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

MEMORANDUM FOR DISTRIBUTION **20 May 11**

SUBJECT: Special Interoperability Test Certification of EdgeAccess VoiceWise (VW) 9600-Server (SRV) Version R5100831J

References: (a) DoD Directive 4630.05, "Interoperability and Supportability of Information Technology (IT) and National Security Systems (NSS)," 5 May 2004
(b) CJCSI 6212.01E, "Interoperability and Supportability of Information Technology and National Security Systems," 15 December 2008
(c) through (f), see Enclosure 1

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

2. The EdgeAccess VW9600- SRV Version R5100831J is hereinafter referred to as the system under test (SUT). The SUT meets all of the critical interoperability requirements and is certified as interoperable for joint use within the Defense Information System Network (DISN) as a Private Branch Exchange (PBX) 1 and PBX 2. The SUT offers an Internet Protocol (IP) interface to support Voice over Internet Protocol; however, it did not meet the minimum requirements for Assured Services. Therefore, the IP interface is not certified by JITC or authorized for use within the DISN. The VW4800-SRV and VW2416-SRV employ the same software and similar hardware as the SUT. The JITC analysis determined these systems to be functionally identical to the SUT for interoperability certification purposes and they are also certified for joint use with the same limitations. The SUT meets 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 report, are certified by the JITC. This certification expires upon changes that could affect interoperability, but no later than three years from the date the DISA Field Security Operations (FSO) provided a positive Certification and Accreditation (CA) Recommendation.

3. This finding is based on interoperability testing conducted by JITC, review of the vendor's Letters of Compliance (LoC), and FSO CA Recommendation. Interoperability testing of the SUT was conducted at JITC's Global Information Grid Network Test Facility at Fort Huachuca, Arizona, from 29 November 2010 through 14 January 2011. Review of the vendor's LoC was completed on 25 April 2011. The FSO provided a positive CA Recommendation on 20 April 2011 based on the security testing completed by DISA-led IA test teams and published in a separate report, Reference (e). Enclosure 2 documents the test results and describes the tested network and system configurations.

4. The interoperability test summary of the SUT is indicated in Table 1. The PBX 1 Capability Requirements (CRs) and Feature Requirements (FRs) are listed in Table 2. This interoperability test status is based on the PBX 1's ability to meet:

a. DSN services for Network and Applications specified in Reference (f).

b. PBX 1 interface and signaling requirements for trunks/lines specified in Reference (c) verified through JITC testing and/or vendor submission of LoC.

c. PBX 1 CRs/FRs specified in Reference (c) verified through JITC testing and/or vendor submission of LoC.

d. The overall system interoperability performance derived from test procedures listed in Reference (d).

Table 2. SUT Interoperability Test Summary

DSN Trunk Interfaces			
Interface & Signaling	**Critical**	**Status**	**Remarks**
T1 CAS (DTMF, MFR1, DP)	No	Not Tested	This interface is not supported by the SUT and is not required for a PBX 1.
E1 CAS (DTMF, MFR1, DP)	No (Europe only)	Not Tested	This interface is not supported by the SUT and is not required for a PBX 1.
T1 ISDN PRI NI 1/2 (ANSI T1.619a)	Yes	Certified	Met all critical CRs and FRs.
E1 ISDN PRI (ITU-T Q.955.3)	No (Europe only)	Not Tested	This interface is not supported by the SUT and is not required for a PBX 1.
DSN Line Interfaces			
Interface & Signaling	**Critical**	**Status**	**Remarks**
2-Wire Analog Loop Start (GR-506-CORE)	Yes	Certified	Met all critical CRs and FRs.
ISDN BRI NI 1/2 (ANSI T1.619a)	No	Not Tested	This interface is not supported by the SUT and is not required for a PBX 1.
2-Wire Proprietary Digital	No	Not Tested	This interface is not supported by the SUT and is not required for a PBX 1.
VoIP (Ethernet IEEE 802.3u)	No	Not Certified	VoIP is supported by the SUT; however, testing for this interface was terminated by the vendor and sponsor due to discrepancies. The SUT VoIP interface is therefore not certified by JITC and is not required for a PBX 1.
DSN Features and Capabilities			
Features and Capabilities	**Critical**	**Status**	**Remarks**
Common Features	Yes	Certified	Met all critical CRs and FRs.
Attendant	No	Not Tested	This feature is not supported by the SUT and is not required for a PBX 1.
Public Safety	Yes	Certified	All public safety features are conditional. The SUT met all critical CRs and FRs for Basic 911. The SUT does not support the other public safety features. These features are not required for a PBX 1. There is no risk associated with the SUT not supporting these features.[1]
Conferencing	No	Not Tested	This feature is not supported by the SUT and is not required for a PBX 1.
Nailed-up Connections	No	Not Tested	This feature is not supported by the SUT and is not required for a PBX 1.
DSN Hotline Services	No	Not Tested	This feature is not supported by the SUT and is not required for a PBX 1.
MLPP	Yes	Certified	Met all critical CRs and FRs.
Call Processing	Yes	Certified	Met all critical CRs and FRs.
ISDN Services	Yes	Certified	Met all critical CRs and FRs for PRI only.
Synchronization	Yes	Certified	Met all critical CRs and FRs.
Reliability	Yes	Certified	Met all critical CRs and FRs.

Table 2. SUT Interoperability Test Summary (continued)

DSN Features and Capabilities			
Features and Capabilities	**Critical**	**Status**	**Remarks**
Security	Yes	Certified	See note 2.
VoIP System	No	Not Certified	VoIP is supported by the SUT; however, testing for this interface was terminated by the vendor and sponsor due to discrepancies. The SUT VoIP interface is therefore not certified by JITC and is not required for a PBX 1.

Network Gateways				
Gateway	**Interface & Signaling**	**Critical**	**Status**	**Remarks**
PSTN	T1 CAS (DTMF, MFR1, DP)	No	Not Tested	This interface is not supported by the SUT and is not required for a PBX 1.
	E1 CAS (DTMF, MFR1, DP)	No (Europe only)	Not Tested	This interface is not supported by the SUT and is not required for a PBX 1.
	T1 ISDN PRI NI 1/2 (ANSI T1.607)	No	Certified	Met all critical CRs and FRs.
	E1 ISDN PRI (ITU-T Q.931)	No (Europe only)	Not Tested	This interface is not supported by the SUT and is not required for a PBX 1.
	2-Wire Analog Ground Start (GR-506-CORE)	No	Certified	Met all critical CRs and FRs.

NOTES:

1 The SUT only supports emergency service 911 public safety features. The following public safety features are not supported and therefore are not covered in this certification: Trace of terminating calls, Outgoing call trace, Tandem call trace, and Trace of a call in progress. These features are not required for a PBX 1. There is no risk associated with the SUT not supporting these features.

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

LEGEND:

802.3u	Standard for carrier sense multiple access with collision detection at 100 Mbps	JITC	Joint Interoperability Test Command
ANSI	American National Standards Institute	LSSGR	Local Access and Transport Area (LATA) Switching Systems Generic Requirements
BRI	Basic Rate Interface	Mbps	Megabits per second
CAS	Channel Associated Signaling	MFR1	Multi-Frequency Recommendation 1
CRs	Capability Requirements	MLPP	Multi-Level Precedence and Preemption
DISA	Defense Information Systems Agency	NI 1/2	National ISDN Standard 1 or 2
DP	Dial Pulse	PBX 1	Private Branch Exchange 1
DSN	Defense Switched Network	PRI	Primary Rate Interface
DSS1	Digital Subscriber Signaling 1	PSTN	Public Switched Telephone Network
DTMF	Dual Tone Multi-Frequency	Q.931	Signaling Standard for ISDN
E1	European Basic Multiplex Rate (2.048 Mbps)	Q.955.3	ISDN Signaling standard for E1 MLPP
FRs	Feature Requirements	SS7	Signaling System 7
GR	Generic Requirement	SUT	System Under Test
GR-506-CORE	LSSGR: Signaling for Analog Interfaces	T1	Digital Transmission Link Level 1 (1.544 Mbps)
IEEE	Institute of Electrical and Electronics Engineers	T1.607	ISDN Layer 3 Signaling Specification for Circuit Switched Bearer Service for DSS1
ISDN	Integrated Services Digital Network		
ITU-T	International Telecommunication Union - Telecommunication Standardization Sector	T1.619a	SS7 and ISDN MLPP Signaling Standard for T1
		VoIP	Voice over Internet Protocol

Table 3. PBX 1 Requirements

DSN Trunk Interfaces				
Interface	**Critical**	**Requirements Required or Conditional**		**References**
T1 CAS (MFR1, DTMF, DP) E1 CAS (MFR1, DTMF, DP) T1 ISDN PRI NI 1/2 (ANSI T1.619a) E1 ISDN PRI (ITU-T Q.955.3)	No No (Europe only) Yes No (Europe only)	Trunking	• Direct Inward Dialing (C) • National ISDN 1/2 Primary Access (R: PRI only) • ISDN ANSI MLPP Service Capability (R: PRI only) • ITU-T ISDN Primary Access (C: E1 PRI only) • ITU-T ISDN Primary Access DSS1 MLPP (C: E1 PRI only) • Trunk Group-Remove from Service (C) • Trunk Group-Restore to Service (C) • Normal Wink Start Operations (C: CAS only) • Glare Operation (C: CAS only) • Abnormal Wink Start (C: CAS only) • Glare Resolution (C: CAS only) • Call for Service Timing (R: CAS only) • Guard Timing (R: CAS only) • Satellite Timing (C: CAS only) • Disconnect Control (C: CAS only) • Reselect and Retrial (C: CAS only) • Off-Hook Supervision Transition (C: CAS only) • Dial-Pulse Signals (C: CAS only) • DTMF Signaling (C: CAS only) • Standard Digit Format for Precedence (C: CAS only) • MFR1 2/6 Signaling (C: CAS only) • Alerting Signals and Tones (R) • DSN ISDN User-to-Network Signaling (R: PRI only) • Application (R: PRI only) • Physical Layer (R: PRI only) • Data Link Layer (R: PRI only) • Data Link Connection (R: PRI only) • Peer-to-Peer Procedures of Data-Link Layer (R: PRI only) • Layer 3 DSN User-to-Network Signaling (R: PRI only) • DSN User-to-Network Signaling for Circuit-Switched Bearer Services (R: PRI only) • Sequence of Messages for DSN Circuit Switched Calls (R: PRI only) • Message Functional Definition and Content (R: PRI only) • General Message Format and Information Elements Coding (R: PRI only) • Supplementary Services (C: PRI only) • DSN Transmission Interface (R) • PCM-24 Digital Trunk Interface (R) • Interface Characteristics (R) • Supervisory Channel Associated Signaling (C: CAS only) • Clear Channel Capability (R) • Alarm and Restoral Requirements (R) • PCM-30 Digital Trunk Interface (Europe only) (C) • Supervisory Channel Associated Signaling (C: E1 only) • Alarm and Restoral Requirements (C: E1 only) • Interoperation of PCM-24 and PCM-30 (C) • Analog Trunk Interface (C)	• UCR Section 5.2.1.3.2 • UCR Section 5.2.1.3.4.1 • UCR Section 5.2.1.3.4.1.1 • UCR Section 5.2.1.3.4.2 • UCR Section 5.2.1.3.4.2.1 • UCR Section 5.2.1.5.5 • UCR Section 5.2.1.5.5 • UCR Section 5.2.4.3.3.1.1 • UCR Section 5.2.4.3.3.1.2 • UCR Section 5.2.4.3.3.2.1 • UCR Section 5.2.4.3.3.2.2 • UCR Section 5.2.4.3.5 • UCR Section 5.2.4.3.6 • UCR Section 5.2.4.3.7 • UCR Section 5.2.4.3.8 • UCR Section 5.2.4.3.9 • UCR Section 5.2.4.3.10 • UCR Section 5.2.4.4.1 • UCR Section 5.2.4.4.2 • UCR Section 5.2.4.4.2.1 • UCR Section 5.2.4.4.3 • UCR Section 5.2.4.5.1 • UCR Section 5.2.4.7.1 • UCR Section 5.2.4.7.1.1 • UCR Section 5.2.4.7.1.2 • UCR Section 5.2.4.7.1.3 • UCR Section 5.2.4.7.1.3.1 • UCR Section 5.2.4.7.1.3.2 • UCR Section 5.2.4.7.1.4 • UCR Section 5.2.4.7.1.4.2 • UCR Section 5.2.4.7.1.4.3 • UCR Section 5.2.4.7.1.4.4 • UCR Section 5.2.4.7.1.4.5 • UCR Section 5.2.4.7.1.4.6 • UCR Section 5.2.5 • UCR Section 5.2.6.1 • UCR Section 5.2.6.1.1 • UCR Section 5.2.6.1.2 • UCR Section 5.2.6.1.3 • UCR Section 5.2.6.1.4 • UCR Section 5.2.6.2 • UCR Section 5.2.6.2.1 • UCR Section 5.2.6.2.2 • UCR Section 5.2.6.3 • UCR Section 5.2.6.4
		Voice	• MOS (R) • Secure calls (R)	• CJCSI 6215.01C • CJCSI 6215.01C
		Facsimile	• Analog: ITU-T T.4 (R)	• DISR
		Data	• Modem (VBD) (R) • 56 kbps switched data (R: PRI only) • 64 kbps switched data (R: PRI only) • NX56 synchronous BER (R: PRI only) • NX64 synchronous BER (R: PRI only) • Secure data (STE/STU-III) (R)	• CJCSI 6215.01C • UCR Section 5.2.2.9.6 • UCR Section 5.2.2.9.6 • UCR Section 5.2.2.9.6 • UCR Section 5.2.2.9.6 • CJCSI 6215.01C
		VTC	• ITU-T H.320 (R: PRI only)	• FTR 1080B-2002

