DEFENSE INFORMATION SYSTEMS AGENCY
JOINT INTEROPERABILITY TEST COMMAND
P.O. BOX 12798
FORT HUACHUCA, ARIZONA 85670-2798

IN REPLY REFER TO: Battlespace Communications Portfolio (JTE) **19 July 2007**

MEMORANDUM FOR DISTRIBUTION

SUBJECT: Special Interoperability Test Certification of the Callware Technologies Callegra.UC™ Server with Software Release 6.14-Joint Interoperability Test Command (JITC)

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

1. References (a) and (b) establish the Defense Information Systems Agency, JITC, as the responsible organization for interoperability test certification. Additional references are provided in enclosure 1.

2. The Callware Technologies Callegra.UC™ Server with Software Release 6.14-JITC is hereinafter referred to as the System Under Test (SUT). The JITC suffix was attached to the SUT commercial software release 6.14 because it includes Defense Switched Network (DSN) military unique features. The SUT meets the interface requirements and all required functional capabilities and is certified for joint use within the DSN. The SUT met the interface and functional requirements for automated receiving devices set forth in appendix 7 of reference (c). The SUT offers integrated automated attendant (Auto Attendant) and voice messaging (Voicemail) functionality and included the following optional applications: CallegraVOICE™, CallegraFAX™, CallegraINBOX™, CallegraWEB™, CallegraCOMMUNITY™, and CallegraTTS™. The SUT also offers the Callegra.UC SDK™ application, which was not tested or certified and is not authorized for use on the DSN. All Callware applications run on the Callegra.UC™ Server and are administered using the included Microsoft Management Console (MMC) module. CallegraADMIN™ for MMC is an integral part of the SUT. The SUT was tested with the switching systems and their respective software releases listed in the Certification Testing Summary (enclosure 2). JITC analysis determined that there is a minor risk with including all certified DSN switching systems listed on the DSN Approved Products List (APL) that support the same SUT interfaces. The specific SUT applications certified on each interface are depicted in table 1. Testing was conducted using test procedures derived from reference (d).

The SUT is certified to support DSN assured services over IP with any Assured Services Voice Application Local Area Network (ASVALAN) on the DSN APL. The SUT is also certified for joint use with any Voice Application Local Area Network (VALAN) on the DSN APL. However, since VALANs do not support the Assured Services Requirements detailed in

reference (e), Command and Control (C2) users and Special C2 users are not authorized to be served by the SUT connected to a VALAN. The SUT does not provide Class of Service (CoS) 802.1p/Q tags and is certified only when connected to the ASVALAN at Core Layer 3. This certification expires upon changes that affect interoperability, but no later than three years from the date of this memorandum.

3. This certification is based on interoperability testing and review of the vendor's Letter of Compliance (LoC). Interoperability testing was conducted by JITC at the Global Information Grid Network Test Facility, Fort Huachuca, Arizona, from 30 April through 11 May 2007. Review of the vendor's LoC was completed on 1 June 2007. Enclosure 2 documents the test results and describes the test configuration. No other configurations, features, or functions, except those cited within this report, are certified or authorized for use within the DSN.

4. The Functional Requirements used to evaluate the interoperability of the SUT and the interoperability statuses are indicated in table 1. This interoperability test status is based on the SUT's ability to meet:

a. Automated receiving device requirements specified in reference (c) verified through JITC testing and/or vendor submission of LoC.

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

c. Assured services as defined in reference (e).

d. Internet Protocol version 6 requirements specified in reference (c), paragraph 1.7, table 1-4, by 30 June 2008 in accordance with reference (f) verified through vendor submission of LoC signed by the Vice President of the company.

Table 1. SUT Functional Requirements and Interoperability Status

Interface	Critical	Certified	Functional Requirements	Met	GSCR Paragraph
EIA-232 Serial	No[1]	Yes	ANSI/TIA/EIA-232-F (C)	Met	A7.5
2-Wire Analog (GR-506-CORE)[2] 2-Wire Digital Proprietary[3]	No[1]	Yes	FCC Part15/Part 68 (R)	Met	A7.5
			DTMF outpulsing (C)	Met	A7.5, 5.4.1, 5.4.2
			DISR compliance as applicable (R)	Met	A7.5
			ROUTINE precedence only in accordance with GSCR, Section 3.3 (R)	Met	A7.5.5
			TIA/EIA-470-B (R)	Met	A7.5.1
T1 CAS (DTMF) (Wink Start)[4]	No[1]	Yes	PCM-24 (R)	Met	A7.1
			DISR compliance as applicable (R)	Met	A7.5
			ROUTINE precedence only in accordance with GSCR, Section 3.3 (R)	Met	A7.5.5
T1 CAS (DTMF) (Ground Start)[5]	No[1]	Yes	PCM-24 (R)	Met	A7.1
			DISR compliance as applicable (R)	Met	A7.5
			ROUTINE precedence only in accordance with GSCR, Section 3.3 (R)	Met	A7.5.5
IP 100BaseT (IEEE 802.3u)[6]	No[1]	Yes	CoS (R)	Met	A3.3.2.1
			Traffic Prioritization (R)	Met	A3.3.2.2
			IEEE 802.3u (C)	Met	A7.5
			DISR compliance as applicable (R)	Met	A7.5
			ROUTINE precedence only in accordance with GSCR, Section 3.3 (R)	Met	A7.5.5
			IPv6 in accordance with GSCR, Section 1 (R)	Met[7]	A1.7
Security	Yes	See note 8.	Security (R)	See note 8.	A7.6

