



DEFENSE INFORMATION SYSTEMS AGENCY

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

MEMORANDUM FOR DISTRIBUTION

7 Mar 11

SUBJECT: Extension of the Special Interoperability Test Certification of REDCOM High Density Exchange (HDX) with Software Release 3.0A Revision 3, with Specified Patch Group 0 (3.0A R3P0), certified as a Deployable Voice Exchange (DVX)

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 (g), see Enclosure

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 REDCOM HDX with Software Release 3.0A R3P0 is hereinafter referred to as the System Under Test (SUT). The SUT met all of its critical interoperability requirements and is certified as interoperable for joint use within the Defense Switched Network (DSN). The SUT is certified for Voice over Internet Protocol (VoIP) with certified Assured Services Local Area Networks (ASLANs) on the Unified Capabilities (UC) Approved Products List (APL). The listed test discrepancies shown in the SUT Interoperability Test Summary have an overall minor operational impact. The SUT was tested and met the critical interoperability requirements for a DVX. The SUT offers a virtual-tactical network element Proprietary Internet Protocol Trunk (PIPT). The PIPT trunk can only be deployed within a tactical DSN environment and is not certified for joint use within the strategic DSN. 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 of the original memorandum (29 January 2009).

3. The extension of this certification is based upon Desktop Review (DTR) 1. The original certification is based on interoperability testing conducted by JITC, review of the vendor's Letters of Compliance (LoC), and Defense Information Assurance (IA)/Security Accreditation Working Group (DSAWG) accreditation. Testing was conducted at JITC's Global Information Grid Network Test Facility at Fort Huachuca, Arizona, from 26 November 2007 through 18 January 2008. Regression testing was conducted from 28 July through 5 September 2008 to test patches developed to fix test discrepancies discovered during initial testing and documented in Reference (c). Review of the vendor's LoC was completed on 14 October 2008. DSAWG

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granted accreditation on 13 January 2009 based on the security testing completed by DISA-led Information Assurance test teams and published in a separate report, Reference (d). This DTR was requested to include shared access with the Cisco 7960 Internet Protocol (IP) phone. The Cisco 7960 IP phone will have to be configured for auto negotiation 100 Megabits per second (Mbps) Fast Ethernet (FE) in lieu of hard set 100 Mbps FE to meet the shared access requirements. The JITC determined there was minor risk in approving this DTR based on JITC analysis of the vendor's test results of shared access with the Cisco 7960 IP phone. Therefore, JITC approves this DTR. DISA Network Systems Directorate has approved the Information Assurance posture of SUT in this DTR on 4 February 2011.

4. The interoperability test summary of the SUT is contained in Table 1. The DVX required and conditional 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:

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

Table 1. SUT Interoperability Test Summary

| DSN Trunk Interfaces | | | |
|---|----------------------|---------------|---|
| Interface & Signaling | Critical | Status | Remarks |
| T1 CAS (DTMF, DP) | Yes | Certified | Met all critical CRs and FRs. |
| T1 CAS (MFR1) | No | Certified | Met all critical CRs and FRs. |
| E1 CAS (DTMF, DP) | Yes (Europe only) | Certified | Met all critical CRs and FRs. |
| E1 CAS (MFR1) | No (Europe only) | Certified | Met all critical CRs and FRs. |
| T1 ISDN PRI NI 1/2 (ANSI T1.619a) | Yes | Certified | Met all critical CRs and FRs. |
| E1 PRI (ITU-T Q.955.3) | No (Europe only) | Certified | Met all critical CRs and FRs. |
| T1 SS7 (ANSI T1.619a) | No | Certified | Met all critical CRs and FRs. |
| E1 SS7 (ANSI T1.619a) | No | Not Tested | E1 SS7 is not supported by the SUT. This is not a required interface for a DVX. There is no risk associated with the SUT not supporting this interface. |
| Analog E&M Type I, II, V | Yes | Certified | Met all critical CRs and FRs. |
| PIPT (Session Initiation Protocol) (IEEE 802.3u) | No | Certified | Met all critical CRs and FRs. See note 1. |

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Table 1. SUT Interoperability Test Summary (continued)