Table 3. PBX 1 Requirements (continued)

DSN Line Interfaces				
Interface	**Critical**	**Requirements Required or Conditional**		**References**
2-Wire Analog ISDN BRI NI 1/2 (ANSI T1.619a)	Yes No	Access	• Directory Number Identification (R) • PBX Line (C) • National ISDN 1/2 Basic Access (C) • Analog Line (R) • Basic Line Test Capabilities (R) • Advanced Line Test Capabilities (C) • Loop Start Line (R: 2-Wire Analog only) • Reverse Battery (R) • Alerting Signals and Tones (R) • S/T Reference Point (ISDN BRI) (C)	• UCR Section 5.2.1.1.1 • UCR Section 5.2.1.3.1 • UCR Section 5.2.1.3.3 • UCR Section 5.2.1.3.5 • UCR Section 5.2.1.5.4.1.1 • UCR Section 5.2.1.5.4.1.1 • UCR Section 5.2.4.2.1 • UCR Section 5.2.4.3.1 • UCR Section 5.2.4.5.1 • UCR Section 5.2.4.7.1.2.1
2-Wire Proprietary Digital	No	Voice	• MOS (R) • Secure Calls (R)	• CJCSI 6215.01C • CJCSI 6215.01C
		Facsimile	• Analog: ITU-T T.4 (R)	• DISR
		Data	• Modem (VBD) (R) • Secure data (STE/STU-III) (R)	• CJCSI 6215.01C • CJCSI 6215.01C
		VTC	• ITU-T H.320 (C: BRI only)	• FTR 1080B-2002
DSN Features & Capabilities				
Feature/ Capability	**Critical**	**Requirements Required or Conditional**		**References**
Common Features	Yes		• Individual Lines (R) • Denied originating service (C) • Code restriction and diversion (C) • Call waiting (R) • Three-way calling (R) • Add-on transfer, conference calling, and call hold (C) • Call Transfer Individual - All calls (R) • Call Transfer - Internal Only (R) • Call Transfer - Individual - Incoming Only/Add-On Consultation Hold - Incoming Call (R) • Call Transfer - Outside (R) • Call Transfer - Add-On to Fully Restricted Station (C) • Call Transfer - Attendant (C) • Call Hold (R) • Conference Calling - Six Way Station Controlled (C) • Call Forwarding Variable (R) • Call Forward Busy Line (R) • Call Forwarding - Don't Answer - All Calls (R) • Selective Call Forwarding (C) • Call pick-up (C) • Address Translation (C) • Assured Dial Tone (R)	• UCR Section 5.2.1.1.1 • UCR Section 5.2.1.1.3 • UCR Section 5.2.1.1.4 • UCR Section 5.2.1.1.5.1 • UCR Section 5.2.1.1.6 • UCR Section 5.2.1.1.7 • UCR Section 5.2.1.1.7.1 • UCR Section 5.2.1.1.7.2 • UCR Section 5.2.1.1.7.3 • UCR Section 5.2.1.1.7.4 • UCR Section 5.2.1.1.7.5 • UCR Section 5.2.1.1.7.6 • UCR Section 5.2.1.1.7.7 • UCR Section 5.2.1.1.7.8 • UCR Section 5.2.1.1.8.1 • UCR Section 5.2.1.1.8.2 • UCR Section 5.2.1.1.8.3 • UCR Section 5.2.1.1.8.4 • UCR Section 5.2.1.1.9.1 • UCR Section 5.2.1.7 • UCR Section 5.2.1.9
Attendant	No	• Attendant Features (C)		• UCR Section 5.2.1.2.2
Public Safety	Yes	• Emergency Service (911) Caller (R) • Emergency Service (911) Public Safety Answering Service (C) • Enhanced Emergency Service (E911) (C) • Trace of terminating calls (C) • Outgoing call trace (C)		• UCR Section 5.2.1.4.1.1 • UCR Section 5.2.1.4.1.2 • UCR Section 5.2.1.4.1.3 • UCR Section 5.2.1.4.2 • UCR Section 5.2.1.4.3
Conferencing	No	• Preset Conferencing (C) • Meet-Me Conferencing (C) • Progressive Conferencing (C)		• UCR Section 5.2.1.6.1 • UCR Section 5.2.1.6.2 • UCR Section 5.2.1.6.3
Nailed-up Connections	No	• Nailed-Up Connections (C)		• UCR Section 5.2.1.8
DSN Hotline Services	No	• DSN Analog Hotline Service (C)		• UCR Section 5.2.1.12

Table 3. PBX 1 Requirements (continued)

DSN Features & Capabilities			
Feature/ Capability	**Critical**	**Requirements Required or Conditional**	**References**
MLPP	Yes	• MLPP Overview (R) • Preemption in the Network (R) • Network Facility with Lower Precedence Calls (R) • Network Facility with Equal or Higher Precedence Calls (R) • Precedence Call Diversion (R) • Channel Associated Signaling (C) • Primary Rate Interface (R) • Analog Line MLPP (R) • ISDN MLPP Basic Rate Interface (C) • ISDN Primary Rate Interface (R) • Precedence Call Waiting (R) • Call Forwarding (R) • Call Transfer (R) • Call Hold (R) • Three-Way Calling (R) • Call Pickup (C) • Conferencing (C) • Multiline Hunt Group (C) • Community of Interest (C) • MLPP Interaction with EKTS features (C)	• UCR Section 5.2.2.1.1 • UCR Section 5.2.2.2 • UCR Section 5.2.2.2.1 • UCR Section 5.2.2.2.2 • UCR Section 5.2.2.3 • UCR Section 5.2.2.4.1 • UCR Section 5.2.2.4.2 • UCR Section 5.2.2.5 • UCR Section 5.2.2.6 • UCR Section 5.2.2.7 • UCR Section 5.2.2.8.1 • UCR Section 5.2.2.8.2 • UCR Section 5.2.2.8.3 • UCR Section 5.2.2.8.4 • UCR Section 5.2.2.8.5 • UCR Section 5.2.2.8.6 • UCR Section 5.2.2.8.7.1 • UCR Section 5.2.2.8.8 • UCR Section 5.2.2.8.9 • UCR Section 5.2.2.10.1
Call Processing	Yes	• Call Treatments (R) • Primary and Alternate Routing (C) • E&M Lead Signaling States (C) • 4-Wire Analog User Access Lines (C) • 2-Wire User Access Lines (R) • Termination of Analog Lines (R) • DSN User Dialing (R) • Interswitch and Intraswitch Dialing (R) • Seven-Digit Dialing (R) • Ten-Digit Dialing (R) • Access Code (R) • Access Digit (R) • Precedence Digit (R) • Service Digit (R) • Route Code (R) • Area Code (R) • Switch Code (R) • Line Number (R) • Calling Name Delivery (C) • Calling Number Delivery (R) • Emergency Service 911 Conflict Resolution (R) • DSN Switch Outpulsing Digit Formats (C) • Standard Directory Number (R) • Standard Test Numbers (C) • Base Services – Abbreviated Numbers (C) • Digit Reception Requirements (R) • Screening (C)	• UCR Section 5.2.3.1 • UCR Section 5.2.3.2 • UCR Section 5.2.3.3.1 • UCR Section 5.2.3.3.2 • UCR Section 5.2.3.3.3 • UCR Section 5.2.3.3.4 • UCR Section 5.2.3.5.1.1 • UCR Section 5.2.3.5.1.1 • UCR Section 5.3.3.5.2.1 • UCR Section 5.2.3.5.2.2 • UCR Section 5.2.3.5.1.3 • UCR Section 5.2.3.5.1.3.1 • UCR Section 5.2.3.5.1.3.2 • UCR Section 5.2.3.5.1.3.3 • UCR Section 5.2.3.5.1..4 • UCR Section 5.2.3.5.1.5 • UCR Section 5.2.3.5.1.6 • UCR Section 5.2.3.5.1.7 • UCR Section 5.2.3.5.1.8.1 • UCR Section 5.2.3.5.1.8.2 • UCR Section 5.2.3.5.1.9 • UCR Section 5.2.3.5.2 • UCR Section 5.2.3.5.3 • UCR Section 5.2.3.5.4 • UCR Section 5.2.3.5.5 • UCR Section 5.2.3.5.6 • UCR Section 5.2.3.5.8
ISDN Services	Yes	• BRI Access, Call Control and Signaling (C) • Uniform Interface Configuration for BRIs (C) • EKTS (C) • PRI Access, Call Control and Signaling (R) • PRI Features (R) • Packet Data Features and Capabilities (C)	• UCR Section 5.2.9.2, Table 5.2.9-1 • UCR Section 5.2.9.2, Table 5.2.9-2 • UCR Section 5.2.9.3, Table 5.2.9-3 • UCR Section 5.2.9.2, Table 5.2.9-4 • UCR Section 5.2.9.2, Table 5.2.9-5 • UCR Section 5.2.9.2, Table 5.2.9-6

Table 3. PBX 1 Requirements (continued)

DSN Features & Capabilities (continued)			
Feature/ Capability	**Critical**	**Requirements Required or Conditional**	**References**
Synchronization	Yes	• Line timing mode (R) • Internal Stratum 4 (R) • Synchronization Performance Monitoring Criteria (C) • DS1 Traffic Interfaces (C) • DS0 Traffic Interconnects (C)	• UCR Section 5.2.10.1.1.2 • UCR Section 5.2.10.1.1.2.2 • UCR Section 5.2.10.2 • UCR Section 5.2.10.3 • UCR Section 5.2.10.4
Reliability	Yes	• System Availability (R) • Backup Power (R) • Power Components (R) • UPS Requirements (R) • UPS PBX 1 Load Capacity (R) • Backup Power (Environmental) (R) • Alarms (R)	• UCR Section 5.2.11.2 • UCR Section 5.2.11.3 • UCR Section 5.2.11.3.1 • UCR Section 5.2.11.3.2 • UCR Section 5.2.11.3.2.1 • UCR Section 5.2.11.3.3 • UCR Section 5.2.11.3.4
Security	Yes	• GR-815, STIGs, and DoDI 8510.bb (DIACAP) (R)	• UCR Sections 3.2.3, 3.2.5, and 5.4.6.1

VoIP			
Feature/ Capability	**Critical**	**Requirements Required or Conditional**	**References**
VoIP System	No	VoIP function is conditional. If VoIP is provided, **all** of the following requirements must be met: • Voice Quality with MOS of 4.0 or better (R) • ITU-T G.711 PCM CODEC (R) • MLPP (R) • Security (R) • Network management (C) • System timing (R) • Latency ≤ 60 milliseconds (R) • IPv6 capable (R) • Service Class Tagging (R)	• UCR section 5.2.12.8.2.1 • UCR section 5.2.12.8.2.2 • UCR section 5.2.12.8.2.3 • UCR section 5.2.12.8.2.4 • UCR section 5.2.12.8.2.5 • UCR section 5.2.12.8.2.6 • UCR section 5.2.12.8.2.7 • UCR section 5.2.12.8.2.8 • UCR section 5.2.12.8.2.9

Network Gateways				
Gateway	**Critical**	**Requirements Required or Conditional**		**References**
PSTN (See note.)	No	Trunking	• Positive Identification Control (C) • On-Netting (C) • Off-Netting (C) • Ground Start Line (R) • Immediate Start (C) • Delay Dial (C)	• CJCSI 6215.01C • CJCSI 6215.01C • CJCSI 6215.01C • UCR Section 5.2.4.2.2 • UCR Section 5.2.4.3.2 • UCR Section 5.2.4.3.4

NOTE: Voice, facsimile, data, and VTC service requirements for PSTN are identical to DSN with the exception of MLPP.