LEGEND:

5ESS	- Class 5 Electronic Switching System
100baseT	- 100 Mbps (Baseband Operation, Twisted Pair) Ethernet
802.3u	- Standard for carrier sense multiple access with collision detection at 100 Mbps
A	- Appendix
ANSI	- American National Standards Institute
APL	- Approved Products List
C	- Conditional
CAS	- Channel Associated Signaling
CoS	- Class of Service
DISA	- Defense Information Systems Agency
DISR	- Department of Defense Information Technology Standards Registry
DSN	- Defense Switched Network
DTMF	- Dual Tone Multi-Frequency
EIA	- Electronic Industries Alliance
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
EWSD	- Elektronisches Wählsystem Digital
FCC	- Federal Communications Commission
GR	- Generic Requirement
GR-506-CORE	- LSSGR: Signaling for Analog Interfaces
GSCR	- Generic Switching Center Requirements
IEEE	- Institute of Electrical and Electronics Engineers, Inc.
IP	- Internet Protocol
IPv4	- Internet Protocol version 4
IPv6	- Internet Protocol version 6
LSSGR	- Local Access and Transport Area (LATA) Switching Systems Generic Requirements
Mbps	- Megabits per second
PBX 1	- Private Branch Exchange 1
PCM-24	- Pulse Code Modulation - 24 Channels
PCM-30	- Pulse Code Modulation - 30 Channels
R	- Required
SUT	- System Under Test
T1	- Digital Transmission Link Level 1 (1.544 Mbps)
TIA	- Telecommunications Industry Association
TIA/EIA-470-B	- Performance and Compatibility Requirements for Telephone Sets with Loop Signaling

NOTES:

1 The Automated Receiving Device requirements can be met via one of the following interfaces: 2-Wire Analog, 4-Wire Digital, PCM-24, or PCM-30.

2 The SUT analog interface supports all of the SUT applications which include: Auto Attendant, Voicemail, CallegraVOICE™, CallegraFAX™, CallegraINBOX™, CallegraWEB™, CallegraCOMMUNITY™, and CallegraTTS™.

3 The digital proprietary interface supports the following SUT applications: Auto Attendant, Voicemail, CallegraVOICE™, CallegraINBOX™, CallegraWEB™, CallegraCOMMUNITY™, and CallegraTTS™. The SUT digital proprietary interface emulates the Nortel Meridian1 M2616 and the Avaya 8434D.

4 The SUT T1 CAS wink start interface supports the following SUT applications: Voicemail, CallegraFAX™, CallegraINBOX™, CallegraWEB™, CallegraCOMMUNITY™, and CallegraTTS™. The SUT is certified with this interface only with the Lucent 5ESS and Siemens EWSD switching systems listed on the DSN APL.

5 The SUT T1 CAS ground start interface supports all of the SUT applications which include: Auto Attendant, Voicemail, CallegraVOICE™, CallegraFAX™, CallegraINBOX™, CallegraWEB™, CallegraCOMMUNITY™, and CallegraTTS™.

6 The SUT IP interface supports the following SUT applications: Auto Attendant, Voicemail, CallegraINBOX™, CallegraWEB™, CallegraCOMMUNITY™, and CallegraTTS™. The SUT is certified with this interface specifically with the CISCO CallManager PBX 1 switching systems listed on the DSN APL.

7 An IPv6 capable system or product, as defined in the GSCR, paragraph 1.7, shall be capable of receiving, processing, and forwarding IPv6 packets and/or interfacing with other systems and protocols in a manner similar to that of IPv4. IPv6 capability is currently satisfied by a vendor Letter of Compliance signed by the Vice President of the company. The vendor must state, in writing, compliance to the following criteria by 30 June 2008**:**

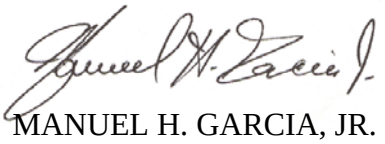
a. Conformant with IPv6 standards profile contained in the DISR.
b. Maintaining interoperability in heterogeneous environments and with IPv4.
c. Commitment to upgrade as the IPv6 standard evolves.
d. Availability of contractor/vendor IPv6 technical support.

8 Security is tested by DISA-led Information Assurance test teams and published in a separate report.

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), 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 Michael Napier, DSN 879-6787, commercial (520) 538-6787, FAX DSN 879-4347, or e-mail to michael.napier@disa.mil. The tracking number for the IP interface Cisco solution is 0703102. The tracking number for the TDM Solution is 0703103.

