PESA Technical Paper

PESA and the U.S. DoD Unified Capabilities Approved Product List
- PESA Cheetah with Release 5.1 -

APPROVED For General Public Release.

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PESA Technical Paper
PESA and the U.S. DoD Unified Capabilities Approved Product List
(Publicly Releasable Version)

The Approved Product List (APL) is the only listing of approved equipment by DoD to be fielded in DoD networks. DoD components are required to fulfill their system needs by only purchasing APL listed products, providing one of the listed products meets their needs. This means the APL must be consulted prior to purchasing a system or product. If no listed product meets the organization's needs, they may sponsor a product for testing that does meet their needs.

It is DoD policy (DoDI 8100.4) that DoD Components are required to acquire or operate only unified capability (UC) products that are listed on the UC Approved Products List (APL), unless, and until, a waiver is approved. For a UC product to be placed on the APL it must be certified by DoD for both interoperability (IO) and information assurance (IA). The primary baseline for IA-focused requirements are Security Technical Implementation Guides (STIGs) and Security Requirements Guides (SRGs) managed by DISA. The STIGs and SRGs are developed in compliance with NIST Common Criteria guidance. Therefore if a DoD Component acquires a UC product from the UC APL said product is in compliance with DoD requirements for IO and IA (which incorporates the Common Criteria).

Video Distribution System Description

The current UCR includes definitions for two major product categories: network infrastructure; and, voice, video, and data services. The category of voice, video, and data services specific descriptions for "Video Distribution System" (VDS) to include broad-band (full-motion video) routers and/or switches.

The PESA Cheetah Rel. 5.1 is a baseband (uncompressed) Video Distribution System (VDS) (inclusive of hardware and software) used in DoD command and control application (See Figure 2-1 for Operational Architecture). It is used for the production and distribution of video (to include computer workstation displays) within these facilities, for example Combatant Commands' ops centers. The VDS is used to interconnect various pieces of video capture (cameras), recording (tape machines or video servers), playback (video tape machines or video servers) and image manipulation equipment (special effects for picture manipulation or scene transition and the overlay of graphic elements onto a picture). Computer video outputs may also be converted to be routed through the VDS and interconnected to all the listed equipment. The VDS is often used to connect these devices to various display units such as LCD monitors, video projectors, wall processors, and digital signage equipment. Control of the VDS is through a closed loop that is not connected to the GIG or other house networks.

PESA VDS: first VDS to be certified under Unified Capabilities Requirements (UCR)

PESA products are certified as a Video Distribution System in accordance with UCR by JITC. PESA submitted our equipment with DoD sponsorship for full Information Assurance (IA) and Interoperability (IO) testing. Our equipment completed testing at JITC's Fort Huachuca Test Center in the Fall of 2012 with final approval received in January 2013. The system under test (PESA Cheetah Release 5.1) received no Category I findings and a POAM was submitted to address all other findings. Subsequently PESA has undergone two Desktop Reviews to upgrade software and firmware. PESA's Military-Unique Features Deployment Guide provides guidance to program managers and system administrators for implementation of the Cheetah VDS in a UCR environment (Note: U.S. Government and Allied officials may request a copy of this guide from PESA.)

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The **Approved Products List Memo** and **IO Certificate** may be downloaded from the APLITS (Approved Products List Integrated System) at https://aplits.disa.mil/processAPList.action or the PESA website. Search APLITS by **Device Type** = "Video Distribution System (VDS)" or **Vendor** = "PESA".

Company : PESA
Model : Cheetah
Version : 5.1

TN : 1206801
Effective Date : 11-Jan-2013
Expiration Date : 11-Jan-2016

Authorized US Government Civilians or U.S. Uniformed Military Personnel may submit a request for the Information Assurance Assessment Package (IAAP) for Tracking Number (TN) 1206801 to disa.meade.ns.list.unified-capabilities-certification-office@mail.mil .

The PESA Video Distribution System was the first VDS to receive certification by JITC and the first listed on the Approved Products List. The Interoperability (IO) certification from the Joint Interoperability Test Command (JITC) was received 07 Jan 2013 and updated 8 July 2014. The Field Security Operations (FSO) granted Information Assurance (IA) certification on 20 Dec 2012, updated 8 July 2014. All security testing was completed by the Defense Information Systems Agency (DISA)-led IA test teams. In accordance with the UCR and APL, PESA submitted updated documentation related to the Cattrax-J Management Control Software and associated hardware for a JITC Desktop Review in November 2013 and the VIDBLOX DVI_Dual Link in May 2014. The updated DoD UC APL approval of the PESA Cheetah Rel. 5.1 TN 1206801 as a closed VDS was granted 5 Dec 2013 for Desktop Review 1 and Desktop Review 2 was granted 24 June 2014 (IO) and 8 July 2014 (IA).

