

National Aeronautics and Space Administration



# Center Site Visit IT Infrastructure Integration Program (I<sup>3</sup>P)

Office of the Chief Information Officer

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May 04, 2009

VISION: Integrated, secure, and efficient information technology and solutions that support NASA



# Agenda

Office of the Chief Information Officer

- Comments and Questions
- I<sup>3</sup>P Overview
- Site Visit Objectives
- Center Overview
- Center IT Infrastructure Today
  - End User Environment
  - Communication Environment
  - Data Center Environment
- Center Tour



## Comments and Questions

Office of the Chief Information Officer

- Aside from site visit logistics questions, NASA will handle comments and questions as described below.
- Submit comments/questions to <http://I3P.nasa.gov> [Q/A tab].
- Comments Received by May 20:
  - Sender will receive acknowledgement e-mail.
  - Comments will not be posted online nor to any publicly accessible website but will be considered internally by the government when finalizing the RFP and no response will be provided.
- Questions Received by May 20:
  - Sender will receive acknowledgement e-mail.
  - Questions, in whole, in part, or consolidated with similar questions, will be posted online along with the government's response. Individual and company identifiers will not be used in the online posting.



## I<sup>3</sup>P Overview: Why I<sup>3</sup>P?

Office of the Chief Information Officer

- NASA's commitment to the strategy of Agency-wide IT services and Agency-wide procurement aligns with:



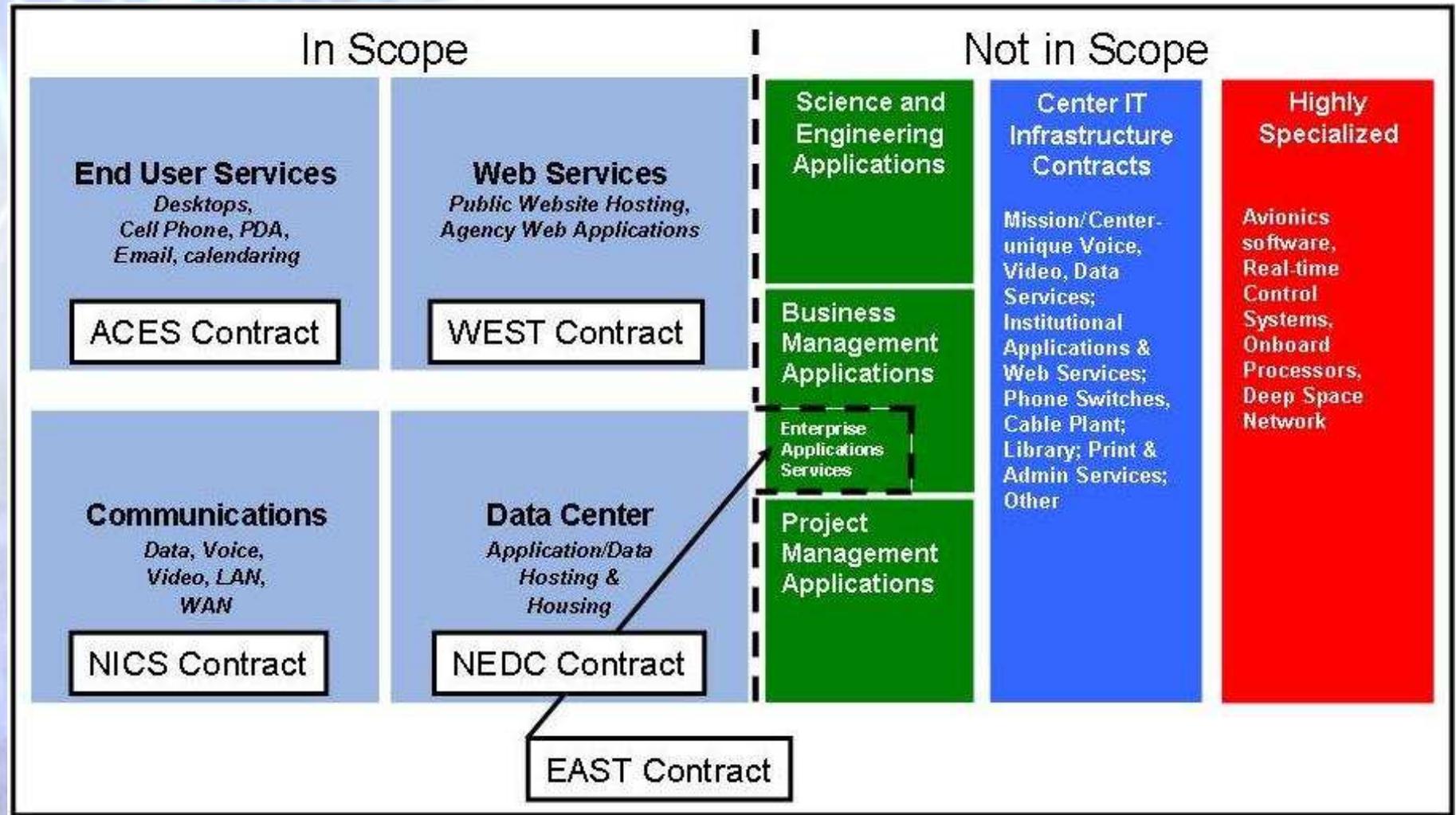
- NASA's need for IT security, efficiency, and collaboration for mission support
- Industry and business best practices
- Administration's priorities of effectiveness, efficiency, transparency, participation and collaboration

