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DISN: NIPRNet/SIPRNet Services Update

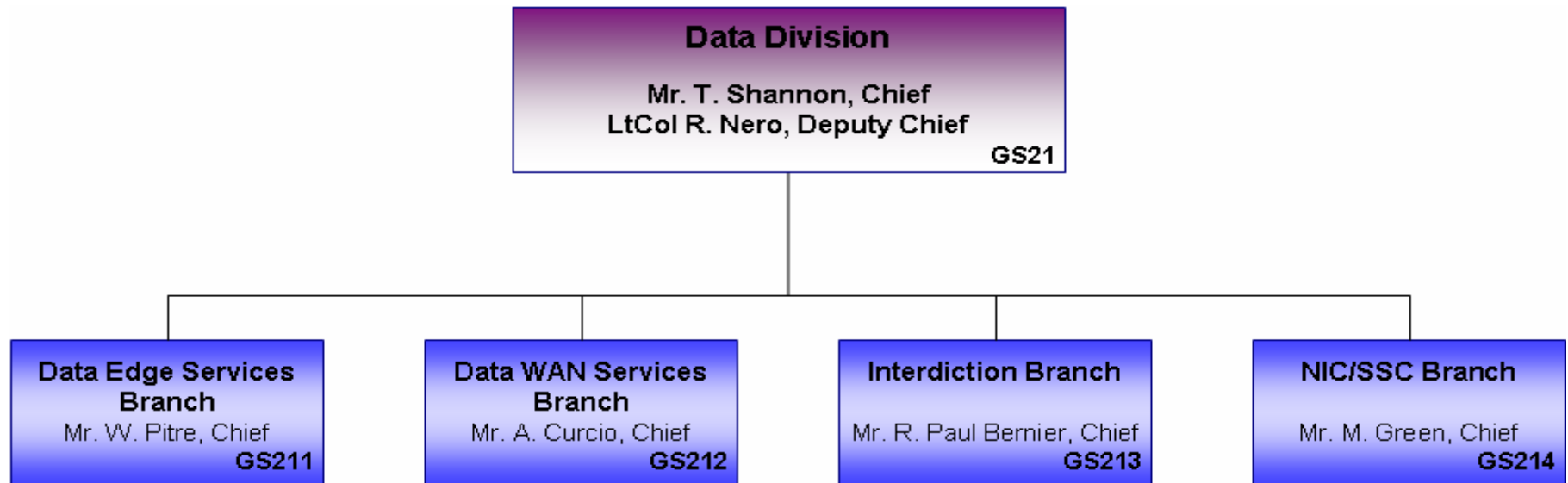
**Mr. Tim Shannon
Chief, Data Division
8 May 2008**

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Data Division: Mission



Mission

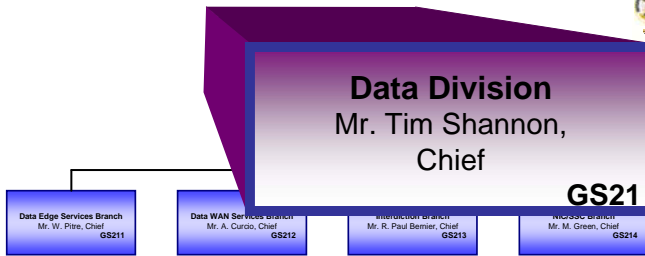
The GS21 Data Division is responsible for planning, resourcing, fielding, sustaining and evolving GIG Combat Support data networks that provide Information Superiority to the Commander-in-Chief, Combatant Commanders, Senior Leadership, Services, Agencies, and the Warfighter. Provide C4I technologies and services for federal, state, and foreign counter-narco terrorism partners.

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GS21 – Data Division

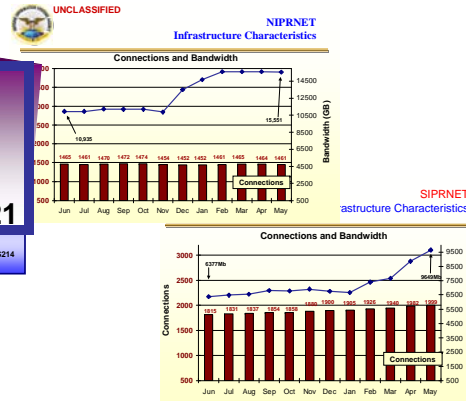


PERSONNEL

- 68 Civilian; 1 Military

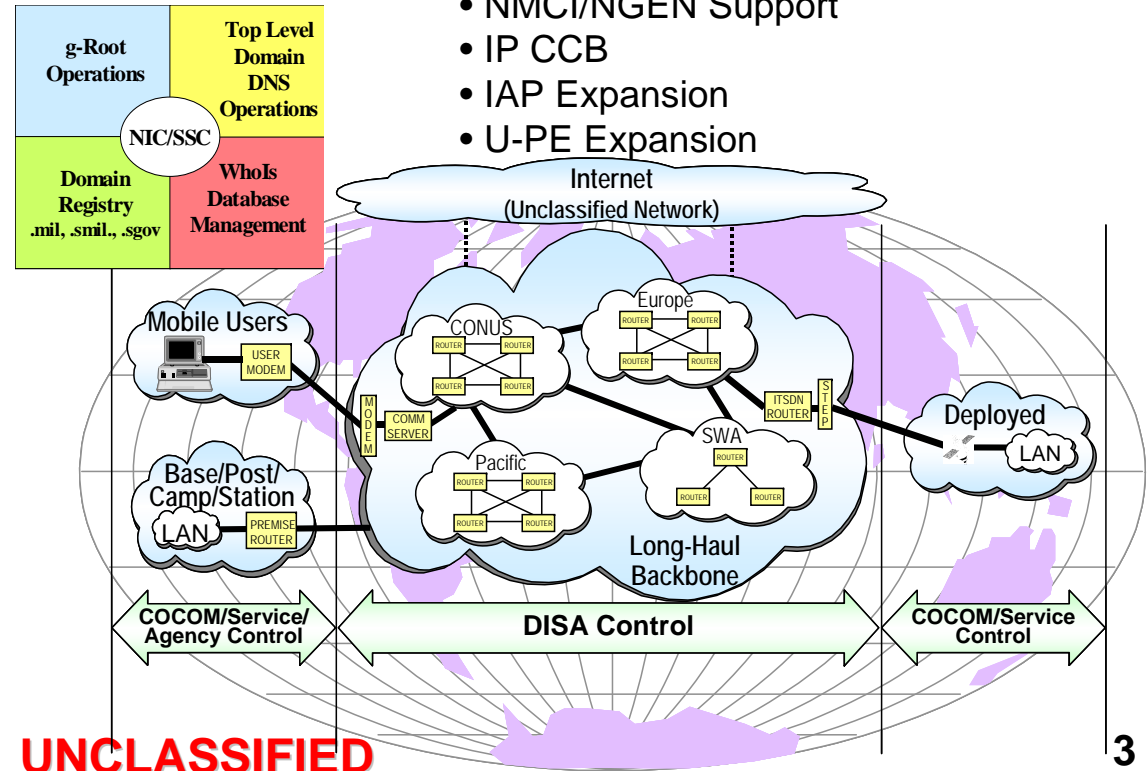
FUNCTIONS/CONTRIBUTIONS

- Classified Data Services (SIPRNet)
- Unclassified Data Services (NIPRNet)
- Internet access
- DoD IP address management
- DNS management/administration (g-Root/.mil/.smil.mil/.sgov.gov)
- DISN Dial-In services
- DISN COMSEC Controlling Authority
- Anti-Drug Network (ADNET) Program
- DISN-LES Services
- IP Sonar Services
- DISN Data Training Course
- UTM Pensacola
- PUSHKEY
- IP Tactical Edge Services