Table 3. PBX 1 Requirements (continued)

LEGEND:

ANSI	American National Standards Institute	FTR 1080B-2002	Video Teleconferencing Services	PCM-24	Pulse Code Modulation - 24 Channels
BER	Bit Error Ratio	G.711	PCM of voice frequencies	PCM-30	Pulse Code Modulation - 30 Channels
BRI	Basic Rate Interface	GR	Generic Requirement		
C	Conditional	GR-815	Generic Requirements For Network Element/Network System (NE/NS) Security	PRI	Primary Rate Interface
CAS	Channel Associated Signaling			PSTN	Public Switched Telephone Network
CJCSI	Chairman of the Joint Chiefs of Staff Instruction	H.320	Standard for Narrowband VTC	Q.955.3	ISDN Signaling Standard for E1 MLPP
CODEC	Coder/Decoder	IPv6	Internet Protocol version 6	R	Required
DIACAP	DoD Information Assurance Certification and Accreditation Process	ISDN	Integrated Services Digital Network	S/T	ISDN BRI four-wire interface
		IT	Information Technology	SS7	Signaling System 7
DISR	DoD IT Standards Registry	ITU-T	International Telecommunication Union - Telecommunication	STE	Secure Terminal Equipment
DoD	Department of Defense			STIGs	Security Technical Implementation Guides
DoDI	DoD Instruction		Standardization Sector	STU-III	Secure Telephone Unit -3rd generation
DP	Dial Pulse	kbps	kilobits per second		
DS0	Digital Signal Level 0 (64 kbps)	Mbps	Megabits per second	T.4	Standardization of Group 3 facsimile terminals for document transmission
		MFR1	Multi-Frequency Recommendation 1		
DS1	Digital Signal Level 1 (1.544 Mbps) (2.048 Mbps European)	MLPP	Multi-Level Precedence and Preemption	T1	Digital Transmission Link Level 1 (1.544 Mbps)
DSN	Defense Switched Network	MOS	Mean Opinion Score	T1.619a	SS7 and ISDN MLPP Signaling Standard for T1
DTMF	Dual Tone Multi-Frequency	NI 1/2	National ISDN Standard 1 or 2		
E&M	Ear and Mouth	NX56	Data format restricted to multiples of 56 kbps	UCR	Unified Capabilities Requirements
E1	European Basic Multiplex Rate (2.048 Mbps)	NX64	Data format restricted to multiples of 64 kbps	UPS	Uninterruptible Power Supply
				VBD	Variable bit data
EKTS	Electronic Key Telephone System	PBX	Private Branch Exchange	VoIP	Voice over Internet Protocol
FTR	Federal Telecommunications Recommendation	PBX 1	Private Branch Exchange 1	VTC	Video Teleconferencing
		PCM	Pulse Code Modulation		

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 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: ucco@disa.mil.

6. The JITC point of contact is Ms. Anita Mananquil, DSN 879-5164, commercial (520) 538-5164, FAX DSN 879-4347, or e-mail to anita.mananquil@disa.mil. The JITC's mailing address is P.O. Box 12798, Fort Huachuca, AZ 85670-2798. The tracking number for the SUT is 1022901.

FOR THE COMMANDER:

2 Enclosures a/s

for BRADLEY A. CLARK
Chief
Battlespace Communications Portfolio

Distribution (electronic mail):
Joint Staff J-6
Joint Interoperability Test Command, Liaison, TE3/JT1
Office of Chief of Naval Operations, CNO N6F2
Headquarters U.S. Air Force, Office of Warfighting Integration & CIO, AF/XCIN (A6N)
Department of the Army, Office of the Secretary of the Army, DA-OSA CIO/G-6 ASA (ALT), SAIS-IOQ
U.S. Marine Corps MARCORSYSCOM, SIAT, MJI Division I
DOT&E, Net-Centric Systems and Naval Warfare
U.S. Coast Guard, CG-64
Defense Intelligence Agency
National Security Agency, DT
Defense Information Systems Agency, TEMC
Office of Assistant Secretary of Defense (NII)/DOD CIO
U.S. Joint Forces Command, Net-Centric Integration, Communication, and Capabilities Division, J68
Defense Information Systems Agency, GS23

ADDITIONAL REFERENCES

(c) Office of the Assistant Secretary of Defense, "Department of Defense Unified Capabilities Requirements 2008," 22 January 2009
(d) Joint Interoperability Test Command, "Defense Switched Network Generic Switch Test Plan (GSTP), Change 2," 2 October 2006
(e) Joint Interoperability Test Command, "Information Assurance (IA) Assessment of EdgeAccess VW9600-SRV Version R5100831J (Tracking Number 1022901)," 17 May 2011
(f) Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 6215.01C, "Policy for Department of Defense Voice Services with Real Time Services (RTS)," 9 November 2007

CERTIFICATION TESTING SUMMARY

1. SYSTEM TITLE. EdgeAccess Incorporated VoiceWise (VW) 9600-SVR with Software Release Version R5100831; hereinafter referred to as the System Under Test (SUT).

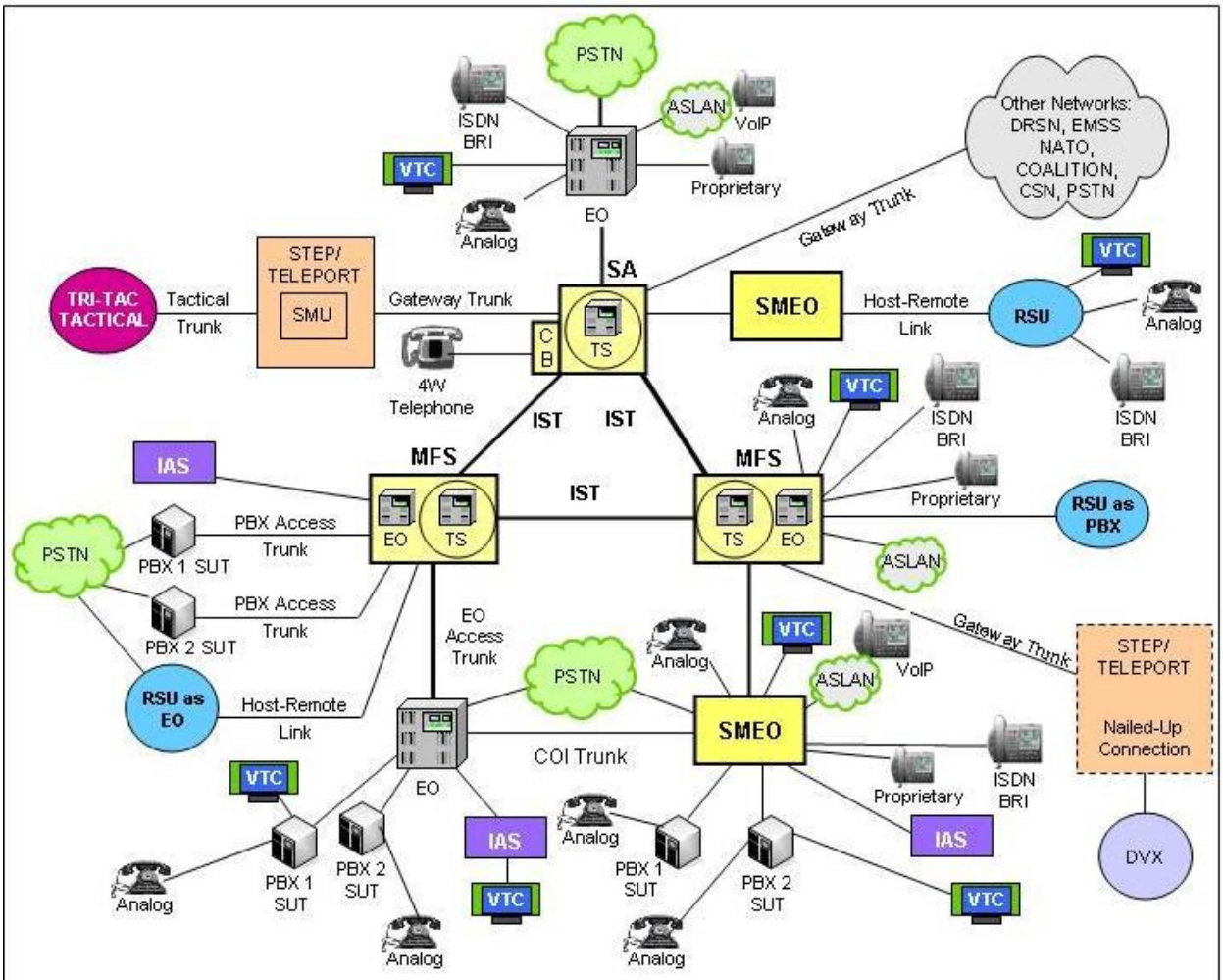
2. PROPONENT. United States Army Reserve (USAR).

3. PROGRAM MANAGER. Chuck Russell, Special Projects Officer, GS-13, United States Army Reserve, 4710 Knox Street, Fort Bragg, NC, 28310-5010, e-mail: chuck.russell@usar.army.mil.

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

5. SYSTEM UNDER TEST DESCRIPTION. The SUT is a Private Branch Exchange (PBX) 1. The SUT supports American National Standards Institute (ANSI) T1.619a Digital Transmission Link Level 1 (T1) Integrated Services Digital Network (ISDN) Primary Rate Interface (PRI) National ISDN Standard 1 or 2 (NI 1/2). The SUT has 96 line interfaces, allowing the connection of standard analog telephones. The SUT is composed of the VW9600-SRV. The VW9600-SRV uses the media gateway to terminate calls to the Defense Switched Network (DSN) or Public Switched Telephone Network (PSTN). Connectivity between the VW9600-SRV is provided through one of the network ports available on the device. All other network ports have been disabled. The dedicated10/100 Megabits per second (Mbps) Ethernet point-to-point link between the two devices provide a management and voice VLAN for configuration and voice communication purposes. Management interfaces for this device include the Edge Access Incorporated (EAI) Web Configuration application accessible by Hyper Text Transfer Protocol Secure (HTTPS) or the EAI Manager interface accessible via Secure Shell (SSH). There is also a single emergency serial console account accessible through the serial console port 0. The SUT offers an Internet Protocol (IP) interface to support Voice over Internet Protocol; however, it did not meet the minimum requirements for Assured Services. Therefore, the IP interface is not certified by JITC or authorized for use within the DISN.

6. OPERATIONAL ARCHITECTURE. The DSN architecture is a two-level network hierarchy consisting of DSN backbone switches and Service/Agency installation switches. Joint Staff policy and subscriber mission requirements determine which type of switch can be used at a particular location. The DSN architecture, therefore, consists of several categories of switches including PBXs. The Unified Capabilities Requirements (UCR) operational DSN Architecture is depicted in Figure 2-1. The architecture depicts the relationship of Military Department PBX 1s to the other DSN switch types.



LEGEND:

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

Figure 2-1. DSN Architecture

7. REQUIRED SYSTEM INTERFACES. Requirements specific to PBX 1s are listed in Table 2-1. These requirements are derived from:

a. DSN services for Network and Applications specified in Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 6215.01C, “Policy for Department of Defense Voice Services with Real Time Services (RTS).”

b. UCR interface and signaling requirements for trunks/lines verified through JITC testing and/or vendor submission of Letters of Compliance (LoC).

c. UCR PBX 1 Capability Requirements (CRs) and Feature Requirements (FRs) verified through JITC testing and/or vendor submission of LoC.

Table 2-1. PBX 1 Requirements

DSN Trunk Interfaces				
Interface	**Critical**	**Requirements Required or Conditional**		**References**
T1 CAS (MFR1, DTMF, DP) E1 CAS (MFR1, DTMF, DP) T1 ISDN PRI NI 1/2 (ANSI T1.619a) E1 ISDN PRI (ITU-T Q.955.3)	No No (Europe only) Yes No (Europe only)	Trunking	• Direct Inward Dialing (C) • National ISDN 1/2 Primary Access (R: PRI only) • ISDN ANSI MLPP Service Capability (R: PRI only) • ITU-T ISDN Primary Access (C: E1 PRI only) • ITU-T ISDN Primary Access DSS1 MLPP (C: E1 PRI only) • Trunk Group-Remove from Service (C) • Trunk Group-Restore to Service (C) • Normal Wink Start Operations (C: CAS only) • Glare Operation (C: CAS only) • Abnormal Wink Start (C: CAS only) • Glare Resolution (C: CAS only) • Call for Service Timing (R: CAS only) • Guard Timing (R: CAS only) • Satellite Timing (C: CAS only) • Disconnect Control (C: CAS only) • Reselect and Retrial (C: CAS only) • Off-Hook Supervision Transition (C: CAS only) • Dial-Pulse Signals (C: CAS only) • DTMF Signaling (C: CAS only) • Standard Digit Format for Precedence (C: CAS only) • MFR1 2/6 Signaling (C: CAS only) • Alerting Signals and Tones (R) • DSN ISDN User-to-Network Signaling (R: PRI only) • Application (R: PRI only) • Physical Layer (R: PRI only) • Data Link Layer (R: PRI only) • Data Link Connection (R: PRI only) • Peer-to-Peer Procedures of Data-Link Layer (R: PRI only) • Layer 3 DSN User-to-Network Signaling (R: PRI only) • DSN User-to-Network Signaling for Circuit-Switched Bearer Services (R: PRI only) • Sequence of Messages for DSN Circuit Switched Calls (R: PRI only) • Message Functional Definition and Content (R: PRI only) • General Message Format and Information Elements Coding (R: PRI only) • Supplementary Services (C: PRI only) • DSN Transmission Interface (R) • PCM-24 Digital Trunk Interface (R) • Interface Characteristics (R) • Supervisory Channel Associated Signaling (C: CAS only) • Clear Channel Capability (R) • Alarm and Restoral Requirements (R) • PCM-30 Digital Trunk Interface (Europe only) (C) • Supervisory Channel Associated Signaling (C: E1 only) • Alarm and Restoral Requirements (C: E1 only) • Interoperation of PCM-24 and PCM-30 (C) • Analog Trunk Interface (C)	• UCR Section 5.2.1.3.2 • UCR Section 5.2.1.3.4.1 • UCR Section 5.2.1.3.4.1.1 • UCR Section 5.2.1.3.4.2 • UCR Section 5.2.1.3.4.2.1 • UCR Section 5.2.1.5.5 • UCR Section 5.2.1.5.5 • UCR Section 5.2.4.3.3.1.1 • UCR Section 5.2.4.3.3.1.2 • UCR Section 5.2.4.3.3.2.1 • UCR Section 5.2.4.3.3.2.2 • UCR Section 5.2.4.3.5 • UCR Section 5.2.4.3.6 • UCR Section 5.2.4.3.7 • UCR Section 5.2.4.3.8 • UCR Section 5.2.4.3.9 • UCR Section 5.2.4.3.10 • UCR Section 5.2.4.4.1 • UCR Section 5.2.4.4.2 • UCR Section 5.2.4.4.2.1 • UCR Section 5.2.4.4.3 • UCR Section 5.2.4.5.1 • UCR Section 5.2.4.7.1 • UCR Section 5.2.4.7.1.1 • UCR Section 5.2.4.7.1.2 • UCR Section 5.2.4.7.1.3 • UCR Section 5.2.4.7.1.3.1 • UCR Section 5.2.4.7.1.3.2 • UCR Section 5.2.4.7.1.4 • UCR Section 5.2.4.7.1.4.2 • UCR Section 5.2.4.7.1.4.3 • UCR Section 5.2.4.7.1.4.4 • UCR Section 5.2.4.7.1.4.5 • UCR Section 5.2.4.7.1.4.6 • UCR Section 5.2.5 • UCR Section 5.2.6.1 • UCR Section 5.2.6.1.1 • UCR Section 5.2.6.1.2 • UCR Section 5.2.6.1.3 • UCR Section 5.2.6.1.4 • UCR Section 5.2.6.2 • UCR Section 5.2.6.2.1 • UCR Section 5.2.6.2.2 • UCR Section 5.2.6.3 • UCR Section 5.2.6.4
		Voice	• MOS (R) • Secure calls (R)	• CJCSI 6215.01C • CJCSI 6215.01C
		Facsimile	• Analog: ITU-T T.4 (R)	• DISR
		Data	• Modem (VBD) (R) • 56 kbps switched data (R: PRI only) • 64 kbps switched data (R: PRI only) • NX56 synchronous BER (R: PRI only) • NX64 synchronous BER (R: PRI only) • Secure data (STE/STU-III) (R)	• CJCSI 6215.01C • UCR Section 5.2.2.9.6 • UCR Section 5.2.2.9.6 • UCR Section 5.2.2.9.6 • UCR Section 5.2.2.9.6 • CJCSI 6215.01C
		VTC	• ITU-T H.320 (R: PRI only)	• FTR 1080B-2002