| DSN Line Interfaces | | | | |
|--------------------------------------|---|---------------|---|-------------------------------|
| Interface & Signaling | Critical | Status | Remarks | |
| 2-Wire Analog (GR-506-CORE) | Yes | Certified | Met all critical CRs and FRs with the following minor exception: The conference disconnect tone does not meet the specifications. ² | |
| ISDN BRI NI 1/2 | Yes | Certified | Met all critical CRs and FRs with the following minor exceptions: The precedence above ROUTINE ringing cadence that the SUT applies to BRI phones does not meet the specifications. ³ The conference disconnect tone does not meet the specifications. ² | |
| 2-Wire Proprietary Digital | No | Not Tested | This interface is not supported by the SUT. This is not a required feature for a DVX. There is no risk associated with the SUT not supporting this interface. | |
| VoIP (Session Initiation Protocol) | No | Certified | Met all critical CRs and FRs with the following minor exception: The conference disconnect tone does not meet the specifications. ² | |
| DSN Features and Capabilities | | | | |
| Features and Capabilities | Critical | Status | Remarks | |
| Common Features | Yes | Certified | Met all critical CRs and FRs with the following minor exception: The SUT does not correctly support the call forwarding variable "ping" ring feature. ⁴ | |
| Attendant | No | Certified | Met all critical CRs and FRs. | |
| Public Safety | Yes | Certified | Met all critical CRs and FRs with the following minor exception: The SUT does not support tandem call trace. ⁵ | |
| Conferencing | Preset | Yes | Certified | Met all critical CRs and FRs. |
| | Conference Notification Recorded Announcement | Yes | Certified | Met all critical CRs and FRs. |
| | Automatic Retrial and Alternate Address | Yes | Certified | Met all critical CRs and FRs. |
| | Bridge Release | Yes | Certified | Met all critical CRs and FRs. |
| | Lost Connection | Yes | Certified | Met all critical CRs and FRs. |
| | Secondary Conferencing | Yes | Certified | Met all critical CRs and FRs. |
| | Meet-me | No | Certified | Met all critical CRs and FRs. |
| | Progressive | No | Certified | Met all critical CRs and FRs. |
| Nailed-up Connections | No | Not Tested | This feature is not supported by the SUT. This is not a required feature for a DVX. There is no risk associated with the SUT not supporting this feature. | |
| DSN Hotline Services | Yes | Certified | Met all critical CRs and FRs with the following minor exceptions: The SUT will not allow the protection of a hotline call originator through the use of a hotline list as required by the UCR. The operational impact is minor. ⁶ The SUT does not support interswitch protected hotline calling. ⁷ | |
| MLPP | Yes | Certified | Met all critical CRs and FRs with the following minor exception: The SUT does not support the loss of Command and Control announcement. ⁸ | |
| Call Processing | Yes | Certified | Met all critical CRs and FRs with the following minor exceptions: The SUT does not support the full complement of CoS tables. ⁹ The SUT does not support calling number delivery. ⁸ | |
| Network Management | Yes | Certified | Met all critical CRs and FRs with both serial EIA-232 and Internet Protocol (IP) interfaces. | |
| ISDN Services | Yes | Certified | Met all critical CRs and FRs. | |
| Synchronization | Yes | Certified | Met all critical CRs and FRs. | |
| Reliability | Yes | Certified | Met all critical CRs and FRs. ¹⁰ | |
| Security | Yes | Certified | See note 11. | |
| VoIP System | No | Certified | The SUT is certified for VoIP with any certified ASLAN posted on the UC APL. See note 12. | |

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Table 1. SUT Interoperability Test Summary (continued)

| Network Gateways | | | | |
|---|----------------------------------|-------------------|-----------|-------------------------------|
| Gateway | Interface & Signaling | Critical | Status | Remarks |
| PSTN | T1 CAS (DTMF, DP, MFR1) | Yes | Certified | Met all critical CRs and FRs. |
| | E1 CAS (DTMF, DP, MFR1) | Yes (Europe only) | Certified | Met all critical CRs and FRs. |
| | T1 ISDN PRI NI 1/2 (ANSI T1.607) | Yes | Certified | Met all critical CRs and FRs. |
| | E1 PRI (ITU-T Q.931) | No (Europe only) | Certified | Met all critical CRs and FRs. |
| | Ground Start Line | Yes | Certified | Met all critical CRs and FRs. |
| <p>NOTES:</p> <ol style="list-style-type: none"> 1 The PIPT trunk can only be deployed within a tactical DSN environment and is not certified for joint use within the strategic DSN. 2 The conference disconnect tone that is provided by the SUT does not meet the specifications designated in UCR, section 5.5.2. The SUT conference disconnect tone is distinguishable from other DSN tones and cadences; therefore, this anomaly has a minor operational impact. 3 The precedence above ROUTINE ringing cadence that the SUT applies to BRI phones does not meet the specifications as detailed in the UCR, section 5.5.1. The precedence above ROUTINE cadence is distinct from the ROUTINE cadence when it is configured properly; therefore this anomaly has no operational impact. 4 When CFV is assigned to any station on the SUT and CFV is invoked by the user, any station with CFV invoked does not receive a “ping” ring when calls are being forwarded. The operational impact is minor. 5 The SUT cannot perform a tandem call trace of a specified distant office directory number as specified in the UCR. This anomaly was adjudicated by DISA, and determined to have a minor operational impact. 6 The SUT will not allow the protection of a hotline call originator through the use of a hotline list as required by the UCR. However, this capability can be accomplished with the SUT by classmarking authorized hotline users for receiving only calls from other hotline callers. The operational impact is minor. 7 This requirement was modified in the UCR 2007 to add clarification regarding interswitch hotline protection. Prior to the UCR 2007 only intraswitch hotline protection was required and tested. The SUT meets the intraswitch hotline protection requirement. The SUT does not support interswitch hotline protection in accordance with the UCR 2007; however, the vendor has 18 months (till June 2009) to develop this new requirement. The operational impact is minor. 8 This is a new UCR requirement and the vendor has 18 months (until July 2009) to develop this capability. 9 The SUT does not support the full complement of CoS tables as specified in the UCR. The SUT supports 255 CoS tables for analog lines and does not support CoS tables on access lines, number codes, trunks, or groups of trunks. This limitation has posed a minor operational impact within the DSN when assigning lines and trunks on the SUT. 10 Backup power, power components, UPS requirements, UPS load capacity and alarms are non-testable requirements. It is the responsibility of the respective base/post/camp/station communication agency to provide this with the SUT when installed. 11 Security is tested by DISA-led Information Assurance test teams and published in a separate report, Reference (d). 12 An IPv6 capable system or product, as defined in the UCR, paragraph 1.7, shall be capable of receiving, processing, and forwarding IPv6 packets and/or interfacing with other systems and protocols in manner similar to that of IPv4. IPv6 capability is currently satisfied by a vendor Letter of Compliance signed by the Vice President of their respective company. The vendor stated in writing, their intent to return to JITC for testing of their solution with IPv6 enabled earliest date available. In addition they stated in writing, compliance to the following criteria: <ol style="list-style-type: none"> a. Conformance with IPv6 standards profile contained in the Department of Defense Information Technology Standards Registry (DISR). These standards are delineated in the UCR, appendix 11. 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. | | | | |

