DEFENSE INFORMATION SYSTEMS AGENCY
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IN REPLY REFER TO: Joint Interoperability Test Command (JTE) 23 January 2020

MEMORANDUM FOR DISTRIBUTION

SUBJECT: Joint Interoperability Certification of the Callware Technologies Inc. Callegra.UC, Software Release 6.25

References: (a) Department of Defense Instruction 8100.04, "DoD Unified Capabilities (UC)," 9 December 2010
(b) Office of the Department of Defense Chief Information Officer, "Department of Defense Unified Capabilities Requirements 2013 (UCR 2013) Change 2," September 2017
(c) through (e), see Enclosure 1

1. Certification Authority. Reference (a) establishes the Joint Interoperability Test Command (JITC) as the Joint Interoperability Certification Authority for the Department of Defense Information Network (DoDIN) products, Reference (b).

2. Conditions of Certification. The Callware Technologies Inc. Callegra.UC with Software Release 6.25, hereinafter referred to as the System Under Test (SUT), meets the critical requirements of the Unified Capabilities Requirements, Reference (b), as a Customer Premises Equipment (CPE) Voicemail (VM) system with fax capabilities and is certified for joint use with no conditions (See Table 1). This certification expires upon changes that affect interoperability, but no later than the expiration date specified in the DoDIN Approved Products List (APL) memorandum.

Table 1. Conditions

Condition	Operational Impact	Remarks
Not applicable; the Callware Technologies Inc. Callegra.UC with Software Release 6.25 meets all of the critical joint interoperability requirements in accordance with the Unified Capabilities Requirements (UCR), Reference (b).		

3. Interoperability Status. Table 2 provides the SUT interface interoperability status, Table 3 provides the Capability Requirements and Functional Requirements status and Table 4 provides the DoDIN APL product summary, to include all subsequent Desktop Review (DTR) updates.

Table 2. SUT Interface Status

Interface (See note 1.)	Applicability	Status	Remarks
Legacy Line/Trunk Interfaces			
2-/4-Wire Analog	C	Met	
Proprietary Digital	C	Not Tested	(See note 2.)
T1 ISDN PRI	C	Met	
T1 CAS	C	Met	(See note 3.)
IP Network Interfaces			
10Base-X	C	Met	
100Base-X	C	Met	
1000Base-X	C	Met	
Network Management Interfaces			
ITU-T Recommendation V.35	C	Not Tested	(See note 2.)
TIA-232-F	C	Not Tested	(See note 2.)
EIA-449-1	C	Not Tested	(See note 2.)
TIA-530-A	C	Not Tested	(See note 2.)
IEEE 802.3-2002	C	Met	

NOTE(S):
1. The UCR does not specify a minimum required interface for a CPE voicemail system; therefore, the SUT can support one or more of the listed conditional interfaces. The SUT high-level requirements are depicted in Table 3. These high-level requirements refer to a more detailed list of requirements provided in Table 3-2.
2. The SUT does not support this Conditional interface; therefore, this interface was not tested and is not included in this certification.
3. The T1 CAS interface was not tested; however, JITC analysis determined the T1 CAS legacy interface to be compliant based on the vendor's LoC, previous test data collected on the same hardware platform with similar performing software, and product maturity.

LEGEND:

Base-X	Mbps (Baseband Operation, Twisted Pair) Ethernet	ISDN	Integrated Services Digital Network
BRI	Basic Rate Interface	ITU-T	International Telecommunication Union - Telecommunication Standardization Sector
C	Conditional		
CAS	Channel Associated Signaling	Mbps	Megabits per second
CPE	Customer Premises Equipment	PRI	Primary Rate Interface
E1	European Basic Multiplex Rate	SUT	System Under Test
EIA	Electronic Industries Alliance	T1	Digital Transmission Link Level 1
IEEE	Institute of Electrical and Electronics Engineers	TIA	Telecommunications Industry Association
IP	Internet Protocol	UCR	Unified Capabilities Requirements

Table 3. SUT Capability Requirements and Functional Requirements Status

CR/FR ID	UCR Requirement (See note.)	UCR 2013 Reference	Status
1	Requirements (R)	3.7.2	Met
2	Voicemail Specific Requirements (R)	2.2.10	Met
3	Media Gateway FoIP Specific Requirements (C)	2.16.8.9	Met
4	DSCP Tagging Requirements (R)	7.2.3	Met
5	Internet Protocol version 6 (R)	Section 5, Table 5.2-1	Met

NOTE(S): The annotation of 'required' refers to a high-level requirement category. The applicability of each sub-requirement is provided in References (c) and (d).