- What will success look like?
  - Reliable, efficient, secure, and well-managed IT infrastructure that customers rely on
  - Systems seamlessly deployed and used across Centers
  - Investing in the right IT solutions that provide the greatest benefit to the NASA mission



# I<sup>3</sup>P Overview: Five Procurements Drive NASA's IT Transformation

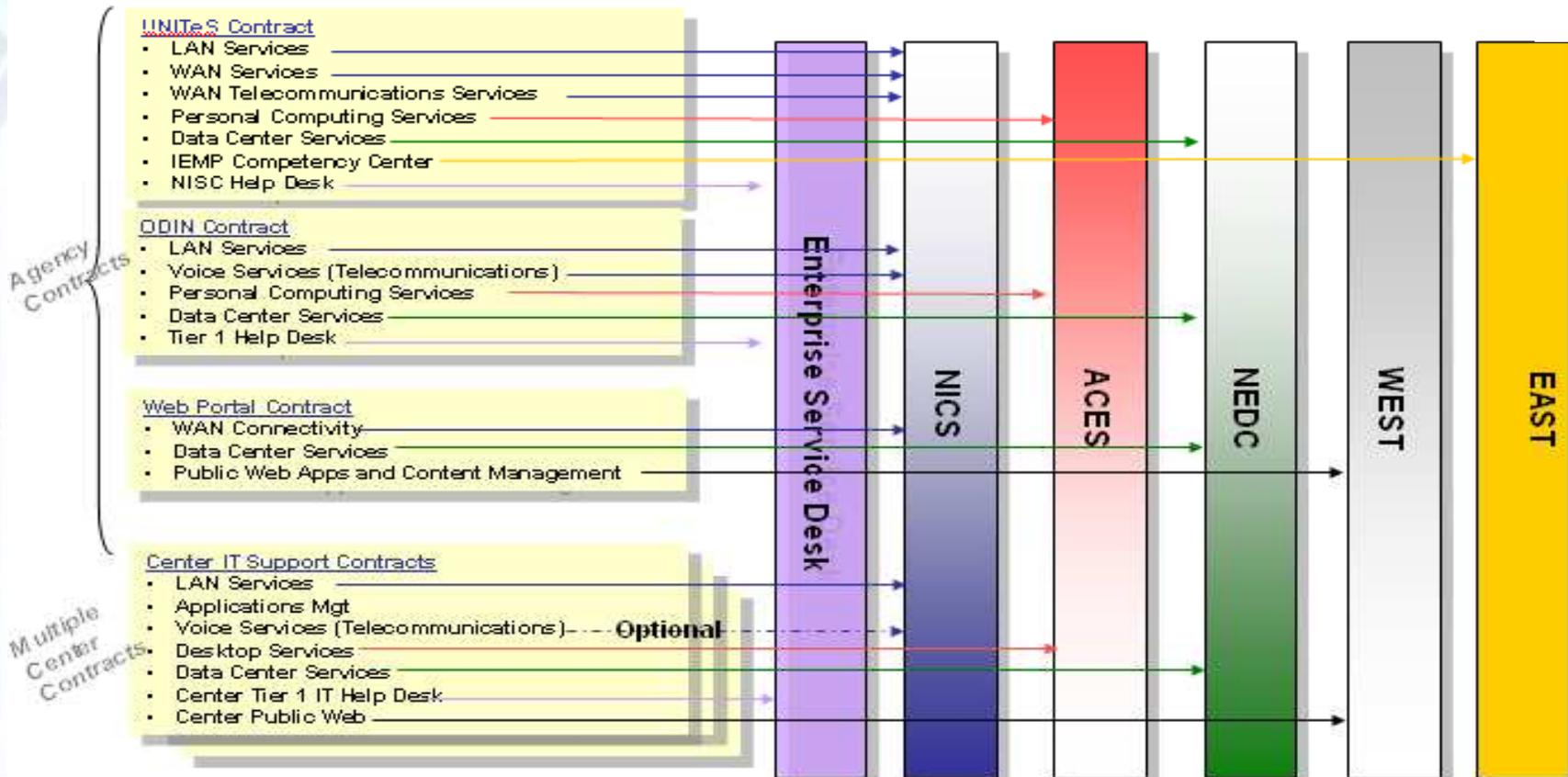
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# I<sup>3</sup>P Overview: Agency IT Infrastructure Supports Transformation