MAJOR PROJECTS

- DISN IP Core transition/integration
- MHS implementation
- Cisco IOS/JUNOS upgrades
- REL/FED DMZ support
- DNS Upgrade
- Router upgrade program
- IPv6 Implementation
- CCER IPT for .cmil.mil
- NMCI/NGEN Support
- IP CCB
- IAP Expansion
- U-PE Expansion



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DISA NIPRNet Major Accomplishments

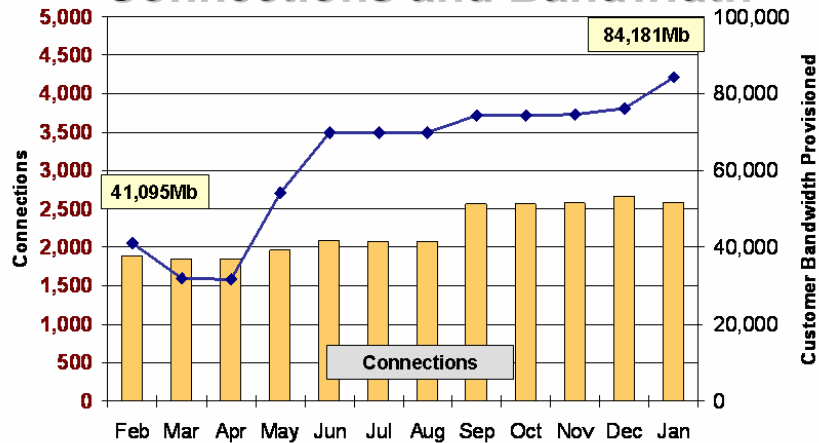
- NIPRNet transition 98% completed (118/120); two CONUS hubs remain
- NMCI Phase II completed (9 sites; 473 circuits) Mar 08
- Wiesbaden OC-12 Internet Access Point (IAP) operational Dec 07; Internet consolidation (2 OC-12 IAPs) completed in EUR.
- NIPRNet PAC and EUR AS Merge completed Mar 08
- NIPRNet SWA traffic (portion) now being routed via EUR vice CONUS
- Pushkey 7500 router IOS upgrade completed Nov 07
- CITS BLOCK 30 AF Gateways (10 CONUS/3 EUR/3 PAC) operational Dec 07
- SOUTHCOM (Miami) NIPRNet Hub physical path diversity completed Dec 07



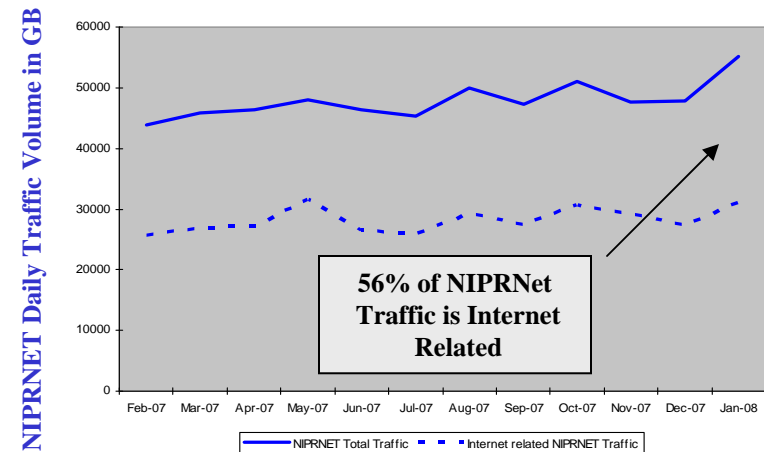
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NIPRNet Performance Metrics

NIPRNet Infrastructure Characteristics Connections and Bandwidth



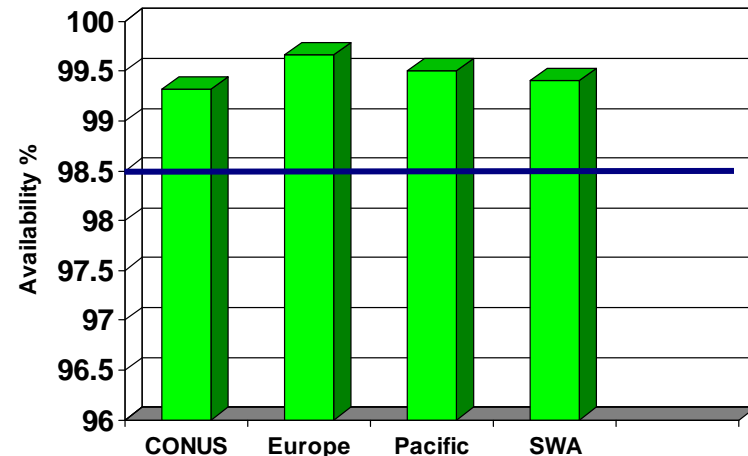
NIPRNet Traffic Volume



NIPRNet Performance (January 2008)

	<u>Latency (ms)</u>	<u>Packet Loss (%)</u>
Within CONUS	45 / 100	.03 / 1.0
CONUS to Europe	124 / 150	.02 / 1.0
Within Europe	29 / 150	.31 / 1.0
CONUS to Pacific	119 / 150	.02 / 1.0
Within Pacific	91 / 150	.02 / 1.0
CONUS to SWA	457 / 700	1.55 / 1.0
Within SWA	267 / 700	.41 / 1.0

NIPRNet Availability (January 2008)



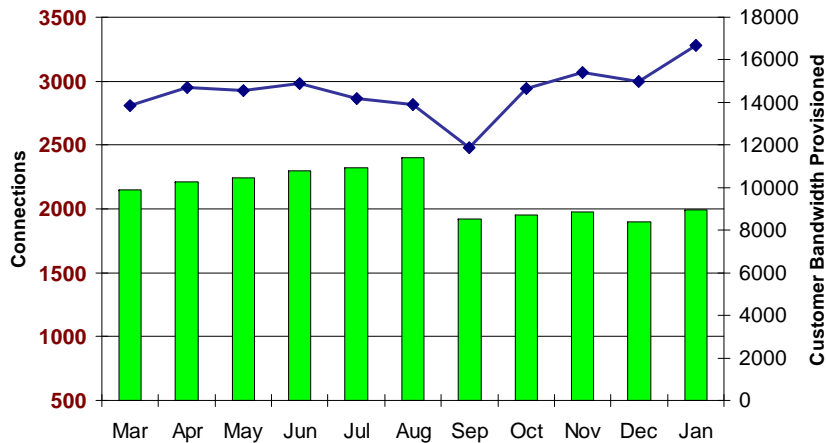
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DISA SIPRNet Major Accomplishments

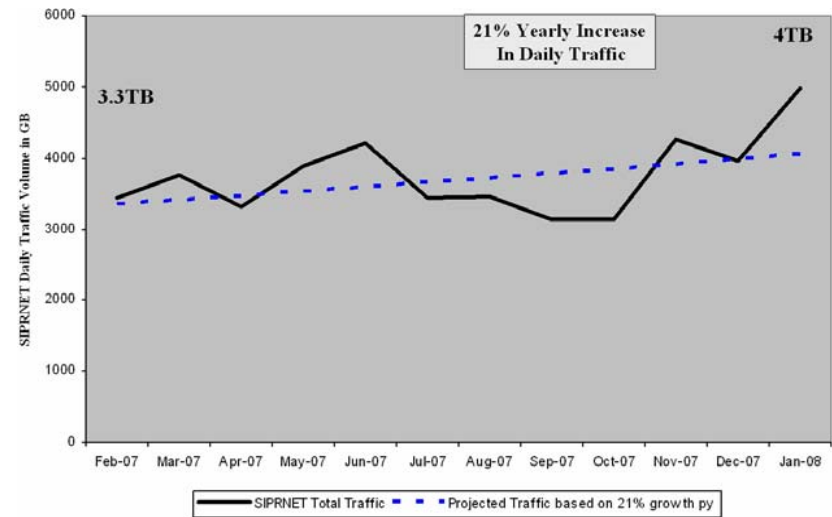
- SIPRNet transition 35% logically and 81% physically complete
- SIPRNet PAC Transitioned minus ASN Merge
- DATMS-C terminated and customers transitioned to SIPRNet
- Miami SOUTHCOM SIPRNet hub physical path diversity completed
- SIPRNet Network Management transitioned to the new DISN EMS
- Enterprise Collaborative Operational Sensor (ECOS)
 - 22 on line: 19 Pacific, 3 CONUS