Table 2-1. PBX 1 Requirements (continued)

DSN Line Interfaces				
Interface	**Critical**	**Requirements Required or Conditional**		**References**
2-Wire Analog ISDN BRI NI 1/2 (ANSI T1.619a) 2-Wire Proprietary Digital	Yes No No	Access	• Directory Number Identification (R) • PBX Line (C) • National ISDN 1/2 Basic Access (C) • Analog Line (R) • Basic Line Test Capabilities (R) • Advanced Line Test Capabilities (C) • Loop Start Line (R: 2-Wire Analog only) • Reverse Battery (R) • Alerting Signals and Tones (R) • S/T Reference Point (ISDN BRI) (C)	• UCR Section 5.2.1.1.1 • UCR Section 5.2.1.3.1 • UCR Section 5.2.1.3.3 • UCR Section 5.2.1.3.5 • UCR Section 5.2.1.5.4.1.1 • UCR Section 5.2.1.5.4.1.1 • UCR Section 5.2.4.2.1 • UCR Section 5.2.4.3.1 • UCR Section 5.2.4.5.1 • UCR Section 5.2.4.7.1.2.1
		Voice	• MOS (R) • Secure Calls (R)	• CJCSI 6215.01C • CJCSI 6215.01C
		Facsimile	• Analog: ITU-T T.4 (R)	• DISR
		Data	• Modem (VBD) (R) • Secure data (STE/STU-III) (R)	• CJCSI 6215.01C • CJCSI 6215.01C
		VTC	• ITU-T H.320 (C: BRI only)	• FTR 1080B-2002
DSN Features & Capabilities				
Feature/ Capability	**Critical**	**Requirements Required or Conditional**		**References**
Common Features	Yes	• Individual Lines (R) • Denied originating service (C) • Code restriction and diversion (C) • Call waiting (R) • Three-way calling (R) • Add-on transfer, conference calling, and call hold (C) • Call Transfer Individual - All calls (R) • Call Transfer - Internal Only (R) • Call Transfer - Individual - Incoming Only/Add-On Consultation Hold - Incoming Call (R) • Call Transfer - Outside (R) • Call Transfer - Add-On to Fully Restricted Station (C) • Call Transfer - Attendant (C) • Call Hold (R) • Conference Calling - Six Way Station Controlled (C) • Call Forwarding Variable (R) • Call Forward Busy Line (R) • Call Forwarding - Don't Answer - All Calls (R) • Selective Call Forwarding (C) • Call pick-up (C) • Address Translation (C) • Assured Dial Tone (R)		• UCR Section 5.2.1.1.1 • UCR Section 5.2.1.1.3 • UCR Section 5.2.1.1.4 • UCR Section 5.2.1.1.5.1 • UCR Section 5.2.1.1.6 • UCR Section 5.2.1.1.7 • UCR Section 5.2.1.1.7.1 • UCR Section 5.2.1.1.7.2 • UCR Section 5.2.1.1.7.3 • UCR Section 5.2.1.1.7.4 • UCR Section 5.2.1.1.7.5 • UCR Section 5.2.1.1.7.6 • UCR Section 5.2.1.1.7.7 • UCR Section 5.2.1.1.7.8 • UCR Section 5.2.1.1.8.1 • UCR Section 5.2.1.1.8.2 • UCR Section 5.2.1.1.8.3 • UCR Section 5.2.1.1.8.4 • UCR Section 5.2.1.1.9.1 • UCR Section 5.2.1.7 • UCR Section 5.2.1.9
Attendant	No	• Attendant Features (C)		• UCR Section 5.2.1.2.2
Public Safety	Yes	• Emergency Service (911) Caller (R) • Emergency Service (911) Public Safety Answering Service (C) • Enhanced Emergency Service (E911) (C) • Trace of terminating calls (C) • Outgoing call trace (C)		• UCR Section 5.2.1.4.1.1 • UCR Section 5.2.1.4.1.2 • UCR Section 5.2.1.4.1.3 • UCR Section 5.2.1.4.2 • UCR Section 5.2.1.4.3
Conferencing	No	• Preset Conferencing (C) • Meet-Me Conferencing (C) • Progressive Conferencing (C)		• UCR Section 5.2.1.6.1 • UCR Section 5.2.1.6.2 • UCR Section 5.2.1.6.3
Nailed-up Connections	No	• Nailed-Up Connections (C)		• UCR Section 5.2.1.8
DSN Hotline Services	No	• DSN Analog Hotline Service (C)		• UCR Section 5.2.1.12

Table 2-1. PBX 1 Requirements (continued)

DSN Features & Capabilities			
Feature/ Capability	**Critical**	**Requirements Required or Conditional**	**References**
MLPP	Yes	• MLPP Overview (R) • Preemption in the Network (R) • Network Facility with Lower Precedence Calls (R) • Network Facility with Equal or Higher Precedence Calls (R) • Precedence Call Diversion (R) • Channel Associated Signaling (C) • Primary Rate Interface (R) • Analog Line MLPP (R) • ISDN MLPP Basic Rate Interface (C) • ISDN Primary Rate Interface (R) • Precedence Call Waiting (R) • Call Forwarding (R) • Call Transfer (R) • Call Hold (R) • Three-Way Calling (R) • Call Pickup (C) • Conferencing (C) • Multiline Hunt Group (C) • Community of Interest (C) • MLPP Interaction with EKTS features (C)	• UCR Section 5.2.2.1.1 • UCR Section 5.2.2.2 • UCR Section 5.2.2.2.1 • UCR Section 5.2.2.2.2 • UCR Section 5.2.2.3 • UCR Section 5.2.2.4.1 • UCR Section 5.2.2.4.2 • UCR Section 5.2.2.5 • UCR Section 5.2.2.6 • UCR Section 5.2.2.7 • UCR Section 5.2.2.8.1 • UCR Section 5.2.2.8.2 • UCR Section 5.2.2.8.3 • UCR Section 5.2.2.8.4 • UCR Section 5.2.2.8.5 • UCR Section 5.2.2.8.6 • UCR Section 5.2.2.8.7.1 • UCR Section 5.2.2.8.8 • UCR Section 5.2.2.8.9 • UCR Section 5.2.2.10.1
Call Processing	Yes	• Call Treatments (R) • Primary and Alternate Routing (C) • E&M Lead Signaling States (C) • 4-Wire Analog User Access Lines (C) • 2-Wire User Access Lines (R) • Termination of Analog Lines (R) • DSN User Dialing (R) • Interswitch and Intraswitch Dialing (R) • Seven-Digit Dialing (R) • Ten-Digit Dialing (R) • Access Code (R) • Access Digit (R) • Precedence Digit (R) • Service Digit (R) • Route Code (R) • Area Code (R) • Switch Code (R) • Line Number (R) • Calling Name Delivery (C) • Calling Number Delivery (R) • Emergency Service 911 Conflict Resolution (R) • DSN Switch Outpulsing Digit Formats (C) • Standard Directory Number (R) • Standard Test Numbers (C) • Base Services – Abbreviated Numbers (C) • Digit Reception Requirements (R) • Screening (C)	• UCR Section 5.2.3.1 • UCR Section 5.2.3.2 • UCR Section 5.2.3.3.1 • UCR Section 5.2.3.3.2 • UCR Section 5.2.3.3.3 • UCR Section 5.2.3.3.4 • UCR Section 5.2.3.5.1.1 • UCR Section 5.2.3.5.1.1 • UCR Section 5.3.3.5.2.1 • UCR Section 5.2.3.5.2.2 • UCR Section 5.2.3.5.1.3 • UCR Section 5.2.3.5.1.3.1 • UCR Section 5.2.3.5.1.3.2 • UCR Section 5.2.3.5.1.3.3 • UCR Section 5.2.3.5.1..4 • UCR Section 5.2.3.5.1.5 • UCR Section 5.2.3.5.1.6 • UCR Section 5.2.3.5.1.7 • UCR Section 5.2.3.5.1.8.1 • UCR Section 5.2.3.5.1.8.2 • UCR Section 5.2.3.5.1.9 • UCR Section 5.2.3.5.2 • UCR Section 5.2.3.5.3 • UCR Section 5.2.3.5.4 • UCR Section 5.2.3.5.5 • UCR Section 5.2.3.5.6 • UCR Section 5.2.3.5.8
ISDN Services	Yes	• BRI Access, Call Control and Signaling (C) • Uniform Interface Configuration for BRIs (C) • EKTS (C) • PRI Access, Call Control and Signaling (R) • PRI Features (R) • Packet Data Features and Capabilities (C)	• UCR Section 5.2.9.2, Table 5.2.9-1 • UCR Section 5.2.9.2, Table 5.2.9-2 • UCR Section 5.2.9.3, Table 5.2.9-3 • UCR Section 5.2.9.2, Table 5.2.9-4 • UCR Section 5.2.9.2, Table 5.2.9-5 • UCR Section 5.2.9.2, Table 5.2.9-6

Table 2-1. PBX 1 Requirements (continued)