- Consolidates and requires Centers to use Agency contracts for core IT infrastructure services
- Allows Centers to use Center specific IT support contracts for Non-I<sup>3</sup>P services
- Uses a single Enterprise Service Desk and Enterprise Service Request System for reporting/tracking Incidents and for requesting I<sup>3</sup>P defined services
- Primary purpose is to provide better IT security, collaboration, efficiencies to accomplish NASA mission





## I<sup>3</sup>P Overview: Efforts Under Way

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- Making NASA's information easier to discover and safely access through current projects (e.g., Security Ops Center)
- Continuing consolidation of NASA's information technology (IT) through current contracts and projects (e.g., ODIN, NOMAD)
- Working procurements for Agency-wide IT services:
  - **NICS** will integrate networks and provide seamless operations across Centers;
  - **NEDC** will improve availability and access to applications and data;
  - **WEST** will improve the quality of web services for the same cost;
  - **ACES** will provide a consistent level of IT services across NASA; and
  - **EAST** will enable more efficient development and maintenance of Agency-wide applications, as well as improve the availability of business information for better informed decision making.
  - Enterprise Service Desk at NSSC will provide a single point of contact for IT incident and problem resolution and I<sup>3</sup>P service ordering



# I<sup>3</sup>P Overview: Procurement Schedule

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Updated April 20, 2009

Milestones	NICS	ACES	NEDC	WEST	EAST
Draft RFP	4/20/09	4/20/09	4/20/09	4/20/09	5/11/09
Industry Days	4/21 and 4/22	4/21 and 4/22	4/21 and 4/22	4/21 and 4/22	4/21 and 4/22
Due Diligence	5/1 to 5/15 – Primary focus is on ACES, NEDC and NICS. NOTE: The EAST site visit will be on 5-20 at MSFC.				
RFP Release *	6/15/2009	6/15/2009	6/15/2009	6/15/2009	6/15/2009
Proposals Due *	7/30/2009	7/30/2009	7/30/2009	7/30/2009	7/30/2009
Contract Start *	May 2010	June 2010	May 2010	June 2010	May 2010

\* Dates reflect current schedule posted online.



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# Site Visit Objectives

Office of the Chief Information Officer

- What we are planning to do
  - Explain the Center: facilities & people (who we are)
  - Explain involvement with major programs, projects, and missions (what we do)
  - Explain the current state of IT infrastructure at the Center
    - End-user services (desktop/laptop/workstations)
    - Communications (networks, phones)
    - Data centers
- What we are NOT planning to do
  - Explain further the five I<sup>3</sup>P acquisitions or associated strategy
  - Explain the content of the draft RFPs
  - Entertain questions on the acquisition strategy or draft RFPs
  - Discuss future state/plans for Center IT infrastructure



# Agenda

Office of the Chief Information Officer

- Comments and Questions
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- **Center Overview – Victor Thompson**
- Center IT Infrastructure Today
  - End User Environment
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  - Data Center Environment
- Center Tour



