

IP Technology Evolution Project Implementations

Technology Evolution Branch
(NS123)

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V3

Quality of Service (QoS)

- **The ability to provide different priority to different pre-marked packets (applications, users, or data flows) or to guarantee a certain level of performance to those packets.**
 - **Example, a required bit rate, delay, jitter, packet dropping probability, or bit error rate may be guaranteed.**
- **Guarantees are important for real-time streaming media applications, such as VoIP or Video over IP, because they often require fixed bit rate and are delay sensitive, and these guarantees are important in networks where the capacity is a limited resource.**
 - **VoIP requires 150kbps per stream after call set up**

Quality of Service (QoS) Current Status

Phase 1 (Gateway IAPs)

- Initial Performance Measurement Tools Installation 31 May 12
- DISN Edge Router Upgrades (24 CONUS UPE sites) 30 Jun 12
- Initial Capability 30 Jun 12

Phase 2 (DISN)

- Performance Measurement Tools Installation (sites TBD) 30 Sep 16
- DISN Core Router Upgrades 30 Sep 16
- Full Capability 30 Sep 16

IPv6

- **The White House, OMB, and DoD have issued directives for the federal government to convert to IPv6.**
- **The directives require:**
 - **Upgrade of all federal public facing web site support IPv6 by 30 Sept 2012**
 - **Upgrade all internal networks/applications to IPv6 by 30 Sept 2014**
- **IPv6 is designed to replace IPv4, the Internet protocol currently deployed and used most extensively throughout the world.**

IPv6

- **Benefits of IPv6 include:**
 - **Simplified packet header for routing efficiency**
 - **Large address space - 128-bit (16-byte) source and destination IP addresses**
 - **Efficient and hierarchical addressing and routing infrastructure**
 - **Stateless and stateful address configuration**
 - **Built-in security**
 - **Better support for prioritized delivery**
 - **New protocol for neighboring node interaction**
 - **Extensibility (up to 1280 octet)**

IPv6

- **Upgrade federal public facing web site support for IPv6 by 30 Sept 2012**
 - DISN Core is IPv6 capable
 - Ongoing IPv6 capable aggregation router line card procurement
 - End-to-end testing is scheduled
 - Turn on Sensitive But Unclassified (SBU) IPv6 service by August 2012
- **Upgrade internal networks/applications to IPv6 by 30 Sept 2014**
 - DISN Core is IPv6 capable (used for Classified & Unclassified traffic)
 - Ongoing IPv6 capable aggregation router line card procurement
 - Turn on Secret IPv6 service by August 2014

Private IP Service

- **Is an enterprise Virtual Private Network (VPN) service providing data privacy to customers across the Sensitive But Unclassified (SBU) IP Data Network (formerly known as NIPRNet). Service is available as a DISN Subscription Service (DSS) at any of the DSS locations that include SBU IP Data. The service will also be accessible from non-DSS sites; however, the customer will be responsible for access from non-DSS sites.**
- **Provides a segregated IP service for DISN customers utilizing an MPLS Layer 3 VPN**
- **Alternative service for some ATM and Low-Speed TDM (LSTDM) customers**
- **Uses Backbone Transport STIG**
- **Modified CAP applies subject to DSAWG review**
 - **Separate physical interface**
- **Inter-Theater VPNs: Yes**

Private IP Service Current Status

- Initial Operational Capability achieved.
- DISA Service Catalog updated Jan 2012
 - <https://www.disadirect.disa.mil/products/asp/welcome.asp>
- Connection Process Guide
 - Update pending resolution of questions raised by FSO
 - <http://disa.mil/Services/Network-Services/DISN-Connection-Process/Getting-Started>
- Service can be ordered via DDOE
 - <https://www.disadirect.disa.mil/products/asp/welcome.asp>

Secret Private IP Service

- Is an enterprise Virtual Private Network (VPN) service providing data privacy to customers across the Secret IP Data Network (formerly known as SIPRNet). Service is available as a DISN Subscription Service (DSS) at any of the DSS locations that include Secret IP Data.
- Provides a segregated IP service for DISN customers utilizing an MPLS Layer 3 VPN
- Uses Backbone Transport STIG
- Modified CAP applies subject to DSAWG review
 - Separate physical interface
- Inter-Theater VPNs: Yes

Secret Private IP Service Current Status

- Initial Operational Capability planned for 2Q 2013
- Service will be orderable via DISN Direct Order Entry (DDOE)
 - <https://www.disadirect.disa.mil/products/asp/welcome.asp>