For additional information on the Unified Capabilities:

UCCO Policies and Procedures: http://www.disa.mil/ucco/apl_process.html
UCR: http://www.disa.mil/Services/Network-Services/UCCO/Policies-and-Procedures
Approved Products List Integrated System (APLITS): https://aplits.disa.mil

Attachments:

1: Important Information for U.S. Government (U.S. Department of Defense) Acquisition Officials

2: Operational Architecture and Best Practices for a VDS

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Attachment 1: Important Information for Acquisition Officials

The U.S. Department of Defense's Defense Information Services Agency (DISA) Joint Interoperability Test Command (JITC) defines Unified Capabilities (UC) "as the seamless integration of voice, video, and data delivered ubiquitously across a secure and highly available network infrastructure, independent of technology, to provide increased mission effectiveness to the warfighter and business communities. UC integrates standards-based communication and collaboration services including, but not limited to, the following; messaging; voice, video, and web conferencing; unified communications; and collaboration applications or clients."

In accordance with the DODI 8100.4 Instruction, DoD Unified Capabilities (UC), dated December 9, 2010, ENCLOSURE 3, Paragraph 4, "UC products acquired by the DoD Components, and connected or planned for connection to DoD networks, shall be both interoperability and IA certified pursuant to the UCR or an approved information support plan that includes UC products." Paragraph 4.3 states: "The UC APL is the single authoritative source for certified UC products intended for use on DoD networks. The DoD Components are required to acquire or operate only UC products listed on the UC APL, unless, and until, a waiver is approved. The DoD Components shall issue a new or update an existing accreditation decision when UC products are installed, pursuant to DoD Instruction 8510.01, "DoD Information Assurance Certification and Accreditation Process (DIACAP)," dated November 28, 2007". As a result, all vendors, who wish to have their product listed on the Approved Product List APL, must comply with the DoDI 8510.01 instruction, DoD Information Assurance Certification and Accreditation Process (DIACAP), dated November 28, 2007 and obtain an Authorization to Operate (ATO).

Under the DIACAP process, Section 4.1 states that "The Department of Defense shall certify and accredit Information Systems (ISs) through an enterprise process for identifying, implementing, and managing Information Assurance (IA) capabilities and services. IA capabilities and services are expressed as IA controls as defined in DoD Instruction 8500.2, "Information Assurance (IA) Implementation," dated February 6, 2003." These IA controls are tested as part of the IA testing phase of the UCCO APL process and the results of the testing are documented in an Information Assurance Assessment Report (IAAR) and a DIACAP Scorecard.

Use of Certified Approved Products List hardware for VDS in an approved architecture provides a level of physical separation not available in web-based, cloud-based, or network distributed video. This physical separation is critical to avoid issues associated with hacking, intrusion, denial of service, malware, and network take-over attacks. The users who receive video via a closed VDS can be assured that their critical video feeds will be uninterrupted during such events.