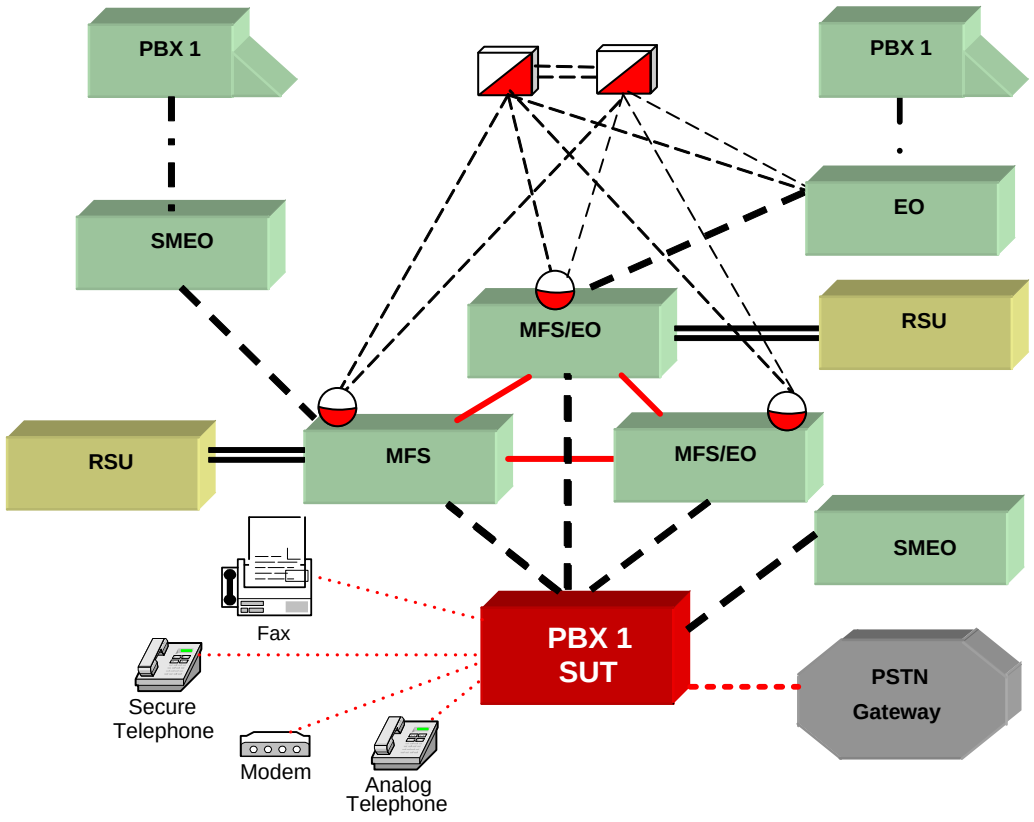
DSN Features & Capabilities (continued)				
Feature/ Capability	**Critical**	**Requirements Required or Conditional**		**References**
Synchronization	Yes	• Line timing mode (R) • Internal Stratum 4 (R) • Synchronization Performance Monitoring Criteria (C) • DS1 Traffic Interfaces (C) • DS0 Traffic Interconnects (C)		• UCR Section 5.2.10.1.1.2 • UCR Section 5.2.10.1.1.2.2 • UCR Section 5.2.10.2 • UCR Section 5.2.10.3 • UCR Section 5.2.10.4
Reliability	Yes	• System Availability (R) • Backup Power (R) • Power Components (R) • UPS Requirements (R) • UPS PBX 1 Load Capacity (R) • Backup Power (Environmental) (R) • Alarms (R)		• UCR Section 5.2.11.2 • UCR Section 5.2.11.3 • UCR Section 5.2.11.3.1 • UCR Section 5.2.11.3.2 • UCR Section 5.2.11.3.2.1 • UCR Section 5.2.11.3.3 • UCR Section 5.2.11.3.4
Security	Yes	• GR-815, STIGs, and DoDI 8510.bb (DIACAP) (R)		• UCR Sections 3.2.3, 3.2.5, and 5.4.6.1
VoIP				
Feature/ Capability	**Critical**	**Requirements Required or Conditional**		**References**
VoIP System	No	VoIP function is conditional. If VoIP is provided, **all** of the following requirements must be met: • Voice Quality with MOS of 4.0 or better (R) • ITU-T G.711 PCM CODEC (R) • MLPP (R) • Security (R) • Network management (C) • System timing (R) • Latency ≤ 60 milliseconds (R) • IPv6 capable (R) • Service Class Tagging (R)		• UCR section 5.2.12.8.2.1 • UCR section 5.2.12.8.2.2 • UCR section 5.2.12.8.2.3 • UCR section 5.2.12.8.2.4 • UCR section 5.2.12.8.2.5 • UCR section 5.2.12.8.2.6 • UCR section 5.2.12.8.2.7 • UCR section 5.2.12.8.2.8 • UCR section 5.2.12.8.2.9
Network Gateways				
Gateway	**Critical**	**Requirements Required or Conditional**		**References**
PSTN (See note.)	No	Trunking	• Positive Identification Control (C) • On-Netting (C) • Off-Netting (C) • Ground Start Line (R) • Immediate Start (C) • Delay Dial (C)	• CJCSI 6215.01C • CJCSI 6215.01C • CJCSI 6215.01C • UCR Section 5.2.4.2.2 • UCR Section 5.2.4.3.2 • UCR Section 5.2.4.3.4
NOTE: Voice, facsimile, data, and VTC service requirements for PSTN are identical to DSN with the exception of MLPP.				

Table 2-1. PBX 1 Requirements (continued)

LEGEND:

ANSI	American National Standards Institute	FTR 1080B-2002	Video Teleconferencing Services	PCM-24	Pulse Code Modulation - 24 Channels
BER	Bit Error Ratio	G.711	PCM of voice frequencies	PCM-30	Pulse Code Modulation - 30 Channels
BRI	Basic Rate Interface	GR	Generic Requirement	PRI	Primary Rate Interface
C	Conditional	GR-815	Generic Requirements For Network Element/Network System (NE/NS) Security	PSTN	Public Switched Telephone Network
CAS	Channel Associated Signaling	H.320	Standard for Narrowband VTC	Q.955.3	ISDN Signaling Standard for E1 MLPP
CJCSI	Chairman of the Joint Chiefs of Staff Instruction	IPv6	Internet Protocol version 6	R	Required
CODEC	Coder/Decoder	ISDN	Integrated Services Digital Network	S/T	ISDN BRI four-wire interface
DIACAP	DoD Information Assurance Certification and Accreditation Process	IT	Information Technology	SS7	Signaling System 7
DISR	DoD IT Standards Registry	ITU-T	International Telecommunication Union - Telecommunication Standardization Sector	STE	Secure Terminal Equipment
DoD	Department of Defense	kbps	kilobits per second	STIGs	Security Technical Implementation Guides
DoDI	DoD Instruction	Mbps	Megabits per second	STU-III	Secure Telephone Unit -3rd generation
DP	Dial Pulse	MFR1	Multi-Frequency Recommendation 1	T.4	Standardization of Group 3 facsimile terminals for document transmission
DS0	Digital Signal Level 0 (64 kbps)	MLPP	Multi-Level Precedence and Preemption	T1	Digital Transmission Link Level 1 (1.544 Mbps)
DS1	Digital Signal Level 1 (1.544 Mbps) (2.048 Mbps European)	MOS	Mean Opinion Score	T1.619a	SS7 and ISDN MLPP Signaling Standard for T1
DSN	Defense Switched Network	NI 1/2	National ISDN Standard 1 or 2	UCR	Unified Capabilities Requirements
DTMF	Dual Tone Multi-Frequency	NX56	Data format restricted to multiples of 56 kbps	UPS	Uninterruptible Power Supply
E&M	Ear and Mouth	NX64	Data format restricted to multiples of 64 kbps	VBD	Variable bit data
E1	European Basic Multiplex Rate (2.048 Mbps)	PBX	Private Branch Exchange	VoIP	Voice over Internet Protocol
EKTS	Electronic Key Telephone System	PBX 1	Private Branch Exchange 1	VTC	Video Teleconferencing
FTR	Federal Telecommunications Recommendation	PCM	Pulse Code Modulation		

8. TEST NETWORK DESCRIPTION. The SUT was tested at JITC's Global Information Grid Network Test Facility in a manner and configuration similar to that of the DSN operational environment. Figure 2-2 is a notional test configuration of the SUT and its relation to other switches within the DSN. The SUT was tested as the end-point in relation to the other switches. Testing of the system's required functions and features was conducted using the test configuration depicted in Figure 2-3.

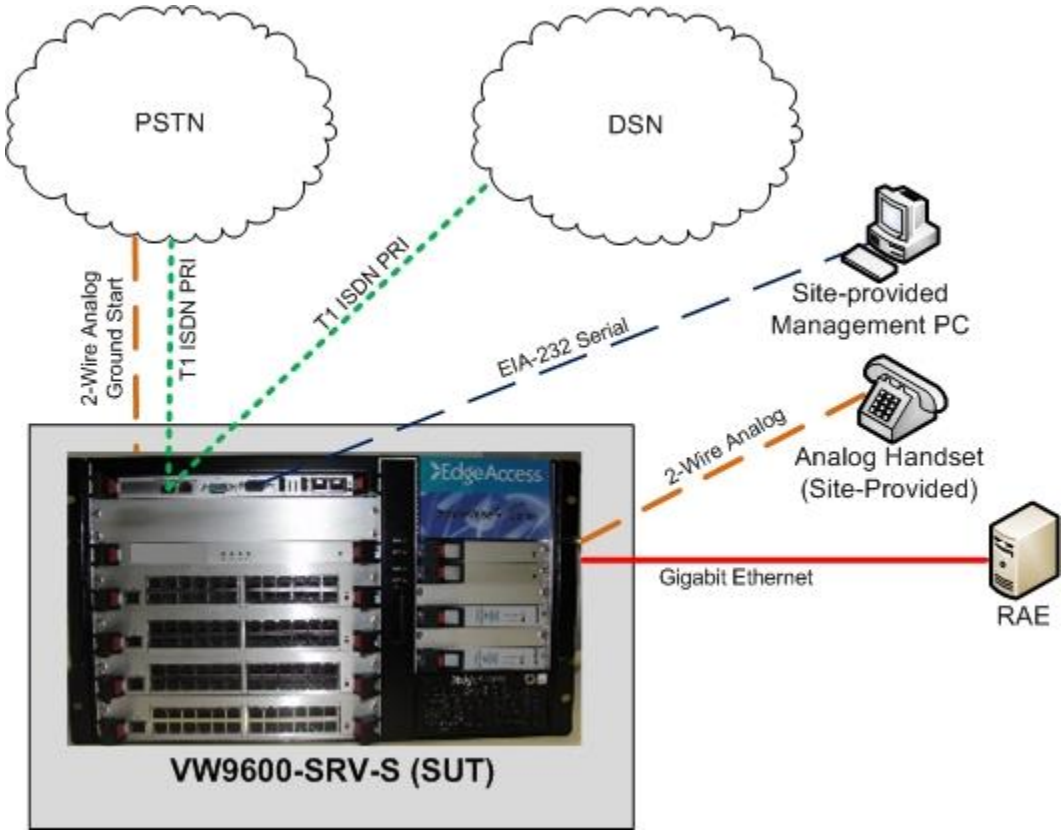


LEGEND:

A-Link	Access Link (SS7)
B-Link	Bridge Link (SS7)
BRI	Basic Rate Interface
C-Link	Cross Link (SS7)
CAS	Channel Associated Signaling
DSN	Defense Switched Network
E1	European Basic Multiplex Rate (2.048 Mbps)
EO	End Office
FAX	facsimile
ISDN	Integrated Services Digital Network
Mbps	Megabits per second
MFS	Multifunction Switch
PBX	Private Branch Exchange
PBX 1	Private Branch Exchange 1
PRI	Primary Rate Interface
PSTN	Public Switched Telephone Network
RSU	Remote Switching Unit
SMEO	Small End Office
SS7	Signaling System 7
SUT	System Under Test
T1	Digital Transmission Link Level 1 (1.544 Mbps)

- SS7 Service Switching Point (SSP)
- SS7 Signal Transfer Point (STP)
- DSN Gateway Trunk (T1 ISDN PRI, Analog Ground Start)
- DSN Interswitch Trunk (T1/E1 SS7, T1/E1 CAS, T1/E1 ISDN PRI)
- DSN Line (2 Wire Analog, ISDN BRI, Digital Proprietary)
- SS7 Links (A-Link, B-Link, or C-Link)
- DSN End Office Access Trunk (T1/E1 SS7, T1/E1 CAS, T1/E1 ISDN PRI) (SUT certified for T1 PRI only)
- DSN PBX Access Trunk (T1/E1 SS7, T1/E1 CAS, T1/E1 ISDN PRI)
- RSU-Host Umbilical Link

Figure 2-2. SUT Notional Test Configuration



LEGEND:

DSN	Defense Switched Network	PC	Personal Computer
EIA	Electronic Industries Alliance	PRI	Primary Rate Interface
EIA-232	Standard for defining the mechanical and electrical characteristics for connecting Data Terminal Equipment (DTE) and Data Circuit-terminating Equipment (DCE) data communications devices	PSTN	Public Switched Telephone Network
		RAE	Required Ancillary Equipment
		SUT	System Under Test
ISDN	Integrated Services Digital Network	T1	Digital Transmission Link Level 1 (1.544 Mbps)
Mbps	Megabits per second	VW	VoiceWise

Figure 2-3. SUT Test Configuration

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

Table 2-2. Tested System Configurations

System Name	Software Release
Nortel CS2100	Succession Enterprise (SE) 09.1
Siemens EWSD	19d with Patch Set 46
Alcatel-Lucent 5ESS	5E16.2 Broadcast Warning Message (BWM) 09-003
Avaya S8720	Communication Manager (CM) 4.0 (R014x.00.2.731.7: Super Patch 14419)
Required Ancillary Equipment	Active Directory
	Public Key Infrastructure
	SysLog Server

System Name	Equipment		
	Hardware	**Cards**	**Software/Firmware**
EdgeAccess EAI VW9600-SVR R5100831J (SUT)	VW9600-SVR	CPU Module	Red Hat Enterprise Linux 5.5
			McAfee Virus Scan Command Line v6.0.3
			OSSEC Host Intrusion Detection v2.4
			EAI Web Configuration v1.3-13
			Apache 2.2.3
			Tectia Server v6.1.7.139
			wanpipe 3.5.18.18, Kernel 2.6.18.194.17.1e15.dahdi.2.4.0.rpm patch
		DSP Module	1.6-BB02
		Data Module (x4)	2.3.0B
	Management Console	N/A	Windows Vista SP2
			Tectia Client v6.1.7.139
			IE 7.0.6002.18005

SUT Telephones		
Telephone Type	**Model**	**Firmware**
Analog	Panasonic KX-TS105W	N/A
IP	Teo TSG-6 7810 (x4)	05.03.15.05 (See note.)
IP	Polycom Soundpoint IP 450 (x4)	3.3.1.0769 (See note.)

