



DEFENSE INFORMATION SYSTEMS AGENCY
JOINT INTEROPERABILITY TEST COMMAND
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IN REPLY
REFER TO: Battlespace Communications Portfolio (JTE)

20 September 2007

MEMORANDUM FOR DISTRIBUTION

SUBJECT: Special Interoperability Test Certification of REDCOM Slice™ Digital Switching System with Software Release 2.0A, Revision 3 with Specified Patch Group 1 (2.0A R3P1)

References: (a) DoD Directive 4630.5, "Interoperability and Supportability of Information Technology (IT) and National Security Systems (NSS)," 5 May 2004
(b) CJCSI 6212.01D, "Interoperability and Supportability of Information Technology and National Security Systems," 8 March 2006

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. Additional references are provided in the enclosure.
2. The REDCOM Slice™ Digital Switching System with Software Release 2.0A R3P1 is hereinafter referred to as the System Under Test (SUT). The SUT meets all of its critical interoperability requirements and is certified for joint use within the Defense Switched Network (DSN) for the following switch types: Private Branch Exchange (PBX) 1 and PBX 2. The SUT offers Voice over Internet Protocol (VoIP); however, this function was not tested and is not covered under this certification. This certification expires upon changes that could affect interoperability, but no later than three years from the date of the original certification memorandum (17 January 2007).
3. This finding is based on interoperability testing and review of the vendor's Letters of Compliance (LoC) conducted by JITC. Testing was conducted at JITC's Global Information Grid Network Test Facility at Fort Huachuca, Arizona, from 17 July through 25 August 2006, and is documented in reference (c). Review of the vendor's LoC was completed on 11 December 2006. Patch R3P1 was developed to fix a problem noted by the warfighter with an automatic switchover of active and standby processors. Regression testing of the patch update was conducted on 1 through 3 August 2007. System interoperability should be verified before deployment in an operational environment that varies significantly from the test environment.
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 SUT's ability to meet:

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- a. DSN services for Network and Applications specified in reference (d).
- b. PBX 1 interface and signaling requirements for trunks/lines specified in reference (e) verified through JITC testing and/or vendor submission of LoC.
- c. PBX 1 CRs/FRs specified in reference (e) verified through JITC testing and/or vendor submission of LoC.
- d. The overall system interoperability performance derived from test procedures listed in reference (f).

Table 1. SUT Interoperability Test Summary

DSN Trunk Interfaces			
Interface & Signaling	Critical	Status	Remarks
T1 CAS (DTMF, MFR1, DP)	No	Certified	Met all CRs and FRs.
E1 CAS (DTMF, MFR1, DP)	No (Europe only)	Certified	Met all CRs and FRs.
T1 ISDN PRI NI 1/2 (ANSI T1.619a)	Yes	Certified	Met all CRs and FRs.
E1 ISDN PRI (ITU-T Q.955.3)	No (Europe only)	Certified	Met all CRs and FRs.
Single Frequency (2600 Hz)	No	Certified	Met all CRs and FRs.
Analog E&M Type I, II, and V	No	Certified	Met all CRs and FRs.
DSN Line Interfaces			
Interface & Signaling	Critical	Status	Remarks
2-Wire Analog (GR-506-CORE)	Yes	Certified	Met all CRs and FRs.
2-Wire Loop Start 20Hz/90 vAC Ringdown	No	Certified	Met all CRs and FRs.
ISDN BRI NI 1/2 (ANSI T1.619a)	No	Certified	Met all CRs and FRs with the following minor exceptions: The SUT only supports an ISDN BRI S/T interface. ¹ The SUT BRI, when configured with multiple appearances of a single DN, preempts only the active resource. ²
DSN Features and Capabilities			
Features and Capabilities	Critical	Status	Remarks
Common Features	No	Certified	Met all Common Features CRs and FRs except for selective call rejection and denied originating service, which are not offered by the SUT. There is no operational impact because all Common Features are conditional for a PBX 1.
Attendant	No	Certified	Met all CRs and FRs with a single console.
Public Safety	No	Certified	Met all CRs and FRs.
Preset Conferencing	No	Not Certified	The SUT does not support the minimum number of 10 conferences with 20 conferees as required by the GSCR. There is no operational impact because Preset Conferencing is conditional for a PBX 1.