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Table 1. SUT Interoperability Test Summary (continued)

| LEGEND: | | | | | |
|----------------|---|--------------------------|---|----------------|---|
| 802.3u | Standard for carrier sense multiple access with collision detection at 100 Mbps | FRs GR GR-506-CORE | Feature Requirements Generic Requirement LSSGR: Signaling for Analog Interfaces | NI 1/2 PIPT | National ISDN Standard 1 or 2 Proprietary Internet Protocol Trunk |
| ANSI | American National Standards Institute | | | PRI | Primary Rate Interface |
| APL | Approved Products List | IEEE | Institute of Electrical and Electronics Engineers | PMO | Program Management Office |
| ASLAN | Assured Services Local Area Network | | | PSTN | Public Switched Telephone Network |
| BRI | Basic Rate Interface | IPv4 | Internet Protocol version 4 | | |
| CAS | Channel Associated Signaling | IPv6 | Internet Protocol version 6 | Q.931 | Signaling Standard for ISDN |
| CFV | Call Forwarding Variable | ISDN | Integrated Services Digital Network | Q.955.3 | ISDN signaling standard for E1 MLPP |
| CoS | Class of Service | | | | |
| CRs | Capability Requirements | ITU-T | International | SS7 | Signaling System 7 |
| DISA | Defense Information Systems Agency | | | SUT | System Under Test |
| DP | Dial Pulse | | | T1 | Digital Transmission Link Level 1 (1.544 Mbps) |
| DSN | Defense Switched Network | | | | |
| DSS1 | Digital Subscriber Signaling 1 | JITC | Joint Interoperability Test Command | T1.607 | ISDN – Layer 3 Signaling Specification for Circuit Switched Bearer Service for DSS1 |
| DTMF | Dual Tone Multi-Frequency | | | | |
| DVX | Deployable Voice Exchange | LSSGR | Local Access and Transport Area (LATA) Switching Systems | T1.619a | SS7 and ISDN MLPP Signaling Standard for T1 |
| E&M | Ear and Mouth | | | | |
| E1 | European Basic Multiplex Rate (2.048 Mbps) | | | | |
| EIA | Electronic Industries Alliance | Mbps | Megabits per second | UC | Unified Capabilities |
| 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 | MFR1 MLPP | Multi-Frequency Recommendation 1 Multi-Level Precedence and Preemption | UCR | Unified Capabilities Requirements |
| | | | | UPS | Uninterruptible Power Supply |
| | | | | VoIP | Voice over Internet Protocol |