NOTE: VoIP is supported by the SUT; however, testing for this interface was terminated by the vendor and sponsor due to discrepancies. The SUT VoIP interface is therefore not certified by JITC and is not required for a PBX 1.

LEGEND:

5ESS	Class 5 Electronic Switching System	OSSEC	Open Source Security
CPU	Central Processing Unit	PBX 1	Private Branch Exchange 1
CS	Communication Server	SP	Service Pack
DSP	Digital Signal Processor	SUT	System Under Test
EAI	Edge Access Incorporated	SVR	Server
EWSD	Elektronisches Wählsystem Digital	TSG	Telephone Security Group
IE	Internet Explorer	v	version
IP	Internet Protocol	VoIP	Voice over Internet Protocol
JITC	Joint Interoperability Test Command	VW	VoiceWise
N/A	Not Applicable		

10. TESTING LIMITATIONS. None.

11. TEST RESULTS

a. Discussion

(1) DSN Trunk Interfaces. The SUT met all critical CRs and FRs for the T1 ISDN PRI NI 1/2 ANSI T1.619a interface.

(2) DSN Line Interfaces. The SUT met all critical CRs and FRs for the 2-Wire Loop Start Analog (GR-506-CORE).

(3) Features and Capabilities

(a) Common Features. The SUT met all critical CRs and FRs.

(b) Attendant. This feature is not supported by the SUT and is not required for a PBX 1.

(c) Public Safety. The SUT only supports emergency service 911 public safety features. The following public safety features are not supported and therefore are not covered in this certification: Trace of terminating calls, Outgoing call trace, Tandem call trace, and Trace of a call in progress. There is no operational impact because these public safety features are not required for a PBX 1.

(d) Conferencing. This feature is not supported by the SUT and is not required for a PBX 1.

(e) Nailed-up Connections. This feature is not supported by the SUT and is not required for a PBX 1.

(f) DSN Hotline Services. This feature is not supported by the SUT and is not required for a PBX 1.

(g) MLPP. The SUT met all critical CRs and FRs.

(h) Call Processing. The SUT met all critical CRs and FRs.

(i) ISDN Services. This feature is not supported by the SUT and is not required for a PBX 1.

(j) Synchronization. All critical interoperability certification CRs and FRs were met for this feature by the SUT. The SUT supports line timing mode and Internal Stratum 4 for synchronization.

(k) Reliability. All critical interoperability certification CRs and FRs for this feature were met by the vendor's LoC.

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

(4) Network Gateways. The SUT met all critical interoperability certification requirements for the PSTN Network Gateways. The interfaces certified for the PSTN are T1 ISDN PRI NI 1/2 (ANSI T1.607) and 2-Wire Analog Ground Start Line (GR-506 CORE).

b. System Interoperability Results. The SUT is certified for joint use in the DSN as a PBX 1 and PBX 2 in accordance with the requirements set forth in the UCR. The SUT interoperability test summary is shown in Table 2-3. The SUT Interoperability Requirements/Status is shown in Table 2-4.

Table 2-3. SUT Interoperability Test Summary

DSN Trunk Interfaces			
Interface & Signaling	**Critical**	**Status**	**Remarks**
T1 CAS (DTMF, MFR1, DP)	No	Not Tested	This interface is not supported by the SUT and is not required for a PBX 1.
E1 CAS (DTMF, MFR1, DP)	No (Europe only)	Not Tested	This interface is not supported by the SUT and is not required for a PBX 1.
T1 ISDN PRI NI 1/2 (ANSI T1.619a)	Yes	Certified	Met all critical CRs and FRs.
E1 ISDN PRI (ITU-T Q.955.3)	No (Europe only)	Not Tested	This interface is not supported by the SUT and is not required for a PBX 1.
DSN Line Interfaces			
Interface & Signaling	**Critical**	**Status**	**Remarks**
2-Wire Analog Loop Start (GR-506-CORE)	Yes	Certified	Met all critical CRs and FRs.
ISDN BRI NI 1/2 (ANSI T1.619a)	No	Not Tested	This interface is not supported by the SUT and is not required for a PBX 1.
2-Wire Proprietary Digital	No	Not Tested	This interface is not supported by the SUT and is not required for a PBX 1.
VoIP (Ethernet IEEE 802.3u)	No	Not Certified	VoIP is supported by the SUT; however, testing for this interface was terminated by the vendor and sponsor due to discrepancies. The SUT VoIP interface is therefore not certified by JITC and is not required for a PBX 1.
DSN Features and Capabilities			
Features and Capabilities	**Critical**	**Status**	**Remarks**
Common Features	Yes	Certified	Met all critical CRs and FRs.
Attendant	No	Not Tested	This feature is not supported by the SUT and is not required for a PBX 1.
Public Safety	Yes	Certified	All public safety features are conditional. The SUT met all critical CRs and FRs for Basic 911. The SUT does not support the other public safety features. These features are not required for a PBX 1. There is no risk associated with the SUT not supporting these features.[1]
Conferencing	No	Not Tested	This feature is not supported by the SUT and is not required for a PBX 1.
Nailed-up Connections	No	Not Tested	This feature is not supported by the SUT and is not required for a PBX 1.
DSN Hotline Services	No	Not Tested	This feature is not supported by the SUT and is not required for a PBX 1.
MLPP	Yes	Certified	Met all critical CRs and FRs.
Call Processing	Yes	Certified	Met all critical CRs and FRs.
ISDN Services	Yes	Certified	Met all critical CRs and FRs for PRI only.
Synchronization	Yes	Certified	Met all critical CRs and FRs.
Reliability	Yes	Certified	Met all critical CRs and FRs.
Security	Yes	Certified	See note 2.
VoIP System	No	Not Certified	VoIP is supported by the SUT; however, testing for this interface was terminated by the vendor and sponsor due to discrepancies. The SUT VoIP interface is therefore not certified by JITC and is not required for a PBX 1.

Table 2-3. SUT Interoperability Test Summary (continued)

Network Gateways				
Gateway	**Interface & Signaling**	**Critical**	**Status**	**Remarks**
PSTN	T1 CAS (DTMF, MFR1, DP)	No	Not Tested	This interface is not supported by the SUT and is not required for a PBX 1.
	E1 CAS (DTMF, MFR1, DP)	No (Europe only)	Not Tested	This interface is not supported by the SUT and is not required for a PBX 1.
	T1 ISDN PRI NI 1/2 (ANSI T1.607)	No	Certified	Met all critical CRs and FRs.
	E1 ISDN PRI (ITU-T Q.931)	No (Europe only)	Not Tested	This interface is not supported by the SUT and is not required for a PBX 1.
	2-Wire Analog Ground Start (GR-506-CORE)	No	Certified	Met all critical CRs and FRs.

NOTES:

1 The SUT only supports emergency service 911 public safety features. The following public safety features are not supported and therefore are not covered in this certification: Trace of terminating calls, Outgoing call trace, Tandem call trace, and Trace of a call in progress. These features are not required for a PBX 1. There is no risk associated with the SUT not supporting these features.

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

LEGEND:

802.3u	Standard for carrier sense multiple access with collision detection at 100 Mbps	JITC	Joint Interoperability Test Command
ANSI	American National Standards Institute	LSSGR	Local Access and Transport Area (LATA) Switching Systems Generic Requirements
BRI	Basic Rate Interface	Mbps	Megabits per second
CAS	Channel Associated Signaling	MFR1	Multi-Frequency Recommendation 1
CRs	Capability Requirements	MLPP	Multi-Level Precedence and Preemption
DISA	Defense Information Systems Agency	NI 1/2	National ISDN Standard 1 or 2
DP	Dial Pulse	PBX 1	Private Branch Exchange 1
DSN	Defense Switched Network	PRI	Primary Rate Interface
DSS1	Digital Subscriber Signaling 1	PSTN	Public Switched Telephone Network
DTMF	Dual Tone Multi-Frequency	Q.931	Signaling Standard for ISDN
E1	European Basic Multiplex Rate (2.048 Mbps)	Q.955.3	ISDN Signaling standard for E1 MLPP
FRs	Feature Requirements	SS7	Signaling System 7
GR	Generic Requirement	SUT	System Under Test
GR-506-CORE	LSSGR: Signaling for Analog Interfaces	T1	Digital Transmission Link Level 1 (1.544 Mbps)
IEEE	Institute of Electrical and Electronics Engineers	T1.607	ISDN Layer 3 Signaling Specification for Circuit Switched Bearer Service for DSS1
ISDN	Integrated Services Digital Network	T1.619a	SS7 and ISDN MLPP Signaling Standard for T1
ITU-T	International Telecommunication Union - Telecommunication Standardization Sector	VoIP	Voice over Internet Protocol

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: ucco@disa.mil.

Table 2-4. SUT Interoperability Requirements/Status

DSN Trunk Interfaces							
Interface	**Critical**	**Interface Status**	**UCR Requirement**		**Reference**	**Test Results**	**Remarks**
T1 CAS (MFR1, DTMF, DP)	No	Not Tested (See note 1.)	Trunking	Direct Inward Dialing (C)	UCR Section 5.2.1.3.2		
				Trunk Group-Remove from Service (C)	UCR Section 5.2.1.5.5		
				Trunk Group-Restore to Service (C)	UCR Section 5.2.1.5.5		
				Normal Wink Start Operations (C)	UCR Section 5.2.4.3.3.1.1		
				Glare Operation (C)	UCR Section 5.2.4.3.3.1.2		
				Abnormal Wink Start (C)	UCR Section 5.2.4.3.3.2.1		
				Glare Resolution (C)	UCR Section 5.2.4.3.3.2.2		
				Call for Service Timing (R)	UCR Section 5.2.4.3.5		
				Guard Timing (R)	UCR Section 5.2.4.3.6		
				Satellite Timing (C)	UCR Section 5.2.4.3.7		
				Disconnect Control (C)	UCR Section 5.2.4.3.8		
				Reselect and Retrial (C)	UCR Section 5.2.4.3.9		
				Off-Hook Supervision Transition (C)	UCR Section 5.2.4.3.10		
				Dial-Pulse Signals (C)	UCR Section 5.2.4.4.1		
				DTMF Signaling (C)	UCR Section 5.2.4.4.2		
				Standard Digit Format for Precedence (C)	UCR Section 5.2.4.4.2.1		
				MFR1 2/6 Signaling (C)	UCR Section 5.2.4.4.3		
				Alerting Signals and Tones (R)	UCR Section 5.2.4.5.1		
				DSN Transmission Interface (R)	UCR Section 5.2.5		
				PCM-24 Digital Trunk Interface (R)	UCR Section 5.2.6.1		
				Interface Characteristics (R)	UCR Section 5.2.6.1.1		
				Supervisory Channel Associated Signaling	UCR Section 5.2.6.1.2		
				Clear Channel Capability (R)	UCR Section 5.2.6.1.3		
				Alarm and Restoral Requirements (R)	UCR Section 5.2.6.1.4		
				Interoperation of PCM-24 and PCM-30 (C)	UCR Section 5.2.6.3		
			Voice	MOS (R)	CJCSI 6215.01C		
				Secure calls (R)	CJCSI 6215.01C		
			Facsimile	Analog: ITU-T T.4 (R)	DISR		
			Data	Modem (VBD) (R)	CJCSI 6215.01C		
				Secure data (STE/STU-III) (R)	CJCSI 6215.01C		

Table 2-4. SUT Interoperability Requirements/Status (continued)

DSN Trunk Interfaces							
Interface	**Critical**	**Interface Status**	**UCR Requirement**		**Reference**	**Test Results**	**Remarks**
E1 CAS (MFR1, DTMF, DP)	No (Europe only)	Not Tested (See note 1.)	Trunking	Direct Inward Dialing (C)	UCR Section 5.2.1.3.1		
				Trunk Group-Remove from Service (C)	UCR Section 5.2.1.5.5		
				Trunk Group-Restore to Service (C)	UCR Section 5.2.1.5.5		
				Normal Wink Start Operations (C)	UCR Section 5.2.4.3.3.1.1		
				Glare Operation (C)	UCR Section 5.2.4.3.3.1.2		
				Wink Start (C)	UCR Section 5..2.4.3.3.2.1		
				Glare Resolution (C)	UCR Section 5.2.4.3.3.2.2		
				Call for Service Timing (R)	UCR Section 5.2.4.3.5		
				Guard Timing (R)	UCR Section 5.2.4.3.6		
				Satellite Timing (C)	UCR Section 5.2.4.3.7		
				Disconnect Control (C)	UCR Section 5.2.4.3.8		
				Reselect and Retrial (C)	UCR Section 5.2.4.3.9		
				Off-Hook Supervision Transition (C)	UCR Section 5.2.4.3.10		
				Dial-Pulse Signals (C)	UCR Section 5.2.4.4.1		
				DTMF Signaling (C)	UCR Section 5.2.4.4.2		
				Standard Digit Format for Precedence (C)	UCR Section 5.2.4.4.2.1		
				MFR1 2/6 Signaling (C)	UCR Section 5.2.4.4.3		
				Alerting Signals and Tones (R)	UCR Section 5.2.4.5.1		
				DSN Transmission Interface (R)	UCR Section 5.2.5		
				PCM-30 Digital Trunk Interface (C)	UCR Section 5.2.6.2		
				Supervisory Channel Associated Signaling (C)	UCR Section 5.2.6.2.1		
				Alarm and Restoral Requirements (C)	UCR Section 5.2.6.2.2		
				Interoperation of PCM-24 and PCM-30 (C)	UCR Section 5.2.6.3		
			Voice	MOS (R)	CJCSI 6215.01C		
				Secure calls (R)	CJCSI 6215.01C		
			Facsimile	Analog: ITU-T T.4 (R)	DISR		
			Data	Modem (VBD) (R)	CJCSI 6215.01C		
				Secure data (STE/STU-III) (R)	CJCSI 6215.01C		