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Table 1. SUT Interoperability Test Summary (continued)

DSN Features and Capabilities (continued)				
Features and Capabilities	Critical	Status	Remarks	
DSN Hotline Services	No	Certified	Met all CRs and FRs.	
Network Management	No	Certified	Met all CRs and FRs. The certified network management interface is IEEE 802.3 10BaseT. ³	
Synchronization	Yes	Certified	Met all CRs and FRs.	
Reliability	Yes	Certified	Met all CRs and FRs.	
Security	Yes	See note 4.	See note 4.	
Network Gateways				
Gateway	Interface & Signaling	Critical	Status	Remarks
PSTN	T1 CAS (DTMF, MFR1, DP)	No	Certified	Met all CRs and FRs.
	E1 CAS (DTMF, MFR1, DP)	No (Europe only)	Certified	Met all CRs and FRs.
	T1 ISDN PRI NI 1/2 (ANSI T1.607)	No	Certified	Met all CRs and FRs.
	E1 ISDN PRI (ITU-T Q.931)	No (Europe only)	Certified	Met all CRs and FRs.
	Ground Start Line	Yes	Certified	Met all CRs and FRs.
DRSN	TPC 2-Wire Analog (GR-506-CORE)	No	Certified ⁵	Met all CRs and FRs.
LEGEND: 802.3 - Standard for carrier sense multiple access with collision detection at 10 Mbps 10BaseT - 10 Mbps (Baseband Operation, Twisted Pair) Ethernet ANSI - American National Standards Institute BRI - Basic Rate Interface CAS - Channel Associated Signaling CRs - Capability Requirements DISA - Defense Information Systems Agency DN - Directory Number DP - Dial Pulse DRSN - Defense Red Switch Network DSN - Defense Switched Network DSS1 - Digital Subscriber Signaling 1 DTMF - Dual Tone Multi-Frequency E&M - Ear & Mouth E1 - European Basic Multiplex Rate (2.048 Mbps) FRs - Feature Requirements GR - Generic Requirement GR-506-CORE - Telcordia Signaling for Analog Interface Generic Requirement GSCR - Generic Switching Center Requirements Hz - Hertz IEEE - Institute of Electrical and Electronics Engineers, Inc. IPv4 - Internet Protocol version 4 IPv6 - Internet Protocol version 6 ISDN - Integrated Services Digital Network ITU-T - International Telecommunication Union – Telecommunication Standardization Sector Mbps - Megabits per second MFR1 - Multifrequency Recommendation 1 MLPP - Multi-Level Precedence and Preemption NI 1/2 - National ISDN Standard 1 or 2 PBX 1 - Private Branch Exchange 1 PM - Program Manager PRI - Primary Rate Interface PSTN - Public Switched Telephone Network Q.931 - Signaling Standard for ISDN Q.955.3 - ISDN Signaling standard for E1 MLPP SS7 - Signaling System 7 S/T - ISDN BRI 4-Wire Interface SUT - System Under Test T1 - Digital Transmission Link Level 1 (1.544 Mbps) T1.607 - ISDN - Layer 3 Signaling Specification for Circuit Switched Bearer Service for DSS1 T1.619a - SS7 and ISDN MLPP Signaling Standard For T1 TPC - Twisted Pair Copper U - Standard 2-Wire Interface for ISDN BRI vAC - volts Alternating Current				
NOTES: 1 The SUT only supports ISDN BRI S/T interface. The U interface is not supported. There is no operational impact because the ISDN BRI interface is conditional for a PBX 1. 2 When the SUT ISDN BRI is configured with multiple appearances of a single DN and all appearances are busy with calls, incoming higher precedence calls will preempt the station based on precedence level of the active call only. The non-active calls remain on hold and are not affected. There is no operational impact. When the active call is preempted by a higher precedence call, the preempted user can still retrieve the other call appearances on hold after the preemption occurs. 3 An IPv6 capable system or product, as defined in the GSCR, paragraph 1.7, shall be capable of receiving, processing, and forwarding IPv6 packets and/or interfacing with other systems and protocols in a manner similar to that of IPv4. IPv6 capability is currently satisfied by a vendor Letter of Compliance signed by the Vice President of the company. The vendor stated, in writing, compliance to the following criteria by 30 June 2008: (a) Conformance with IPv6 standards profile contained in the Department of Defense Information Technology Standards Registry (DISR). (b) Maintaining interoperability in heterogeneous environments and with IPv4. (c) Commitment to upgrade as the IPv6 standard evolves. (d) Availability of contractor/vendor IPv6 technical support. 4 Information assurance testing is accomplished via DISA-led Information Assurance test teams and published in a separate report. 5 Interoperability certification of the SUT does not constitute DRSN PM approval for connectivity to the DRSN. It is the user's responsibility to request connectivity approval directly from the PM.				