Table 3. SUT Capability Requirements and Functional Requirements Status (continued)

LEGEND:			
C	Conditional	ID	Identification
CR	Capability Requirement	R	Required
DSCP	Differentiated Services Code Point	SUT	System Under Test
FoIP	Fax over Internet Protocol	UCR	Unified Capabilities Requirements
FR	Functional Requirement		

Table 4. DoDIN APL Product and Certification Summary

Product Identification			
Product Name	Callware Technologies Inc., Callegra.UC		
Software Release	Software Release 6.25		
UCR Product Type(s)	Customer Premises Equipment (CPE) Voicemail system with facsimile capabilities		
Product Description	Callegra.UC is a Customer Premise Equipment (CPE) solution that provides voicemail, auto attendant and unified messaging functionality including fax, email integration and web access for its users. Callegra.UC interoperates with VoIP based Local Session Controllers (LSC) using the DoD AS-SIP standard. Callegra.UC also provides interoperability with legacy TDM phone systems using AudioCodes gateway(s), which converts traditional TDM integration methods (analog, T1, PRI) to the DoD AS-SIP standard.		
Product Components (See note 1.)	**Component Name** (See note 2.)	**Version**	**Remarks**
ESXi Host Server 6.7 (10.255.15.42)	VMWare Client	6.7	
Primary Server 1 – CWDataCenter Server: (10.255.15.28)	Microsoft Windows Server 2019 64-bit	Version 1809 (Build 17763.437)	
	DataCenter Service (Callware DataCenter Service)	6.25	
	CWCallCenter Service (Telephony Services)	6.25	
	ClientServices	6.25	
	CallegraWeb	6.25	
	Callegra WebAdmin	6.25	
	IIS 10	Version 10.0.14393.0	
	LumenVox	14.2	
	Dialogic Brooktrout	6.7.3	
Primary Server 2 – CWDatabase Server: (10.255.15.29)	Microsoft Windows Server 2019 64-bit	Version 1809 (Build 17763.437)	
	Microsoft SQL Server 2016	12.0.4213	
	Database Server	6.25	
Primary Server 3 – Media/SIP appliance: (10.255.15.30)	Ubuntu	18.04	
	Media Server	6.25	
	Sip Server	6.25	
Secondary Server 4 – CWCallCenter Server (10.255.15.26)	Microsoft Windows Server 2019 64-bit	Version 1809 (Build 17763.437)	
	CWCallCenter Service (Telephony Services)	6.25	
	IIS 10	Version 10.0.14393.0	
Secondary Server 5 – Media/SIP appliance (10.255.15.27)	Ubuntu	18.04	
	Media Server	6.25	
	Sip Server	6.25	
AudioCodes Mediant 800 Gateway	Gateway	Version 6.6 (6.60A.336.004)	
ADIT600 Channel Bank	Channel Bank	1.18	

NOTE(S):
1. The detailed component and subcomponent list is provided in Enclosure 3.
2. Components bolded and underlined were tested by NIWC. The other components in the family series were not tested; however, JITC certified the other components for joint use because they utilize the same software and similar hardware as tested components and JITC analysis determined they were functionally identical for interoperability certification purposes.

Table 4. DoDIN APL Product and Certification Summary (continued)

LEGEND:			
APL	Approved Products List	NIWC	Naval Information Warfare Center
CPE	Customer Premise Equipment	PRI	Prime Rate Interface
CW	Callware	SIP	Session Initiation Protocol
DoDIN	Department of Defense Information Network	SQL	Structured Query Language
IIS	Internet Information Services	TDM	Time Division Multiplexing
JITC	Joint Interoperability Test Command	UC	Unified Communication
LSC	Local Session Controller	UCR	Unified Capabilities Requirements

4. This certification is based on interoperability testing, review of the vendor's Letters of Compliance (LoC), and DISA Certifying Authority Recommendation for inclusion on the DoDIN APL. The Naval Information Warfare Center (NIWC) conducted testing at the Assured Real-Time Communications Lab at Norfolk, Virginia, from 9 September through 28 October 2019 using test procedures derived from Reference (c) and (d). Review of the vendor's LoC completed on 3 September 2019. NIWC-led Cybersecurity (CS) test teams conducted CS testing and published the results published in a separate report, Reference (e). Enclosure 2 documents the test results and describes the tested network and system configurations. Enclosure 3 provides a detailed list of the interface, capability, and functional requirements.

5. Additional Information. JITC distributes interoperability information via the JITC Electronic Report Distribution system, which uses Unclassified-But-Sensitive Internet Protocol Router Network (NIPRNet) e-mail. Interoperability status information is available via the JITC System Tracking Program (STP). STP is accessible by .mil/.gov users at https://stp.fhu.disa.mil/. Test reports, lessons learned, and related testing documents and references are on the JITC Industry Toolkit at https://jit.fhu.disa.mil/. Due to the sensitivity of the information, the CS Assessment Package that contains the approved configuration and deployment guide must be requested directly from the Approved Products Certification Office (APCO), e-mail: disa.meade.ie.list.approved-products-certification-office@mail.mil. All associated information is available on the DISA APCO website located at http://aplits.disa.mil/.

6. Point of Contact (POC). Naval Information Warfare Center (NIWC) testing POC: Lalanti Antolin; 757-618-0224; Lalanti.antolin@navy.mil. JITC POC: Lisa Esquivel; commercial telephone 520-538-5531; e-mail address: lisa.r.esquivel.civ@mail.mil; mailing address: Joint Interoperability Test Command, ATTN: JTE Lisa Esquivel, P.O. Box 12798, Fort Huachuca, AZ 85670-2798. The APCO tracking number for the SUT is 1823501.

