



DEFENSE INFORMATION SYSTEMS AGENCY

P. O. BOX 549
FORT MEADE, MARYLAND 20755-0549

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

5 Oct 11

MEMORANDUM FOR DISTRIBUTION

SUBJECT: Extension of the Special Interoperability Test Certification of Siemens HiPath 4000 Version 5.0

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 (h), 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 Siemens HiPath 4000 Version 5.0 is hereinafter referred to as the System Under Test (SUT). The SUT meets all of its critical interoperability requirements and is certified as interoperable for joint use within the Defense Information System Network (DISN) for the following switch types: Private Branch Exchange (PBX) 1 and PBX 2. The SUT meets the critical interoperability requirements with any certified Assured Services Local Area Network (ASLAN) or ASLAN components on the Unified Capabilities (UC) Approved Products List (APL). The identified test discrepancies shown in the Certification Testing Summary (Enclosure 2) have an overall minor operational impact. 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 Defense Information Assurance (IA)/Security Accreditation Working Group (DSAWG) accreditation.
3. The extension of this certification is based upon Desktop Review (DTR) 1. The original certification is based on Interoperability testing of the SUT which was conducted at JITC's Global Information Grid Network Test Facility at Fort Huachuca, Arizona, from 11 May through 2 July 2009. Review of vendor's LoC was completed on 9 September 2009. Regression Testing was conducted from 7 through 18 December 2009. The DISA adjudication of outstanding test discrepancy reports was completed on 21 July 2009. The DSAWG granted accreditation on 4 January 2011. This DTR was requested to include the Siemens-MicroAutomation CallCenter Millennium (CCM) Customer Premises Equipment (CPE), E-911 capability as an optional enhancement to the SUT. JITC determined Verification and Validation (V&V) testing was required prior to DTR approval. This E-911 capability was V&V tested for IA and Interoperability (IO) with the SUT from 18 through 22 July 2011. There were no IA or IO issues

during this test window; therefore, JITC approves this DTR. DISA CA provided a positive recommendation for this DTR on 29 September 2011.

4. The IO test summary of the SUT is indicated in Table 1. The PBX 1 Capability Requirements (CRs) and Functional Requirements (FRs) are listed in Table 2. The CCM CPE E-911 system configurations are depicted in Table 3. The CCM CPE E-911 test configuration is depicted in Figure 1. This IO test status is based on the SUT's ability to meet:

- a. Defense Switched Network (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 in accordance with Reference (f) and/or vendor submission of LoC.
- c. PBX 1 CRs/FRs specified in Reference (e) verified through JITC testing in accordance with Reference (f) and/or vendor submission of LoC.
- d. Internet Protocol CRs/FRs specified in References (e) and (g) verified through JITC testing in accordance with Reference (f) and/or vendor submission of LoC.
- e. Softphone CRs/FRs specified in References (e) and (h) verified through JITC testing in accordance with Reference (f) and/or vendor submission of LoC.
- f. 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, DP)	No	Certified	Met all critical CRs and FRs with the following minor exception: Wink start recognition is not within the UCR specifications. ¹
E1 CAS (DTMF, DP)	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 with the following exception: The SUT does not support NFAS. ²
E1 ISDN PRI (ITU-T Q.955.3)	No (Europe only)	Certified	Met all critical CRs and FRs.
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 exception. Analog phones do not support call waiting or precedence call waiting. ³
ISDN BRI NI 1/2 (ANSI T1.619a)	No	Certified	The SUT met all critical CRs and FRs for the ISDN BRI S/T interface with the following minor exceptions: The ISDN BRI S/T interface does not support Call Transfer or Three-Way-Calling. ⁴ The SUT does not support ISDN BRI U interface. ISDN BRI is not a required interface for a PBX 1. There is no risk associated with the SUT not supporting this interface.
2-Wire Proprietary Digital	No	Certified	Met all critical CRs and FRs.
VoIP (Ethernet IEEE 802.3u)	No	Certified	Met all critical CRs and FRs.