Table 2. PBX 1 Requirements

DSN Trunk Interfaces				
Interface	Critical	Requirements Required or Conditional		References
T1 CAS (MFR1, DTMF, DP)	No	Trunking	<ul style="list-style-type: none"> • Framing (R) • Line Code (R) • Signaling (R) • Alarms and Restoral on Digital Interface Unit (R) • Alarms and Restoral Features(C) • WWNDP (R) • Outpulsing digit formats (C: CAS only) • Trunk Groups (C) • Call Processing (C) • PCM-24/PCM-30 Interoperation (C) • Direct Inward Dialing (C) 	<ul style="list-style-type: none"> • GSCR Section 7 • GSCR Section 7 • GSCR Section 5 • GSCR Section 7.1.4 • GSCR Section 7.2.2 • GSCR Section 4.5.1 • GSCR Section 4.5.2 • GSCR Section 2.5.5 & 2.5.6 • GSCR Section 4 • GSCR Section 7.3 • GSCR Section 2.3.2
E1 CAS (MFR1, DTMF, DP)	No (Europe only)			
	Yes			
T1 ISDN PRI NI 1/2 (ANSI T1.619a)	No (Europe only)	Voice	<ul style="list-style-type: none"> • MOS (R) • MLPP (R) • Secure calls (R) 	<ul style="list-style-type: none"> • CJCSI 6215.01B • GSCR Section 3 • CJCSI 6215.01B
E1 ISDN PRI (ITU-T Q.955.3)	No	Facsimile	<ul style="list-style-type: none"> • Analog: TIA/EIA-465-A (R) 	<ul style="list-style-type: none"> • DISR
Analog E&M Type I, II, V	No	VTC	<ul style="list-style-type: none"> • ITU-T H.320 (R: PRI only) 	<ul style="list-style-type: none"> • DISR
Single Frequency (2600Hz)				
DSN Line Interfaces				
Interface	Critical	Requirements Required or Conditional		References
2-Wire Analog (GR-506-CORE)	Yes	Access	<ul style="list-style-type: none"> • Directory Number Identification (R) • Line signaling (R) • Loop Start Line (R: 2-Wire Analog only) • Alerting Signals and Tones (R) • WWNDP (R) • Call Treatments (R) • 2W user access (R: 2-Wire Analog only) • Analog busy/idle (R: 2-Wire Analog only) 	<ul style="list-style-type: none"> • GSCR Section 2.1.1 • GSCR Section 5.2 • GSCR Section 5.2.1 • GSCR Section 5.5 • GSCR Section 4.5 • GSCR Section 4.1 • GSCR Section 4.3.3 • GSCR Section 4.3.4.1
ISDN BRI NI 1/2 (ANSI T1.619a)	No	Voice	<ul style="list-style-type: none"> • MOS (R) • Announcements (R) • Secure Calls (R) 	<ul style="list-style-type: none"> • CJCSI 6215.01B • GSCR Section 3.1.3 • CJCSI 6215.01B
		Facsimile	<ul style="list-style-type: none"> • Analog: TIA/EIA-465-A (R) 	<ul style="list-style-type: none"> • DISR
2-Wire Loop Start 20Hz/90 vAC Ringdown	No	VTC	<ul style="list-style-type: none"> • ITU-T H.320 (R: BRI only) 	<ul style="list-style-type: none"> • DISR

Table 2. PBX 1 Requirements (continued)