FOR THE COMMANDER:



2 Enclosures a/s

MANUEL H. GARCIA, JR.
Chief
Battlespace Communications Portfolio

JITC Memo, JTE, Special Interoperability Test Certification of the Callware Technologies Callegra.UC ™ Server with Software Release 6.14-Joint Interoperability Test Command (JITC)

Distribution:
Joint Staff J6I, Room 1E596, Pentagon, Washington, DC 20318-6000
Joint Interoperability Test Command, Liaison, ATTN: TED/JT1, 2W24-8C, P.O. Box 4502, Falls Church, VA 22204-4502
Defense Information Systems Agency, Net-Centricity Requirements and Assessment Branch, ATTN: GE333, Room 244, P.O. Box 4502, Falls Church, VA 22204-4502
Office of Chief of Naval Operations (N71CC2), CNO N6/N7, 2000 Navy Pentagon, Washington, DC 20350
Headquarters U.S. Air Force, AF/XICF, 1800 Pentagon, Washington, DC 20330-1800
Department of the Army, Office of the Secretary of the Army, CIO/G6, ATTN: SAIS-IOQ, 107 Army Pentagon, Washington, DC 20310-0107
U.S. Marine Corps (C4ISR), MARCORSYSCOM, 2200 Lester St., Quantico, VA 22134-5010
DOT&E, Net-Centric Systems and Naval Warfare, 1700 Defense Pentagon, Washington, DC 20301-1700
U.S. Coast Guard, CG-64, 2100 2nd St. SW, Washington, DC 20593
Defense Intelligence Agency, 2000 MacDill Blvd., Bldg 6000, Bolling AFB, Washington, DC 20340-3342
National Security Agency, ATTN: DT, Suite 6496, 9800 Savage Road, Fort Meade, MD 20755-6496
Director, Defense Information Systems Agency, ATTN: GS235, Room 5W24-8A, P.O. Box 4502, Falls Church, VA 22204-4502
Office of Assistant Secretary of Defense (NII)/DoD CIO, Crystal Mall 3, 7th Floor, Suite 7000, 1851 S. Bell St., Arlington, VA 22202
Office of Under Secretary of Defense, AT&L, Room 3E144, 3070 Defense Pentagon, Washington, DC 20301
U.S. Joint Forces Command, J68, Net-Centric Integration, Communications, and Capabilities Division, 1562 Mitscher Ave., Norfolk, VA 23551-2488
Defense Information Systems Agency (DISA), ATTN: GS23 (Mr. Osman), Room 5W23, 5275 Leesburg Pike (RTE 7), Falls Church, VA 22041

ADDITIONAL REFERENCES

(c) Defense Information Systems Agency (DISA), "Defense Switched Network (DSN) Generic Switching Center Requirements (GSCR), Errata Change 2," 14 December 2006

(d) Joint Interoperability Test Command, "Generic Switch Test Plan (GST), Change 2," 2 October 2006

(e) Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 6215.01B, "Policy for Department of Defense Voice Services," 23 September 2001

(f) Executive Office of the President, "Transition Planning for Internet Protocol version 6 (IPv6)," 2 August 2005

CERTIFICATION TESTING SUMMARY

1. SYSTEM TITLE. Callware Technologies Callegra.UC™ Server with Software Release 6.14-Joint Interoperability Test Command (JITC), hereinafter referred to as the System Under Test (SUT).

2. PROPONENT. Air Force Communications Agency (AFCA).

3. PROGRAM MANAGER. Mr. Terry Diurba, ECNV, 203 West Losey Street, Bldg. 1700, Room 3100, Scott AFB, IL, 62225, e-mail: terry.diurba@scott.af.mil.

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

5. SYSTEM UNDER TEST DESCRIPTION. The SUT offers an integrated automated attendant (Auto Attendant) and voice messaging (Voicemail) solution that expands to include speech recognition. The SUT also offers additional unified messaging advantages such as fax services, browser-based voice and fax messaging, and e-mail integration including text-to-speech. The SUT was designed with an extensible markup language based N-tier (N denotes any number; i.e., 2, 3, 10, etc.), object-oriented, distributed architecture allowing it to scale from a full-featured four-port voicemail system up to a very large network of unified communication installations. Client applications are supported on the desktop versions of Microsoft Windows that are approved for use within the Department of Defense. The SUT utilizes a graphical interface for system setup and administration. The JITC suffix was attached to the SUT commercial software release 6.14, because it includes Defense Switched Network (DSN) military unique features. The SUT offers both an integrated Auto Attendant and Voicemail functionality, and includes the following optional applications: CallegraVOICE™, CallegraFAX™, CallegraINBOX™, CallegraCOMMUNITY™, CallegraWEB™, and CallegraTTS™. The SUT also offers the Callegra.UC SDK™ application, which was not tested and is not covered under this certification. All Callware applications run on the Callegra.UC™ Server and are administered using the included Microsoft Management Console (MMC) module. CallegraADMIN™ for MMC is an integral part of the SUT. The following are descriptions of the applications covered by this certification:

The Callegra.UC™ Server offers integrated Auto Attendant and Voicemail and expands to include speech recognition. The following features are supported by this application:

- Multiple Private Branch Exchange (PBX) integration methods across multiple PBX manufacturers
- Diagnostic tracing
- Multi-tenanting
- Multi-site networking
- On-line help and documentation
- Fax tone auto-transfer
- Box alias table (inbound routing)
- Dial string translation (outbound routing)

The Auto Attendant can be used as the primary reception, answering all incoming calls, or it can be set up to provide overflow or secondary support for a live receptionist. The following features are supported by this application:

- "0" for operator or another extension
- Multiple call routing options. Audiotext boxes within Callegra systems can offer up to 250 distinct call routing options per box. Audiotext boxes are used mainly for auto attendant trees and can also be used for unlimited announcement applications, general information, and call routing capabilities without messaging capability
- Direct to voice mail transfer
- Directory look-up
- Scheduled greetings
- Holiday greetings
- Message edit and delivery options
- Auto transfers