Table 1. SUT Interoperability Test Summary (continued)

DSN Features and Capabilities				
Features and Capabilities	Critical	Status	Remarks	
Common Features	Yes	Certified	Met all critical CRs and FRs with the following minor exceptions: The SUT does not provide the exact conference disconnect tone in accordance with the UCR. ⁵ The SUT fails to provide a 0.5 second ring on phone provisioned with Call Forward Variable. ⁶ Analog phones do not support Call Waiting. ³	
Attendant	No	Not Tested	This feature is supported by the SUT; however it was not tested. The feature is therefore not certified by JITC. This is not a required feature for a PBX 1.	
DSN Features and Capabilities (continued)				
Public Safety	Yes	Certified	The SUT met all critical CRs and FRs for Basic 911. Additionally the SUT met the following non-critical CRs and FRs: Tracing of a Terminating Call, Outgoing Call Tracing, and Trace of a Call in Progress.	
Conferencing	No	Not Tested	This feature is supported by the SUT; however it was not tested. This feature is therefore not certified by JITC. This is not a required feature for a PBX 1.	
Nailed-up Connections	No	Not Tested	This feature is not supported by the SUT. This is not a required feature for a PBX1. There is no risk associated with the SUT not supporting this feature.	
DSN Hotline Services	No	Certified	Met all critical CRs and FRs.	
MLPP	Yes	Certified	Met all critical CRs and FRs with the following minor exceptions: Analog phones do not support call waiting or precedence call waiting. ³ The SUT does not support Loss of C2 User announcement. ⁷	
Call Processing	Yes	Certified	Met all critical CRs and FRs.	
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.	
Network Management	No	Certified	Met all CRs and FRs with an IEEE 802.3u interface.	
Security	Yes	Certified ⁸	Met all critical CRs and FRs.	
VoIP System	No	Certified	Met all critical CRs and FRs with the following minor exception: The SUT did not meet the IPv6 capability requirements. ⁹	
Softphone	No	Certified	Met all critical CRs and FRs.	
Network Gateways				
Gateway	Interface & Signaling	Critical	Status	Remarks
PSTN	T1 CAS (DTMF, DP)	No	Certified	Met all critical CRs and FRs.
	E1 CAS (DTMF, DP)	No (Europe only)	Certified	Met all critical CRs and FRs.
	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)	Certified	Met all critical CRs and FRs.
	Ground Start Line	Yes	Certified	Met all critical CRs and FRs.

Table 1. SUT Interoperability Test Summary (continued)