DSN Features & Capabilities			
Feature/ Capability	Critical	Requirements Required or Conditional	References
Common Features	No	<ul style="list-style-type: none"> • Denied originating service (C) • Code restriction and diversion (C) • Call waiting (C) • Three-way calling (C) • Add-on transfer, conference calling, and call hold (C) • Call forwarding (C) • Call pick-up (C) 	<ul style="list-style-type: none"> • GSCR Section 2.1.3 • GSCR Section 2.1.4 • GSCR Section 2.1.5 • GSCR Section 2.1.6 • GSCR Section 2.1.7 • GSCR Section 2.1.8 • GSCR Section 2.1.9
Attendant	No	<ul style="list-style-type: none"> • Initiate all precedence levels (C) • Visual display (C) • Override class of service (C) • Override busy line (C) • Call deflection (C) • Auto recall (C) • Waiting queue (C) 	<ul style="list-style-type: none"> • GSCR Section 2.2.1 • GSCR Section 2.2.2 • GSCR Section 2.2.3 • GSCR Section 2.2.4 • GSCR Section 2.2.5 • GSCR Section 2.2.6 • GSCR Section 2.2.7
Public Safety	No	<ul style="list-style-type: none"> • Basic Emergency Service (911) (C) • Trace of terminating calls (C) • Outgoing call trace (C) • Tandem call trace (C) • Trace of a call in progress (C) 	<ul style="list-style-type: none"> • GSCR Section 2.4.1 • GSCR Section 2.4.2 • GSCR Section 2.4.3 • GSCR Section 2.4.4 • GSCR Section 2.4.5
Preset Conferencing	No	<ul style="list-style-type: none"> • Support 10 bridges; 1 originator and 20 conferees per bridge (C) • Assign up to 20 address numbers per bridge (C) • Use KXX codes for bridge access (C) • Conference notification recorded announcement (C) • Auto retrieval and alternate address (C) • Bridge release (C) • Lost connection (C) • Secondary conferencing (C) • Address translation (C) 	<ul style="list-style-type: none"> • GSCR Section 2.6 • GSCR Section 2.6 • GSCR Section 2.6 • GSCR Section 2.6.1 • GSCR Section 2.6.2 • GSCR Section 2.6.3 • GSCR Section 2.6.4 • GSCR Section 2.6.5 • GSCR Section 2.7
DSN Hotline Services	No	<ul style="list-style-type: none"> • Hotline restrictions (C) • Auto initiate (C) • Analog and digital (C) • Subscription basis (C) • Protected hotline calling (C) • WWNDP interoperable (C) 	<ul style="list-style-type: none"> • GSCR Section 2.12 • GSCR Section 2.12 • GSCR Section 2.12 • GSCR Section 2.12 • GSCR Section 2.12.1-4 • GSCR Section 2.12.5
Network Management	No	<ul style="list-style-type: none"> • Interfaces (C) • Measurements and data generation (C) • Fault management (C) • Configuration management (C) • Accounting management (C) • Performance management (C) • Network Management controls (C) • Remote access (C) 	<ul style="list-style-type: none"> • GSCR Section 9.1 • GSCR Section 9.2 • GSCR Section 9.3 • GSCR Section 9.4 • GSCR Section 9.5 • GSCR Section 9.6 • GSCR Section 9.7 • GSCR Section 9.8
Synchronization	Yes	<ul style="list-style-type: none"> • Line timing mode (R) • Internal Stratum 4 (R) 	<ul style="list-style-type: none"> • GSCR Section 11.1.1.2 • GSCR Section 11.1.2.2
Reliability	Yes	<ul style="list-style-type: none"> • GR-512-CORE (R) 	<ul style="list-style-type: none"> • GSCR Section 12
Security	Yes	<ul style="list-style-type: none"> • GR-815, STIGs, and DIACAP (replacement for DITSCAP) (R) 	<ul style="list-style-type: none"> • GSCR Section 13

Table 2. PBX 1 Requirements (continued)