CallegraADMIN™ for MMC is an integral part of the SUT. All Callware applications run on the Callegra.UC™ Server and are administered using the included MMC module. The following features are offered by this application:

- Local or remote access for Callegra administrators
- Real time dynamic box administration
- Global distribution lists
- System utilities

CallegraVOICE™ brings speech-enabled call routing and auto attendant functionality to the SUT through the use of speech recognition technology. The following features are supported by this application:

- Voice activated call routing
- Speech enabled employee directory
- Speech enabled directory for box owners

CallegraFAX™ module allows incoming faxes to be delivered to the SUT. The following features are supported by this application:

- Message waiting indicator
- Pager notification
- Telephone notification
- Directory look-up
- E-mail notification including Short Message Service (SMS) paging to compatible devices

CallegraWEB™ for Internet Explorer is a browser-based Internet client giving the SUT the ability to access and control voice and fax messages over the Internet. The following features are supported by this application:

- Accessing voice messages via the internet
- Accessing faxes via the internet

- Sending voice messages via the internet
- Sending faxes via the internet

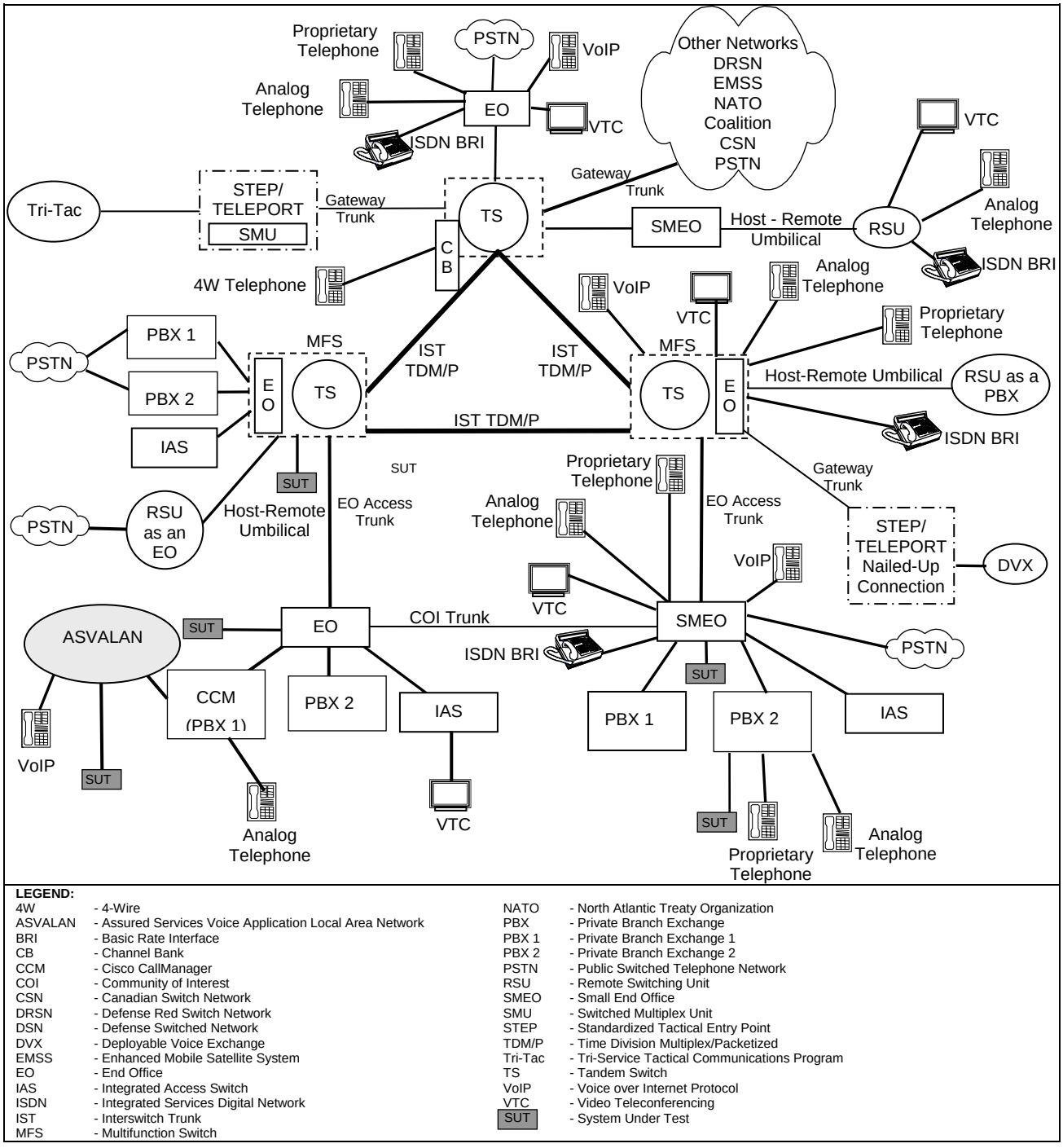
CallegraINBOX™ for Microsoft Outlook provides complete voice and fax integration with Microsoft Outlook. The following features are supported by this application:

- Microsoft Outlook 2000 and XP
- Windows 98, ME, NT4.0, 2000, XP
- Mail server independent
- Callegra options menu
- Passcode protected
- Telephone and multimedia support
- Intuitive visual message control
- Send and forward as e-mail
- Confidential and urgent messaging
- Integrated Callegra address book
- Fax print driver
- Fax viewers
- Xerox TextBridge Optical Character Recognition
- Sent fax log
- Message store controls
- Personal greeting controls
- Remote Internet Protocol (IP) access
- Notification control

CallegraCOMMUNITY**™** provides a method of sending voice messages from one Callegra.UC**™** system to another in a Callegra Voice Profile for Internet Mail (CVPIM) network environment. CallegraCOMMUNITY**™** will allow a network of independent Callegra.UC**™** systems to exchange messages in a loosely-coupled environment. This message exchange will be achieved through CVPIM. CVPIM is a method for encoding voicemail messages as data, enabling travel via the Simple Mail Transfer Protocol (SMTP) mail protocol over IP networks.

CallegraTTS™ provides callers with the ability to call into the Callegra.UC voice mail system and listen to their e-mail messages as they are converted from text to speech via the Telephone User Interface (TUI). CallegraTTS**™** also plays the distributed Datacenter server names when using CallegraCOMMUNITY**™** in a CVPIM IP network and outputs the information over the TUI.

6. OPERATIONAL ARCHITECTURE. The Generic Switching Center Requirements (GSCR) DSN architecture in figure 2-1 depicts the relationship of the SUT to the DSN switches.



LEGEND:

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

Figure 2-1. DSN Architecture

7. REQUIRED SYSTEM INTERFACES. Requirements specific to the SUT and interoperability results are listed in table 2-1. These requirements are derived from the GSCR Interface and Functional Requirements and were verified through JITC testing. The specific SUT applications certified on each interface are depicted in table 2-1.

Table 2-1. SUT Functional Requirements and Interoperability Status

Interface	Critical	Certified	Functional Requirements	Met	GSCR Paragraph
EIA-232 Serial	No[1]	Yes	ANSI/TIA/EIA-232-F (C)	Met	A7.5
2-Wire Analog (GR-506-CORE)[2] 2-Wire Digital Proprietary[3]	No[1]	Yes	FCC Part15/Part 68 (R)	Met	A7.5
			DTMF outpulsing (C)	Met	A7.5, 5.4.1, 5.4.2
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			Traffic Prioritization (R)	Met	A3.3.2.2
			IEEE 802.3u (C)	Met	A7.5
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			ROUTINE precedence only in accordance with GSCR, Section 3.3 (R)	Met	A7.5.5
			IPv6 in accordance with GSCR, Section 1 (R)	Met[7]	A1.7
Security	Yes	See note 8.	Security (R)	See note 8.	A7.6

LEGEND:

5ESS - Class 5 Electronic Switching System
100baseT - 100 Mbps (Baseband Operation, Twisted Pair) Ethernet
802.3u - Standard for carrier sense multiple access with collision detection at 100 Mbps
A - Appendix
ANSI - American National Standards Institute
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R - Required
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T1 - Digital Transmission Link Level 1 (1.544 Mbps)
TIA - Telecommunications Industry Association
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NOTES:

1 The Automated Receiving Device requirements can be met via one of the following interfaces: 2-Wire Analog, 4-Wire Digital, PCM-24, or PCM-30.
2 The SUT analog interface supports all of the SUT applications which include: Auto Attendant, Voicemail, CallegraVOICE™, CallegraFAX™, CallegraINBOX™, CallegraWEB™, CallegraCOMMUNITY™, and CallegraTTS™.
3 The digital proprietary interface supports the following SUT applications: Auto Attendant, Voicemail, CallegraVOICE™, CallegraINBOX™, CallegraWEB™, CallegraCOMMUNITY™, and CallegraTTS™. The SUT digital proprietary interface emulates the Nortel Meridian1 M2616 and the Avaya 8434D.
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5 The SUT T1 CAS ground start interface supports all of the SUT applications which include: Auto Attendant, Voicemail, CallegraVOICE™, CallegraFAX™, CallegraINBOX™, CallegraWEB™, CallegraCOMMUNITY™, and CallegraTTS™.
6 The SUT IP interface supports the following SUT applications: Auto Attendant, Voicemail, CallegraINBOX™, CallegraWEB™, CallegraCOMMUNITY™, and CallegraTTS™. The SUT is certified with this interface specifically with the CISCO CallManager PBX 1 switching systems listed on the DSN APL.
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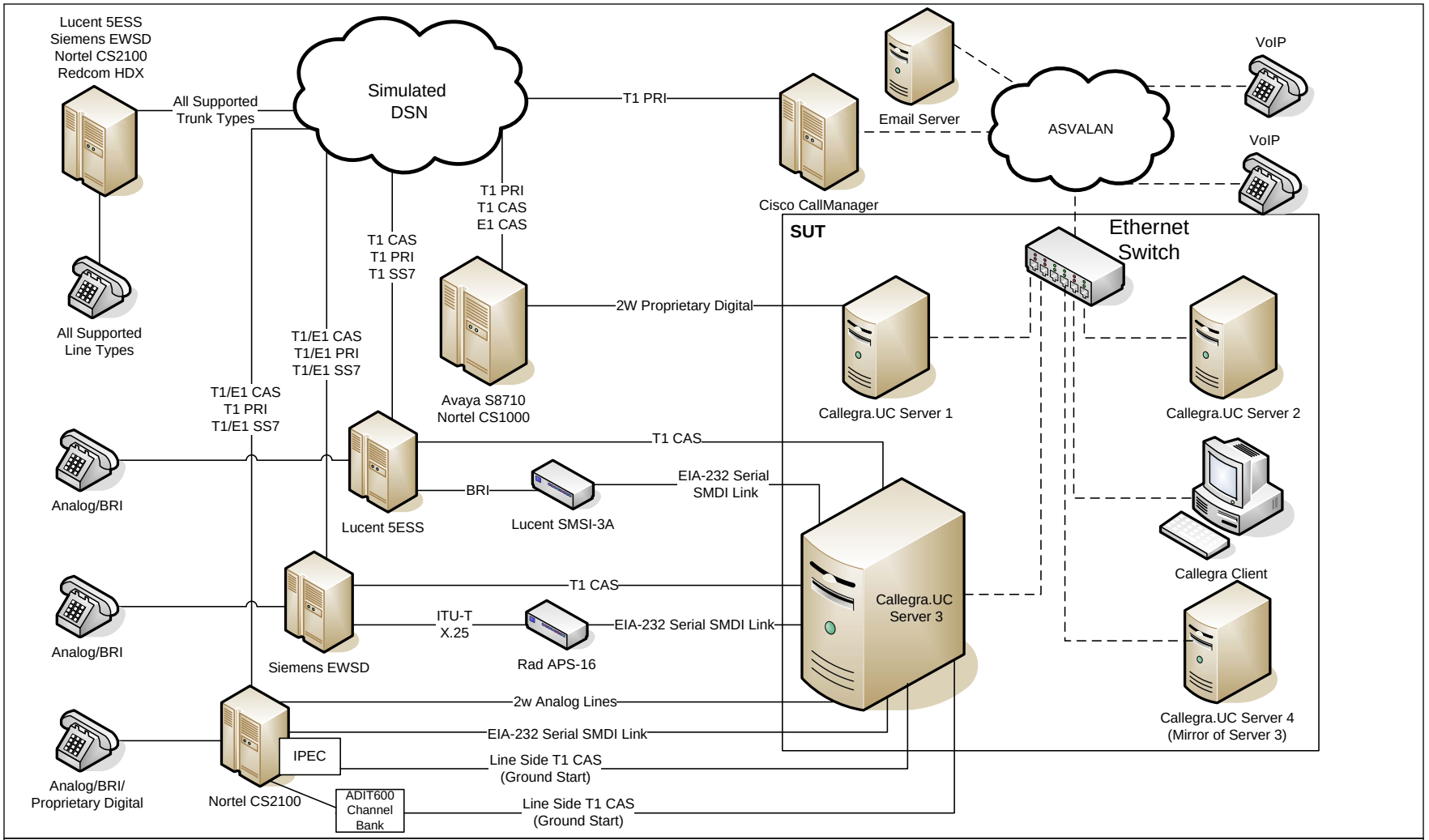
   a. Conformant with IPv6 standards profile contained in the DISR.
   b. Maintaining interoperability in heterogeneous environments and with IPv4.
   c. Commitment to upgrade as the IPv6 standard evolves.
   d. Availability of contractor/vendor IPv6 technical support.
8 Security is tested by DISA-led Information Assurance test teams and published in a separate report.

8. TEST NETWORK DESCRIPTION. The SUT was tested at JITC's Global Information Grid Network Test Facility in a manner and configuration similar to that of the DSN operational environment. Testing the system's required functions and features was conducted using the test configurations depicted in figure 2-2.



LEGEND:

2w	- 2 wire	DSN	- Defense Switched Network	EWSD	- Elektronisches Wählsystem Digital	SS7	- Signaling System 7
APS	- Asynchronous Packet Switching	DTE	- Data Terminal Equipment	HDX	- High Density Exchange	SUT	- System Under Test
ASAVLAN	- Assured Services Voice Application Local Area Network	E1	- European Basic Multiplex Rate (2.048 Mbps)	IPEC	- Intelligent Peripheral Equipment Cabinet	T1	- Digital Transmission Link Level 1 (1.544 Mbps)
5ESS	- Class 5 Electronic Switching System	EIA	- Electronic Industries Alliance	ITU-T	- International Telecommunication Union - Telecommunication Standardization Sector	UC	- Unified Communications
BRI	- Basic Rate Interface	EIA-232	- Standard for defining the mechanical and electrical characteristics for connecting DTE and DCE data communications devices	Mbps	- Megabits per second	VoIP	- Voice over Internet Protocol
CAS	- Channel Associated Signaling			PRI	- Primary Rate Interface	X.25	- Interface between DTE and DCE for terminals operating in the packet mode and connected to public data networks by dedicated circuit
CS	- Communication Server			SMDI	- Simple Message Desk Interface		
DCE	- Data Circuit-terminating Equipment			SMSI	- Simple Message Service Interface		