NOTES:			
1	The SUT T1 CAS wink start recognition is not within specification in accordance with the UCR, Section 5.2.4.3.5. The requirement is to recognize a wink start signal from 100 ms to 350 ms. The SUT recognizes a wink start signal from 85 ms to 365 ms. This discrepancy was previously adjudicated by DISA as having minor operational impact.		
2	The SUT does not support NFAS on their ISDN PRI NI2 interface. This was adjudicated by DISA on 17 December 2008 as having a minor operational impact. Furthermore, DISA, in coordination with the Joint Staff, stated their intent to modify the next update of the UCR to change NFAS for a PBX 1 from required to conditional.		
3	The SUT analog end instruments do not support the following required features: Call Waiting or Precedence Call Waiting. This was adjudicated by DISA on 21 July 2009 as having minor operational impact.		
4	The SUT ISDN BRI S/T interface does not support Call Transfer or Three-Way Calling. This was adjudicated by DISA on 21 July 2009 as having minor operational impact.		
5	The SUT does not provide the correct conference disconnect tone in accordance with the UCR, Table 5.2.4-5. This was adjudicated by DISA on 21 July 2009 as having minor operational impact.		
6	The SUT does not provide 'Ping' Ring when CFV is activated. This was adjudicated by DISA on 21 February 2009 as having a minor operational impact. Also, this is not a required feature for a PBX 1. There is no risk associated with the SUT not supporting this feature.		
7	The SUT does not support the Loss of C2 announcement. This announcement is invoked only when a DSN subscriber is automatically routed to a non-MLPP network. DISA adjudicated this anomaly as having a minor operational impact because this announcement would rarely be invoked on a PBX 1. Furthermore, DISA, in coordination with the Joint Staff, stated their intent to modify the next update of the UCR to change the Loss of C2 announcement from required to conditional for a PBX 1.		
8	Security is tested by DISA-led Information Assurance test teams and published in a separate report, Reference (d).		
9	In accordance with UCR, section 5.3.5, all systems submitted for testing must be IPv6 capable. Dual Stack solutions are preferred and tunneling solutions are unacceptable. In accordance with UCR, section 4.3.1.3, IPv6 capable-products, can create or receive, process, and send or forward (as appropriate) IPv6 packets in mixed IPv4/v6 environments. IPv6 capable products shall be able to interoperate with other IPv6 capable products on networks supporting only IPv4, only IPv6, or both IPv4 and IPv6, and shall also:		
	a.	Conform to the requirements of the DoD IPv6 Standard Profiles for IPv6 Capable Products document contained in the DISR.	
	b.	Possess a migration path and/or written commitment to upgrade from the developer (company Vice President or equivalent) as the IPv6 standard evolves.	
	c.	Ensure product developer IPv6 technical support is available.	
	d.	Conform to NSA and/or Unified Cross Domain Management Office requirements for Information Assurance products. The vendor stated in their LoC that the SUT will not be IPv6 compliant until the next software release and requested a waiver from OSD of this requirement until June of 2010. The OSD waived this requirement for the SUT on 12 November 2008 with the stipulation that the vendor submit this new release for testing via the Unified Capabilities Certification Office after June 2010.	
LEGEND:			
802.3u	Standard for carrier sense multiple access with collision detection at 100 Mbps	LoC	Letter of Compliance
ANSI	American National Standards Institute	LSSGR	Local Access and Transport Area (LATA) Switching Systems Generic Requirements
BRI	Basic Rate Interface	Mbps	Megabits per second
C2	Command and Control	MLPP	Multi-Level Precedence and Preemption
CAS	Channel Associated Signaling	ms	milliseconds
CFV	Call Forward Variable	NFAS	Non-Facility Associated Signaling
CR	Capability Requirements	NI 1/2	National ISDN Standard 1 or 2
DISA	Defense Information Systems Agency	NI2	National ISDN Standard 2
DISR	DoD Information Technology Standards Registry	NSA	National Security Agency
DoD	Department of Defense	OSD	Office of the Secretary of Defense
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
FR	Functional Requirements	S/T	ISDN BRI 4-wire interface
GR	Generic Requirement	SS7	Signaling System 7
GR-506-CORE	LSSGR: Signaling for Analog Interfaces	SUT	System Under Test
IEEE	Institute of Electrical and Electronics Engineers	T1	Digital Transmission Link Level 1 (1.544 Mbps)
IPv4	Internet Protocol version 4	T1.607	ISDN Layer 3 Signaling Specification for Circuit Switched Bearer Service for DSS1
IPv6	Internet Protocol version 6		
ISDN	Integrated Services Digital Network	T1.619a	SS7 and ISDN MLPP Signaling Standard for T1
ITU-T	International Telecommunication Union - Telecommunication Standardization Sector	U	ISDN BRI 2-wire interface
JITC	Joint Interoperability Test Command	UCR	Unified Capabilities Requirements
		VoIP	Voice over Internet Protocol

Table 2. PBX 1 Requirements

DSN Trunk Interfaces					
Interface	Critical	Requirements ¹ Required or Conditional		References	
T1 CAS (MFR1, DTMF, DP)	No	Trunking	<ul style="list-style-type: none"> • 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) 	<ul style="list-style-type: none"> • 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 5.2.4.4.5 • 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 	
E1 CAS (MFR1, DTMF, DP)	No (Europe only)			<ul style="list-style-type: none"> • 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) 	<ul style="list-style-type: none"> • 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
T1 ISDN PRI NI 1/2 (ANSI T1.619a)	Yes				
E1 ISDN PRI (ITU-T Q.955.3)	No (Europe only)				

Table 2. PBX 1 Requirements (continued)