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Table 2. DVX Requirements

| DSN Trunk Interfaces | | | | |
|--------------------------------------|----------------------|---|--|---|
| Interface | Critical | Requirements Required or Conditional | References | |
| T1 SS7 (ANSI T1.619a) | No | Trunking | <ul style="list-style-type: none"> • UCR Section 2.3.2 • UCR Section 2.3.4.1 • UCR Section 2.3.4.1.1 • UCR Section 2.3.4.2 • UCR Section 2.3.4.2.1 | |
| E1 SS7 (ITU-T Q.735.3) | No (Europe only) | | <ul style="list-style-type: none"> • Direct Inward Dialing (C) • National ISDN 1/2 Primary Access (R) • ISDN ANSI MLPP Service Capability (R) • ITU-T ISDN Primary Access (Europe only) (C) • ITU-T ISDN Primary Access Digital Subscriber Signaling System Number 1 MLPP (Europe only) (C) • Normal Wink Start Operations (R) • Glare Operation (R) • Abnormal Wink Start (R) • Glare Resolution (R) • Call for Service Timing (R) • Guard Timing (R) • Satellite Timing (R) • Disconnect Control (R) • Reselect and Retrial (R) • Off-Hook Supervision Transition (R) • Dial-Pulse Signals (R) • DTMF Signaling (R) • Standard Digit Format for Precedence (C) • MFR1 2/6 Signaling (R) • Alerting Signals and Tones (R) • Common Channel Signaling 7 (C) • DSN ISDN User-to-Network Signaling (R) • Application (R) • Physical Layer (R) • Data Link Layer (R) • Data Link Connection (R) • Peer-to-Peer Procedures of Data-Link Layer (R) • Layer 3 DSN User-to-Network Signaling (R) • DSN User-to-Network Signaling for Circuit-Switched Bearer Services (R) • Sequence of Messages for DSN Circuit-Switched Calls (R) • Message Functional Definition and Content (R) • General Message Format and Information Elements Coding (R) • Supplementary Services (C) • PCM-24 Digital Trunk Interface (R) • PCM-30 Digital Trunk Interface (Europe only) (R) • Interoperation of PCM-24 and PCM-30 (C) • Analog Trunk Interface (C) • Integrated Digital Loop Carrier (C) • Local Office Test Line (C) • Outside Plant Test Lines (C) • Test Incoming Trunks Tandem or Local State (C) • Manual Test of Trunks (R) • Trunk Group-Remove from Service (R) • Trunk Group-Restore to Service (R) • Carrier Group Alarm (R) • Software Carrier Group Alarm (C) | <ul style="list-style-type: none"> • UCR Section 5.3.3.1.1 • UCR Section 5.3.3.1.2 • UCR Section 5.3.3.2.1 • UCR Section 5.3.3.2.2 • UCR Section 5.3.5 • UCR Section 5.3.6 • UCR Section 5.3.7 • UCR Section 5.3.8 • UCR Section 5.3.9 • UCR Section 5.3.10 • UCR Section 5.4.1 • UCR Section 5.4.2 • UCR Section 5.4.2.1 • UCR Section 5.4.3 • UCR Section 5.5 • UCR Section 5.6 • UCR Section 5.7.1 • UCR Section 5.7.1.1 • UCR Section 5.7.1.2 • UCR Section 5.7.1.3 • UCR Section 5.7.1.3.1 • UCR Section 5.7.1.3.2 • UCR Section 5.7.1.4 • UCR Section 5.7.1.4.2 |
| T1 CAS (MFR1, DTMF, DP) | Yes | | | <ul style="list-style-type: none"> • UCR Section 5.7.1.4.3 • UCR Section 5.7.1.4.4 • UCR Section 5.7.1.4.5 |
| E1 CAS (MFR1, DTMF, DP) | Yes (Europe only) | | | <ul style="list-style-type: none"> • UCR Section 5.7.1.4.6 • UCR Section 7.1 • UCR Section 7.2 • UCR Section 7.3 • UCR Section 7.4 • UCR Section 7.5 • UCR Section 2.5.1 • UCR Section 2.5.2 • UCR Section 2.5.3 • UCR Section 2.5.4.2 • UCR Section 2.5.5 • UCR Section 2.5.6 • UCR Section 2.5.7 • UCR Section 2.5.7.1 |
| T1 ISDN PRI NI 1/2 (ANSI T1.619a) | Yes | | | |
| E1 ISDN PRI (ITU-T Q.955.3) | No (Europe Only) | | | |
| Analog E&M Type I, II, V | Yes | | | |

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Table 2. DVX Requirements (continued)