DISA SIPRNet Performance Metrics

SIPRNet Infrastructure Characteristics Connections and Bandwidth



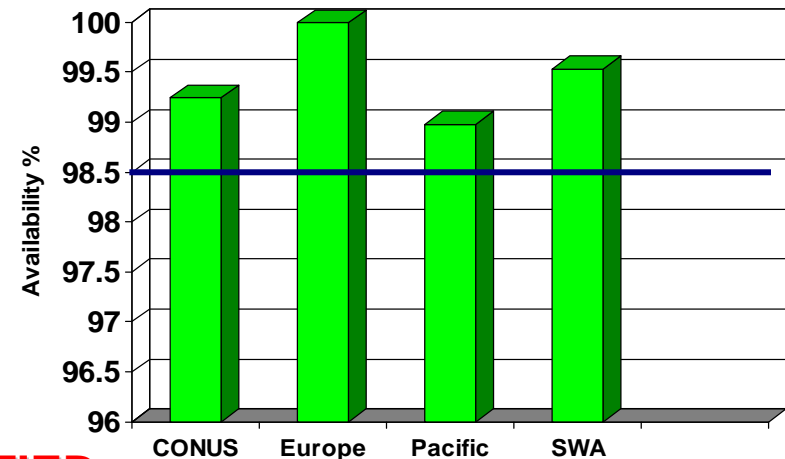
SIPRNet Traffic Volume



SIPRNet Performance (January 2008)

	<u>Latency (ms)</u>	<u>Packet Loss (%)</u>
Within CONUS	52 / 100	.03 / 1.0
CONUS to Europe	139 / 150	.06 / 1.0
Within Europe	34 / 150	.05 / 1.0
CONUS to Pacific	99 / 150	.07 / 1.0
Within Pacific	95 / 150	.08 / 1.0
CONUS to SWA	515 / 700	1.85 / 1.0
Within SWA	268 / 700	1.09 / 1.0

SIPRNet Network Availability (January 2008)





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NIPRNet/SIPRNet Transition Objectives

- **Maximize the use of new DISN Core bandwidth (All theaters)**
- **Minimize dependencies on commercial leased bandwidth**
- **Provide a consistent set of IP features to support converged IP services**
- **Consolidate and streamline the DISN IP networks**

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Current Status

- **NIPRNet Transition**
 - Phase 1: 98% complete; PAC & EUR complete; 2 hubs remain for CONUS – on track for 3QFY08 completion
 - Phase 2 (ASN Merge): PAC and EUR completed; CONUS schedule being developed for 30 Jun merge completion

- **SIPRNet Transition**
 - PAC: 100% complete (physical & logical); ASN Merge in progress
 - CONUS: 78% physically complete; 10% logical transition; ASN Merge concurrent with logical transitions
 - EUR: 68% complete (physical & logical); remainder in progress; 10 awaiting crypto (to follow CONUS)
 - Target completion end of May, pending receipt of encryption devices

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DISA Cisco 7500 End of Life (EoL)

- **EoL Announcement – December 15th, 2006**
 - DISA Informed in November, 2006
- **Actual End of Service Date – December 15th, 2007**
 - Affects Chassis, RSPs, VIPs, and memory
 - Does NOT affect Port Adapters (7200/7300/7600 & others use)
- **End of Software Maintenance – December 14th, 2008**
 - Last maintenance release of IOS for 7500
 - No more regular bug fixes or IAVA fixes
- **End of Service Contract Renewal – March 14th, 2012**
- **Last Date of Support – December 13th, 2012**
- **Product Life Span from 1995 – 2012: 17 Years**



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Issues/Way Ahead

- **Issue:**
 - Over 250 Cisco 7500 routers deployed in DISN Networks
 - NIPRNet and SIPRNet ATOs in jeopardy

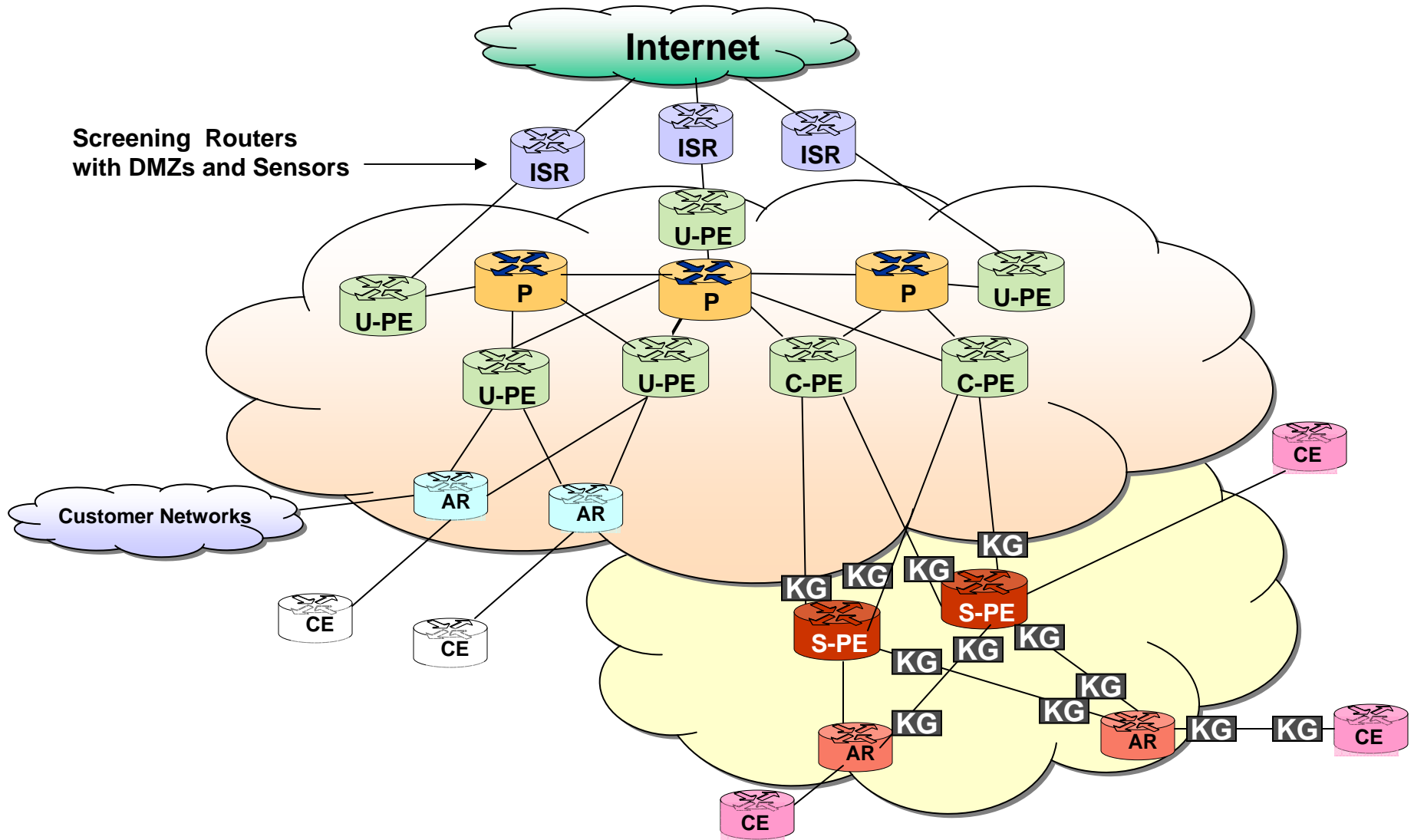
- **Way Ahead:**
 - Work to extend Cisco support for add'l 2 years
 - Business case analysis – Lease vs. Buy (July decision-BUY)
 - Max reuse of existing port adaptor boards
 - FY08: 20 CONUS NIPRNet routers to be replaced
 - FY08: 7 CONUS U-PEs being upgraded plus 7 new sites
 - FY09+: Pending DISN Tech Refresh Plan