Figure 2-2. Callware Callegra.UC Test Configuration

9. SYSTEM CONFIGURATIONS. Table 2-2 provides the system configurations used in the test.

Table 2-2. Tested System Configurations

System Name	Software Release		
Avaya S8710	Communication Manager (CM) 4.0 (R014x.00.2.731.7)		
Siemens EWSD	19d with Patch Set 46		
Nortel CS2100	Succession Enterprise (SE)08		
Lucent 5ESS	5E16.2, Software Update 06-0002		
Nortel CS1000M SG	4.5w		
Cisco CallManager	4.2(3) SR1 Internetworking Operating System (IOS) 12.4(9) T1		
Cisco ASVALAN	(See note.)		
Redcom HDX	2.0A R3P0		
SUT	**Application**	**Hardware**	**Software/Firmware**
Callware Technologies Callegra.UC Servers	6.14-JITC	**Callegra.UC Server 1**	
		2.4 Gigahertz Pentium 4, 1 Gigabyte RAM	Microsoft Windows 2003 Server, Release 2 SQL Server ver 8.0 Client Services ver 6.14.14.1 Callware Call Center ver 6.14.14.1 Callegra Data Center File ver 6.14.14.1 Nuance 8.5 RealSpeak 4.0
		Brooktrout TR1034 Analog Fax Board	Fax Driver: Brooktrout ver 4.8.0.0
		Dialogic Analog Card (D/120 JCT) Dialogic Digital Card (D/82)	SW rev 6.0 / FW rev 2 SW rev 6.0 / FW rev 2
		Callegra.UC Server 2	
		266 Megahertz Pentium 4, 512 Megabyte RAM	Microsoft Windows 2003 Server, Release 2 Callware Call Center ver 6.14.14.1
		Dialogic Card (D/240 JCT-T1)	SW ver 6.0 / FW ver 61
		TSP	Cisco Unity CMT SP-8.1.3 Cisco SP-4.2
		Callegra.UC Server 3	
		2.80 Gigahertz Pentium 4 Dual Core, 1 Gigabyte RAM	Microsoft Windows Server 2003, Release 2 Distributed File System Callegra Data Center File ver 6.14.14.1 SQL Server Management Studio 2005 ver 9.00.3042.00 Client Services ver 6.14.14.1 CallegraWEB ver 6.14.14.1 Callware Call Center Module ver 6.14.14.1 Nuance 8.5 RealSpeak 4.0
		Brooktrout TR1034 T-1 Fax Board	Fax Driver: Brooktrout ver 4.8.0.0
		Dialogic Analog Card (D/120 JCT) Dialogic Card (D/480JCT-2T1)	SW 6.0 / FW rev 2
		Callegra.UC Server 4 (Mirror of Server 3)	
		2.80 Gigahertz Pentium 4 Dual Core, 1 Gigabyte RAM	Microsoft Windows Server 2003, Release 2 Distributed File System Callegra Data Center File ver 6.14.14.1 SQL Server Management Studio 2005 ver 9.00.3042.00 Client Services ver 6.14.14.1 CallegraWEB ver 6.14.14.1 Callware Call Center Module ver 6.14.14.1 Nuance 8.5 RealSpeak 4.0
		Brooktrout TR1034 T-1 Fax Board	Fax Driver: Brooktrout ver 4.8.0.0
		Dialogic Analog Card (D/120 JCT) Dialogic Card (D/480JCT-2T1)	SW 6.0 / FW rev 2

Table 2-2. Tested System Configurations (Continued)

SUT	Application	Hardware	Software/Firmware
Callware Technologies Callegra.UC Servers	6.14-JITC	**Callegra.UC Client**	
		Dell Deminsion 2.4 Gigahertz Pentium 4, 1 Gigabyte RAM	Windows XP SP2 Outlook XP/2003 CallegraWEB ver. 6.14.14.1 CallegraINBOX for Outlook CallegraADMIN remote for MMC CallegraFAX
Peripheral Components	**Component**	**Hardware**	**Firmware**
	Packet Switch	RAD APS	Not Applicable
	Converter	Lucent SMSI-3A	Not Applicable
	Peripheral Module	Nortel IPEC	Not Applicable
	Channel Bank	ADIT600	Version 2.0
	Telephones	Panasonic KX-TS15-W	Not Applicable
		REDCOM VOTPS	Not Applicable
		Siemens Optiset	Not Applicable
		Lucent 8510	Not Applicable
		Nortel M5317T	5.0 1999
		Nortel P-Phone Digital Display	Not Applicable
		Tone Commander: 6210U, 6210T, 6220U, 6220T, 6220T TSG, 8610U, 8610T, 8620U, and 8620T	01.07.22
		Tone Commander: 8810U and 8810T	02.07.22
		Cisco IP Phones: CP7970G, CP7940G, CP7971G GE	Load: SCCP70.8-0-4SR1S

LEGEND:

5ESS	- Class 5 Electronic Switching System	RAM	- Random Access Memory
APL	- Approved Products List	Rev	- Revision
APS	- Asynchronous Packet Switching	SCCP	- Skinny Client Control Protocol
ASVALAN	- Assured Services Voice Application Local Area Network	SG	- Single Group
BRI	- Basic Rate Interface	SMSI	- Simple Message Service Interface
C2	- Command and Control	SP	- Service Pack
CP	- Cisco Phone	SQL	- Structured Query Language
CS	- Communication Server	SR	- Service Release
DSN	- Defense Switched Network	SUT	- System Under Test
EWSD	- Elektronisches Wählsystem Digital	SW	- Software
FW	- Firmware	T	- Part designator for S/T interface (S/T is ISDN BRI 4-Wire interface)
G/GE	- Gigabit Ethernet	T1	- Digital Transmission Link Level 1 (1.544 Mbps)
HDX	- High Density Exchange	TAPI	- Telephony Application Programming Interface
IP	- Internet Protocol	TSP	- TAPI Service Provider
IPEC	- Intelligent Peripheral Equipment Column	TSG	- Telephone Secure Group
ISDN	- Integrated Services Digital Network	U	- Part designator for U interface (U is ISDN BRI 2-Wire Interface)
JITC	- Joint Interoperability Test Command	UC	- Unified Communications
Mbps	- Megabits per second	VALAN	- Voice Application Local Area Network
MMC	- Microsoft Management Console	ver	- Version
P-Phone	- Proprietary Phone	VOTPS	- Voice Only Teleset Plus S (S is for the ISDN BRI 4-wire interface)

NOTE: The SUT is certified to support DSN assured services over IP with any ASVALAN on the DSN APL. The SUT is also certified for joint use with any VALAN on the DSN APL. However, since VALANs do not support the Assured Services Requirements detailed in reference (e), C2 users and Special C2 users are not authorized to be served by the SUT connected to a VALAN.

10. TEST LIMITATIONS. None.

11. TEST RESULTS

a. Discussion

(1) The Callegra.UC™ Server, Auto Attendant, and CallegraVOICE™, CallegraFAX™, CallegraWEB™, and CallegraINBOX™ SUT applications were tested by placing multiple ROUTINE precedence calls via the test configurations as shown in figure 2-2. In accordance with the GSCR, switching systems are required to route only ROUTINE calls to automated receiving devices such as the SUT. After calls were

completed to the SUT, simulated automated directory assistance, voice activated call routing, automatic transfer, and scheduled greetings were extended and completed to verify interoperability between various switching systems shown in figure 2-2. E-mails were sent to the SUT to test the text-to-speech functionality of the SUT and insure this function had no negative impact on interoperability. No anomalies were noted during testing of the text-to-speech function. The CallegraINBOX™, CallegraFAX™, and CallegraWEB™ application's basic functionality was tested to insure that they had no negative impact on interoperability. All tests were successful and when completed, properly disconnected the analog, digital, or VoIP circuits. In addition, completed calls to the SUT were preempted within the simulated DSN as shown in figure 2-2 to ensure that the proper preemption action occurred as required by the GSCR, section 3. All preempted calls received the proper preemption notification tone, were released, and returned to an idle state ready for the subsequent caller.

(2) The GSCR, appendix 3, section A3.3.2, outlines several methodologies to implement Class of Service (CoS) and Quality of Service (QoS), which includes 802.1p/Q at the Data Link Layer 2 (L2) and Differentiated Services Code Point (DSCP) at the Network Layer 3 (L3). The SUT does not provide CoS 802.1p/Q tags and is certified only when connected to the Assured Services Voice Application Local Area Network (ASVALAN) at Core Layer 3. The DSCP priority bits for voice signaling were tagged with 24 and voice media was tagged with a value of 46 in the tested configuration. The ASVALAN Core layer properly queued the signaling at a higher queue than voice media, and voice media queued higher than data as required by the GSCR appendix 3. By using the Ixia test equipment, a data load of 1 times the total access link aggregate was injected on the certified ASVALAN to insure that all QoS settings were working properly. Packet captures determined that the SUT L3 prioritization was properly queuing with no degradation of voice media as required in the GSCR appendix 3.

b. Test Summary. The SUT met the critical interoperability requirements for an automated receiving device for the interfaces shown in table 2-1 as set forth in reference (c) and is certified for joint use within the DSN. The SUT is certified to support DSN assured services over IP with any ASVALAN on the DSN Approved Products List (APL). The SUT is also certified for joint use with any Voice Application Local Area Network (VALAN) on the DSN APL. However, since VALANs do not support the Assured Services Requirements detailed in reference (e), C2 users and Special C2 users are not authorized to be served by the SUT connected to a VALAN. The SUT offers both integrated Auto Attendant and Voicemail and included the following optional applications: CallegraVOICE™, CallegraFAX™, CallegraINBOX™, CallegraWEB™, CallegraCOMMUNITY™, and CallegraTTS™. The SUT was tested with the switching systems and their respective software releases listed in table 2-2. JITC analysis determined a minor risk with including all certified DSN switching systems listed on the DSN APL that support the same SUT interfaces. The specific SUT applications certified on each interface are depicted in table 2-1.

12. TEST AND ANALYSIS REPORT. No detailed test report was developed in accordance with the Program Manager's request. JITC distributes interoperability information via the JITC Electronic Report Distribution (ERD) system, which uses Unclassified-But-Sensitive Internet Protocol Router Network (NIPRNet) e-mail. More comprehensive interoperability status information is available via the JITC System Tracking Program (STP). The STP is accessible by .mil/gov users on the NIPRNet at https://stp.fhu.disa.mil. Test reports, lessons learned, and related testing documents and references are on the JITC Joint Interoperability Tool (JIT) at http://jit.fhu.disa.mil (NIPRNet), 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.