Table 2-4. SUT Interoperability Requirements/Status (continued)

DSN Trunk Interfaces							
Interface	**Critical**	**Interface Status**	**UCR Requirement**		**Reference**	**Test Results**	**Remarks**
T1 ISDN PRI NI 1/2 (ANSI T1.619a)	Yes	Certified	Trunking	Direct Inward Dialing (C)	UCR Section 5.2.1.3.2	Met	
				National ISDN 1/2 Primary Access (R)	UCR Section 5.2.1.3.4.1	Met	
				ISDN ANSI MLPP Service Capability (R)	UCR Section 5.2.1.3.4.1.1	Met	
				Trunk Group-Remove from Service (C)	UCR Section 5.2.1.5.5	Met	
				Trunk Group-Restore to Service (C)	UCR Section 5.2.1.5.5	Met	
				Alerting Signals and Tones (R)	UCR Section 5.2.4.5.1	Met	
				DSN ISDN User-to-Network Signaling (R)	UCR Section 5.2.4.7.1	Met	
				Application (R)	UCR Section 5.2.4.7.1.1	Met	
				Physical Layer (R)	UCR Section 5.2.4.7.1.2	Met	
				Data Link Layer (R)	UCR Section 5.2.4.7.1.3	Met	
				Data Link Connection (R)	UCR Section 5.2.4.7.1.3.1	Met	
				Peer-to-Peer Procedures of Data-Link Layer (R)	UCR Section 5.2.4.7.1.3.2	Met	
				Layer 3 DSN User-to-Network Signaling (R)	UCR Section 5.2.4.7.1.4	Met	
				DSN User-to-Network Signaling for Circuit-Switched Bearer Services (R)	UCR Section 5.2.4.7.1.4.2	Met	
				Sequence of Messages for DSN Circuit-Switched Calls (R)	UCR Section 5.2.4.7.1.4.3	Met	
				Message Functional Definition and Content (R)	UCR Section 5.2.4.7.1.4.4	Met	
				General Message Format and Information Elements Coding (R)	UCR Section 5.2.4.7.1.4.5	Met	
				Supplementary Services (C)	UCR Section 5.2.4.7.1.4.6	Met	
				DSN Transmission Interface (R)	UCR Section 5.2.5		
				PCM-24 Digital Trunk Interface (R)	UCR Section 5.2.6.1	Met	
				Interface Characteristics (R)	UCR Section 5.2.6.1.1	Met	
				Clear Channel Capability (R)	UCR Section 5.2.6.1.3	Met	
				Alarm and Restoral Requirements (R)	UCR Section 5.2.6.1.4	Met	
				Interoperation of PCM-24 and PCM-30 (C)	UCR Section 5.2.6.3	Not Tested	
			Voice	MOS (R)	CJCSI 6215.01C	Met	
				Secure calls (R)	CJCSI 6215.01C	Met	
			Facsimile	Analog: ITU-T T.4 (R)	DISR	Met	
			Data	Modem (VBD) (R)	CJCSI 6215.01C	Met	
				56 kbps switched data (R: PRI only)	UCR Section 5.2.2.9.6	Not Tested	See note 2.
				64 kbps switched data (R: PRI only)	UCR Section 5.2.2.9.6	Not Tested	See note 2.
				NX56 synchronous BER (R: PRI only)	UCR Section 5.2.2.9.6	Not Tested	See note 2.
				NX64 synchronous BER (R: PRI only)	UCR Section 5.2.2.9.6	Not Tested	See note 2.
				Secure data (STE/STU-III) (R)	CJCSI 6215.01C	Met	
			VTC	ITU-T H.320 (R: PRI only)	FTR 1080B-2002	Not Tested	See note 2.

Table 2-4. SUT Interoperability Requirements/Status (continued)

DSN Trunk Interfaces							
Interface	**Critical**	**Interface Status**	**UCR Requirement**		**Reference**	**Test Results**	**Remarks**
E1 ISDN PRI (ITU-T Q.955.3)	No (Europe only)	Not Tested (See note 1.)	Trunking	Direct Inward Dialing (C)	UCR Section 5.2.1.3.2		
				ITU-T ISDN Primary Access (C)	UCR Section 5.2.1.3.4.2		
				ITU-T ISDN Primary Access Digital Subscriber Signaling System Number 1 MLPP (C)	UCR Section 5.2.1.3.4.2.1		
				Trunk Group-Remove from Service (C)	UCR Section 5.2.1.5.5		
				Trunk Group-Restore to Service (C)	UCR Section 5.2.1.5.5		
				Call for Service Timing (R)	UCR Section 5.2.4.3.5		
				Disconnect Control (C)	UCR Section 5.2.4.3.8		
				Off-Hook Supervision Transition (C)	UCR Section 5.2.4.3.10		
				DSN ISDN User-to-Network Signaling (R)	UCR Section 5.2.4.7.1.4.2		
				Application (R)	UCR Section 5.2.4.7.1.1		
				Physical Layer (R)	UCR Section 5.2.4.7.1.2		
				Data Link Layer (R)	UCR Section 5.2.4.7.1.3		
				Data Link Connection (R)	UCR Section 5.2.4.7.1.3.1		
				Peer-to-Peer Procedures of Data-Link Layer (R)	UCR Section 5.2.4.7.1.3.2		
				Layer 3 DSN User-to-Network Signaling (R)	UCR Section 5.2.4.7.1.4		
				DSN User-to-Network Signaling for Circuit-Switched Bearer Services (R)	UCR Section 5.2.4.7.1.4.2		
				Sequence of Messages for DSN Circuit-Switched Calls (R)	UCR Section 5.2.4.7.1.4.3		
				Message Functional Definition and Content (R)	UCR Section 5.2.4.7.1.4.4		
				General Message Format and Information Elements Coding (R)	UCR Section 5.2.4.7.1.4.5		
				DSN Transmission Interface (R)	UCR Section 5.2.5		
				PCM-30 Digital Trunk Interface (C)	UCR Section 5.2.6.2		
				Interoperation of PCM-24 and PCM-30 (C)	UCR Section 5.2.6.3		
			Voice	MOS (R)	CJCSI 6215.01C		
				Secure calls (R)	CJCSI 6215.01C		
			Facsimile	Analog: ITU-T T.4 (R)	DISR		
			Data	Modem (VBD) (R)	CJCSI 6215.01C		
				56 kbps switched data (R: PRI only)	UCR Section 5.2.2.9.6		
				64 kbps switched data (R: PRI only)	UCR Section 5.2.2.9.6		
				NX56 synchronous BER (R: PRI only)	UCR Section 5.2.2.9.6		
				NX64 synchronous BER (R: PRI only)	UCR Section 5.2.2.9.6		
				Secure data (STE/STU-III) (R)	CJCSI 6215.01C		
			VTC	ITU-T H.320 (R: PRI only)	FTR 1080B-2002		

Table 2-4. SUT Interoperability Requirements/Status (continued)

DSN Line Interfaces							
Interface	**Critical**	**Interface Status**	**UCR Requirement**		**Reference**	**Test Results**	**Remarks**
2-Wire Loop Start Analog	Yes	Certified	Access	Directory Number Identification (R)	UCR Section 5.2.1.1.1	Met	
				PBX Line (C)	UCR Section 5.2.1.3.1	Met	
				Analog Line (R)	UCR Section 5.2.1.3.5	Met	
				Basic Line Test Capabilities (R)	UCR Section 5.2.1.5.4.1.1	Met	
				Advanced Line Test Capabilities (C)	UCR Section 5.2.1.5.4.1.1	Met	
				Loop Start Line (R: 2-Wire Analog only)	UCR Section 5.2.4.2.1	Met	
				Reverse Battery (R)	UCR Section 5.2.4.3.1	Met	
				Alerting Signals and Tones (R)	UCR Section 5.2.4.5.1	Met	
			Voice	MOS (R)	CJCSI 6215.01C	Met	
				Secure calls (R)	CJCSI 6215.01C	Met	
			Facsimile	Analog: ITU-T T.4 (R)	DISR	Met	
			Data	Modem (VBD) (R)	CJCSI 6215.01C	Met	
				Secure data (STE/STU-III) (R)	CJCSI 6215.01C	Met	
ISDN BRI NI 1/2 (ANSI T1.619a)	No	Not Tested (See note 1.)	Access	Directory Number Identification (R)	UCR Section 5.2.1.1.1		
				National ISDN 1/2 Basic Access (C)	UCR Section 5.2.1.3.3		
				Alerting Signals and Tones (R)	UCR Section 5.2.4.5.1		
				S/T Reference Point (R)	UCR Section 5.2.4.7.1.2.1		
			Voice	MOS (R)	CJCSI 6215.01C		
				Secure calls (R)	CJCSI 6215.01C		
			Facsimile	Analog: ITU-T T.4 (R)	DISR		
			Data	Modem (VBD) (R)	CJCSI 6215.01C		
				Secure data (STE/STU-III) (R)	CJCSI 6215.01C		
			VTC	ITU-T H.320 (R: BRI only)	FTR 1080B-2002		
2-Wire Proprietary Digital	No	Not Tested (See note 1.)	Access	Directory Number Identification (R)	UCR Section 5.2.1.1.1		
				Alerting Signals and Tones (R)	UCR Section 5.2.4.5.1		
			Voice	MOS (R)	CJCSI 6215.01C		
				Secure calls (R)	CJCSI 6215.01C		

Table 2-4. SUT Interoperability Requirements/Status (continued)

DSN Features and Capabilities						
Feature/ Capability	**Critical**	**Feature Status**	**UCR Requirement**	**Reference**	**Test Results**	**Remarks**
Common Features	Yes	Certified	Individual Lines (R)	UCR Section 5.2.1.1.1	Met	
			Denied originating service (C)	UCR Section 5.2.1.1.3	Not Tested	See note 2.
			Code restriction and diversion (C)	UCR Section 5.2.1.1.4	Met	
			Call waiting (R)	UCR Section 5.2.1.1.5.1	Met	
			Three-way calling (R)	UCR Section 5.2.1.1.6	Met	
			Add-on transfer, conference calling, and call hold (C)	UCR Section 5.2.1.1.7	Met	
			Call Transfer Individual - All calls (R)	UCR Section 5.2.1.1.7.1	Met	
			Call Transfer - Internal Only (R)	UCR Section 5.2.1.1.7.2	Met	
			Call Transfer - Individual - Incoming Only/Add-On Consultation Hold - Incoming Call (R)	UCR Section 5.2.1.1.7.3	Met	
			Call Transfer - Outside (R)	UCR Section 5.2.1.1.7.4	Met	
			Call Transfer - Add-On Restricted Station (C)	UCR Section 5.2.1.1.7.5	Not Tested	See note 2.
			Call Transfer - Attendant (C)	UCR Section 5.2.1.1.7.6	Not Tested	See note 2.
			Call Hold (R)	UCR Section 5.2.1.1.7.7	Met	
			Conference Calling - Six Way Station Controlled (C)	UCR Section 5.2.1.1.7.8	Met	
			Call Forwarding Variable (R)	UCR Section 5.2.1.1.8.1	Met	
			Call Forward Busy Line (R)	UCR Section 5.2.1.1.8.2	Met	
			Call Forwarding - Don't Answer - All Calls (R)	UCR Section 5.2.1.1.8.3	Met	
			Selective Call Forwarding (C)	UCR Section 5.2.1.1.8.4	Met	
			Call pick-up (C)	UCR Section 5.2.1.1.9.1	Not Tested	See note 2.
			Address Translation (C)	UCR Section 5.2.1.7	Met	
			Assured Dial Tone (C)	UCR Section 5.2.1.9	Met	
Attendant	No	Not Tested	Attendant Features (C)	UCR Section 5.2.1.2.2	Not Tested	See note 2.
Public Safety	Yes	Certified	Emergency Service (911) Caller (R)	UCR Section 5.2.1.4.1.1	Met	See note 3.
			Emergency Service (911) Public Safety Answering Service (C)	UCR Section 5.2.1.4.1.2	Not Tested	See note 3.
			Enhanced Emergency Service (E911) (C)	UCR Section 5.2.1.4.1.3	Not Tested	See note 3.
			Trace of terminating calls (C)	UCR Section 5.2.1.4.2	Not Tested	See note 3.
			Outgoing call trace (C)	UCR Section 5.2.1.4.3	Not Tested	See note 3.