Network Gateways					
Gateway	Critical	Requirements Required or Conditional			References
PSTN ¹	No	Trunking	<ul style="list-style-type: none"> • Positive Identification Control (C) • On-Netting (C) • Off-Netting (C) • Ground Start Line 		<ul style="list-style-type: none"> • CJCSI 6215.01B • CJCSI 6215.01B • CJCSI 6215.01B • GSCR Section 5.2.2
DRSN ²	No	Access	<ul style="list-style-type: none"> • Alerting Signals and Tones (R) • Call Treatments (R) • Analog busy/idle (R) 		<ul style="list-style-type: none"> • GSCR Section 5.5 • GSCR Section 4.1 • GSCR Section 4.3.4.1
		Voice	<ul style="list-style-type: none"> • MOS (C) • MLPP (C) • Secure calls (C) 		<ul style="list-style-type: none"> • CJCSI 6215.01B • GSCR Section 3 • CJCSI 6215.01B
LEGEND: 2W - 2-Wire A/D - Analog to Digital Conversion ANSI - American National Standards Institute BRI - Basic Rate Interface C - Conditional CAS - Channel Associated Signaling CJCSI - Chairman of the Joint Chief of Staff Instruction DIACAP - DoD Information Assurance Certification and Accreditation Process DISR - DoD IT Standards Registry DITSCAP - DoD IT Security Certification and Accreditation Process DoD - Department of Defense DP - Dial Pulse DRSN - Defense Red Switch Network DSN - Defense Switched Network DTMF - Dual Tone Multi-Frequency E&M - Ear & Mouth E1 - European Basic Multiplex Rate (2.048 Mbps) EIA - Electronic Industries Alliance GR - Generic Requirement GR-506-CORE - Telcordia Signaling for Analog Interface Generic Requirement GR-815 - Generic Requirements For Network Element/Network System (NE/NS) Security GSCR - Generic Switching Center Requirements H.320 - Standard for Narrowband VTC Hz - Hertz IPv6 - Internet Protocol version 6 ISDN - Integrated Services Digital Network IT - Information Technology ITU-T - International Telecommunication Union-Telecommunication Standardization Sector KXX - K= any number 2-8; X= any number 1-9 Mbps - Megabits per second MFR1 - Multi-Frequency Recommendation 1 MLPP - Multi-Level Precedence and Preemption MOS - Mean Opinion Score NI 1/2 - National ISDN Standard 1 or 2 PBX 1 - Private Branch Exchange 1 PCM - Pulse Code Modulation PCM-24 - Pulse Code Modulation - 24 Channels PCM-30 - Pulse Code Modulation - 30 Channels PRI - Primary Rate Interface PSTN - Public Switched Telephone Network Q.955.3 - ISDN Signaling Standard for E1 MLPP R - Required SS7 - Signaling System 7 STIGs - Security Technical Implementation Guides T1 - Digital Transmission Link Level 1 (1.544 Mbps) T1.619a - SS7 and ISDN MLPP Signaling Standard for T1 TIA - Telecommunications Industry Association TIA/EIA-465-A - Group 3 Facsimile Apparatus for Document Transmission vAC - volts Alternating Current VTC - Video Teleconferencing WWNDP - Worldwide Numbering and Dialing Plan					
NOTES: 1 Voice, facsimile, data, and VTC service requirements for PSTN are identical to DSN with the exception of MLPP. 2 Facsimile, data, and VTC services are not provided via the DSN to DRSN interface.					

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 <https://jit.fhu.disa.mil> (NIPRNet), or <http://199.208.204.125> (SIPRNet). Information related to DSN testing is on the Telecom Switched Services Interoperability (TSSI) website at <http://jitc.fhu.disa.mil/tssi>.

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6. The JITC point of contact is Capt. Oskar Widecki, DSN 879-5269, commercial (520) 538-5269, FAX DSN 879-4347, or e-mail to oskar.widecki@disa.mil. The tracking number for the SUT is 600902.

FOR THE COMMANDER:

Enclosures a/s


MANUEL H. GARCIA, JR.
Chief
Battlespace Communications Portfolio

REDCOM Slice™ Digital Switching System with Software Release 2.0A, Revision 3 with Specified Patch Group 1 (2.0A R3P1)

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ADDITIONAL REFERENCES

- (c) Joint Interoperability Test Command, Memo, JTE, “of REDCOM Slice™ (HDX) Digital Switching System with Software Release 2.0A Revision 3, with Specified Patch Group 0 (2.0A R3P0),” 17 January 2007
- (d) Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 6215.01B, “Policy for Department of Defense Voice Services,” 23 September 2001
- (e) Defense Information Systems Agency, “Department of Defense Voice Networks Generic Switching Center Requirements (GSCR), Incorporated Change 1,” 1 March 2005
- (f) Joint Interoperability Test Command, “Defense Switched Network Generic Switch Test Plan (GSTP), Change 1, Revision 1,” 1 June 2005