| DSN Trunk Interfaces | | | | |
|--|----------------------|--------------------------------------|--|---|
| Interface | Critical | Requirements Required or Conditional | | References |
| T1 SS7 (ANSI T1.619a) | No | Voice | <ul style="list-style-type: none"> • MOS (R) • Secure calls (R) | <ul style="list-style-type: none"> • CJCSI 6215.01C • CJCSI 6215.01C |
| E1 SS7 (ITU-T Q.735.3) | No (Europe only) | Facsimile | <ul style="list-style-type: none"> • Analog: ITU-T T.4 (R) | <ul style="list-style-type: none"> • DISR |
| T1 CAS (MFR1, DTMF, DP) | Yes | Data | <ul style="list-style-type: none"> • 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) | <ul style="list-style-type: none"> • CJCSI 6215.01C • UCR Section 3.10 • UCR Section 3.10 • UCR Section 3.10 • CJCSI 6215.01C |
| E1 CAS (MFR1, DTMF, DP) | Yes (Europe only) | | | |
| T1 ISDN PRI NI 1/2 (ANSI T1.619a) | Yes | VTC | <ul style="list-style-type: none"> • ITU-T H.320 (R: PRI only) | <ul style="list-style-type: none"> • FTR 1080B-2002 |
| E1 ISDN PRI (ITU-T Q.955.3) | No (Europe Only) | | | |
| Analog E&M Type I, II, V | Yes | | | |
| PIPT (Session Initiation Protocol) IEEE 802.3u | No | Trunking | <ul style="list-style-type: none"> • Tactical Network Element TDM Requirements (C) • Tactical Network Element IP Requirements (C) • Encapsulated TDM Requirements (C) • Proprietary IP Trunk Requirements (C) | <ul style="list-style-type: none"> • UCR App. 2, para. A2.4.2 • UCR App. 2, para. A2.4.3 • UCR App. 2, para. A2.4.4 • UCR App. 2, para. A2.4.6 |
| DSN Line Interfaces | | | | |
| 2-Wire Analog | Yes | Access | <ul style="list-style-type: none"> • Directory Number Identification (R) • PBX Line (C) • National ISDN 1/2 Basic Access (C) • Analog Line (R) • Basic Line Test Capabilities (C) • Advanced Line Test Capabilities (C) • Network Power Systems for External Interfaces (C) • Loop Start Line (R: 2-Wire Analog only) • Reverse Battery (R) • Alerting Signals and Tones (R) • S/T Reference Point (ISDN BRI) (C) | <ul style="list-style-type: none"> • UCR Section 2.1.1 • UCR Section 2.3.1 • UCR Section 2.3.3 • UCR Section 2.3.5 • UCR Section 2.5.4.1.1 • UCR Section 2.5.4.1.2 • UCR Section 5.1 • UCR Section 5.2.1 • UCR Section 5.3.1 • UCR Section 5.5 • UCR Section 5.7.1.2.1 |
| ISDN BRI NI 1/2 (ANSI T1.619a) | Yes | | | |
| 2W Digital Proprietary | No | Voice | <ul style="list-style-type: none"> • MOS (R) • Secure Calls (R) | <ul style="list-style-type: none"> • CJCSI 6215.01C • CJCSI 6215.01C |
| | | Facsimile | <ul style="list-style-type: none"> • Analog: ITU-T T.4 (R) | <ul style="list-style-type: none"> • DISR |
| VoIP | No | Data | <ul style="list-style-type: none"> • Modem (VBD) (R) • 56 kbps switched data (R) • 64 kbps switched data (R: BRI only) • NX56 synchronous BER (R: BRI only) • NX64 synchronous BER (R: BRI only) • Secure data (STE/STU-III) (R) | <ul style="list-style-type: none"> • CJCSI 6215.01C • UCR Section 3.10 • UCR Section 3.10 • UCR Section 3.10 • UCR Section 3.10 • CJCSI 6215.01C |
| | | VTC | <ul style="list-style-type: none"> • ITU-T H.320 (R: BRI only) | <ul style="list-style-type: none"> • FTR 1080B-2002 |

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Table 2. DVX Requirements (continued)

| DSN Features & Capabilities | | | |
|--|-----------------|---|--|
| Feature/ Capability | Critical | Requirements Required or Conditional | References |
| Common Features | Yes | <ul style="list-style-type: none"> • Individual Lines (R) • Selective call rejection (C) • Denied originating service (C) • Code restriction and diversion (R) • 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 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) | <ul style="list-style-type: none"> • UCR Section 2.1 • UCR Section 2.1.2 • UCR Section 2.1.3 • UCR Section 2.1.4 • UCR Section 2.1.5 • UCR Section 2.1.6 • UCR Section 2.1.7 • UCR Section 2.1.7.1 • UCR Section 2.1.7.2 • UCR Section 2.1.7.3 • UCR Section 2.1.7.4 • UCR Section 2.1.7.5 • UCR Section 2.1.7.6 • UCR Section 2.1.7.7 • UCR Section 2.1.7.8 • UCR Section 2.1.8.1 • UCR Section 2.1.8.2 • UCR Section 2.1.8.3 • UCR Section 2.1.8.4 • UCR Section 2.1.9 • UCR Section 2.7 • UCR Section 2.9 |
| Attendant | No | <ul style="list-style-type: none"> • Attendant Features (C) | <ul style="list-style-type: none"> • UCR Section 2.2 |
| Public Safety | Yes | <ul style="list-style-type: none"> • Basic Emergency Service (911) Caller (C) • Emergency Service (911) Public Safety Answering Point (C) • Enhanced Emergency Service (E911) (C) • Trace of terminating calls (R) • Outgoing call trace (R) • Tandem call trace (R) • Trace of a call in progress (R) | <ul style="list-style-type: none"> • UCR Section 2.4.1.1 • UCR Section 2.4.1.2 • UCR Section 2.4.1.3 • UCR Section 2.4.2 • UCR Section 2.4.3 • UCR Section 2.4.4 • UCR Section 2.4.5 |
| Conferencing | Yes | <ul style="list-style-type: none"> • Preset Conferencing (R) • Conference Notification Recorded Announcement (R) • Automatic Retrial and Alternate Address (R) • Bridge Release (R) • Lost Connection to Conferee or Originator (R) • Secondary Conferencing (R) • Meet-Me Conferencing (C) • Progressive Conferencing (C) | <ul style="list-style-type: none"> • UCR Section A2.3.3 • UCR Section 2.6.2 • UCR Section 2.6.3 |
| Nailed-up Connections | No | <ul style="list-style-type: none"> • Nailed-Up Connection (C) | <ul style="list-style-type: none"> • UCR Section 2.8 |
| DSN Hotline Services | Yes | <ul style="list-style-type: none"> • DSN Analog Hotline Service (R) • DSN ISDN Hotline Service (R) • Classmarking (R) • Protected Hotline Calling (R) • Hotline Service Protection (R) • Non-Pair Protected Hotline Calling (R) • Pair Protected Hotline Calling (R) | <ul style="list-style-type: none"> • UCR Section 2.12 • UCR Section 2.12 • UCR Section 2.12 • UCR Section 2.12.1 • UCR Section 2.12.2 • UCR Section 2.12.3 • UCR Section 2.12.4 |