DSN Trunk Interfaces (continued)					
Interface	Critical	Requirements¹ Required or Conditional		References	
T1 CAS (MFR1, DTMF, DP)	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 CAS (MFR1, DTMF, DP)	No (Europe only)	Facsimile	<ul style="list-style-type: none"> • Analog: ITU-T T.4 (R) 	<ul style="list-style-type: none"> • DISR 	
T1 ISDN PRI NI 1/2 (ANSI T1.619a)	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 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 	
E1 ISDN PRI (ITU-T Q.955.3)	No (Europe only)	VTC	<ul style="list-style-type: none"> • ITU-T H.320 (R: PRI only) 	<ul style="list-style-type: none"> • FTR 1080B-2002 	
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 (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) • VoIP System Requirements (R: VoIP Phones only) 	<ul style="list-style-type: none"> • 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 • UCR Section 5.2.12.8 	
ISDN BRI NI 1/2 (ANSI T1.619a)	No			<ul style="list-style-type: none"> • MOS (R) • Secure Calls (R) 	<ul style="list-style-type: none"> • CJCSI 6215.01C • CJCSI 6215.01C
2-Wire Proprietary Digital	No			<ul style="list-style-type: none"> • Analog: ITU-T T.4 (R) 	<ul style="list-style-type: none"> • DISR
VoIP (Ethernet IEEE 802.3u)	No			<ul style="list-style-type: none"> • Modem (VBD) (R: 2-Wire Analog only) • Secure data (STE/STU-III) (R: 2-Wire Analog only) 	<ul style="list-style-type: none"> • CJCSI 6215.01C • CJCSI 6215.01C
		VTC	<ul style="list-style-type: none"> • ITU-T H.320 (C: BRI only) 	<ul style="list-style-type: none"> • FTR 1080B-2002 	
DSN Features & Capabilities					
Feature/ Capability	Critical	Requirements¹ Required or Conditional		References	
Common Features	Yes	<ul style="list-style-type: none"> • 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) 		<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • Attendant Features (C) 		<ul style="list-style-type: none"> • UCR Section 5.2.1.2.2 	

Table 2. PBX 1 Requirements (continued)

DSN Features & Capabilities			
Feature/ Capability	Critical	Requirements¹ Required or Conditional	References
Public Safety	Yes	<ul style="list-style-type: none"> • 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) 	<ul style="list-style-type: none"> • UCR Section 5.3.2.2.2.2.1 • UCR Section 5.3.2.2.2.2 • UCR Section 5.3.2.2.2.2.1 • UCR Section 5.3.2.2.2.2.2 • UCR Section 5.3.2.2.2.2.3
	No	<ul style="list-style-type: none"> • CPE Enhanced 911 PSAP Requirements 	<ul style="list-style-type: none"> • UCR Section 5.2.12.3
Conferencing	No	<ul style="list-style-type: none"> • Preset Conferencing (C) • Meet-Me Conferencing (C) • Progressive Conferencing (C) 	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • Nailed-Up Connections (C) 	<ul style="list-style-type: none"> • UCR Section 5.2.1.8
DSN Hotline Services	No	<ul style="list-style-type: none"> • DSN Analog Hotline Service (C) 	<ul style="list-style-type: none"> • UCR Section 5.2.1.12
MLPP	Yes	<ul style="list-style-type: none"> • 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) 	<ul style="list-style-type: none"> • 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

Table 2. PBX 1 Requirements (continued)

DSN Features & Capabilities (continued)			
Feature/ Capability	Critical	Requirements¹ Required or Conditional	References
Call Processing	Yes	<ul style="list-style-type: none"> • 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) 	<ul style="list-style-type: none"> • 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 5.2.3.5.1.1.1 • 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	<ul style="list-style-type: none"> • 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) 	<ul style="list-style-type: none"> • 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
Synchronization	Yes	<ul style="list-style-type: none"> • Line timing mode (R) • 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 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	<ul style="list-style-type: none"> • System Availability (R) • Backup Power (R) • Power Components (R) • UPS Requirements (R) • UPS PBX 1 Load Capacity (R) • Backup Power (Environmental) (R) • Alarms (R) 	<ul style="list-style-type: none"> • 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
Network Management	No	<ul style="list-style-type: none"> • Interfaces (R) • 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"> • UCR section 5.2.8.1 • UCR section 5.2.8.2 • UCR section 5.2.8.3 • UCR section 5.2.8.4 • UCR section 5.2.8.5 • UCR section 5.2.8.6 • UCR section 5.2.8.7 • UCR section 5.2.8.8
Security	Yes	<ul style="list-style-type: none"> • GR-815, STIGs, and DoDI 8510.bb (DIACAP) (R) 	<ul style="list-style-type: none"> • UCR Sections 3.2.3, 3.2.5, and 5.4.6.1

Table 2. PBX 1 Requirements (continued)