Private LAN Service

- **Is a way to provide Ethernet based multipoint to multipoint communication over the DISN IP MPLS network. It allows geographically dispersed sites to share an ethernet broadcast domain by connecting sites through pseudo-wires.**
- **This layer 2 VPN technology allows any-to-any (multipoint) connectivity.**
- **The LAN at each site is extended to the edge of the DISN network. The DISN then emulates a switch/bridge to connect all of the customer LANs to create a single bridged LAN.**
- **Provides a segregated IP service for DISN customers utilizing an MPLS Layer 2 VPN**
 - **Layer 2 VPN routing based on MAC address**
 - **Dependent on acquisition and installation of IPT-PE router infrastructure**
- **Modified CAP applies subject to DSAWG review**
 - **Separate physical interface**
- **Inter-Theater VPNs: Yes**

Private LAN Service Current Status

- **Pilot locations installed and pending config for operation**
- **Pending DDOE, WWOLS, NCCM, SQM changes, and NRRB, approval**
- **4Q 2012 availability**

Label Transport Service

- **Layer 2 VPN routing based on MPLS Label**
- **Dependent on acquisition and installation of IPT-PE router infrastructure**
- **Provides a segregated IP service for DISN customers**
- **Provided as a DISN Subscription Service**
- **Alternative service for some ATM and Low-Speed TDM (LSTDM) customers**
- **Modified CAP applies subject to DSAWG review**
 - **Separate physical interface**
- **Inter-Theater VPNs: Yes**

Label Transport Service Current Status

- **Pilot locations installed and pending config for operation**
- **Pending DDOE, WWOLS, NCCM, SQM changes, and NRRB, approval**
- **4Q 2012 availability**

Multicast

- **Traditional IP allow a host to send packets to another host (unicast transmissions) or to all hosts (broadcast transmissions).**
- **IP Multicast provides a third communication alternative: allowing a host to send packets to a group that is made up of a subset of the hosts on the network.**
- **MPLS IP Multicast is a bandwidth-conserving technology specifically designed to reduce traffic by simultaneously delivering a single stream of information to potentially thousands of corporate recipients or homes. By replacing copies for all recipients with the delivery of a single stream of information, IP Multicast is able to minimize the burden on both sending and receiving hosts and reduce overall network traffic.**
- **Within a multicast network, routers are responsible for replicating and distributing multicast content to all hosts that are listening to a particular multicast group.**
- **Routers employ Protocol Independent Multicast (PIM) to build distribution trees for transmitting multicast content, resulting in the most efficient delivery of data to multiple receivers.**
- **Multicast will support the service classes for priority handling.**

Multicast Current Status

Phase 1 (PIM-SM)

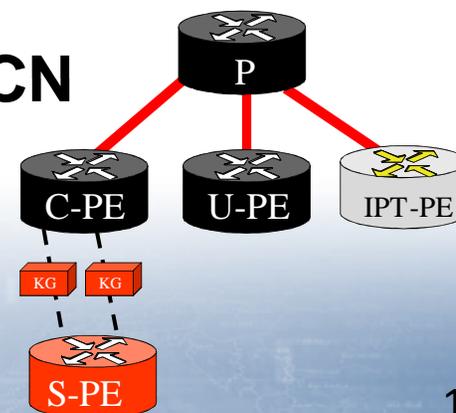
- Design Document 15 Jan 12
- Test Plan 25 Jan 12
- IP CCB 1 Feb 12
- Pilot Capability 3Q 2012

IP Transport

- **IP Transport service provides a flexible but very reliable way to use our established network for low-layer connectivity in point-to-point and point-to-multipoint connections**
- **Protocol Components:**
 - **Stream Control Transmission Protocol (SCTP)**
 - **Transmission Control Protocol (TCP)**
 - **User Datagram Protocol (UDP)**
 - **Service Specific Connection Oriented Protocol (SSCOP) for Multi-Cast Environments (MCE) (SSCOP-MCE)**
 - **Internet Protocol (IP)**

IP Transport

- **New PE Layer – IP Transport Provider Edge (IPT-PE)**
- **Exists at the same level as U-PE and C-PE**
- **No connectivity to Internet**
- **Only MPLS VPN services will be enabled**
 - All customer traffic is segregated in dedicated VPNs
 - Customer responsible for encryption
- **Hardware optimized for high density Ethernet**
- **Network Management via out-of-band DCN**



IP Transport Current Status

- **IPT-PE Router Installations**
 - **Phase I**
 - **Sites – Ft. Bragg and Hampton Roads**
 - **Date – January 2012**
 - **Phase II**
 - **Sites – Hickam and Wahiawa**
 - **Date – Q4 2012**
 - **Phase III**
 - **Sites – Yokota and Camp Walker**
 - **Date – Q4 2012**
 - **Beyond**
 - **Sites – DISN Core sites**
 - **Date – 2014 to 2016**

QUESTIONS