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Table 2. DVX Requirements (continued)

| DSN Features & Capabilities | | | |
|-----------------------------|----------|---|---|
| Feature/ Capability | Critical | Requirements Required or Conditional | References |
| MLPP | Yes | <ul style="list-style-type: none"> • MLPP Overview (R) • Precedence Levels (R) • Announcements (R) • Attendant Queue Announcement (C) • Loss of C2 Announcement (C) • Invocation and Operation (R) • Preemption in the Network (R) • Network Facility with Lower Precedence Calls (R) • Cancel to / Cancel from (C) • Network Facility with Equal or Higher Precedence Calls (R) • MLPP Trunk Selection (R) • Hunt Sequence for Trunks (R) • ROUTINE Precedence Calls (R) • Precedence Calls Above ROUTINE Precedence (R) • Method 1 (R) • Method 2 (C) • MLPP Interworking with Other Networks (R) • Precedence Call Diversion (R) • Channel Associated Signaling (R) • Primary Rate Interface (R) • Common Channel Signaling Number 7 (C) • Analog Line MLPP (R) • ISDN MLPP Basic Rate Interface General Description (C) • Single B Channel, Single Appearance, Single DN (C) • Line Active with a Lower Precedence Call (C) • Line Active with a Equal or Higher Precedence Call (C) • Single B Channel, Multiple Appearances, Single DN (C) • Two B Channels, Multiple Appearances, Single DN (C) • Two B Channel, Two DN (Data Mode Only) (C) • ISDN Primary Rate Interface (R) • Precedence Call Waiting (C) • Call Forwarding (C) • Call Transfer (C) • Call Hold (C) • Three-Way Calling (C) • Call Pickup (C) • Conferencing (C) • Multiline Hunt Group (C) • Community of Interest (C) • MLPP Common Channel Signaling Number 7 (C) • CAS to CCS Trunk Network in a Mixed Media Network (C) • MLPP Interaction with EKTS features (C) • Network Management Manual Controls (C) • Data Collection (R) | <ul style="list-style-type: none"> • UCR Section 3.1 • UCR Section 3.1.2 • UCR Section 3.1.3 • UCR Section 3.1.3 • UCR Section 3.1.3 • UCR Section 3.1.4 • UCR Section 3.1.4 • UCR Section 3.2 • UCR Section 3.2.1 • UCR Section 3.2.1.1 • UCR Section 3.2.2 • UCR Section 3.2.3 • UCR Section 3.2.3.1 • UCR Section 3.2.3.1.1 • UCR Section 3.2.3.1.2 • UCR Section 3.2.3.1.2.1 • UCR Section 3.2.3.1.2.2 • UCR Section 3.2.4 • UCR Section 3.3 • UCR Section 3.4.1 • UCR Section 3.4.2 • UCR Section 3.4.3 • UCR Section 3.5 • UCR Section 3.6.1 • UCR Section 3.6.2 • UCR Section 3.6.2.1 • UCR Section 3.6.2.2 • UCR Section 3.6.3 • UCR Section 3.6.4 • UCR Section 3.6.5 • UCR Section 3.7 • UCR Section 3.8.1 • UCR Section 3.8.2 • UCR Section 3.8.3 • UCR Section 3.8.4 • UCR Section 3.8.5 • UCR Section 3.8.6 • UCR Section 3.8.7 • UCR Section 3.8.8 • UCR Section 3.8.9 • UCR Section 3.9 • UCR Section 3.10 • UCR Section 3.11 • UCR Section 3.13 • UCR Section 3.14 |

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Table 2. DVX Requirements (continued)