VoIP				
Feature/ Capability	Critical	Requirements¹ Required or Conditional		References
VoIP System	No	VoIP function is conditional. If VoIP is provided, all of the following requirements must be met: <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 (C) • System timing (R) • Latency ≤ 60 milliseconds (R) • IPv6 capable (R) • Service Class Tagging (R) • Softphone Requirements 		<ul style="list-style-type: none"> • 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 • DISA Memo Reference (h)
Network Gateways				
Gateway	Critical	Requirements¹ Required or Conditional		References
PSTN ²	No	Trunking	<ul style="list-style-type: none"> • Positive Identification Control (C) • On-Netting (C) • Off-Netting (C) • Ground Start Line (R) • Immediate Start (C) • Delay Dial (C) 	<ul style="list-style-type: none"> • 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
NOTES:				
1 All requirements are derived from the UCR 2008, Reference (c) with the exception of the voice quality, IPv6, and softphone requirements, because TDM requirements were not included in the UCR 2008, Change 2. The voice quality, IPv6, and softphone requirements are derived from the UCR 2008, Change 2, Reference (d).				
2 Voice, facsimile, data, and VTC service requirements for PSTN are identical to DSN with the exception of MLPP.				

Table 2. PBX 1 Requirements (continued)

LEGEND:					
ANSI	American National Standards Institute	FTR	Federal Telecommunications Recommendation	PBX 1	Private Branch Exchange 1
BER	Bit Error Ratio	FTR 1080B-2002	Video Teleconferencing Services	PCM	Pulse Code Modulation
BRI	Basic Rate Interface			PCM-24	Pulse Code Modulation - 24 Channels
C	Conditional	G.711	PCM of voice frequencies	PCM-30	Pulse Code Modulation - 30 Channels
CAS	Channel Associated Signaling	GR	Generic Requirement	PRI	Primary Rate Interface
CJCSI	Chairman of the Joint Chiefs of Staff Instruction	GR-815	Generic Requirements For Network Element/Network System (NE/NS) Security	PSTN	Public Switched Telephone Network
CODEC	Coder/Decoder	H.320	Standard for Narrowband VTC	Q.955.3	ISDN Signaling Standard for E1 MLPP
DIACAP	DoD Information Assurance Certification and Accreditation Process	IEEE	Institute of Electrical and Electronics Engineers	R	Required
DISA	Defense Information Systems Agency	IPv6	Internet Protocol version 6	S/T	ISDN BRI four-wire interface
DISR	DoD IT Standards Registry	ISDN	Integrated Services Digital Network	SS7	Signaling System 7
DoD	Department of Defense	IT	Information Technology	STE	Secure Terminal Equipment
DoDI	DoD Instruction	ITU-T	International Telecommunication Union - Telecommunication	STIGs	Security Technical Implementation Guides
DP	Dial Pulse			STU-III	Secure Telephone Unit -3rd generation
DS0	Digital Signal Level 0 (64 kbps)	kbps	Standardization Sector kilobits per second	T.4	Standardization of Group 3 facsimile terminals for document transmission
DS1	Digital Signal Level 1 (1.544 Mbps) (2.048 Mbps European)	Mbps MFR1	Megabits per second Multi-Frequency Recommendation 1	T1	Digital Transmission Link Level 1 (1.544 Mbps)
DSN	Defense Switched Network	MLPP	Multi-Level Precedence and Preemption	T1.619a	SS7 and ISDN MLPP Signaling Standard for T1
DSS1	Digital Subscriber Signaling 1	MOS	Mean Opinion Score	UCR	Unified Capabilities Requirements
DTMF	Dual Tone Multi-Frequency	NI 1/2	National ISDN Standard 1 or 2	UPS	Uninterruptible Power Supply
E&M	Ear and Mouth	NX56	Data format restricted to multiples of 56 kbps	VBD	Variable bit data
E1	European Basic Multiplex Rate (2.048 Mbps)	NX64	Data format restricted to multiples of 64 kbps	VoIP	Voice over Internet Protocol
EKTS	Electronic Key Telephone System	PBX	Private Branch Exchange	VTC	Video Teleconferencing

Table 3. CCM CPE E-911 Tested System Configurations

System Name	Hardware/Software Release		
Required Ancillary Equipment	Public Key Infrastructure		
Siemens HiPath 4000	Version 5		
Siemens EWSD	19d with Patch Set 46		
Avaya CS2100	Release SEO9.1		
SUT Optional Component System Name	Hardware/Software Release		
Siemens-MicroAutomation CTI Server System V2.5	Hardware	Card Name Part Number/Name	Application/Software
	CTI Server	N/A	Windows Server 2008 SP1
			CCM E-911 Base Server
			CCM E-911 ALI Server
			CCM E-911 CAD Server
			CCM E-911 Reporting Package
			CCM E-911 Test Facility
			MySQL
			JAVA 1.6
			Syntellect CT Connect 7.6

