the EI is served by a DSN EO, but the attendant console is served by an LSC, MFSS, or WAN SS. Because AS-SIP and T1.619A PRI trunks do not support delivery of CoS information, this information will not be available to DSN Attendant Consoles on calls from EIs, or to attendant consoles on calls from DSN EIs.	Conditional	5.3.2.26.2	Met
	If the LSC, MFSS, or WAN SS supports assignment of a CoS to an individual EI, then this appliance and the attendant console shall give the attendant the ability to override any incoming call's calling party CoS (based on calling area or precedence) on a call-by-call basis. The appliance and the attendant console shall also give the attendant the ability to override any diverting call's calling party CoS (based on calling area or precedence) on a call-by-call basis.	Conditional	5.3.2.26.3	Not Tested[2]

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

CR/FR ID	Capability/Function	Applicability[1]	UCR Reference	Status
	Attendant Console Requirements (continued)			
2	The appliance and the attendant console shall give the attendant the ability to verify and override a busy line condition. In commercial VoIP networks, attendant verification of a busy line is called Busy Line Verification (BLV), and attendant override of a busy line is called Emergency Interrupt. In the network, support for these BLV and Emergency Interrupt capabilities is • Required when the "busy line" is an UC EI served by the local UC appliance. • Conditional when the "busy line" is an UC EI served by a remote UC appliance. The condition here is that the Attendant's appliance, the remote appliance, and any intermediate appliances all have to support the SIP requirements for BLV and Emergency Interrupt signaling in RFC 3603. In RFC 3603, the "P-DCS-OSPS: BLV" header indicates an attendant's request for BLV, and the "P-DCS-OSPS: EI" header indicates an attendant's request for Emergency Interrupt.	Required	5.3.2.26.4	Met
	If the attendant uses BLV on a called line, and that called line (called EI) is busy, the appliance and the attendant console shall give an audible and visual "called line busy" indication back to the attendant. The appliance and attendant console shall also allow the attendant to request the Emergency Interrupt feature in this case.	Required	5.3.2.26.4	Met
	The appliance and the attendant console shall prevent an attendant from activating BLV or Emergency Interrupt to called lines and called numbers that are located in the commercial network (the PSTN).	Required	5.3.2.26.4	Met
	The appliance and the attendant console shall give the attendant the ability to use Emergency Interrupt to interrupt an existing call on a busy line, and inform the busy user of a new incoming call. The appliance shall provide an override tone to the busy user before the attendant enters the conversation, and they shall repeat the tone periodically for as long as the attendant is connected to the busy user.	Required	5.3.2.26.4	Met
	The appliance shall give selected destination EIs the ability to be exempt from Emergency Interrupt and attendant break-in. In particular, it shall be possible for the appliance to preclude the BLV and Emergency Interrupt services from being applied to selected destination EIs (e.g., EIs that provide secure voice service).	Required	5.3.2.26.4	Met
	The appliance and the attendant console shall have the ability to route all calls that are normally directed to the console to a separate night service deflection number. The night service deflection number shall be a fixed (preconfigured) or manually-selected DN.	Required	5.3.2.26.5	Met
	When an attendant redirects an incoming call to a destination station, and that station is either busy or does not answer the call within a preset time, the appliance and the attendant console shall ensure that calling party on the redirected call is recalled automatically to the console.	Required	5.3.2.26.6	Met
	In this case, the appliance shall ensure that that the "recalled" call is returned to the console that originally processed the call. If that console is busy, the appliance shall ensure that the "recalled" calls are placed into the queue for that console. But if that console is out of service, then the appliance shall ensure that the "recalled" call is routed to another console on that appliance, if another console is available.	Required	5.3.2.26.6	Met