FOR THE COMMANDER:

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3 Enclosures a/s

for RIC HARRISON
Chief
Networks/Communications &
DoDIN Capabilities Division

Distribution (electronic mail):
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DISA/ISG REP
DIA, Office of the Acquisition Executive
NSG Interoperability Assessment Team
DOT&E, Netcentric Systems and Naval Warfare
Medical Health Systems, JMIS PEO T&IVV
HQUSAISEC, AMSEL-IE-IS
APCO

ADDITIONAL REFERENCES

(c) Joint Interoperability Test Command, "Customer Premise Equipment (CPE) Voicemail (VM) Test Procedures Version 1.0 For Unified Capabilities Requirements (UCR) 2013 Change 2," September 2019
(d) Joint Interoperability Test Command, "Customer Premise Equipment (CPE) Facsimile (Fax) Test Procedures Version 1.0 For Unified Capabilities Requirements (UCR) 2013 Change 2," September 2019
(e) Naval Information Warfare Center, "Cybersecurity Assessment Report for Callware Technologies, Inc. Callegra UC Software Release 6.25," October 2019

CERTIFICATION SUMMARY

1. SYSTEM AND REQUIREMENTS IDENTIFICATION. The Callware Technologies, Inc. Callegra.UC, Software Release 6.25, is hereinafter referred to as the System Under Test (SUT). Table 2-1 depicts the SUT identifying information and requirements source.

Table 2-1. System and Requirements Identification

System Identification	
Sponsor	United States Navy
Sponsor Point of Contact	Michael Robinson, E-mail: michael.r.robinson.ctr@navy.mil
Vendor Point of Contact	Christopher Toomer, E-mail: ctoomer@callware.com
System Name	Callegra.UC
Increment and/or Version	Release 6.25
Product Category	Customer Premises Equipment (CPE) voicemail system
System Background	
Previous certifications	Tracking Number 1823501
Tracking	
APCO ID	1823501
System Tracking Program ID	4733
Requirements Source	
Unified Capabilities Requirements	Unified Capabilities Requirements 2013, Change 2, Section 2.2.10, 2.16.8.9, 3.7.2, 5.2.1, 7.2.3
Remarks	None
Test Organization(s)	NIWC

LEGEND:
APCO Approved Products Certification Office
CPE Customer Premises Equipment
NIWC Naval Information Warfare Center
ID Identification
UC Unified Communication

2. SYSTEM DESCRIPTION. A wide variety of Customer Premises Equipment (CPE) manufactured and sold by many sources was connected to the line (subscriber) side of a Defense Switched Network (DSN) switching system. Such varieties include industry "American National Standards Institute – European Telecommunications Standards Institute (ANSI-ETSI) Standards"- based digital and analog devices, and non-standards based proprietary digital devices. During the transition period between Time Division Multiplexing- and Internet Protocol (IP)-based technologies, some locations may have a requirement to interface the legacy CPE to a Session Controller (SC). As a result, most SC vendors provide an optional Integrated Access Device to permit the use of CPE until it is replaced. The CPE devices may include answering machines, voice mail systems, automated call distributors, proprietary telephone sets, standards-based telephone sets, facsimile machines, voice-band modems, Integrated Services Digital Network (ISDN) Network Termination 1 devices and Terminal Adapters, and certain devices that are deemed mandatory for local or host nation telecommunications network compliance (i.e., 911 emergency service).

The SUT is a CPE voicemail system. Callegra.UC is a Customer Premise Equipment (CPE) solution that provides voicemail, auto attendant, and unified messaging functionality including fax, email integration and web access for its users. Callegra.UC interoperates with VoIP based Local Session Controllers (LSC) using the DoD AS-SIP standard. Callegra.UC also provides

interoperability with legacy TDM phone systems using AudioCodes gateway(s) which converts traditional TDM integration methods (analog, T1, PRI) to the DoD AS-SIP standard.

Component 1. ESXi Host Server [10.255.15.42] - Callegra.UC systems are configured using virtualized VMware ESXi 6 bare-metal hypervisor.

Component 2. Primary Server 1- CWDataCenter Server [10.255.15.28] – The data center server hosts the following applications: Callegra.UC DataCenter stores all user configuration data as well as all messages and associated metadata. Stores voice messages and application data. Callegra.UC TelephonyServices interoperates with the LSC and processes incoming\outgoing voice mail and auto attendant calls. The ClientServices module is a Web Service API responsible for connectivity to all Callegra.UC client applications such as CallegraINBOX for Microsoft Outlook, CallegraWEB, and CallegraFAX Print Driver. CallegraWeb is a web application for Callegra.UC voice mail users. Callegra WebAdmin is a web application for administration of voice mail mailboxes

Component 3. Primary Server 2 – CWDatabase Server [10.255.15.29] – The Database server hosts the following applications: The Callegra.UC DataCenter application uses Microsoft SQL Server 2016 to store user data, metadata, and reporting logs.

Component 4. Primary Server 3 – Media/SIP appliance [10.255.15.30] –Container image of Callegra media server running on Ubuntu.

Component 5. Secondary Server 4 – CWCallCenter Server [10.255.15.26] – The Call Center server hosts the following applications: Callegra.UC TelephonyServices interoperates with the LSC and processes incoming\outgoing voice mail and auto attendant calls

Component 6. Secondary Server 5 – Media/SIP appliance [10.255.15.27] –Container image of Callegra media server running on Ubuntu.