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FY 09 DISN Architecture



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IP Convergence

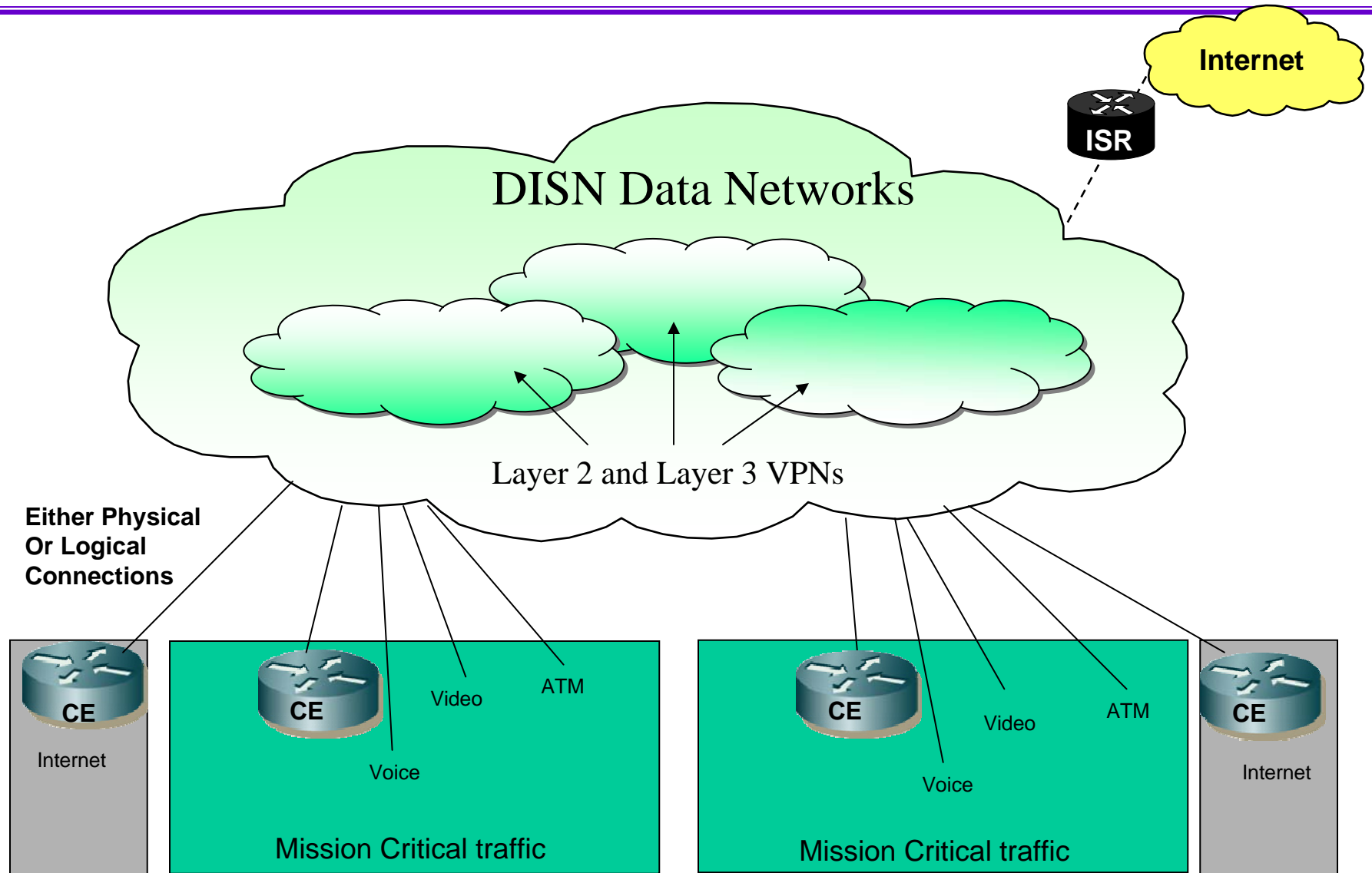
- **Converges Data, Video and Voice Requirement over IP Network**
- **Leverage Existing IP Infrastructure to Provision Additional Services**
- **Create service VPNs on the IP Network**
- **All customer interface with the IP Network (with few exceptions)**
- **Services exist everywhere NIPRNet exists**
- **Partner with other ISPs' on Lessons Learned from Interoperability and IP Convergence**

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IP Convergence Architecture



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DISA Design and Validation Requirements (FY08-FY09)

- **Identify Features/Requirements for Service VPNs**
- **Continue Research with Other Service Provider and Vendors**
- **Extending MPLS to the IP Edge**
- **QoS policy needs to be configured**
- **Perform MPLS Interoperability Assessment**
- **Perform Testing on Layer 2 and Layer 3 VPNs**
- **May Need Additional Hardware Deployment**