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

CR/FR ID	Capability/Function	Applicability[1]	UCR Reference	Status
	Attendant Console Requirements (continued)			
	The appliance and the attendant console shall have the ability to place calls (both directed to the attendant and diverted to the attendant) into a waiting queue. The appliance and the attendant console shall ensure that calls placed in queue to the attendant are retrieved by the attendant in order of their precedence level (i.e., FLASHOVERRIDE first, ROUTINE last) and the longest holding time within that precedence level.	Required	5.3.2.26.7	Met
2	The appliance and the attendant console shall ensure that calls in the attendant queue are not lost when a console is placed out of service or has its calls forwarded to a night service deflection number. When the console is placed out of service or forwarded to night service while calls are in queue, the appliance and the console shall be capable of one of the following solutions to ensure that calls are not lost: 1. All the existing calls in the queue shall be forwarded first to a separate DN for the centralized attendant (i.e., a different attendant at a different attendant console), and then on to the night service DN (if the centralized attendant activated night service deflection). 2. All subsequent calls placed to the attendant console shall be forwarded first to the separate DN for the centralized attendant, and then on to the night service DN (if the centralized attendant activated night service deflection). For the existing calls in the queue, the attendant remains at the console and answers all these remaining calls (even though the attendant placed the console out of service or forwarded the console to night service deflection), thereby preventing any of the calls from being lost.	Required	5.3.2.26.7	Met
	IPv6 Requirements			
3	If the Attendant Console has an IP interface, the Attendant Console must be IPv6 capable. Use guidance in Table 5.3.5-4 for NA/SS	Required	5.3.5	Met[3]
	Information Assurance			
4	Security	Required	5.4	Met[4]

NOTES:
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.
2. The SUT was tested and is certified with legacy Avaya CS2100 and Alcatel-Lucent 5ESS switches only; therefore, those requirements for LSC, WAN SS and MFSS do not apply.
3. 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.
4. Information assurance testing is accomplished via DISA-led Information Assurance test teams and published in a separate report, Reference (e).

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

LEGEND:

5ESS	Class 5 Electronic Switching System
ASAC	Assured Services Admission Control
AS-SIP	Assured Services-Session Initiation Protocol
BLV	Busy Line Verification
CoS	Class of Service
CR	Capability Requirement
CS	Communication Server
DN	Directory Number
DSN	Defense Switched Network
EI	End Instrument
EO	End Office
FR	Functional Requirement
ID	Identification
IP	Internet Protocol
IPv6	Internet Protocol version 6
ISDN	Integrated Services Digital Network
LSC	Local Session Controller
MFS	Multifunction Switch
MFSS	Multifunction Soft Switch
MLPP	Multi-Level Precedence and Preemption
NA/SS	Network Appliances and Simple Servers
PBAS	Precedence Based Assured Service
PCD	Precedence Call Diversion
PRI	Primary Rate Interface
PSTN	Public Switched Telephone Network
RFC	Request for Comments
RTS	Real Time Services
SS	Soft Switch
SS7	Signaling System 7
SUT	System Under Test
T1.619a	SS7 and ISDN MLPP Signaling Standard for T1
TDM	Time Division Multiplexing
UC	Unified Capabilities
UCR	Unified Capabilities Requirements
VoIP	Voice over Internet Protocol
WAN SS	Wide Area Network Soft Switch

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. Attendant Console Requirements

(1) The UCR 2008, Change 3, paragraph 5.3.2.26, states that the attendant console shall be an EI that serves other EIs on the same LSC, MFSS, or WAN SS (when the WAN SS contains an internal LSC). In the MFSS case, the attendant station shall be an EI on the IP side of the MFSS (the SS) and shall serve other EIs on the IP side of the MFSS. The SUT is not required to meet this requirement because it was tested with the legacy Avaya CS2100 and Alcatel-Lucent 5ESS switches only.

(2) The UCR 2008, Change 3, paragraph 5.2.3.26.1, states that the attendant console shall interoperate with PBAS/ASAC as described in:

(a) Section 5.3.2.7.2.1, PBAS/ASAC Requirements
(b) Section 5.3.2.2.2.3, ASAC – Open Loop
(c) Section 5.3.4.10, Precedence and Preemption

Note: The console shall be able to initiate all levels of precedence calls (i.e., ROUTINE through FLASH OVERRIDE).

The SUT is not required to meet this requirement because it was tested and is certified with the legacy Avaya CS2100 and Alcatel-Lucent 5ESS switches only. However, the SUT met all requirements for MLPP per Section 5.3.2.31.3 of the UCR and is capable of being able to initiate all levels of precedence calls.