Component 7. AudioCodes Mediant 800 Gateway – Converts legacy TDM to AS-SIP.

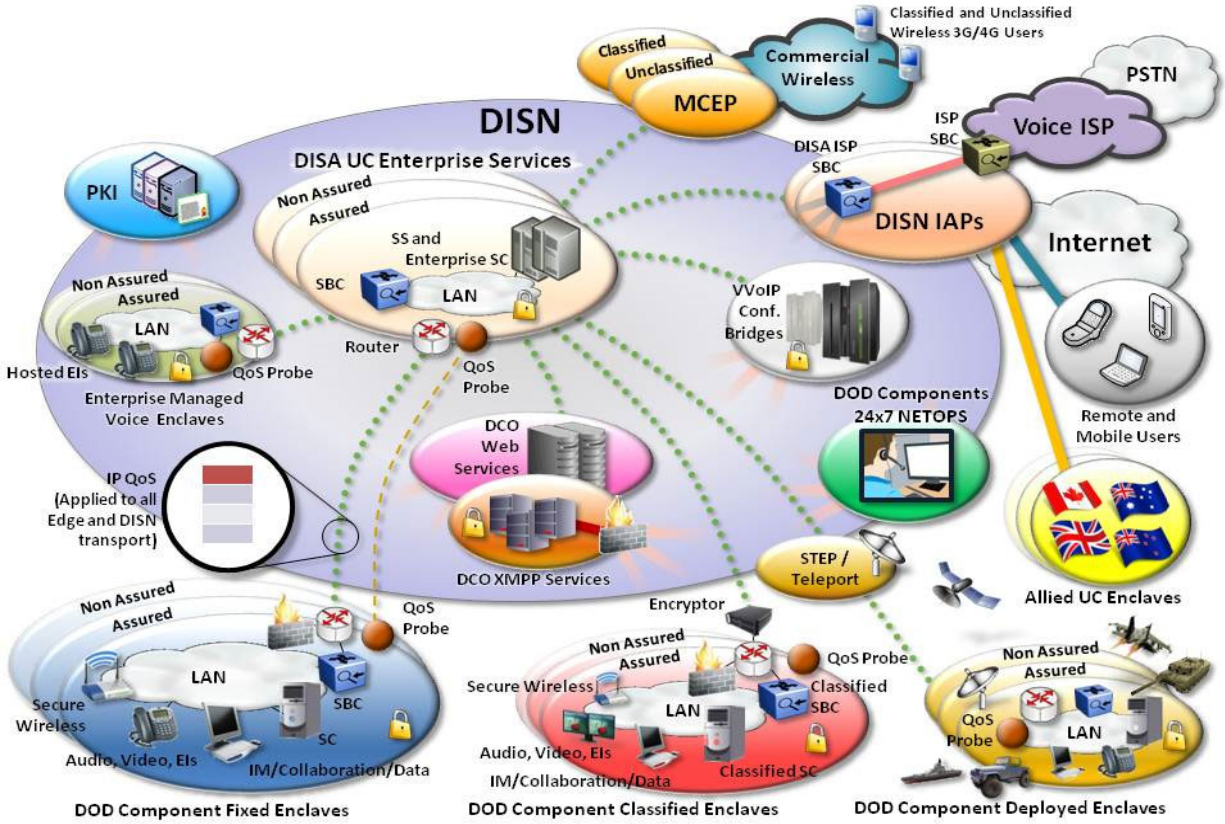
Component 8. ADIT600 Channel Bank – Convert analog connection to T1 digital connection.

3. OPERATIONAL ARCHITECTURE. The Department of Defense (DoD) Information Network (DoDIN) architecture is a two-level network hierarchy consisting of Defense Information Systems Network backbone switches and Service/Agency installation switches. The DoD Chief Information Officer and Joint Staff policy and subscriber mission requirements determine which type of switch can be used at a particular location. The DoDIN architecture, therefore, consists of several categories of switches. Figure 2-1 depicts the notional operational DoDIN architecture in which the SUT may be used.

4. TEST CONFIGURATION. The Naval Information Warfare Center (NIWC) test team conducted testing on the SUT at Norfolk, Virginia in a manner and configuration similar to that of the notional operational environment depicted in Figure 2-1. The test team verified the required functions and features of the SUT using the end-to-end test configuration depicted in Figure 2-2. The test team conducted interoperability testing of the SUT components by testing

the SUT with different vendor DoDIN Approved Products List certified products. Cybersecurity (CS) testing used the same configuration.