| DSN Features & Capabilities | | | |
|--|-----------------|--|---|
| Feature/ Capability | Critical | Requirements Required or Conditional | References |
| Call Processing | Yes | <ul style="list-style-type: none"> • Call Treatments (R) • Primary and Alternate Routing (R) • 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 Interswitch Trunk Call Processing (non-CCS/ISDN) (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 (C) • DSN Switch Outpulsing Digit Formats (R) • Standard Directory Number (R) • Standard Test Numbers (C) • Base Services – Abbreviated Numbers (R) • Digit Reception Requirements (R) • Digit Registration Capacity (R) • Screening (R) • Additional Dialing format for Coalition Forces (R) | <ul style="list-style-type: none"> • UCR Section 4.1 • UCR Section 4.2 • UCR Section 4.3.1 • UCR Section 4.3.2 • UCR Section 4.3.3 • UCR Section 4.3.4 • UCR Section 4.4 • UCR Section A2.3.4 • UCR Section 4.5.1.2 • UCR Section 4.5.1.2.1 • UCR Section 4.5.1.2.2 • UCR Section 4.5.1.3 • UCR Section 4.5.1.3.1 • UCR Section 4.5.1.3.2 • UCR Section 4.5.1.3.3 • UCR Section 4.5.1.4 • UCR Section 4.5.1.5 • UCR Section 4.5.1.6 • UCR Section 4.5.1.7 • UCR Section 4.5.1.8.1 • UCR Section 4.5.1.8.2 • UCR Section 4.5.1.9 • UCR Section 4.5.2 • UCR Section 4.5.3 • UCR Section 4.5.4 • UCR Section 4.5.5 • UCR Section 4.5.6 • UCR Section 4.5.7 • UCR Section 4.5.8 • UCR App. 2, para A2.3.4 |
| Network Management | Yes | <ul style="list-style-type: none"> • Interfaces (R) • Data Quality (R) • Traffic Measurements (R) • Reference Data (C) • Line Servicing (C) • Trunk Groups (C) • Call Processors (C) • Switch Services (C) • Special Studies (C) • Remote Switching Studies (C) • Features (C) • Common Channel Signaling Network Measurements (C) • ISDN Measurements (C) • Traffic Capacity (R) • Fault management (R) • Configuration management (R) • Call Detail Recording Data Retention (C) • Network Management controls (C) • Remote access (R) | <ul style="list-style-type: none"> • UCR Section A2.3.6 • UCR Section 9.2.1 • UCR Section 9.2.2.1.1 • UCR Section 9.2.2.1.2 • UCR Section 9.2.2.2 • UCR Section 9.2.2.3 • UCR Section 9.2.2.4 • UCR Section 9.2.2.5 • UCR Section 9.2.2.6 • UCR Section 9.2.2.7 • UCR Section 9.2.2.8 • UCR Section 9.2.3 • UCR Section 9.2.4 • UCR Section 9.2.5 • UCR Section 9.3 • UCR Section 9.4 • UCR Section 9.5.2 • UCR Section 9.7 • UCR Section 9.8 |

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Table 2. DVX Requirements (continued)

| DSN Features & Capabilities (continued) | | | |
|---|----------|---|---|
| Feature/ Capability | Critical | Requirements Required or Conditional | References |
| ISDN Services | Yes | <ul style="list-style-type: none"> • ISDN BRI signaling (C) • BRI Access, Call Control and Signaling (C) • Uniform Interface Configuration for BRIs (C) • Electronic Key Telephone Systems (EKTS) (C) • PRI Access, Call Control and Signaling (R) • PRI Features (C) • Packet Data Features and Capabilities (C) | <ul style="list-style-type: none"> • UCR App. 2, para. A2.3.4 • UCR Section 10, Table 10-1 • UCR Section 10, Table 10-2 • UCR Section 10, Table 10-3 • UCR Section 10, Table 10-4 • UCR Section 10, Table 10-5 • UCR Section 10, Table 10-6 |
| Synchronization | Yes | <ul style="list-style-type: none"> • External Timing Mode (C) • Line timing mode (R) • General (C) • Internal Stratum 4 (R) • Synchronization Performance Monitoring Criteria (C) • DS1 Traffic Interfaces (C) • DS0 Traffic Interconnects (C) | <ul style="list-style-type: none"> • UCR Section 11.1.1.1 • UCR Section A2.3.9 • UCR Section 11.1.2.1 • UCR Section 11.1.2.2 • UCR Section 11.2 • UCR Section 11.3 • UCR Section 11.4 |
| Reliability (See note 1.) | No | <ul style="list-style-type: none"> • Reliability Requirements (C) | <ul style="list-style-type: none"> • UCR Section 12.1 |
| Security | No | <ul style="list-style-type: none"> • GR-815, STIGs, and DoDI 8510.bb (DIACAP) (R) | <ul style="list-style-type: none"> • UCR Section 13 |
| VoIP | | | |
| VoIP System | No | <p>VoIP function is conditional. If VoIP is provided, all of the following requirements must be met:</p> <ul style="list-style-type: none"> • Voice Quality with MOS of 4.0 or better (R) • ITU-T G.711 PCM CODEC (R) • MLPP (R) • Security (R) • Network management (R) • System timing (R) • Latency ≤ 60 milliseconds (R) • IPv6 capable (R) • Service Class Tagging (R) • VoIP System Downtime (IP network 35 min/yr Subscriber 12 min/yr) (C) | <ul style="list-style-type: none"> • UCR App. 3, para. A3.2.1 • UCR App. 3, para. A3.2.2 • UCR App. 3, para. A3.2.3 • UCR App. 3, para. A3.2.4 • UCR App. 3, para. A3.2.5 • UCR App. 3, para. A3.2.6 • UCR App. 3, para. A3.2.7 • UCR App. 3, para. A3.2.8 • UCR App. 3, para. A3.2.9 • UCR App. 3, para. A3.2.10 |
| Network Gateways | | | |
| Interface | Critical | Requirements Required or Conditional | References |
| PSTN (See note 2.) | Yes | <p>Trunking</p> <ul style="list-style-type: none"> • Positive Identification Control (C) • On-Netting (C) • Off-Netting (C) • Ground Start Line (R) • Immediate Start (C) | <ul style="list-style-type: none"> • CJCSI 6215.01C • CJCSI 6215.01C • CJCSI 6215.01C • UCR Section 5.2.2 • UCR Section 5.3.2 |
| NOTES: | | | |
| 1 Backup power, power components, UPS requirements, UPS load capacity and alarms are non-testable requirements. It is the responsibility of the respective base/post/camp/station communication agency to provide this with the SUT when installed. | | | |
| 2 Voice, facsimile, data, and VTC service requirements for PSTN are identical to DSN with the exception of MLPP. | | | |