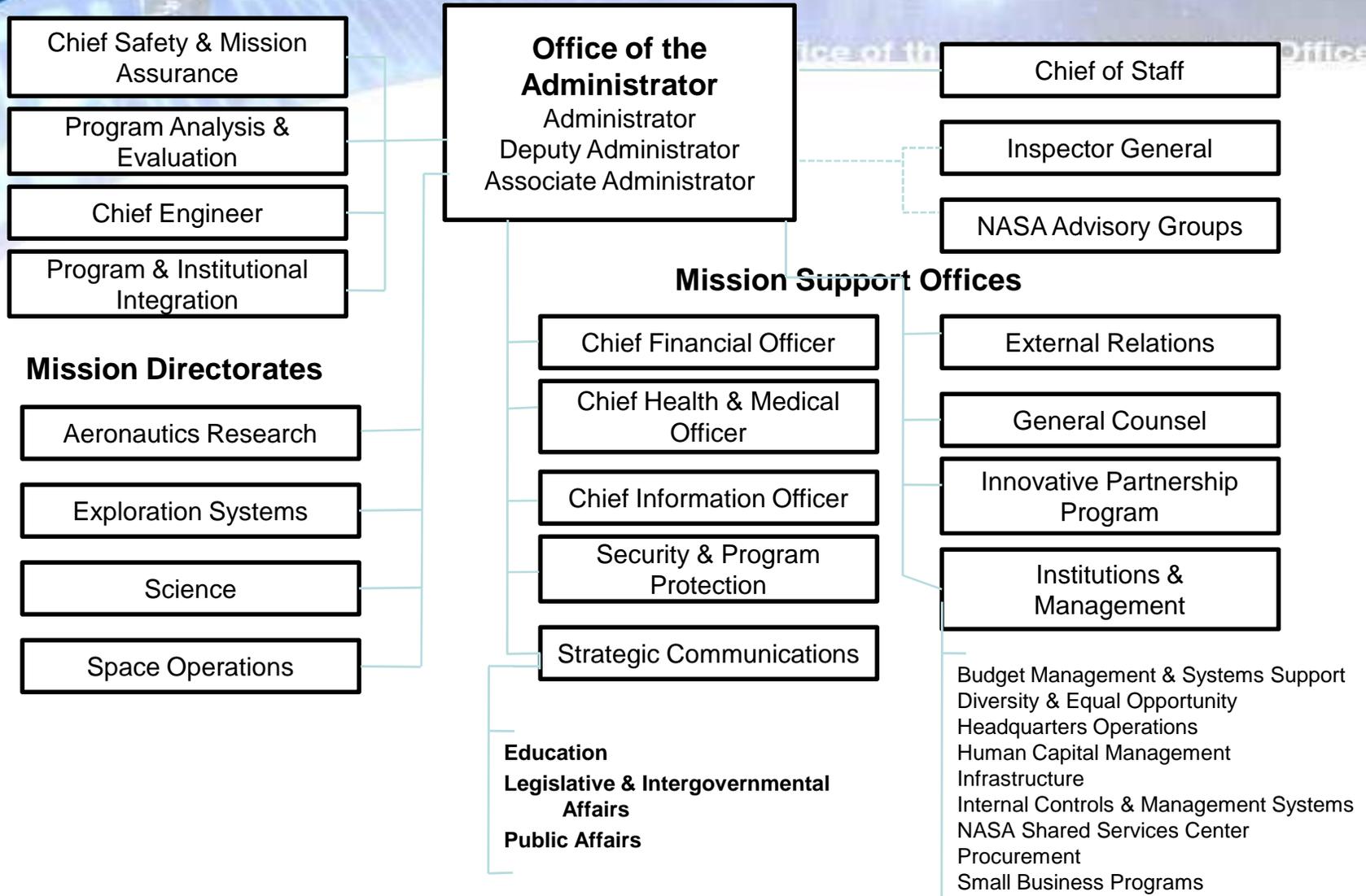
# Center Overview

Office of the Chief Information Officer

- NASA Headquarters, in Washington D.C., provides overall planning, guidance, direction, budgeting, advocacy, external liaison, and coordination in support of NASA's mission.
- Headquarters is comprised of;
  - Executive and Staff Offices
  - Mission Directorates
  - Mission Support Offices



# Center Overview





# Center Overview

Office of the Chief Information Officer

- Executive and staff Offices
  - Office of the Administrator
- Mission Directorates
  - Distinct technical and program responsibilities (e.g. Space Operations)
- Mission Support Offices
  - Provide supporting services and business functions for Headquarters and the Agency at large (e.g. Institutions and Management)
- Staffing
  - Total Civil Servants ~1640
  - Total Contractors ~ 300 (excluding IT)