(3) The UCR 2008, Change 3, paragraph 5.2.3.26.2, states that the attendant console shall provide a visual display of each precedence level and the calling number, for incoming direct dialed calls to the attendant, and diverted calls to the attendant (e.g., calls that reach the attendant through Precedence Call Diversion (PCD). The SUT met this requirement.

(4) The UCR 2008, Change 3, paragraph 5.2.3.26.2, states that if the LSC, MFSS, or WAN SS supports assignment of a Class of Service (CoS) to an individual EI, then the attendant console also shall provide a visual display of the calling EI's CoS, for incoming direct dialed calls to the attendant and diverted calls to the attendant. This is a conditional requirement for LSC, MFSS and WAN SS; however, the SUT is able to meet the requirement by providing a visual display of the CoS for intra switch calls.

(5) The UCR 2008, Change 3, paragraph 5.2.3.26.3, states that if the LSC, MFSS, or WAN SS supports assignment of a CoS to an individual EI, then this appliance and the attendant console shall give the attendant the ability to override any incoming call's calling party CoS (based on calling area or precedence) on a call-by-call basis. This is a conditional requirement and is not supported by the SUT.

(6) The UCR 2008, Change 3, paragraph 5.2.3.26.4, states that if the appliance and the attendant console shall give the attendant the ability to verify and override a busy line condition. In commercial VoIP networks, attendant verification of a busy line is called Busy Line Verification (BLV), and attendant override of a busy line is called Emergency Interrupt. The SUT met this requirement.

(7) The UCR 2008, Change 3, section 5.2.3.26.5 states that the appliance and the attendant console shall have the ability to route all calls that are normally directed to the console to a separate night service deflection number. The night service deflection number shall be a fixed (preconfigured) or manually-selected DN. The SUT met this requirement.

(8) The UCR 2008, Change 3, section 5.2.3.26.6 states that when an attendant redirects an incoming call to a destination station, and that station is either busy or does not answer the call within a preset time, the appliance and the attendant console shall ensure that calling party on the redirected call is recalled automatically to the console. The SUT met this requirement.

(9) The UCR 2008, Change 3, section 5.2.3.26.7 states that the appliance and the attendant console shall have the ability to place calls (both directed to the attendant and diverted to the attendant) into a waiting queue. The appliance and the

attendant console shall ensure that calls placed in queue to the attendant are retrieved by the attendant in order of their precedence level (i.e., FLASH OVERRIDE first, ROUTINE last) and the longest holding time within that precedence level. The appliance and the attendant console shall ensure that calls in the attendant queue are not lost when a console is placed out of service or has its calls forwarded to a night service deflection number. When the console is placed out of service or forwarded to night service while calls are in queue, the appliance and the console shall be capable of one of the following solutions to ensure that calls are not lost:

(a) All the existing calls in the queue shall be forwarded first to a separate DN for the centralized attendant (i.e., a different attendant at a different attendant console), and then on to the night service DN (if the centralized attendant activated night service deflection).

(b) All subsequent calls placed to the attendant console shall be forwarded first to the separate DN for the centralized attendant, and then on to the night service DN (if the centralized attendant activated night service deflection). For the existing calls in the queue, the attendant remains at the console and answers all these remaining calls (even though the attendant placed the console out of service or forwarded the console to night service deflection), thereby preventing any of the calls from being lost.

The SUT met this requirement.

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

Attendant Consoles have required and conditional features and capabilities that are established by Section 5.3.2 of the Unified Capabilities Requirements (UCR) 2008, Change 3. The System Under Test 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. Attendant Console Capability/Functional Requirements