Table 2-4. SUT Interoperability Requirements/Status (continued)

DSN Features and Capabilities						
Feature/ Capability	**Critical**	**Feature Status**	**UCR Requirement**	**Reference**	**Test Results**	**Remarks**
Conferencing	No	Not Tested	Preset Conferencing (C)	UCR Section 5.2.1.6.1	Not Tested	See note 2.
			Meet-Me Conferencing (C)	UCR Section 5.2.1.6.2	Not Tested	See note 2.
			Progressive Conferencing (C)	UCR Section 5.2.1.6.3	Not Tested	See note 2.
Nailed-up Connections	No	Not Tested	Nailed-Up Connections (C)	UCR Section 5.2.1.8	Not Tested	See note 2.
DSN Hotline Services	No	Not Tested	DSN Analog Hotline Service (C)	UCR Section 5.2.1.12	Not Tested	See note 2.
MLPP	Yes	Certified	MLPP Overview (R)	UCR Section 5.2.2.1.1	Met	
			Preemption in the Network (R)	UCR Section 5.2.2.2	Met	
			Network Facility with Lower Precedence Calls (R)	UCR Section 5.2.2.2.1	Met	
			Network Facility with Equal or Higher Precedence Calls (R)	UCR Section 5.2.2.2.2	Met	
			Precedence Call Diversion (R)	UCR Section 5.2.2.3	Met	
			Channel Associated Signaling (C)	UCR Section 5.2.2.4.1	Not Tested	See note 1.
			Primary Rate Interface (R)	UCR Section 5.2.2.4.2	Met	
			Analog Line MLPP (R)	UCR Section 5.2.2.5	Met	
			ISDN MLPP Basic Rate Interface (C)	UCR Section 5.2.2.6	Not Tested	See note 1.
			ISDN Primary Rate Interface (R)	UCR Section 5.2.2.7	Met	
			Precedence Call Waiting (R)	UCR Section 5.2.2.8.1	Met	
			Call Forwarding (R)	UCR Section 5.2.2.8.2	Met	
			Call Transfer (R)	UCR Section 5.2.2.8.3	Met	
			Call Hold (R)	UCR Section 5.2.2.8.4	Met	
			Three-Way Calling (R)	UCR Section 5.2.2.8.5	Met	
			Call Pickup (C)	UCR Section 5.2.2.8.6	Not Tested	See note 2.
			Conferencing (C)	UCR Section 5.2.2.8.7.1	Met	
			Multiline Hunt Group (C)	UCR Section 5.2.2.8.8	Not Tested	See note 2.
			Community of Interest (C)	UCR Section 5.2.2.8.9	Not Tested	See note 2.
			MLPP Interaction with EKTS features (C)	UCR Section 5.2.2.10.1	Not Tested	See note 2.

Table 2-4. SUT Interoperability Requirements/Status (continued)

DSN Features and Capabilities						
Feature/ Capability	**Critical**	**Feature Status**	**UCR Requirement**	**Reference**	**Test Results**	**Remarks**
Call Processing	Yes	Certified	Call Treatments (R)	UCR Section 5.2.3.1	Met	
			Primary and Alternate Routing (C)	UCR Section 5.2.3.2	Met	
			E&M Lead Signaling States (C)	UCR Section 5.2.3.3.1	Not Tested	See note 1.
			4-Wire Analog User Access Lines (C)	UCR Section 5.2.3.3.2	Not Tested	See note 1.
			2-Wire User Access Lines (R)	UCR Section 5.2.3.3.3	Met	
			Termination of Analog Lines (R)	UCR Section 5.2.3.3.4	Met	
			DSN User Dialing (R)	UCR Section 5.2.3.5.1.1	Met	
			Interswitch and Intraswitch Dialing (R)	UCR Section 5.2.3.5.1.1	Met	
			Seven-Digit Dialing (R)	UCR Section 5.3.3.5.2.1	Met	
			Ten-Digit Dialing (R)	UCR Section 5.2.3.5.2.2	Met	
			Access Code (R)	UCR Section 5.2.3.5.1.3	Met	
			Access Digit (R)	UCR Section 5.2.3.5.1.3.1	Met	
			Precedence Digit (R)	UCR Section 5.2.3.5.1.3.2	Met	
			Service Digit (R)	UCR Section 5.2.3.5.1.3.3	Met	
			Route Code (R)	UCR Section 5.2.3.5.1.4	Met	
			Area Code (R)	UCR Section 5.2.3.5.1.5	Met	
			Switch Code (R)	UCR Section 5.2.3.5.1.6	Met	
			Line Number (R)	UCR Section 5.2.3.5.1.7	Met	
			Calling Name Delivery (C)	UCR Section 5.2.3.5.1.8.1	Not Tested	See note 2.
			Calling Number Delivery (R)	UCR Section 5.2.3.5.1.8.2	Met	
			Emergency Service 911 Conflict Resolution (R)	UCR Section 5.2.3.5.1.9	Met	
			DSN Switch Outpulsing Digit Formats (C)	UCR Section 5.2.3.5.2	Met	
			Standard Directory Number (R)	UCR Section 5.2.3.5.3	Met	
			Standard Test Numbers (C)	UCR Section 5.2.3.5.4	Not Tested	See note 2.
			Base Services – Abbreviated Numbers (C)	UCR Section 5.2.3.5.5	Not Tested	See note 2.
			Digit Reception Requirements (R)	UCR Section 5.2.3.5.6	Met	
			Screening (C)	UCR Section 5.2.3.5.8	Met	
ISDN Services	Yes	Certified	BRI Access, Call Control and Signaling (C)	UCR Section 5.2.9.2, Table 5.2.9-1	Not Tested	See note 1.
			Uniform Interface Configuration for BRIs (C)	UCR Section 5.2.9.2, Table 5.2.9-2	Not Tested	See note 1.
			Electronic Key Telephone Systems (EKTS) (C)	UCR Section 5.2.9.2, Table 5.2.9-3	Not Tested	See note 1.
			PRI Access, Call Control and Signaling (R)	UCR Section 5.2.9.2, Table 5.2.9-4	Met	
			PRI Features (R)	UCR Section 5.2.9.2, Table 5.2.9-5	Met	
			Packet Data Features and Capabilities (C)	UCR Section 5.2.9.2, Table 5.2.9-6	Not Tested	See note 1.

Table 2-4. SUT Interoperability Requirements/Status (continued)

DSN Features and Capabilities						
Feature/ Capability	**Critical**	**Feature Status**	**UCR Requirement**	**Reference**	**Test Results**	**Remarks**
Synchroniz-ation	Yes	Certified	Line timing mode (R)	UCR Section 5.2.11.2	Met	
			Internal Stratum 4 (R)	UCR Section 5.2.10.1.1.2.2	Met	
			Synchronization Performance Monitoring Criteria (C)	UCR Section 5.2.10.2	Met	
			DS1 Traffic Interfaces (C)	UCR Section 5.2.10.3	Met	.
			DS0 Traffic Interconnects (C)	UCR Section 5.2.10.4	Met	
Reliability	Yes	Certified	System Availability (R)	UCR Section 5.2.11.2	Met	
			Backup Power (R)	UCR Section 5.2.11.3	Not Tested	See note 4.
			Power Components (R)	UCR Section 5.2.11.3.1	Not Tested	See note 4.
			UPS Requirements (R)	UCR Section 5.2.11.3.2	Not Tested	See note 4.
			UPS PBX 1 Load Capacity (R)	UCR Section 5.2.11.3.2.1	Not Tested	See note 4.
			Backup Power (Environmental) (R)	UCR Section 5.2.11.3.3	Not Tested	See note 4.
			Alarms (R)	UCR Section 5.2.11.3.4	Not Tested	See note 4.
Security	Yes	Certified	GR-815, STIGs, and DoDI 8510.bb (DIACAP) (R)	UCR Sections 3.2.3, 3.2.5, and 5.4.6.1	Met	See note 5.
VoIP						
Feature/ Capability	**Critical**	**Feature Status**	**UCR Requirement**	**Reference**	**Test Results**	**Remarks**
VoIP System	No	Not Tested (See note 1.)	Voice Quality with MOS of 4.0 or better (R)	UCR Section 5.2.12.8.2.1		
			ITU-T G.711 PCM CODEC (R)	UCR Section 5.2.12.8.2.2		
			MLPP (R)	UCR Section 5.2.12.8.2.3		
			Security (R)	UCR Section 5.2.12.8.2.4		
			Network management (C)	UCR Section 5.2.12.8.2.5		
			System timing (R)	UCR Section 5.2.12.8.2.6		
			Latency ≤ 60 milliseconds (R)	UCR Section 5.2.12.8.2.7		
			IPv6 capable (R)	UCR Section 5.2.12.8.2.8		
			Service Class Tagging (R)	UCR Section 5.2.12.8.2.9		

Table 2-4. SUT Interoperability Requirements/Status (continued)

Network Gateways							
Interface	**Critical**	**Interface Status**	**UCR Requirement**		**Reference**	**Test Results**	**Remarks**
PSTN (See note 6.)	No	Certified	Trunking	Positive Identification Control (C)	CJCSI 6215.01C	Met	
				On-Netting (C)	CJCSI 6215.01C	Met	
				Off-Netting (C)	CJCSI 6215.01C	Met	
				Ground Start Line (R)	UCR Section 5.2.4.2.2	Met	See note 7.
				Immediate Start (C)	UCR Section 5.2.4.3.2	Met	
				Delay Dial (C)	UCR Section 5.2.4.3.4	Met	

NOTES:
1 This interface is not supported by the SUT. This interface is not required for a PBX 1. There is no risk associated with the SUT not supporting this interface.
2 This feature is not supported by the SUT. This feature is not required for a PBX 1. There is no risk associated with the SUT not supporting this feature.
3 The SUT only supports emergency service 911 public safety features. The following public safety features are not supported and therefore are not covered in this certification: Trace of terminating calls, Outgoing call trace, Tandem call trace, and Trace of a call in progress. These features are not required for a PBX 1. There is no risk associated with the SUT not supporting these features.
4 This requirement is a non-testable requirement. It is the responsibility of the respective base/post/camp/station communications agency to provide this with the SUT when installed.
5 Security is tested by DISA-led Information Assurance test teams and published in a separate report, Reference (c).
6 Voice, facsimile, data, and VTC service requirements for PSTN are identical to DSN with the exception of MLPP.
7 This was verified through the vendor's Letters of Compliance.

Table 2-5. SUT Interoperability Requirements/Status (continued)

LEGEND:

ANSI	American National Standards Institute	G.711	PCM of voice frequencies	PCM-30	Pulse Code Modulation - 30 Channels
BER	Bit Error Ratio	GR	Generic Requirement	PMO	Program Management Office
BRI	Basic Rate Interface	GR-815	Generic Requirements For Network Element/Network System (NE/NS) Security	PNT	Preemption Notification Tone
C	Conditional			PRI	Primary Rate Interface
CAS	Channel Associated Signaling	H.320	Standard for Narrowband VTC	PSTN	Public Switched Telephone Network
CJCSI	Chairman of the Joint Chiefs of Staff Instruction	IPv6	Internet Protocol version 6	Q.955.3	ISDN Signaling Standard for E1 MLPP
		ISDN	Integrated Services Digital Network	R	Required
CODEC	Coder/Decoder	IT	Information Technology	S/T	ISDN BRI 4-wire interface
DIACAP	DoD Information Assurance Certification and Accreditation Process	ITU-T	International Telecommunication Union - Telecommunication Standardization Sector	SS7	Signaling System 7
				STE	Secure Terminal Equipment
DISA	Defense Information Systems Agency	kbps	kilobits per second	STIGs	Security Technical Implementation Guides
DISR	DoD IT Standards Registry	LoC	Letter of Compliance	STU-III	Secure Telephone Unit -3rd generation
DoD	Department of Defense	Mbps	Megabits per second	SUT	System Under Test
DoDI	Department of Defense Instruction	MFR1	Multi-Frequency Recommendation 1	T1	Digital Transmission Link Level 1 (1.544 Mbps)
DP	Dial Pulse	MLPP	Multi-Level Precedence and Preemption		
DS0	Digital Signal Level 0 (64 kbps)	MOS	Mean Opinion Score	T1.619a	SS7 and ISDN MLPP Signaling Standard for T1
DS1	Digital Signal Level 1 (1.544 Mbps) (2.048 Mbps European)	ms	millisecond		
		NFAS	Non Facility Associated Signaling	T.4	Standardization of Group 3 facsimile terminals for document transmission
DSN	Defense Switched Network	NI 1/2	National ISDN Standard 1 or 2		
DTMF	Dual Tone Multi-Frequency	NI2	National ISDN Standard 2	TDM	Time Division Multiplexing
E&M	Ear and Mouth	NX56	Data format restricted to multiples of 56 kbps	UCR	Unified Capabilities Requirements
E1	European Basic Multiplex Rate (2.048 Mbps)	NX64	Data format restricted to multiples of 64 kbps	UPS	Uninterruptible Power Supply
EKTS	Electronic Key Telephone System	PBX	Private Branch Exchange	VBD	Variable bit data
FTR	Federal Telecommunications Recommendation	PBX 1	Private Branch Exchange 1	VoIP	Voice over Internet Protocol
		PCM	Pulse Code Modulation	VTC	Video Teleconferencing
FTR 1080B-2002	Video Teleconferencing Services	PCM-24	Pulse Code Modulation - 24 Channels		