# Center Overview

Office of the Chief Information Officer

- Governance
  - IT Board of Directors (BOD)
  - Customer Advisory Committee (CAC)
  - Configuration Control Board (CCB)



# Center Overview

Office of the Chief Information Officer

- IT Board of Directors (BOD)
  - The Headquarters' BOD is an advisory panel that provides input to the Executive Director for Headquarters Operations and the HQ CIO in managing the alignment with the OCIO governance structure
  - They review ITCD projects and priorities associated with Agency integration activities and HQ-specific activities.
  - The Board provides strategic and executive guidance to the HQ CIO in meeting IT requirements of HQ mission and staff offices.
  - The Board plays a key role in supporting large projects and investments.



# Center Overview

Office of the Chief Information Officer

- IT Customer Advisory Committee (CAC)
  - The CAC provides tactical guidance to ensure the IT services provided to Headquarters offices is in alignment with their organization's needs and is responsive to business requirements
  - Identify IT service requirements and recommend IT projects for technical evaluation
  - Serve as a forum for discussion of business process reengineering and technological initiatives
  - Escalate recommendations on strategic decisions to the IT BOD
  - Review and provide feedback on IT tactical planning
  - Provide feedback on IT service performance



# Center Overview

Office of the Chief Information Officer

- Headquarters Configuration Control Board (CCB)
  - The Headquarters CCB ensures that the application of Agency and Headquarters IT technical standards, security standards, and Agency and federal policies are applied and followed throughout the life-cycle of all IT related assets
  - Manages and approves all project milestones including Service Request Reviews (project initiation), Requirements Reviews, Preliminary Design Reviews, Critical Design Reviews, Test Readiness Reviews, Operational Readiness Reviews, and Post Implementation Reviews.
  - Manages all changes or modification to production systems and services
  - Escalation of projects that exceed \$500K or multi-Center service projects to appropriate Headquarters or Agency board



# Center Overview

Office of the Chief Information Officer

- Headquarters IT Support and Services contracts
  - Headquarters IT Support Services (HITSS)
    - Systems Engineering
    - Data Center, Local Area Networks, Voice communications
    - Applications and Web development
    - IT Security services
    - Customer training and outreach
    - Project Management and Contract support
  - ODIN
    - Desktop and Help Desk services, non-MFD printers, Fax machines, cellular phones, and PDAs
  - Xerox Multi Function Devices (MFD)
  - NISN (Headquarters element)
    - Wide Area Network, Video & Voice teleconferencing



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# Center IT Infrastructure

Office of the Chief Information Officer

Network and Communication Services – Dennis Groth

Data Center

Desktop Services



# Network and Communication Services

Office of the Chief Information Officer

- Wide Area Network Services
- Local Area Network Services (wired and wireless)
- Remote Access Services
- Voice Communication Services
- Headquarters Firewalls
- Cable Plant
- Teleconferencing Services
- Key take away points



# Network and Communication Services

Office of the Chief Information Officer

- Headquarters Wide Area Network Services
  - All Wide Area Network services into the facility are provisioned through the NASA Integrated Services Network (NISN)
    - NISN Premium IP Services (PIP) providing Center - Center communications
    - NISN Standard IP Services (SIP) external communications and PIP failover
    - Refer to NISN for additional detail
  - The Wide Area to Local Area handoff between NISN and Headquarters occurs at the interconnects between the NISN HQ Gateway and the Headquarters Border Router
    - Redundant connections between the HQ High Availability Border and NISN systems (1000Mbs Primary, 100Mbs failover)



# Network and Communication Services

Office of the Chief Information Officer

- Headquarters local Area Network Services (wired)
  - All network switches are Cisco 6500 devices
    - Border, Core/Distribution, and each floor center communication closets are 6509e's with Supervisor 720s.
    - Border and Core/Distribution are High Availability devices
      - Deployed in pairs with redundant power supplies and supervisor modules
    - Each floor has an East and West wing communications closet with 6506e's Supervisor 32
  - All trunk connections between all switches is 10Gbs
    - Each switch has a primary and failover 10Gbs path
  - All switch ports (RJ-45) support 10/100/1000Mbs with PoE to end devices
  - Wired network service is provided to all occupied areas within the Headquarters physical security perimeter