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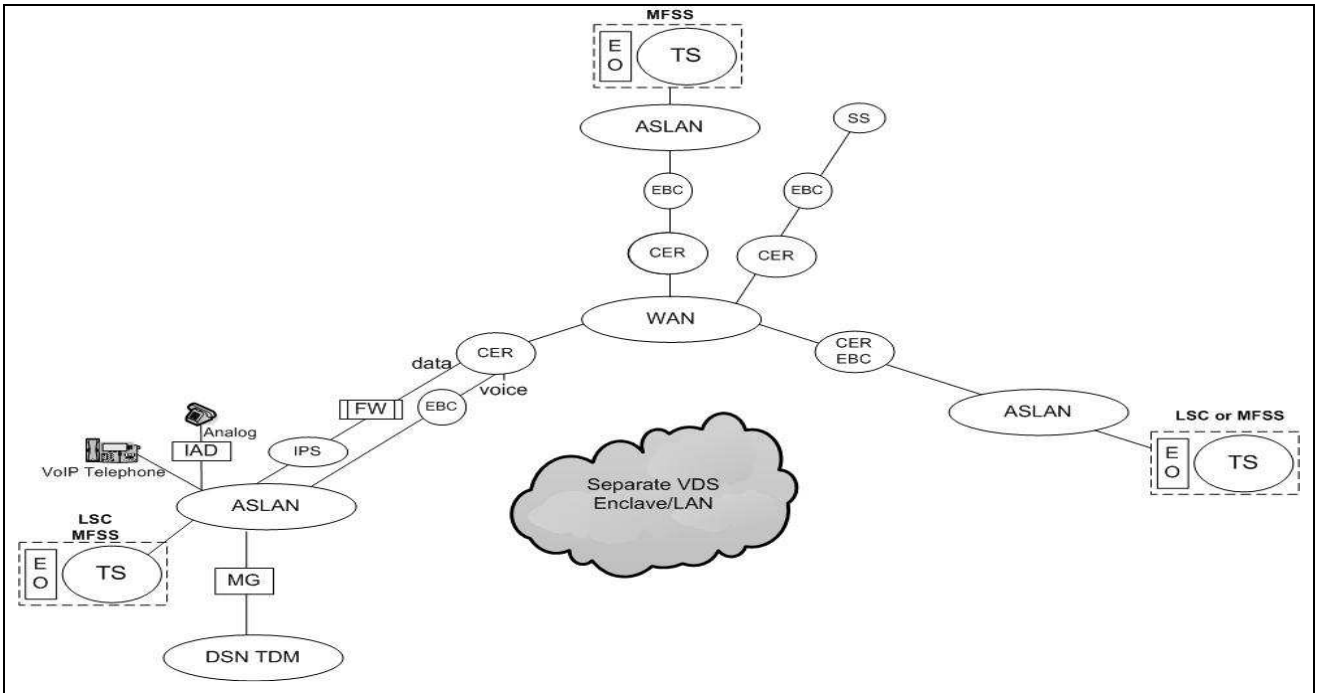
Attachment 2: Operational Architecture & Best Practices

The UC architecture is a two-level network hierarchy consisting of the Defense Information System Network/GIG Network Test Facility (GNTF) backbone switches and Service/Agency installation switches. Joint Staff policy and subscriber mission requirements determine which type of switch is used at a particular location. The UC architecture consists of several categories of devices from Multi-Function Switches to VDS. Figure 2-1 depicts the PESA Cheetah Rel. 5.1's operational UC architecture with relationship to the main UC switch types and location in the GIG architecture.



LEGEND:

ASLAN	Assure Services Local Area Network	MFSS	Multi-Function Soft Switch
CER	Customer Edge Router	MG	Media Gateway
DSN	Defense Switched Network	SS	Softswitch
EBC	Edge Border Controller	TDM	Time Division Multiplexing
EO	End Office	TS	Tandem Switch
FW	Firewall	UC	Unified Capabilities
IAD	Integrated Analog Device	VDS	Video Distribution Switch
IPS	Intrusion Protection System	VoIP	Voice over Internet Protocol
LAN	Local Area Network	WAN	Wide Area Network
LSC	Local Session Controller		

Figure 2-1: Operational Architecture for a VDS in a UC environment

The Closed VDS (Figure 2-2) or Separate VDS Enclave (as depicted in Figure 2-1) avoids interconnection to the GIG and therefore by design is impermeable to outside connections and avoids the potential pitfalls of hackers, malware intrusions, and denial of service attacks. For example, the recent hacking of a Combatant Command's social media networking sites did not impact the operational C4ISR video distribution system. Best practices for critical C4ISR Video Distribution Systems is to utilize the closed VDS architecture and to only utilize JITC tested and certified VDS components listed on the Approved Products List.