ID	Requirement	UCR Reference	Required or Conditional
1	The attendant console shall be an EI that serves other EIs on the same LSC, MFSS, or WAN SS (when the WAN SS contains an internal LSC). In the MFSS case, the attendant station shall be an EI on the IP side of the MFSS (the SS) and shall serve other EIs on the IP side of the MFSS. **NOTE:** In the MFSS case, the RTS Attendant Console is not required to serve DSN EIs that are served by the TDM side of the MFSS (i.e., are served by the DSN MFS). This means that the attendant console is not required to bridge calls between the TDM and IP sides of the MFSS. For example, the attendant console is not required to bridge a call to or from a DSN EI on the MFS with another call to or from another DSN EI on that MFS.	5.3.2.26	R
2	The attendant console shall interoperate with PBAS/ASAC as described in: a. Section 5.3.2.7.2.1, PBAS/ASAC Requirements b. Section 5.3.2.2.2.3, ASAC – Open Loop c. Section 5.3.4.10, Precedence and Preemption NOTE: The console shall be able to initiate all levels of precedence calls (i.e., ROUTINE through FLASH OVERRIDE)	5.3.2.26.1	R
3	The attendant console shall interoperate with MLPP as described in Section 5.3.2.31.3, Multilevel Precedence and Preemption.	5.3.2.26.1	R
4	When the attendant console receives a call at Precedence A and the attendant transfers the call to a destination at Precedence B, the resulting call should have the higher precedence between A and B.	5.3.2.26.1	R
5	The attendant console shall provide a visual display of each precedence level and the calling number, for incoming direct dialed calls to the attendant, and diverted calls to the attendant (e.g., calls that reach the attendant through PCD). The AS-SIP trunks and T1.619A PRI trunks support delivery of precedence level and calling number information on incoming calls to LSCs. This means that the precedence level and the calling number should be available to the attendant console, for incoming calls that originate from outside of the LSC.	5.3.2.26.2	R

Table 3-1. Attendant Console Capability/Functional Requirements (continued)

ID	Requirement	UCR Reference	Required or Conditional
6	If the LSC, MFSS, or WAN SS supports assignment of a CoS to an individual EI, then the attendant console also shall provide a visual display of the calling EI's CoS, for incoming direct dialed calls to the attendant and diverted calls to the attendant. The AS-SIP trunks and T1.619A PRI trunks do not support delivery of CoS information on incoming calls to LSCs. This means that CoS information will not be available to the attendant console for incoming calls that originate from outside of the LSC. The CoS information may be available to the attendant console for calls that originate within the LSC. A similar situation also occurs for : a. Calls where the EI is served by an LSC, but the attendant console is served by a DSN EO or MFS, and b. Calls where the EI is served by an DSN EO, but the attendant console is served by an LSC, MFSS, or WAN SS. Because AS-SIP and T1.619A PRI trunks do not support delivery of CoS information, this information will not be available to DSN Attendant Consoles on calls from EIs, or to attendant consoles on calls from DSN EIs.	5.3.2.26.2	C
7	If the LSC, MFSS, or WAN SS supports assignment of a CoS to an individual EI, then this appliance and the attendant console shall give the attendant the ability to override any incoming call's calling party CoS (based on calling area or precedence) on a call-by-call basis. The appliance and the attendant console shall also give the attendant the ability to override any diverting call's calling party CoS (based on calling area or precedence) on a call-by-call basis.	5.3.2.26.3	C
8	The appliance and the attendant console shall give the attendant the ability to verify and override a busy line condition. In commercial VoIP networks, attendant verification of a busy line is called Busy Line Verification (BLV), and attendant override of a busy line is called Emergency Interrupt. In the network, support for these BLV and Emergency Interrupt capabilities is. • Required when the "busy line" is an UC EI served by the local UC appliance. • Conditional when the "busy line" is an UC EI served by a remote UC appliance. – The condition here is that the Attendant's appliance, the remote appliance, and any intermediate appliances all have to support the SIP requirements for BLV and Emergency Interrupt signaling in RFC 3603. In RFC 3603, the "P-DCS-OSPS: BLV" header indicates an attendant's request for BLV, and the "P-DCS-OSPS: EI" header indicates an attendant's request for Emergency Interrupt. • Not required when the "busy line" is a DSN EI served by a DSN switch.	5.3.2.26.4	R
9	If the attendant uses BLV on a called line, and that called line (called EI) is busy, the appliance and the attendant console shall give an audible and visual "called line busy" indication back to the attendant. The appliance and attendant console shall also allow the attendant to request the Emergency Interrupt feature in this case.	5.3.2.26.4	R
10	The appliance and the attendant console shall prevent an attendant from activating BLV or Emergency Interrupt to called lines and called numbers that are located in the commercial network (the PSTN).	5.3.2.26.4	R
11	The appliance and the attendant console shall give the attendant the ability to use Emergency Interrupt to interrupt an existing call on a busy line, and inform the busy user of a new incoming call. The appliance and the Attendant console shall provide an override tone to the busy user before the attendant enters the conversation, and they shall repeat the tone periodically for as long as the attendant is connected to the busy user.	5.3.2.26.4	R
12	The appliance shall give selected destination EIs the ability to be exempt from Emergency Interrupt and attendant break-in. In particular, it shall be possible for the appliance to preclude the BLV and Emergency Interrupt services from being applied to selected destination EIs (e.g., EIs that provide secure voice service).	5.3.2.26.4	R
13	The appliance and the attendant console shall have the ability to route all calls that are normally directed to the console to a separate night service deflection number. The night service deflection number shall be a fixed (preconfigured) or manually-selected DN.	5.3.2.26.5	R