Table 3. CCM CPE E-911 Tested System Configurations (continued)

SUT Optional Component System Name	Hardware/Software Release																																		
	Hardware	Card Name	Application/Software																																
Siemens-MicroAutomation CTI Server System V2.5 (continued)	CTI Server	N/A	Siemens HiPath CAP																																
Siemens-MicroAutomation CAMA Gateway V2.5	PC Server	N/A	Windows Server 2008 SP1																																
Amtelco	PCB	H.100 PCI Express 8 Span T1 Board 259L002	Siemens-MicoAutomation Proprietary Embedded																																
Amtelco	PCB	H.100 24-port Station Board 259L031	Siemens-MicoAutomation Proprietary Embedded																																
HiPath optiClient Dispatch Workstation	PC Workstation	N/A	CCM E-911 ALI Display – JAVA																																
			JAVA 1.6																																
<p>LEGEND:</p> <table> <tr> <td>ALI</td> <td>Automatic Location Identification</td> <td>EWSD</td> <td>Elektronisches Wählsystem Digital</td> </tr> <tr> <td>CAD</td> <td>Computer Aided Dispatch</td> <td>JAVA</td> <td>Programming Language</td> </tr> <tr> <td>CAMA</td> <td>Centralized Automatic Message Accounting</td> <td>PC</td> <td>Personal Computer</td> </tr> <tr> <td>CAP</td> <td>Common Application Platform</td> <td>PCB</td> <td>Printed Circuit Board</td> </tr> <tr> <td>CCM</td> <td>CallCenter Millennium</td> <td>SP1</td> <td>Service Pack 1</td> </tr> <tr> <td>CPE</td> <td>Customer Premises Equipment</td> <td>SUT</td> <td>System Under Test</td> </tr> <tr> <td>CTI</td> <td>Computer Telephony Integration</td> <td>T1</td> <td>Digital Transmission Link Level 1 (1.544 Mbps)</td> </tr> <tr> <td>E911</td> <td>Enhanced 911</td> <td></td> <td></td> </tr> </table>				ALI	Automatic Location Identification	EWSD	Elektronisches Wählsystem Digital	CAD	Computer Aided Dispatch	JAVA	Programming Language	CAMA	Centralized Automatic Message Accounting	PC	Personal Computer	CAP	Common Application Platform	PCB	Printed Circuit Board	CCM	CallCenter Millennium	SP1	Service Pack 1	CPE	Customer Premises Equipment	SUT	System Under Test	CTI	Computer Telephony Integration	T1	Digital Transmission Link Level 1 (1.544 Mbps)	E911	Enhanced 911		
ALI	Automatic Location Identification	EWSD	Elektronisches Wählsystem Digital																																
CAD	Computer Aided Dispatch	JAVA	Programming Language																																
CAMA	Centralized Automatic Message Accounting	PC	Personal Computer																																
CAP	Common Application Platform	PCB	Printed Circuit Board																																
CCM	CallCenter Millennium	SP1	Service Pack 1																																
CPE	Customer Premises Equipment	SUT	System Under Test																																
CTI	Computer Telephony Integration	T1	Digital Transmission Link Level 1 (1.544 Mbps)																																
E911	Enhanced 911																																		