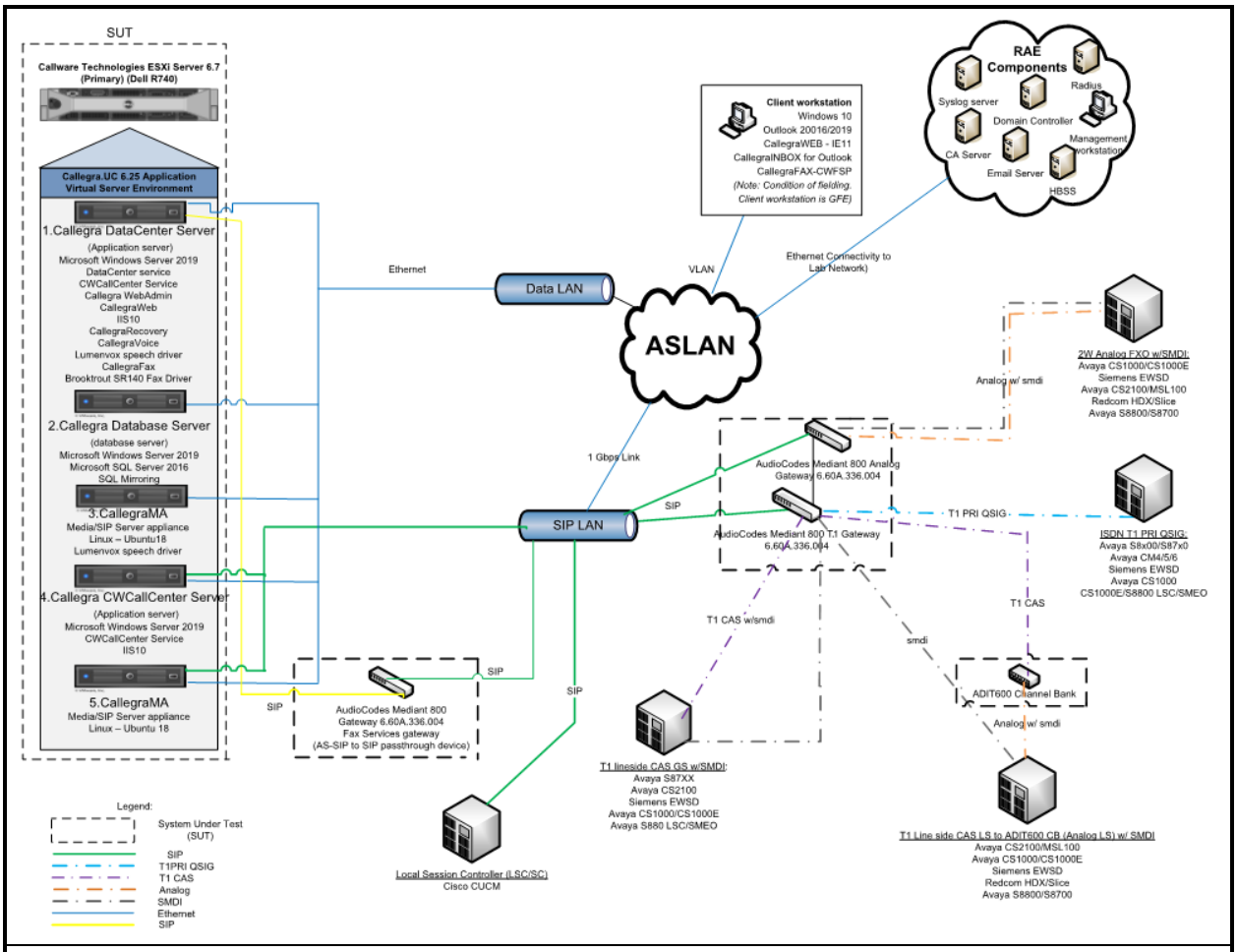
5. METHODOLOGY. NIWC conducted testing using CPE voicemail requirements derived from the Unified Capabilities Requirements (UCR) 2013, Change 2, Reference (b), and CPE test procedures derived from Reference (c) and (d). Any discrepancy noted in the operational environment will be evaluated for impact on the existing certification. These discrepancies will be adjudicated to the satisfaction of DISA via a vendor Plan of Action and Milestones (POA&M), which will address all new critical Test Discrepancy Reports (TDRs) within 120 days of identification.



LEGEND:

Conf.	Conference	MCEP	Multi Carrier Entry Point
DCO	Defense Connection Online	NETOPS	Network Operations
DISA	Defense Information Systems Agency	PKI	Public Key Infrastructure
DISN	Defense Information Systems Network	PSTN	Public Switched Telephone Network
DoD	Department of Defense	QoS	Quality of Service
DoDIN	Department of Defense Information Network	SBC	Session Border Controller
EI	End Instrument	SC	Session Controller
IAP	Internet Access Point	SS	Softswitch
IM	Instant Messaging	STEP	Standardized Tactical Entry Point
IP	Internet Protocol	UC	Unified Capabilities
ISP	Internet Service Provider	VVoIP	Voice and Video over IP
LAN	Local Area Network	XMPP	Extensible Messaging and Presence Protocol

Figure 2-1. Notional DoDIN Network Architecture



LEGEND:

ASLAN	Assured Services Local Area Network	LSC	Local Session Controller
AS-SIP	Assured Services Session Initiation Protocol	PKI	Public Key Infrastructure
CA	Certificate Authority	PRI	Primary Rate Interface
CUCM	Cisco Unified Communications Manager	QoS	Quality of Service
CWFSP	Callware File Service Protocol	QSIG	Q Signaling
DISA	Defense Information Systems Agency	SBC	Session Border Controller
DISN	Defense Information Systems Network	SC	Session Controller
DOD	Department of Defense	SMDI	Simplified Message Desk Interface
EI	End Instrument	SS	Softswitch
G	Gigabit	UC	Unified Capabilities
HBSS	Host Based Security System	VLAN	Virtual Local Area Network
IP	Internet Protocol	VVoIP	Voice and Video over IP
ISP	Internet Service Provider	XMPP	Extensible Messaging and Presence Protocol
LAN	Local Area Network		

