



DEFENSE INFORMATION SYSTEMS AGENCY
JOINT INTEROPERABILITY TEST COMMAND
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IN REPLY
REFER TO: Networks and Transport Division (JTE)

21 July 2004

MEMORANDUM FOR DISTRIBUTION

SUBJECT: Special Interoperability Test Certification of REDCOM Integrated Services Digital Network (ISDN) Gateway Exchange (IGX) Digital Switching System with Software Release 6.0A Revision 1, with Specified Patch Group B (6.0A R1PB)

References: (a) DOD Directive 4630.5, "Interoperability and Supportability of Information Technology (IT) and National Security Systems (NSS)," 5 May 2004
(b) CJCSI 6212.01C, "Interoperability and Supportability of Information Technology and National Security Systems," 20 November 2003

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 enclosure 1.
2. The REDCOM IGX Digital Switching System with Software Release 6.0A with patch set R1PB, hereinafter referred to as the system under test (SUT), meets all of its critical interoperability requirements, and is certified as interoperable for joint use within the Defense Switched Network (DSN). The SUT was tested and met the critical interoperability requirements for the following DSN switch types: Small End Office (SMEO), Private Branch Exchange (PBX) 1 and PBX 2. The SUT meets the SMEO critical interoperability certification requirements with the following configuration: a minimum of four (4) shelves, with each shelf containing no more than 100 lines or 25 percent of the total equipped lines, whichever is less. The SUT also offers a Remote Switching Unit capability, however this capability was not tested and is not covered by this certification. This certification expires upon changes that could affect interoperability, but no later than three years from the date of this memorandum.
3. This certification is based on interoperability testing of the REDCOM IGX Digital Switching System with Software Release 6.0A with patch set R1 and specified patch group 3 conducted at the Global Information Grid Network Test Facility, JITC, Fort Huachuca, AZ, documented in reference (c), and regression testing of patch set R1PB conducted from 14 through 24 June 2004. The Certification Test Summary shown in reference (c) documents the test results and describes the tested network and system configurations. System interoperability should be verified before deployment in an operational environment that varies significantly from the test environment.

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4. The interoperability summary of the SUT is indicated in table 1. Network Management (NM) capabilities of the SUT platform were tested in accordance with the DISA NS53 requirements as set forth in references (d) and (e). This reference requires that a switch provide NM capabilities via either Ethernet, serial (EIA-232), or serial (X.25 or BX.25 variant). The SUT meets the NM requirements through the use of Ethernet connections. This interoperability test status is based on evaluation of:

a. The following network interfaces as specified in reference (f): DSN, Defense Red Switch Network Gateway, Tactical Network Gateway, North Atlantic Treaty Organization Gateway, and Public Switched Telecommunications Network.

b. The interface and signaling requirements for trunk/line interfaces, and interoperability Exchange Requirements (ERs) and Functional Requirements (FRs) derived from references (g) and (h).

c. The overall system interoperability performance derived from test procedures listed in reference (i). The interoperability status and criticality are listed in table 2, and the ERs and FRs for each network interface are listed in table 3.

d. Review of Letters of Compliance submitted by REDCOM.

Table 1. REDCOM IGX Digital Switching Systems Interoperability Summary

Network	Critical	Status	Remarks
DSN	Yes	Certified	<ul style="list-style-type: none"> - Certified as SMEO, PBX 1, and PBX 2. - E1 CAS and CDC certified (DISN-E only). - Meets SMEO hardware reliability requirements with minimum of four shelves, with each shelf containing no more than 100 lines or 25 percent of total equipped lines, whichever is less. - Remote Switching Unit not tested. - The identified test discrepancies shown in reference (c), enclosure 2, which remained open have an overall minor operational impact.
DRSN Gateway	Yes	Certified	
Tactical Gateway	No	Certified	
NATO Gateway	No	Not Tested	
PSTN Gateway	Yes	Certified	
Legend:			
CAS	- Channel Associated Signaling	IGX	- Integrated Services Digital Network (ISDN) Gateway Exchange
CDC	- Common Data Channel	Mbps	- Megabits per second
DISN-E	- Defense Information System Network Europe	NATO	- North Atlantic Treaty Organization
DRSN	- Defense Red Switch Network	PBX	- Private Branch Exchange
DSN	- Defense Switched Network	PSTN	- Public Switched Telephone Network
E1	- European Basic Multiplex Rate (2.048 Mbps)	SMEO	- Small End Office