Table 3-1. Attendant Console Capability/Functional Requirements (continued)

ID	Requirement	UCR Reference	Required or Conditional
14	When an attendant redirects an incoming call to a destination station, and that station is either busy or does not answer the call within a preset time, the appliance and the attendant console shall ensure that calling party on the redirected call is recalled automatically to the console.	5.3.2.26.6	R
15	In this case, the appliance shall ensure that that the "recalled" call is returned to the console that originally processed the call. If that console is busy, the appliance shall ensure that the "recalled" call is placed into the queue for that console. But if that console is out of service, then the appliance shall ensure that the "recalled" call is routed to another console on that appliance, if another console is available.	5.3.2.26.6	R
16	The appliance and the attendant console shall have the ability to place calls (both directed to the attendant and diverted to the attendant) into a waiting queue. The appliance and the attendant console shall ensure that calls placed in queue to the attendant are retrieved by the attendant in order of their precedence level (i.e., FLASH OVERRIDE first, ROUTINE last) and the longest holding time within that precedence level.	5.3.2.26.7	R
17	The appliance and the attendant console shall ensure that calls in the attendant queue are not lost when a console is placed out of service or has its calls forwarded to a night service deflection number. When the console is placed out of service or forwarded to night service while calls are in queue, the appliance and the console shall be capable of one of the following solutions to ensure that calls are not lost: 1. All the existing calls in the queue shall be forwarded first to a separate DN for the centralized attendant (i.e., a different attendant at a different attendant console), and then on to the night service DN (if the centralized attendant activated night service deflection). 2. All subsequent calls placed to the attendant console shall be forwarded first to the separate DN for the centralized attendant, and then on to the night service DN (if the centralized attendant activated night service deflection). For the existing calls in the queue, the attendant remains at the console and answers all these remaining calls (even though the attendant placed the console out of service or forwarded the console to night service deflection), thereby preventing any of the calls from being lost.	5.3.2.26.7	R

LEGEND:

ASAC	Assured Services Admission Control	MLPP	Multi-Level Precedence and Preemption
AS-SIP	Assured Services-Session Initiation Protocol	NA/SS	Network Appliances and Simple Servers
BLV	Busy Line Verification	PBAS	Precedence Based Assured Service
C	Conditional	PCD	Precedence Call Diversion
CoS	Class of Service	PRI	Primary Rate Interface
CR	Capability Requirement	PSTN	Public Switched Telephone Network
DN	Directory Number	R	Required
DSN	Defense Switched Network	RFC	Request for Comments
EI	End Instrument	RTS	Real Time Services
EO	End Office	SS	Soft Switch
FR	Functional Requirement	SS7	Signaling System 7
ID	Identification	SUT	System Under Test
IP	Internet Protocol	T1.619a	SS7 and ISDN MLPP Signaling Standard for T1
IPv6	Internet Protocol version 6	TDM	Time Division Multiplexing
ISDN	Integrated Services Digital Network	UC	Unified Capabilities
LSC	Local Session Controller	UCR	Unified Capabilities Requirements
MFS	Multifunction Switch	VoIP	Voice over Internet Protocol
MFSS	Multifunction Soft Switch	WAN SS	Wide Area Network Soft Switch