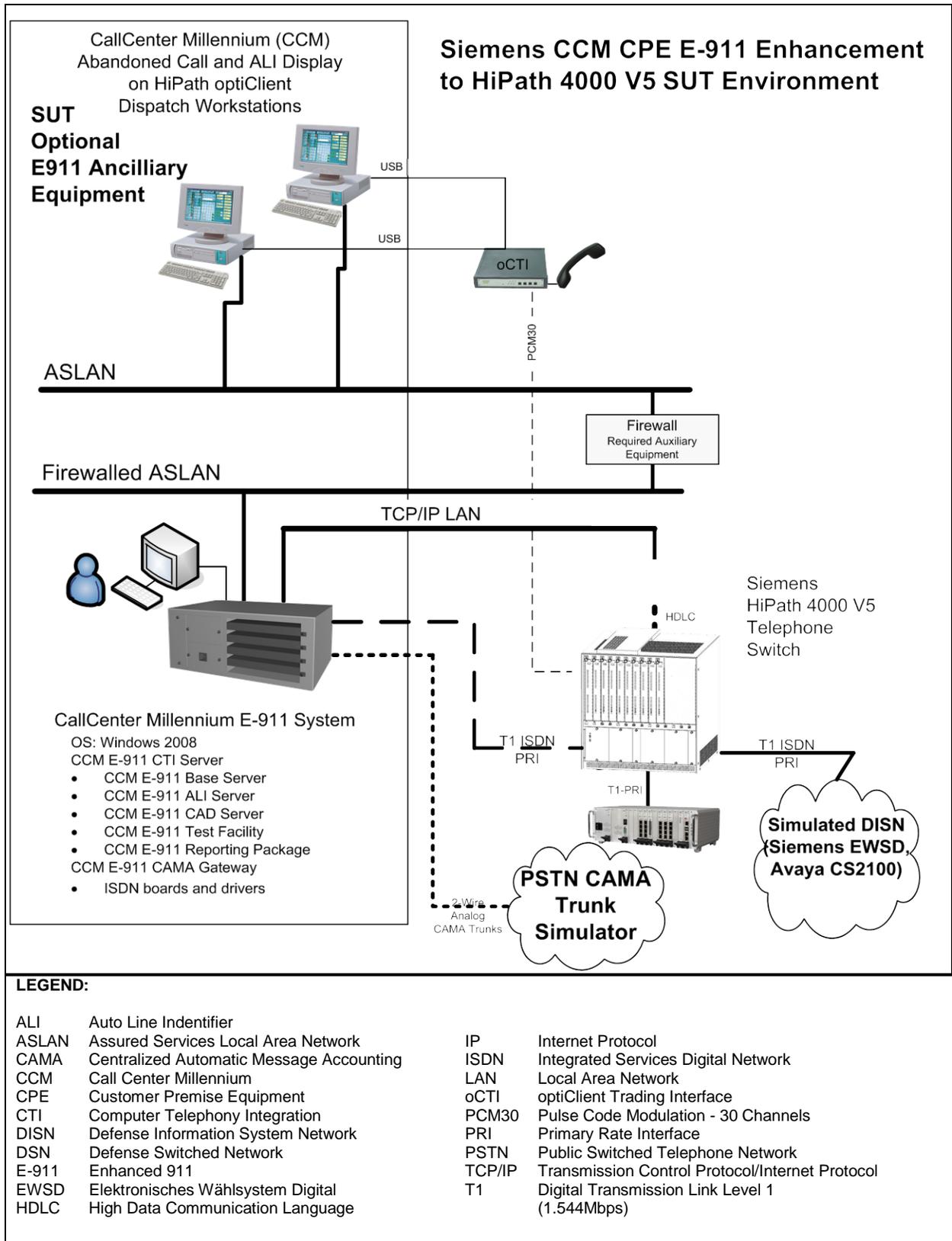


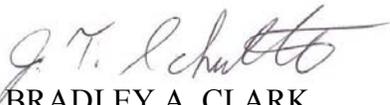
Figure 1. SUT Test Configuration

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 Mr. Cary Hogan, DSN 879-2589, commercial (520) 538-2589, FAX DSN 879-4347, or e-mail to cary.hogan@disa.mil. The JITC's mailing address is P.O. Box 12798, Fort Huachuca, AZ 85670-2798. The tracking number for this DTR is 0923002.

FOR THE COMMANDER:

Enclosure 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 MARCORSSYSCOM, 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) Joint Interoperability Test Command, "Information Assurance (IA) Assessment of Siemens HiPath 4000 Version 5 (TN0923002)," 4 January 2011
- (d) 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
- (e) Office of the Assistant Secretary of Defense, "Department of Defense Unified Capabilities Requirements 2008," 22 January 2009
- (f) Joint Interoperability Test Command, "Defense Switched Network Generic Switch Test Plan (GSTP), Change 2," 2 October 2006
- (g) Office of the Secretary of Defense, "Interim Unified Capabilities (UC) IPv6 Rules of Engagement (ROE)," 31 July 2009
- (h) Defense Information Systems Agency NS3 Memorandum, "Softphone Certification" 20 April 2009