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Table 2. Interoperability Status

	Trunk Interfaces			
	Interface and Signaling	Critical	Status	Remarks
Defense Switched Network	PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS DTMF	Yes	Certified	Met all critical ERs and FRs.
	PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS MFR1	Yes	Certified	Met all critical ERs and FRs.
	PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS DP	Yes	Certified	Met all critical ERs and FRs.
	PCM-30 E1 CAS HDB3 MFR1	No	Certified	Met all ERs and FRs.
	PCM-24 T1 (B8ZS/ESF) ISDN PRI	Yes	Certified	Met all critical ERs and FRs.
	Analog E&M Signaling Type I	No	Certified	Met all ERs and FRs.
	Line Interfaces			
	Interface and Signaling	Critical	Status	Remarks
	TPC ISDN BRI ST and U Interface Q.931	Yes	Certified	Met all critical ERs and FRs. ISDN Supplemental Services not met. ¹ Operational impact is none.
	TPC 2-Wire analog	Yes	Certified	Met all critical ERs and FRs.
	Network Management Interfaces			
	Interface and Signaling	Critical	Status	Remarks
	CAT 5 TPC IEEE 802.3 10BaseT Ethernet, TCP/IP	No	Certified	Met all ERs and FRs. ²
TPC EIA-232 Asynchronous @ 9.6 kbps	No	Not Tested		
TPC X.25 or BX.25 Synchronous	No	Not Tested		
Defense Red Switch Network Gateway	Trunk Interfaces			
	Interface and Signaling	Critical	Status	Remarks
2-Wire Analog Loop	Yes	Certified	Met all critical ERs and FRs. ³	
Tactical Network Gateway	Trunk Interfaces			
	Interface and Signaling	Critical	Status	Remarks
	PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS MFR1	No	Certified	Met all ERs and FRs.
	PCM-30 E1 HDB3 CAS MFR1	No	Certified	Met all ERs and FRs.
	Analog E&M Signaling Type I	No	Certified	Met all ERs and FRs.
Single Frequency Signaling	No	Certified	Met all ERs and FRs.	
NATO Gateway	Trunk Interfaces			
	Interface and Signaling	Critical	Status	Remarks
		No	Not Tested	

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Table 2. Interoperability Status (continued)

PSTN Gateway	Trunk Interfaces			
	Interface and Signaling	Critical	Status	Remarks
	Same Interfaces and Signaling as DSN	Yes	Certified	See note 4.
Legend:				
802.3	- IEEE Ethernet Protocol	HDB3	- High Density Bi-polar Three	
10BaseT	- 10 Mbps (Baseband Operation, Twisted Pair) Ethernet	IEEE	- Institute of Electrical and Electronic Engineers, Inc.	
AMA	- Automated Message Accounting	ISDN	- Integrated Services Digital Network	
AMI	- Alternate Mark Inversion	ITU	- International Telecommunication Union	
ANSI	- American National Standards Institute	kbps	- kilobits per second	
B8ZS	- Bipolar Eight Zero Substitution	Mbps	- Megabits per second	
BRI	- Basic Rate Interface	MFR1	- Multi-Frequency R1	
CAS	- Channel Associated Signaling	NATO	- North Atlantic Treaty Organization	
CAT	- Category	PCM-24	- Pulse Code Modulation 24 Channels	
DISN	- Defense Information System Network	PCM-30	- Pulse Code Modulation 30 Channels	
DP	- Dial Pulse	PM	- Program Manager	
DRSN	- Defense Red Switch Network	PRI	- Primary Rate Interface	
DSN	- Defense Switched Network	PSTN	- Public Switched Telephone Network	
DTMF	- Dual Tone Multi-Frequency	Q.931	- ITU signaling standard for ISDN	
E1	- European Basic Multiplex Rate (2.048 Mbps)	SF	- Superframe	
E&M	- Ear and Mouth	ST	- ISDN BRI Four-Wire Interface	
EIA	- Electronic Industries Alliance	SUT	- System Under Test	
ERS	- Exchange Requirements	T1	- Digital Transmission Link level 1 (1.544 Mbps)	
ESF	- Extended Superframe	TCP/IP	- Transmission Control Protocol/Internet Protocol	
FRs	- Functional Requirements	TPC	- Twisted Pair Copper	
GSCR	- Generic Switching Center Requirements	U	- ISDN BRI Two-Wire Interface	
GSTP	- Generic Switch Test Plan			
Notes:				
1 ISDN Supplemental Services currently not used in the DISN. The operational impact is none.				
2 The SUT did not meet the following non-critical Network Management measurements: Traffic Measurements (Trunks in Service, Incoming failures, Glare, and Trunk Group Busy), AMA (Conference Call Indicator). Operational impact is minor.				
3 Interoperability Certification of the SUT does not constitute DRSN Program Manager's (PM) approval for connectivity to the DRSN. It is the user's responsibility to request connectivity approval directly from the PM.				
4 The certification of interoperability with commercial networks was verified based on the review of the vendor's letter of compliance to requirements identified as the "Letter" and "Verify" items listed in appendix E of the GSTP and specified in tables 2-1 through 2-15 of the GSCR.				