Figure 2-2. SUT Test Configuration

6. INTEROPERABILITY REQUIREMENTS, RESULTS, AND ANALYSIS. The interface, Capability Requirements, Functional Requirements, CS, and other requirements for the DoDIN CPE voicemail and fax systems are established by UCR 2013, Change 2, Sections 3.7.2, 2.2.10, 2.16.8.9, 7.2.3, and 5.2.1.

a. Interface Requirements. The status of JITC interface testing on the SUT is provided in Table 3-1.

1) Legacy Line/Trunk Interfaces. The SUT was tested for the Legacy Line/Trunk Interfaces with the T1 ISDN-PRI QSIG signaling legacy interface. In addition, JITC analysis determined the T1 CAS legacy interface to be compliant based on the vendor's LoC, previous test data collected on the same hardware platform with similar performing software, and product maturity.

2) IP Network Interfaces. The SUT met the requirements for the IP Network Interfaces through testing.

3) Network Management Interfaces. The SUT the requirements for the Network Management Interfaces through testing.

b. Capability and Functional Requirements

1) The UCR 2013, Change 2, Section 3.7.2, includes the general CPE requirements in the subparagraphs below.

a) If a CPE device supports Multilevel Precedence and Preemption (MLPP), then that device shall do so in accordance with the requirements listed in UCR 2013 Change 2, Section 2.25.2, MLPP, and shall not affect the DSN interface features and functions associated with line supervision and control. The SUT does not support this conditional requirement.

b) All DSN CPE, at a minimum, must meet the requirements of Part 15 and Part 68 of the Federal Communications Commission (FCC) Rules and Regulations, and the Administrative Council for Terminal Attachments. The SUT met this requirement with testing and the vendor's LoC.

c) If a CPE device supports autoanswer, then that device shall have an "autoanswer" mode feature allowing the autoanswer mode to be set to a "time" more than the equivalency of four ROUTINE precedence ring intervals, in accordance with UCR 2013 Change 2, Section 2.25.2, MLPP, before "answer" supervision is provided. The SUT met this requirement with testing with support of the session controller and with the vendor's LoC.

d) If a CPE device is required to support precedence calls above ROUTINE precedence, then that device shall respond properly to an incoming alerting (ringing) precedence call cadence, as described in UCR 2013 Change 2, Section 2.9.1.2.1, Unified Capabilities (UC) Ringing Tones, Cadences, and Information Signals. The SUT met this requirement with the facsimile capability during testing and with the vendor's LoC.

e) If a CPE device can "out dial" Dual Tone Multi-Frequency (DTMF) and/or dial pulse digits (automatic and/or manual), then that device shall comply with the requirements as specified in Telcordia Technologies GR-506-CORE, Local Access and Transport Area (LATA) Switching Systems Generic Requirements (LSSGR): Signaling for Analog Interfaces, Issue 1, June 1996, paragraph 10. That device shall also be capable of outpulsing and interpretation of DTMF digits on outgoing and two-way trunks as specified in Telcordia Technologies GR-506-CORE, LSSGR: Signaling for Analog Interfaces, Issue 1, June 1996, paragraph 15, and Table 3.7-1. The SUT met this requirement with testing and the vendor's LoC.

f) If a CPE device contains a modem or facsimile machine, then that modem or facsimile machine shall be compatible with International Telecommunication Union (ITU) and Telcordia standards, as applicable. The SUT met this requirement with the facsimile capability with testing and with the vendor's LoC.

g) If a CPE device contains a facsimile device, then that facsimile device, at a minimum, shall meet the requirements in accordance with applicable DoD Information Technology (IT) Standards Registry (DISR) standards. The SUT met this requirement with testing and the vendor's LoC.

h) If Configuration Management and/or Fault Management is provided by the CPE device so that it can be managed by the Advanced DSN Integrated Management Support System (ADIMSS) or other management systems, then the management information for that CPE device shall be provided by one or more of the following serial or Ethernet interfaces. The SUT met the requirement with testing with the IEEE 802.3-2002 protocol and the vendor's LoC.

1. Serial interfaces shall be in accordance with one of the following standards:

a. International Telecommunication Union (ITU) Recommendation V.35.
b. Telecommunications Industry Association (TIA)-232-F.
c. Electronic Industries Alliance (EIA)-449-1.
d. TIA-530-A.

2. Ethernet interfaces shall be in accordance with Institute of Electrical and Electronics Engineers (IEEE) 802.3-2002.

i) If a CPE device supports 911 and E911 emergency services, then, at a minimum, the 911 and the E911 (tandem) emergency services shall have the capability to "hold" (prevent) the originating subscriber or caller from releasing the call, via the "switch supervision interaction for line and trunk control by the called party" feature, in accordance with Telcordia Technologies GR-529-CORE. Additionally, the FCC regulations regarding 911 and E911 must be considered. The SUT does not support this conditional requirement.