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Internet Gateway Issues

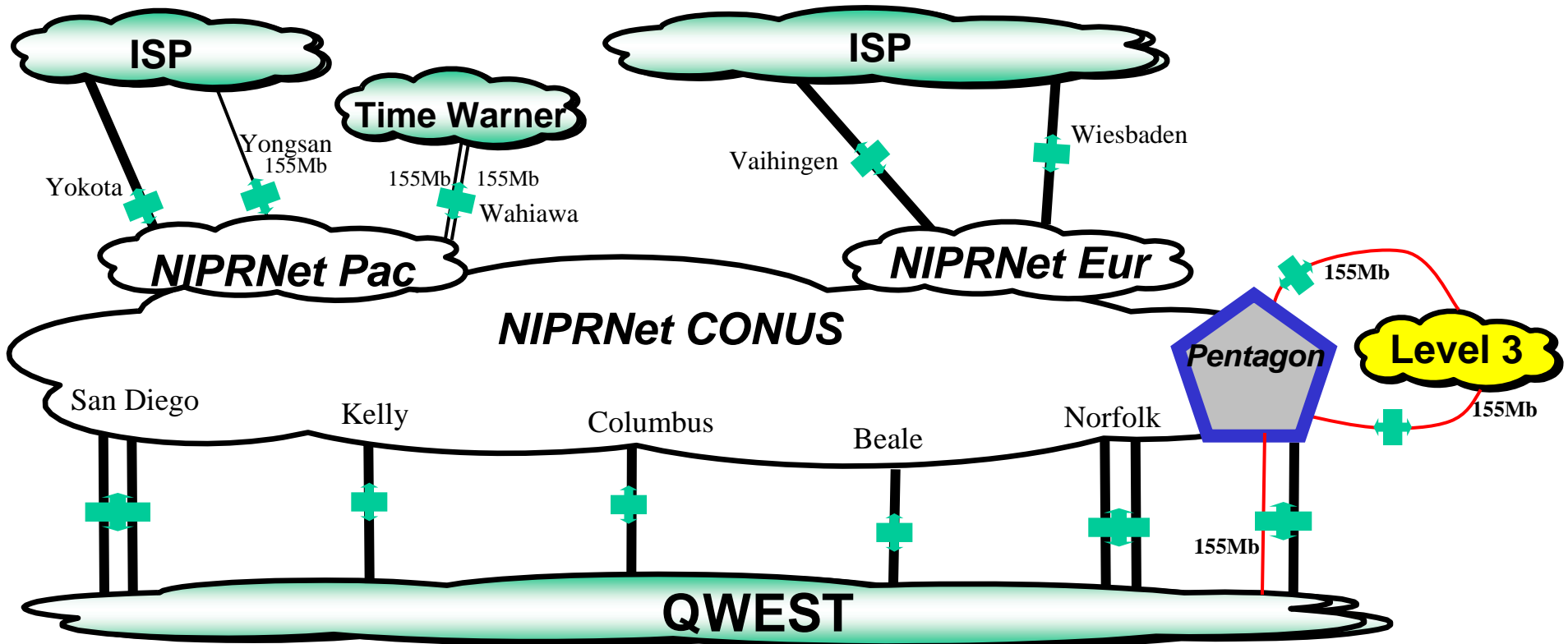
- Internet access is an unconstrained service ... as NIPRNet grows, so must Internet access
- CONUS IAPs reach saturation during peak hours
- Congestion at IAPs may impact DoD applications
 - AKO/DKO
 - E-commerce/logistics
 - Telework by DoD employees

~60% of NIPRNet traffic is Internet related



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Internet Gateways Dec 2007



11 Locations/17 Connections

Internet Bandwidth	
Total Internet BW	7,772Mb

Key

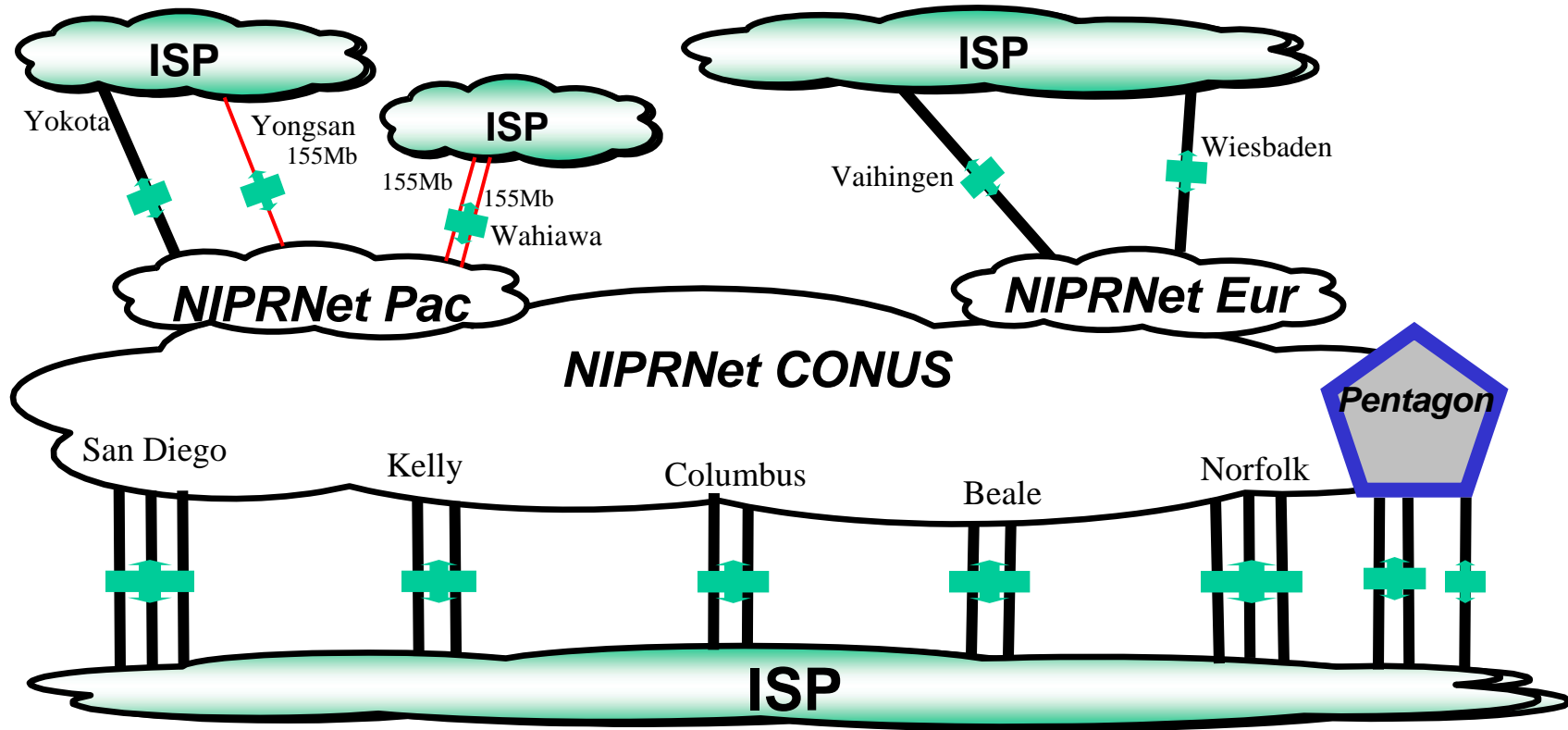
- Operational OC-3
- Operational OC-12
- To be Deactivated in 6-12 months
- Juniper ISR Deployed

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Internet Gateways July 2008



11 Locations/21 Connections

Internet Bandwidth	
Total Internet BW	11,661Mb

Key

- Operational OC-3 (thin black line)
- Operational OC-12 (thick black line)
- To be Deactivated in 6-12 months (red line)
- Juniper ISR Deployed (green cross symbol)