Table 3. Exchange and Functional Requirements

Defense Switched Network	Trunk Interfaces	
	Interface and Signaling	Exchange and Functional Requirements Critical (C), Not Critical (NC)
	PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS DTMF	<ul style="list-style-type: none"> - MLPP (C) - System Interface (C) <ul style="list-style-type: none"> • Non-secure voice and data • Secure voice and data (STU-III and STE) • NX56 and NX64 synchronous data • Non-secure and secure FAX • VTC • Alarms - Integrated Services Digital Network (<i>ISDN PRI only</i>) (C) - Attendant services (NC) - Hotline services (NC) - Preset conferencing (NC) - System Administration, Measurements, and Service Standards (C) - Y2K (Rollover, Valid, and Invalid Dates) (C) - Screening, Zone Restriction, and DSN (C) - Access Restriction (C) - Automated Message Accounting (C) - Network Integration (C) - Common Data Channel (<i>TI and E1 CAS only</i>) (NC) - ANSI T1.619a (<i>TI ISDN PRI</i>) (C)
	PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS MFR1	
	PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS DP	
	PCM-30 E1 CAS HDB3 MFR1	
	PCM-24 T1 B8ZS/ESF ISDN PRI	
	Analog E&M Signaling Type I	
	Line Interfaces	
	Interface and Signaling	Exchange and Functional Requirements Critical (C), Not Critical (NC)
	TPC ISDN BRI ST and U Interface Q.931	<ul style="list-style-type: none"> - MLPP (C) - ANSI T1.619a (C) - ISDN supplemental services (NC) - Call treatments (C) - DSN Announcements (C) - Attendant services (NC) - Hotline services (NC) - Preset conferencing (NC) - VTC (C) - NX56 and NX64 synchronous data (C) - Non-secure voice and data (C) - Secure voice and data (STE) (C)
	TPC 2-Wire analog	
Network Management Interfaces		
Interface and Signaling	Exchange and Functional Requirements Critical (C), Not Critical (NC)	
CAT 5 TPC IEEE 802.3 10BaseT Ethernet, TCP/IP	<ul style="list-style-type: none"> - Automated Message Accounting (C) - Traffic measurements (C) - Alarms (C) - Man Machine Language (C) 	

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Table 3. Exchange and Functional Requirements (continued)