# Network and Communications Services

Office of the Chief Information Officer

- Headquarters Local Area Network Services (wireless)
  - Wireless network service is available in all areas of the Headquarters building
    - HQ Private Network WPA with Cert requirement and strong authentication
    - HQ Guest Network, no encryption, credentials available to all guests, utilizes Bluesocket Captive portal
  - Wireless access points are Cisco AP1200 with centralized management solution
  - Support for cross floor roaming
- All perimeter and Local Area Network services are managed and maintained by the Network Operations Center



# Network and Communications Services

Office of the Chief Information Officer

- Headquarters Remote Access Services
  - Traditional IPSec VPN Service (Cisco 3080s) configured for high availability
    - Usage restricted to Headquarter ODIN supported laptops
    - Requires RSA 2 factor authentication
  - Secure Nomadic Access SSL VPN (Juniper AS4000)
    - Usage open to all HQ employees, no restriction associated with Headquarters ODIN supported devices
    - Requires RSA 2 factor authentication



# Network and Communication Services

Office of the Chief Information Officer

- Headquarters utilizes CheckPoint NGX High Availability firewalls (Sun platform)
  - Perimeter (Private, Public, Shared Printer)
  - Service (remote access, wireless, etc)
  - Systems Engineering Facility (Lab) external
  - Guest Network
  - Network Operations Center and Data Center infrastructure
  - IT Support contractor
- All firewalls are managed and maintained by the Network Operations Center



# Network and Communications Services

Office of the Chief Information Officer

- Headquarters utilizes a Cisco VoIP System configured for high availability as the facility telephone system
  - Voice mail service is provisioned through a Cisco Unity system configured for high availability
  - Telephone hand sets
- Extensive monitoring and event alerting through the use of the CaseSentry monitoring tool
- Extensive lab to test configuration and system updates prior to production deployment
- Core team of telecommunications personnel manage and maintain the VoIP system



# Network and Communications Services

Office of the Chief Information Officer

- Headquarters UTP cable plant
  - Cat5e cable plant, minimum of 2 network drops to each office location
  - Cable plant terminates into patch panels located in communications closets
    - 3 communications closets per floor
- Headquarters Fiber cable plant
  - Multiple 62.5 micron fiber cables to each communications closet, terminating in patch panels
  - Combination of closet-to-closet, risers from Concourse level to each floor and home runs to each communications closet
- All communications closets have individual AC, facility UPS and emergency generator power



# Network and Communications Services

Office of the Chief Information Officer

- Headquarters Teleconferencing Services
  - NISN Managed facility wide ViTS services
    - 3 main conference rooms
  - NISN Managed small conference room and portable ViTS
    - 18 managed fixed and portable ViTS
  - HITSS managed small conference room and portable ViTS
    - 11 managed fixed and portable ViTS



# Network and Communications Services

Office of the Chief Information Officer

- Network and Communications services key take away points
  - Modern and robust network infrastructure
  - High availability perimeter and core
  - Infrastructure is scalable and can support expansion
  - High availability firewall infrastructure
  - Facility wide wireless infrastructure
  - Robust remote access services
  - Modern and up-to-date VoIP communications services
  - Extensive ViTS capability (however, lacks HD service)
  - All systems within planned life-cycle
  - Centralized management and operation
  - Focus on automated monitoring and event alerting tools



# Center IT Infrastructure

Office of the Chief Information Officer

Network and Communication Services

Data Center – Dennis Groth

Desktop Services



# Data Center

Office of the Chief Information Officer

- Headquarters Data Center is a 3800 sq foot facility located on the Concourse level
  - All servers are rack mounted in standard 19" data center equipment racks
  - Each rack is equipped with Cat6 cable system
  - Electrical power to each rack is drawn from separate PDU
  - Facility provided UPS filtered power with emergency generator backup
  - Raised floor with under the floor water sensors
  - Data Center class air conditioners
  - Automated monitoring of electrical and environmental



# Data Center

Office of the Chief Information Officer

- Data Center systems and services
  - Enterprise Storage (NetApp 3070, 2050s)
  - Enterprise Backup (ADIC 2000 and 5000)
  - Application and infrastructure servers
    - 55 Solaris, 20 Linux, 69 Windows, 3 OSX
- All production servers at Headquarters are housed in the NHCC
- All servers and systems in the NHCC are managed by a core Server Operations Team
- All servers and servers in the NHCC are extensively monitored through the use of automated system and service monitoring tools with automated alerting