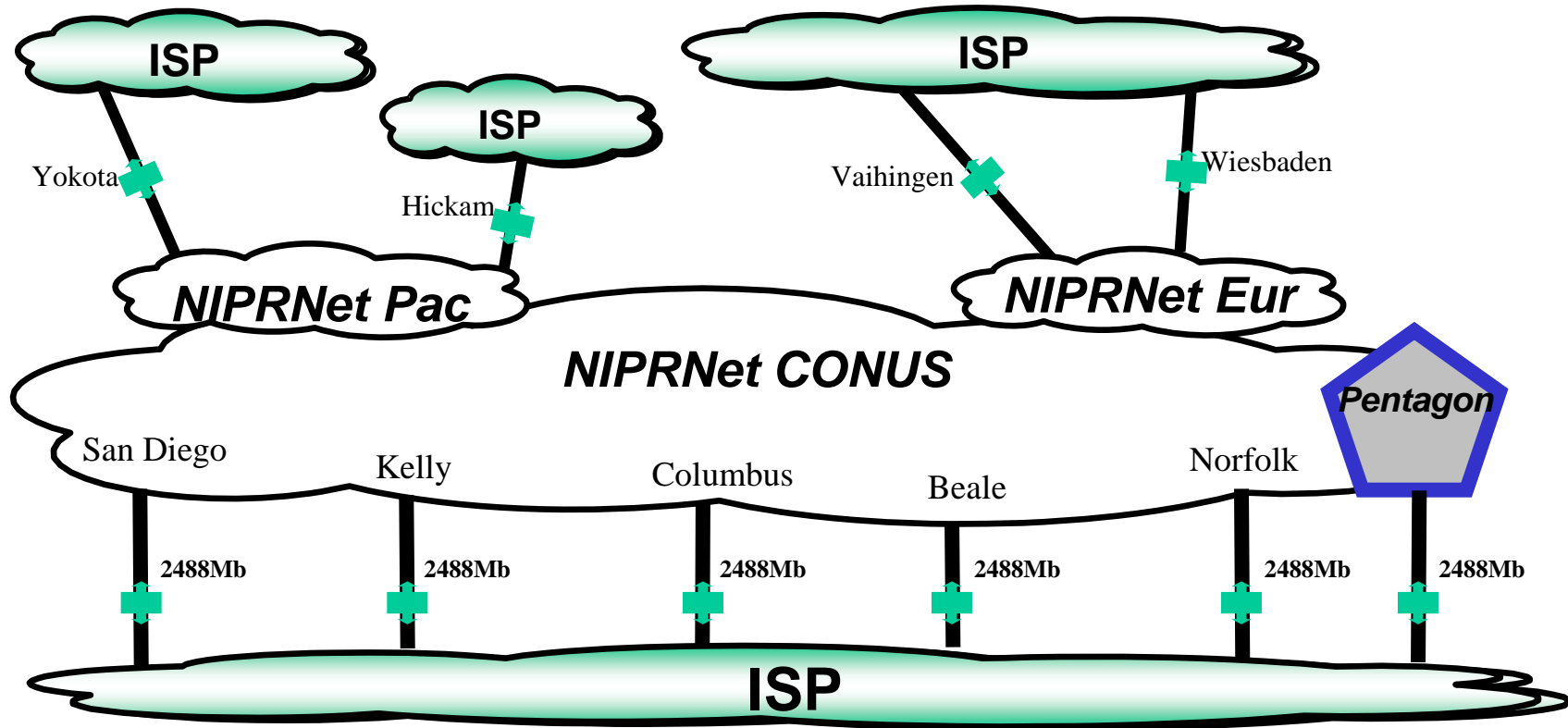
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Internet Gateways End State

OC-48s CONUS, OC-12s OCONUS



10 Locations/10 Connections

Internet Bandwidth	
Total Internet BW	17,416Mb

Key

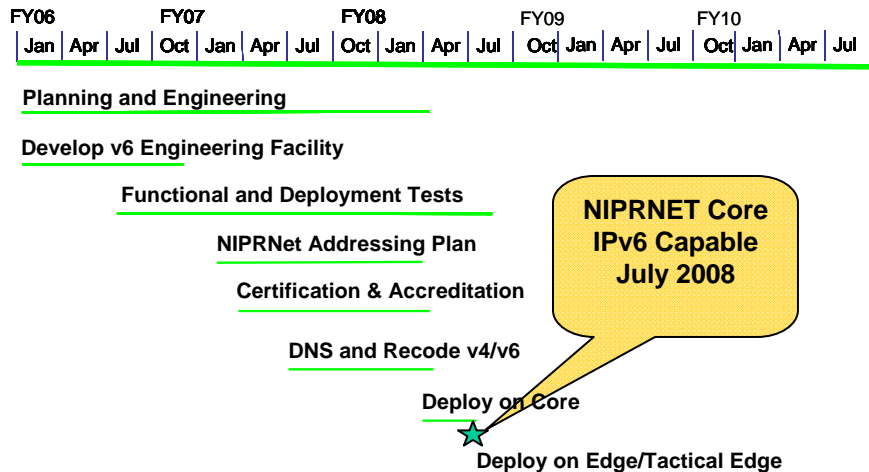
- Operational OC-48
- Operational OC-12
- To be Deactivated in 6-12 months
- Juniper ISR Deployed

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DISA IPv6 Transition Status

NIPRNet Transition:



Critical Path Items:

- Develop IPv6 Engineering Test Facility
- Test IPv6 6PE for Core Network
- NIPRNet IPv6 Address Plan
- Recode Address Mgt Tool
- Core Network C&A
- Conduct Core T&E
 - Deployment Test
 - Operational Test/Demo (ECD: Jun08)

Required Funding/Resources:

- The IPv6 NIPRNet transition effort is fully funded

Transition Issues:

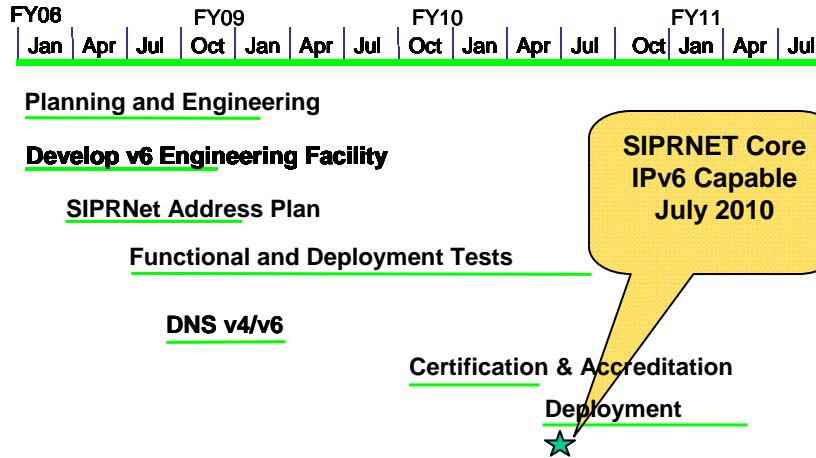
- IPv6 firewall and IA devices availability
 - Impact: Unable to resolve native IPv6 DNS queries
 - Impact: Unable to communicate with tactical users via STEP IA Tools
 - Way Ahead: Work with vendors to upgrade firewalls & IA devices
- Edge routers do not support IPv6
 - Impact: IPv6 traffic limited to Core
 - Way Ahead: Edge routers being upgraded to support IPv6



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DISA IPv6 Transition Status

SIPRNet Transition:



Critical Path Items:

- SIPRNet IPv6 Address Plan (ECD: Sep08)
- HAIPE v3 availability (dependency) (ECD: Jun09)
- Add HAIPE to IPv6 Engineering Test Facility (ECD: Jun09)
- SIPRNet C&A (ECD: May10)
- Conduct Core T&E Deployment Test (ECD: Mar10)
- Operational Test/Demo (ECD: Jun10)

Required Funding/Resources:

- The IPv6 SIPRNet transition effort is fully funded

Transition Issues:

- IPv6-capable HAIPE device development

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IP Tactical Edge Services

- **Mission:** To provide a standard, integrated entry point for DISN Data and converged IP services to authorized, deployed customers

- **JIDS/ITSDN Router Consolidation**
 - Concurrent with 7500 replacement at STEP sites
 - Installations to start late in Q308