Defense Red Switch Network Gateway	Trunk Interfaces	
	Interface and Signaling	Exchange and Functional Requirements Critical (C), Not Critical (NC)
	TPC 2-Wire analog	- MLPP (C) - Secure Voice (STU-III and STE) (C)
Tactical Network Gateway	Trunk Interfaces	
	Interface and Signaling	Exchange and Functional Requirements Critical (C), Not Critical (NC)
	PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS MFR1	- MLPP (C) - Non-secure Voice (C)
	PCM-30 E1 HDB3 CAS MFR1	
	Analog E&M Signaling Type I	
Single Frequency 2600 Hz Signaling		
NATO Gateway	Trunk Interfaces	
	Interface and Signaling	Exchange and Functional Requirements
	Not tested	See note 1.
PSTN Gateway	Trunk Interfaces	
	Interface and Signaling	Exchange and Functional Requirements
	Same Interfaces and Signaling as DSN	See note 2.
Legend: 802.3 - IEEE Ethernet Protocol 10BaseT - 10 Mbps (Baseband Operation, Twisted Pair) Ethernet AMI - Alternate Mark Inversion ANSI - American National Standards Institute B8ZS - Bipolar Eight Zero Substitution BRI - Basic Rate Interface C - Critical CAS - Channel Associated Signaling CAT - Category DP - Dial Pulse DSN - Defense Switched Network DTMF - Dual Tone Multi-Frequency E1 - European Basic Multiplex Rate (2.048 Mbps) E&M - Ear and Mouth EKTS - Electronic Key Telephone Service ESF - Extended Superframe FAX - Facsimile GSCR - Generic Switching Center Requirements GSTP - Generic Switch Test Plan HDB3 - High Density Bipolar Three Hz - Hertz IEEE - Institute of Electrical and Electronic Engineers, Inc. ISDN - Integrated Services Digital Network ITU - International Telecommunication Union kbps - kilobits per second Mbps - Megabits per second MFR1 - Multi-Frequency R1 MLPP - Multi-Level Precedence and Preemption NATO - North Atlantic Treaty Organization NC - Not Critical NX56 - Data format restricted to multiples of 56 kbps NX64 - Data format restricted to multiples of 64 kbps PCM-24 - Pulse Code Modulation 24 Channels PCM-30 - Pulse Code Modulation 30 Channels PRI - Primary Rate Interface PSTN - Public Switched Telephone Network Q.931 - ITU signaling standard for ISDN SF - Superframe SS7 - Signaling System Number 7 ST - ISDN BRI Four-Wire Interface STE - Secure Terminal Equipment STU-III - Secure Telephone Unit-III SUT - System Under Test T1 - Digital Transmission Link level 1 (1.544 Mbps) T1.619A - SS7 and ISDN Signaling Standard for T1 TCP/IP - Transmission Control Protocol/Internet Protocol TPC - Twisted Pair Copper U - ISDN BRI Two-Wire Interface VTC - Video Teleconferencing Y2K - Year 2000		
Notes: 1 NATO interface requirements are in accordance with the GSCR paragraph 10.8. Not all switches are required to perform this function. 2 The certification of interoperability with commercial networks was verified based on the review of the vendor's letter of compliance to requirements identified as the "Letter" and "Verify" items listed in appendix E of the GSTP and specified in tables 2-1 through 2-15 of the GSCR.		

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5. JITC distributes interoperability information via the JITC Electronic Report Distribution (ERD) system, which uses Unclassified but Sensitive Internet Protocol Router Network (NIPRNet) e-mail. More comprehensive interoperability status information is available via the JITC System Tracking Program (STP). The STP is accessible by .mil/.gov users on the NIPRNet at <https://stp.fhu.disa.mil/>. Test reports, lessons learned, and related testing documents and references are on the JITC Joint Interoperability Tool (JIT) at <http://jit.fhu.disa.mil> (NIPRNet), or <http://199.208.204.125/> (SIPRNet). Information related to DSN testing is on the Telecom Switched Services Interoperability (TSSI) website at <http://jitc.fhu.disa.mil/tssi>.

6. The JITC point of contact is Capt. Michel Roy, DSN 821-8575, commercial (520) 533-8575, FAX DSN 879-4347, or e-mail to roym@fhu.disa.mil.

FOR THE COMMANDER:

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ADDITIONAL REFERENCES

- (c) Joint Interoperability Test Command (JITC) Memorandum, Networks, Transmission and Integration Division (JTE), "Joint Interoperability Test Certification of REDCOM IGX Digital Switching System with Software Release 6.0A with Patch Set R1P3," 23 September 2003
- (d) Defense Information Systems Agency (DISA) NS53, Memorandum, "DSN Switch Network Management Interface," 26 July 2001
- (e) DISA NS53, Memorandum, "DSN Network Management Requirements for End Offices," 2 August 2001
- (f) Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 6215.01B, "Policy for Department of Defense Voice Services," 23 September 2001
- (g) DISA, Joint Interoperability and Engineering Organization (JIEO), Technical Report 8249, "Defense Information Systems Network (DISN) Circuit Switched Subsystem, Defense Switched Network (DSN) Generic Switching Center Requirements (GSCR)," March 1997
- (h) DISA NS53, Memorandum, "DSN Global Network Requirements for Tandem (Standalone), Multifunction, End Office, and Small End Office Switches," 30 January 2003
- (i) JITC, "Defense Switched Network Generic Switch Test Plan (GSTP)," 17 June 1999