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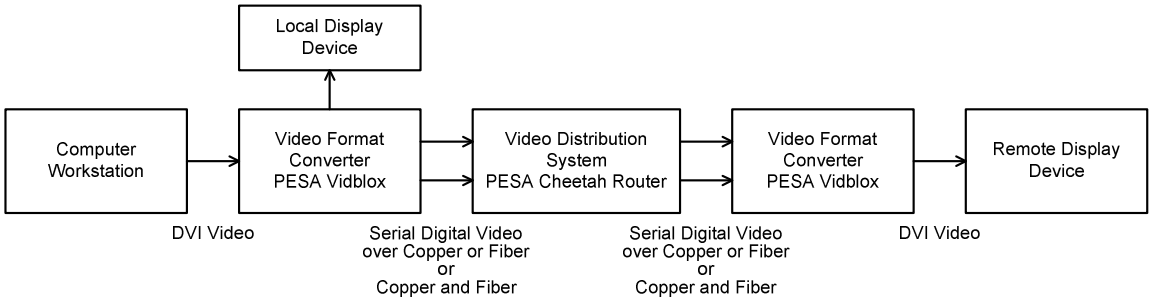

Figure 2-2: Simplified Closed VDS Architecture in a UC environment

Best Practice for a Secure VDS	PESA	Competition
Physically separate architecture	Yes; control and video content are not in the same path	No; control and video are often in the same path
Hardware & software certified against DoD specified threats and tested for Information Assurance (IA) vulnerabilities	Yes; PESA VDS hardware & management control software received the first certifications in the industry. The **Approved Products List Memo** and **IO Certificate** may be downloaded from the APLITS (Approved Products List Integrated System) at https://aplits.disa.mil/processAPList.action or the PESA website. Search APLITS by **Device Type** = "Video Distribution System (VDS)" or **Vendor** = "PESA".	No
VDS System Admin IAW agency/ organization policies	Yes	Yes
VDS monitoring of intrusions	Not required for a Closed VDS because the VDS is not connected to outside networks	Required because their architectures are inherently vulnerable due to connectivity to outside networks
DIACAP and IAAR Scorecards	Yes; as part of the JITC certification process. Scorecards available to U.S. DoD entities. Authorized US Government Civilians or U.S. Uniformed Military Personnel may submit a request for the Information Assurance Assessment Package (IAAP) for Tracking Number (TN) 1206801 to disa.meade.ns.list.unified-capabilities-certification-office@mail.mil	No
Interoperability	Designed and built to industry video standards	Often use proprietary schemes that do not permit interoperability
System resiliency/redundancy	PESA JITC APL products have redundant power supplies and other critical components	Depends upon manufacturer
Cost effective expansion & upgrading	PESA's Cheetah VDS allows for cost effective I/O growth to match your C2 VDS needs as they expand	Varies with manufacturer; many have fixed I/O
Warranty	PESA hardware is manufactured in the U.S. and carries a standard 3 year warranty with extended warranties available out to 10 years	Varies with manufacturer; many have only a 1 year warranty

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Why Closed Video Distribution Systems (VDS) are preferred in Mission Critical environments!

US military Combatant Commands (COCOMs) conduct critical missions on a daily basis. These missions are supported by various platforms that provide data necessary to execute the C4ISR function. Baseband video equipment, collectively known as a Video Distribution System (VDS) in emerging Unified Capabilities (UC) parlance, provides the highest degree of video image quality available to COCOM staffs. The VDS overcomes all of the shortcomings of IP-based video (VIP) distribution and offers a lower total cost of ownership.

Bandwidth – a dedicated VDS means that the images seen by military leaders and staff are unadulterated and enable critical "Go-No Go" decisions with certainty; this is critical in C4ISR missions using aerial platform live full-motion streaming.

Video Quality – a dedicated VDS eliminates the need for the use of complex compression algorithms that result in the loss of data; the VDS allows for storage of the images in their native resolution for future forensic or prosecutorial use easily defended in the court system.

Latency – a dedicated VDS means that full-motion live streaming video from any source is not delayed and is seen by all users simultaneously; latency encountered as a result of buffering may result in delayed decisions and missed targeting opportunities.

Reliability - a dedicated VDS will never result in a staff console within a COCOM being out of service due to video source saturation while an IP-based video distribution system reaches near saturation data packets are arbitrarily lost to accommodate the increased demand; military decision makers cannot afford to be out of service during critical national defense situations such as may be encountered from ICBMs or terrorist threats.

Security – a dedicated VDS is inherently more secure because it does not physically connect with the IP network making it virtually impossible for classified video to be inserted into an unclassified environment; because the VDS is physically separated from the IP-network the certificate of networthiness in a unified capabilities environment is easier.

Supportability – the reliability of a dedicated VDS reduces the need for staffing related to out of service calls; the ease through which users are added to the VDS allows for rapid and flexible configuration and reconfiguration within large military C2 centers.

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