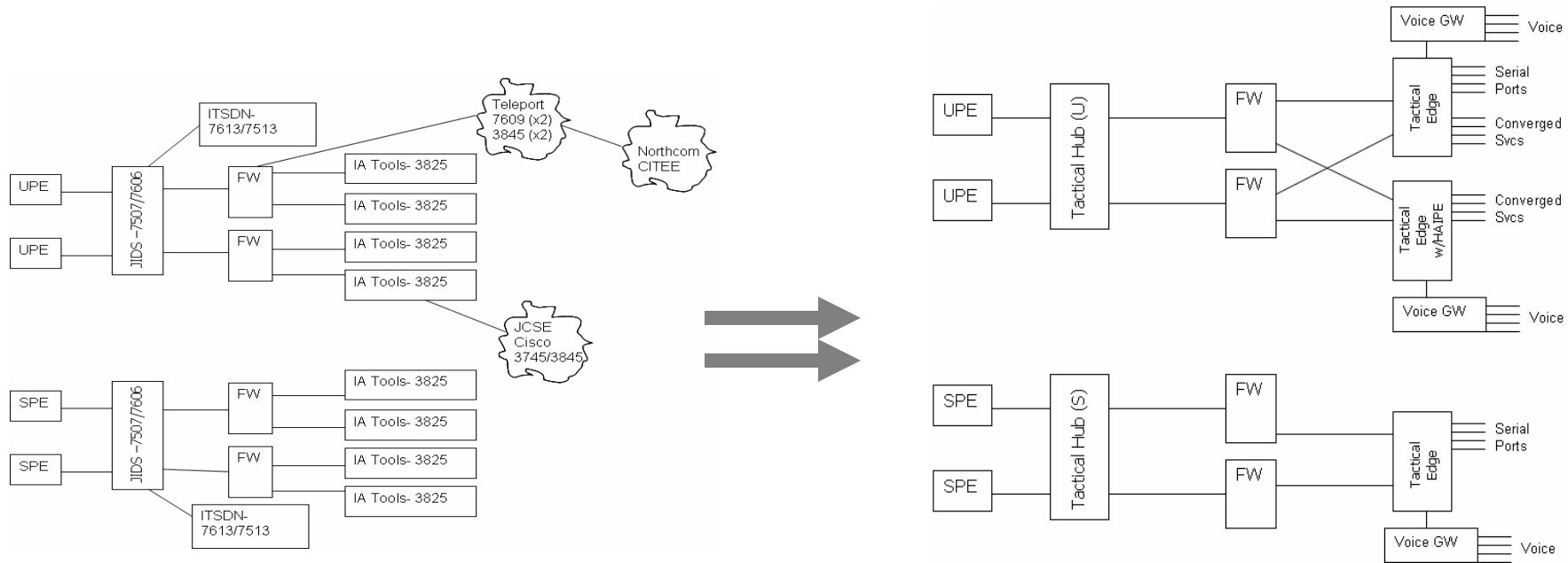
- **Firewall Replacement:** Projected start Q408



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Tactical IP Services

Router Consolidation



TODAY: 192 routers

NIPR: JIDS + ITSDN + (4) IA Tools
 SIPR: JIDS + ITSDN + (4) IA Tools
 X 16 STEP sites

Interim: 160 routers

NIPR: JIDS/ITSDN + (4) IA Tools
 SIPR: JIDS/ITSDN + (4) IA Tools
 X 16 STEP sites

Proposed Future: 80 routers

CITEE: Commercial Internet and Telephone Everything over IP Enclave
 FW: Firewall
 HA/HA/HA: High Assurance Internet Protocol Encryptor
 ITSDN: Integrated Tactical/Strategic Data Network

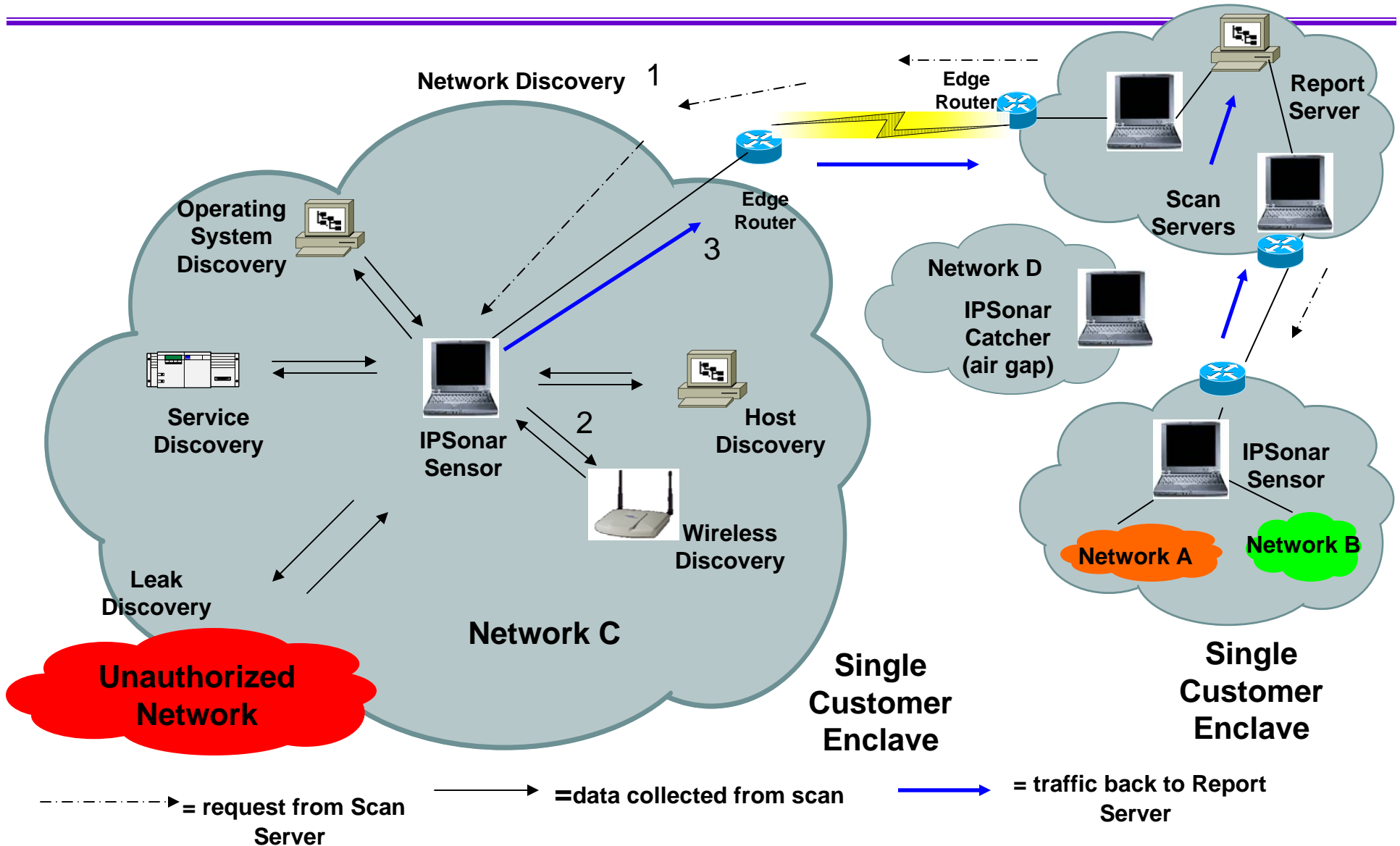
JCSE: Joint Communications Support Element
 JIDS: Joint Intrusion Detection System
 SPE/UPE: Secret/Unclassified Provider Edge Router
 STEP: Standardized Tactical Entry Point

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DISA IP Sonar Network Mapping Tool

- **System Description**
 - Provides an enterprise capability to map, inventory, and discover network assets and connections
 - Capability does not consume large amounts of network resources and does not require an installed agent to perform discovery
 - Operated by JTF-GNO
- **Network Mapping Requirements (JTF-GNO CTO 08-002)**
 - Develop and deploy the capability to map SECRET and UNCLASSIFIED DoD IP networks globally. Networks include the backbone and all enclaves at a minimum. The capability must be able to detect wireless access points and all access points into and out of the UNCLASSIFIED and SECRET portions of the DoD GIG. Analysis capabilities, including adequate personnel and applications must be available to the GNC and TNCs.
 - The system shall detect and report network devices (routers, servers printers, workstations) including unknown devices
 - Mapping threshold – detect all packet forwarding devices
Goal – report all IP-based devices in appropriate detail
 - Reports shall identify network anomalies and misconfigurations