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Table 2. DVX Requirements (continued)

| LEGEND: | | | | | | |
|----------------|---|----------------------|--|---------|--|--|
| 2W | 2-Wire | EKTS | Electronic Key Telephone System | PCM-24 | Pulse Code Modulation - 24 Channels | |
| 802.3u | Standard for carrier sense multiple access with collision detection at 100 Mbps | FTR | Federal Telecommunications Recommendation | PCM-30 | Pulse Code Modulation - 30 Channels | |
| ANSI | American National Standards Institute | FTR 1080B-2002 G.711 | Video Teleconferencing Services Standard for PCM of Voice Frequencies | PIPT | Proprietary Internet Protocol Trunk | |
| App | Appendix | GR | Generic Requirement (Telcordia) | PRI | Primary Rate Interface | |
| BER | Bit Error Ratio | GR-815 | Generic Requirements For Network Element/Network System (NE/NS) Security | PSTN | Public Switched Telephone Network | |
| BRI | Basic Rate Interface | | Standard for Narrowband VTC | Q.735.3 | SS7 Signaling Standard for E1 MLPP | |
| C | Conditional | | Institute of Electrical and Electronics Engineers | Q.955.3 | ISDN Signaling Standard for E1 MLPP | |
| C2 | Command and Control | H.320 | Internet Protocol | R | Required | |
| CAS | Channel Associated Signaling | IEEE | Internet Protocol version 6 | SS7 | Signaling System 7 | |
| CCS | Common Channel Signaling | IP | Integrated Services Digital Network | STE | Secure Terminal Equipment | |
| CJCSI | Chairman of the Joint Chiefs of Staff Instruction | IPv6 | Information Technology | STIGs | Security Technical Implementation Guides | |
| DIACAP | DoD Information Assurance Certification and Accreditation Process | ISDN | International Telecommunication Union - Telecommunication Standardization Sector | STU-III | Secure Telephone Unit – 3 rd Generation | |
| DISR | DoD IT Standards Registry | IT | Multi-Frequency Recommendation 1 | S/T | ISDN BRI 4-wire interface | |
| DoD | Department of Defense | ITU-T | minute | T1 | Digital Transmission Link Level 1 (1.544 Mbps) | |
| DoDI | Department of Defense Instruction | | kbps | T.4 | Standardization of Group 3 facsimile terminals for document transmission | |
| DP | Dial Pulse | | Mbps | | SS7 and ISDN MLPP Signaling Standard for T1 | |
| DN | Directory Number | | MFR1 | | Telecommunications Industry Association | |
| DS0 | Digital Signal Level 0 (64 kbps) | min | | T1.619a | Time Division Multiplexing | |
| DS1 | Digital Signal Level 1 (1.544 Mbps) (2.048 Mbps European) | MLPP | | TIA | Unified Capabilities Requirements | |
| DSN | Defense Switched Network | MOS | | TDM | Uninterruptible Power Supply | |
| DTMF | Dual Tone Multi-Frequency | NI 1/2 | | UCR | Variable bit data | |
| DVX | Deployable Voice Exchange | NX56 | | UPS | Voice over Internet Protocol | |
| E&M | Ear and Mouth | NX64 | | VBD | Video Teleconferencing | |
| E1 | European Basic Multiplex Rate (2.048 Mbps) | para | | VoIP | year | |
| | | PBX | | VTC | | |
| | | PCM | | yr | | |

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). 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.

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FOR THE COMMANDER:

Enclosure a/s


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DOT&E, Net-Centric Systems and Naval Warfare

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Defense Intelligence Agency

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U.S. Joint Forces Command, Net-Centric Integration, Communication, and Capabilities
Division, J68

Defense Information Systems Agency, GS23

ADDITIONAL REFERENCES

- (c) Joint Interoperability Test Command, Memo, JTE, "Special Interoperability Test Certification of REDCOM High Density Exchange (HDX) with Software Release 3.0A, Revision 3, with Specified Patch Group 0 (3.0A R3P0), certified as a Deployable Voice Exchange (DVX)," 29 January 2009
- (d) Joint Interoperability Test Command, "Information Assurance (IA) Assessment of REDCOM High Density Exchange (HDX) with Software Release 3.0A Revision 3, with Specified Patch Group 0 (3.0A R3P0) (Tracking Number 0807201)," 13 January 2009
- (e) 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
- (f) Defense Information Systems Agency, "Department of Defense Networks Unified Capabilities Requirements," 21 December 2007
- (g) Joint Interoperability Test Command, "Defense Switched Network Generic Switch Test Plan (GSTP), Change 2," 2 October 2006