2) The UCR 2013, Change 2, Section 2.2.10, includes the voicemail specific requirements in the subparagraphs below.

a) Unanswered UC Voice over IP (VoIP) calls above the ROUTINE precedence level shall not be forwarded to voicemail, and shall not be forwarded to Automatic Call

Distribution (ACD) systems. Instead, they shall divert to the Precedence Call Diversion (PCD) Directory Number (DN) when the PCD time-period expires. This requirement does not apply to the SUT.

b) Unanswered UC VoIP ROUTINE calls to DNs that are configured with voicemail or an ACD system shall be forwarded to voicemail or to the ACD system. This requirement does not apply to the SUT.

c) Calls above the ROUTINE precedence level that are directly dialed to DNs assigned to voicemail or ACD systems shall divert to the PCD DN as specified above (i.e., when they are unanswered at the voicemail or ACD system, and the PCD time period expires). This requirement does not apply to the SUT.

d) The Assured Services Session Initiation Protocol signaling appliance shall support a per-appliance configuration option that, when activated, diverts ROUTINE calls directly dialed to DNs assigned to voicemail or ACD systems to the PCD DN, if they go unanswered and the PCD time period expires. These calls shall keep their ROUTINE precedence level after they are diverted by PCD. When this configuration option is not used, unanswered ROUTINE calls shall continue to be offered to the voicemail or ACD system, and shall not be diverted by PCD. This requirement does not apply to the SUT.

3) The UCR 2013, Change 2, Section 2.16.8.9.2 Media Gateway (MG) Option To "Handle FoIP Calls as T.38 FoIP Calls" (Fax Relay Calls), includes the Fax over IP (FoIP)-specific conditional requirements in the subparagraphs below.

a) The T.38 Fax Server shall support the full set of procedures and protocols for Fax Relay in ITU-T Recommendation T.38. The SUT met this requirement with testing and the vendor's LoC.

b) The T.38 Fax Server shall support the full set of procedures and protocols for Group 3 Fax reception and transmission in ITU-T Recommendation T.4. The SUT met this requirement with testing and the vendor's LoC.

c) The T.38 Fax Server shall support adequate T.38 Fax Relay resources so at least 10 percent of the total number of calls that pass through the trunk-side interfaces of the MG (from TDM end points to IP end points, or from IP end points to TDM end points) can receive Fax Relay treatment, instead of receiving Fax Pass-through treatment. The SUT met this requirement with testing and the vendor's LoC.

4) The UCR 2013, Change 2, Section 7.2.3, states the product shall support the Differentiated Services Code Point (DSCP) plan, as shown in Table 7.2-3, DSCP Assignments. Differentiated Services assignments shall be software configurable for the full range of six bit values (0-63 Base10) for backwards compatibility with IP precedence environments that may be configured to use the Type of Service (TOS) field in the IP header but do not support DSCP. The SUT met this requirement with testing and the vendor's LoC.

5) The UCR 2013, Change 2, Section 5, Table 5.2-1 states that if a CPE supports IP interfaces, then the CPE shall support the Internet Protocol version 6 (IPv6) requirements as defined for Network Appliance/Simple Server in UCR Section 5, IPv6. The SUT met this requirement with the vendor's LoC.

c. Hardware/Software/Firmware Version Identification. Table 3-3 provides the SUT components' hardware, software, and firmware tested. NIWC tested the SUT in an operationally realistic environment to determine its interoperability capability with associated network devices and network traffic. Table 3-4 provides the hardware, software, and firmware of the components used in the test infrastructure.

7. TESTING LIMITATIONS. None.

8. CONCLUSION(S). The SUT meets the critical interoperability requirements for a CPE voicemail system in accordance with the UCR 2013, Change 2, and is certified for use with the interfaces as depicted in Table 3-1.

DATA TABLES

Table 3-1. SUT Interface Status

Interface (See note 1.)	Applicability	Status	Remarks
Legacy Line/Trunk Interfaces			
2-/4-Wire Analog	C	Met	
Proprietary Digital	C	Not Tested	(See note 2.)
T1 ISDN PRI	C	Met	
T1 CAS	C	Met	(See note 3.)
IP Network Interfaces			
10Base-X	C	Met	
100Base-X	C	Met	
1000Base-X	C	Met	
Network Management Interfaces			
ITU-T Recommendation V.35	C	Not Tested	(See note 2.)
TIA-232-F	C	Not Tested	(See note 2.)
EIA-449-1	C	Not Tested	(See note 2.)
TIA-530-A	C	Not Tested	(See note 2.)
IEEE 802.3-2002	C	Met	

NOTE(S):
1. The UCR does not specify a minimum required interface for a CPE voicemail system; therefore, the SUT can support one or more of the listed conditional interfaces. The SUT high-level requirements are depicted in Table 3. These high-level requirements refer to a more detailed list of requirements provided in References (c) and (d).
2. The SUT does not support this Conditional interface; therefore, this interface was not tested and is not included in this certification.
3. The T1 CAS interface was not tested; however, JITC analysis determined the T1 CAS legacy interface to be compliant based on the vendor's LoC, previous test data collected on the same hardware platform with similar performing software, and product maturity.