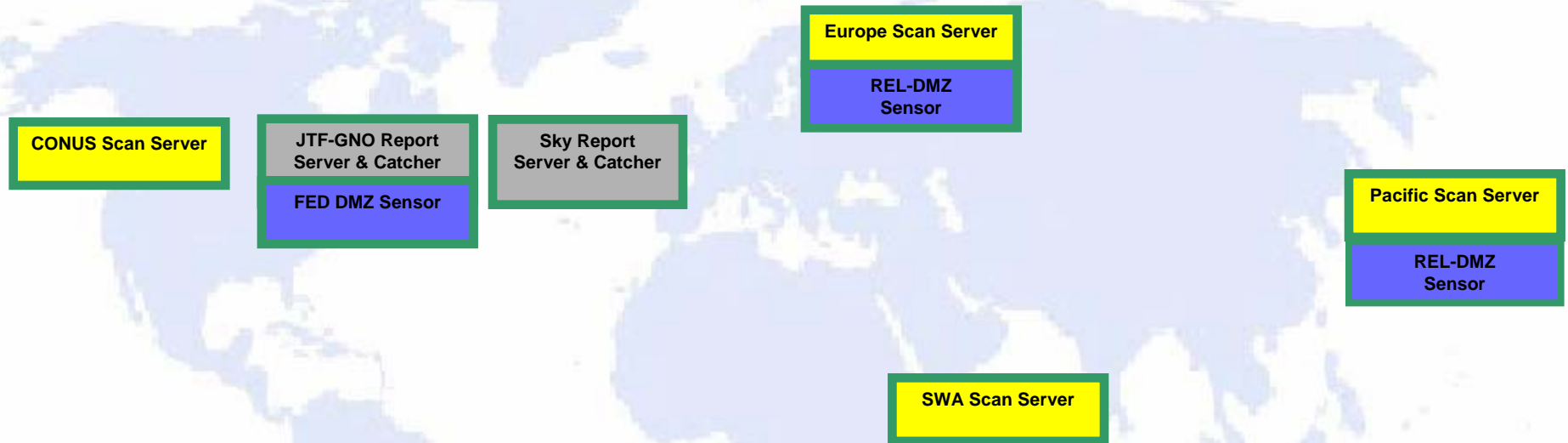
What is IPSonar?





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IPSonar Deployment



- Four mobile devices operated by JTF-GNO
- Future deployment of one Scan Sensor to DECC San Antonio
- 5 spare sensors in warehouse

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Network Information Center (NIC)/ SIPRNet Support Center (SSC)

- Central Authority for the assignment and registration of all DoD Internet Protocol (IP) address space.
- Operates and maintains the **g-root**, one of thirteen root servers supporting the global Internet.
- Manages and administers the IP **.mil**, **.smil**, and **.sgov** top level domains (TLDs) for the DoD supporting the unclassified and classified network environment.
- Operates and maintains the Authorization Authentication and Accounting (AAA) servers remotely located around the world supporting the DISN Dial-In program.
- Maintains DISN registration, the supporting “Whois” database, and controls access to DISN Dial program.



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NIC/SSC Scope



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NIC/SSC Performance

- **g-Root**
 - Resolves over 190B queries annually; (11% Increase)
 - Reduced latency from 388 ms to 39 ms; and Packet Loss reduced from ~ 8% to virtual 0% - (Pre-Transition vs. Post-Transition)
- **DNS Services (.mil/.smil/.sgov)**
 - Global DNS environment resolves over 23B .mil queries annually;
- **Dial Authentication (ACS)**
 - Authenticate over 22,000 network dial-user requests (Unclassified and Classified) annually; (Reduced overhead 45%)
- **Customer Support Services – 24x7**
 - Customers are all DoD COCOMS, Services, Agencies as well as the Intelligence Community and other USG agencies and organizations
 - Process over 15,000 templates; (Reduced re-handling 44%)
 - Resolve over 13,000 user contacts; (Reduced inquiries 38%)
 - Receive over 333K web inquiries; (11% Increase)

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NIC FY08/FY09 Initiatives

- **IPv6 Implementation – 3QFY08**
- **.mil-Proxy Server Implementation – 4QFY08**
- **Anycast capability for g-Root – 4QFY08**
- **Remote site DNS traffic monitoring – 1QFY09**
- **DNSSEC Implementation – .mil zone – 2QFY09**

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DISA DISN Data Services Course: 2008

<u>Class Dates</u>	<u>Command</u>	<u>Location</u>	<u>POC</u>
19-21 Feb.	ARMY	Ft. Monmouth, NJ	Eileen Francesconi eileen.francesconi@us.army.mil
1-3 April	DISA-PAC	Yongsan, Korea	Agnes Bayan agnes.bayan@disa.mil
8-10 April	DISA-PAC	Yokota AFB, Japan	Agnes Bayan agnes.bayan@disa.mil
29-30 April, 1 May	DISA-CENTCOM	MacDill AFB, FL	Herb Wilson herb.wilson@disa.mil
20-22 May	DISA-JTIC	Ft. Huachuca, AZ	Cynthia Haller cynthia.haller@disa.mil
10-12 June	DISA-NORTHCOM	Peterson AFB, CO	Kenneth Love ken.love@disa.mil
1-3 July	DISA-EUR	Garmisch, Germany	MSGT Mark Moore mark.moore@disa.mil
8-10 July	AIR FORCE	Randolph AFB, TX	James Woody james.woody@randolph.af.mil
15-17 July	TRANSCOM	Scott AFB, IL	Carma-Lynn Pollock carma-lynn.pollock@scott.af.mil
5-7 Aug	NAVY	Norfolk, VA	Joel Horner jhorner@ncdoc.navy.mil
26-28 Aug	DISA	Falls Church, VA	Henry Huynh henry.huynh@disa.mil



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Summary

- **NIPRNet - 25 TeraBytes processed every day**
 - Over 2,500 Customer Organizations Connections
 - Over 84,000 Mb Customer provided Bandwidth
- **SIPRNet – 9.5 TeraBytes processed every day**
 - Over 2000 Customer Organizations Connections
 - Over 12,000 Mb Customer provided Bandwidth
- **g-Root:**
 - Resolves over 170B queries annually
- **DNS Services (.mil/.smil/.sgov)**
 - Global DNS environment resolves over 37B .mil queries annually
- **Dial Authentication (AAA Servers)**
 - Authenticate over 40,000 network dial-user requests (Unclassified and Classified) annually

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Points of Contact

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**Paul Bernier, Chief, Interdiction Branch
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**Mike Green, Chief, NIC/SSC Branch
614-692-2058 mgreen@nic.mil**

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Acronyms

CCB	Configuration Control Board
DISN	Defense Information System Network
DMZ	DeMilitarized Zone
DNS	Domain Name System
gSLD	generic Second-Level Domain
gTLD	generic Top-Level Domain
IAP	Internet Access Point
IC	Intelligence Community
IP	Internet Protocol
ISR	Internet Screening Router
ITSDN	Integrated Tactical-Strategic Data Network
LES	Leading Edge Services
NIPRNet	Unclassified but Sensitive IP Router Network
NIC	Network Information Center
NMCI	Navy/Marine Corps Intranet
NOC	Network Operations Center
O&M	Operations and Maintenance
OC-12	Optical Carrier 12 (622MBps)
SIPRNet	Secret IP Router Network
SSC	SIPRNet Support Center
STEP	Standardized Tactical Entry Point
SWA	Southwest Asia

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Questions

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