LEGEND:

Base-X	Mbps ((Baseband Operation, Twisted Pair) Ethernet	ISDN	Integrated Services Digital Network
BRI	Basic Rate Interface	ITU-T	International Telecommunication Union - Telecommunication Standardization Sector
C	Conditional		
CAS	Channel Associated Signaling	Mbps	Megabits per second
CPE	Customer Premises Equipment	PRI	Primary Rate Interface
E1	European Basic Multiplex Rate	SUT	System Under Test
EIA	Electronic Industries Alliance	T1	Digital Transmission Link Level 1
IEEE	Institute of Electrical and Electronics Engineers	TIA	Telecommunications Industry Association
IP	Internet Protocol	UCR	Unified Capabilities Requirements

Table 3-2. SUT Capability and Functional Requirements and Status

CR/FR ID	UCR Requirement (See note.)	UCR 2013 Reference	Status
1	Requirements (R)	3.7.2	Met
2	Voicemail Specific Requirements (R)	2.2.10	Met
3	MG Option To "Handle FoIP Calls as T.38 FoIP Calls" (Fax Relay Calls) (C)	2.16.8.9.2	Met
4	DSCP Tagging Requirements (R)	7.2.3	Met
5	Internet Protocol version 6 (R)	Section 5, Table 5.2-1	Met

NOTE(S): The annotation of 'required' refers to a high-level requirement category. The applicability of each sub-requirement is provided in References (c) and (d).

LEGEND:

CR	Capability Requirement	R	Required
DSCP	Differentiated Services Code Point	SUT	System Under Test
FR	Functional Requirement	UCR	Unified Capabilities Requirements
ID	Identification		

Table 3-3. SUT Hardware/Software/Firmware Version Identification

Product Components (See note 1.)	Component Name (See note 2.)	Version	Remarks
ESXi Host Server 6.7 (10.255.15.42)	VMWare Client	6.7	
Primary Server 1 – CWDataCenter Server: (10.255.15.28)	Microsoft Windows Server 2019 64-bit	Version 1809 (Build 17763.437)	
	DataCenter Service (Callware DataCenter Service)	6.25	
	CWCallCenter Service (Telephony Services)	6.25	
	ClientServices	6.25	
	CallegraWeb	6.25	
	Callegra WebAdmin	6.25	
	IIS 10	Version 10.0.14393.0	
	LumenVox	14.2	
	Dialogic Brooktrout	6.7.3	
Primary Server 2 – CWDatabase Server: (10.255.15.29)	Microsoft Windows Server 2019 64-bit	Version 1809 (Build 17763.437)	
	Microsoft SQL Server 2016	12.0.4213	
	Database Server	6.25	
Primary Server 3 – Media/SIP appliance: (10.255.15.30)	Ubuntu	18.04	
	Media Server	6.25	
	Sip Server	6.25	
Secondary Server 4 – CWCallCenter Server (10.255.15.26)	Microsoft Windows Server 2019 64-bit	Version 1809 (Build 17763.437)	
	CWCallCenter Service (Telephony Services)	6.25	
	IIS 10	Version 10.0.14393.0	
Secondary Server 5 – Media/SIP appliance (10.255.15.27)	Ubuntu	18.04	
	Media Server	6.25	
	Sip Server	6.25	
AudioCodes Mediant 800 Gateway	Gateway	Version 6.6 (6.60A.336.004)	
ADIT600 Channel Bank	Channel Bank	1.18	

NOTE(S):
1. The detailed component and subcomponent list is provided in Enclosure 3.
2. Components bolded and underlined were tested by NIWC. The other components in the family series were not tested; however, JITC certified the other components for joint use because they utilize the same software and similar hardware as tested components and JITC analysis determined they were functionally identical for interoperability certification purposes.

Table 3-3. SUT Hardware/Software/Firmware Version Identification (continued)

LEGEND:			
APL	Approved Products List	NIWC	Naval Information Warfare Center
CPE	Customer Premise Equipment	PRI	Prime Rate Interface
CW	Callware	SIP	Session Initiation Protocol
DoDIN	Department of Defense Information Network	SQL	Structured Query Language
IIS	Internet Information Services	TDM	Time Division Multiplexing
JITC	Joint Interoperability Test Command	UC	Unified Communication
LSC	Local Session Controller	UCR	Unified Capabilities Requirements

Table 3-4. SUT Test Infrastructure Hardware/Software/Firmware Version Identification

System Name	Software Release	Function
Required Ancillary Equipment (Site-Provided)		
Windows Server	2019	Active Directory
Kiwi Syslog Server	Kiwi v9	SysLog Server
Windows Server	2019	Public Key Infrastructure
Windows Server	2019	Network Time Protocol
Windows Server	2019	Remote Authentication Dial-In User Service
Test Network Components		
Cisco UCM	11.5	LSC
Nortel CS1000 Option 11c	X112530	PBX
Tester Workstation	SHB Version 10 1803	Tester Workstation

LEGEND:			
LSC	Local Session Controller	SysLog	System Log
PBX	Private Branch Exchange	TMDE	Test, Measurement & Diagnostic Equipment
SHB	Secure Host Baseline	UGM	Universal Golden Master
SP	Service Pack	v	Version
SQL	Structured Query Language		