# Data Center

Office of the Chief Information Officer

- **Systems Engineering Facility (SEF)**
  - The SEF is facility adjacent to the NHCC that has the ability to duplicate all major elements of the Headquarters Data Center
  - This pre-production test facility is utilized to support the build out of new systems, services, and modification to existing systems and services
  - Provides an environment to reliably conduct developer and government acceptance testing of new services or modifications to existing services
  - Supports the testing of implementation processes and procedures
  - All new services and modifications to existing services are required to be tested in the Headquarters SEF



# Data Center

Office of the Chief Information Officer

- Headquarters Data Center (NHCC) Key take away points
  - Headquarters operates a single Data Center
  - All locally provisioned services are hosted in the NHCC
  - All services and devices are managed and administered by a single core team of System Administrators
  - Services are provisioned on “Infrastructure” hardware
  - Enterprise level backup service
  - Extensive use of NetApp for enterprise storage
  - Extensive system and service monitoring
  - Facility UPS and emergency backup generators
  - All systems are under life-cycle management, legacy systems are on a replacement schedule
  - All system and patches are scheduled and applied in accordance with approved schedules



# Center IT Infrastructure

Office of the Chief Information Officer

Network and Communication Services – Dennis Groth

Data Center

Desktop Services – Jeff Hall



# Desktop Services

Office of the Chief Information Officer

- Desktop Services Overview
  - All Headquarters customer workstations are provisioned, managed, and maintained through the ODIN Contract
    - Standard core software load (with HQ overlay)
    - Above core software installed by ODIN support personnel as required and approved by the ODIN DOCOTR
  - Headquarters support both PC and Mac workstations
    - Ensure service and feature parity, all infrastructure services MUST provide comparable feature support for PC and Mac workstations
    - All applications and services must be accessible and operable on both PC and Mac workstations
    - Services such as calendaring must be fully interoperable between PC and Mac workstations



# Desktop Services

Office of the Chief Information Officer

- Total Headquarters workstations: 2154
- Desktop “Seats”:
  - PC Desktop 322
  - Mac Desktop 108
- Laptop “Seats” total: 1625
  - Standard PC laptop 933
  - Standard Mac laptop 200
  - Lightweight PC laptop 351
  - Lightweight Mac laptop 42
  - Tablet PC 99
- Maintenance only “Seats”: 99



# Desktop Services

Office of the Chief Information Officer

- All customers have access to the enterprise network file storage service (NetApp)
  - User Home folder
  - Organizational and Workgroup folders
  - General Headquarters shared storage space
- Enterprise Desktop Backup Service (Tivoli)
  - Automated nightly backups
  - On-Demand customer initiated day time backups
  - Utilizes enterprise storage (NetApp)



# Desktop Services

Office of the Chief Information Officer

- Patch management and automated software “push” technologies
  - PC Microsoft SMS
  - PC WSUS
  - Mac Lanrev
- Cross platform patch and FDCC compliance reporting (PC/Mac)
  - Patchlink



# Desktop Services

Office of the Chief Information Officer

- Headquarters customers utilize shared printer services configured for direct IP printing
  - No customer facing print servers
- A high availability load balanced print server cluster exists at the Headquarters perimeter
  - Support for mainframe printing to any local networked printer
  - Support for Headquarters Guest Network printing to any local networked printer



# Desktop Services

Office of the Chief Information Officer

- Total networked printers: 178
  - Black/White printers: 112
  - Color printers: 66
  
- Multifunction Devices (MFD): 119
  
- FAX Machines: 45
  
- PDAs (Blackberry/Treo): 757
  
- Cellular Telephones: 292



# Desktop Services

Office of the Chief Information Officer

- Desktop Services key take away points
  - All desktop services at Headquarters are provisioned through the ODIN contract
  - Support and services must be provided for PC and Mac end user workstations
  - Enterprise Desktop backup service
  - Headquarters makes extensive use of the ODIN Helpdesk service for all IT services, for the customer “one call does it all” approach
  - All mobile communications devices (cellular and PDA) are provisioned through ODIN
  - All shared printer services (exception Xerox MFDs) are provisioned through ODIN
  - Up to date and effective software push and user self service tools are fully deployed and operational



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# Center Tour

Office of the Chief Information Officer

- A single tour route will be taken through the Headquarters facility
  - Representative of areas of responsibility for NICS, NEDC, and ACES will be viewed
  - Escorted tours are anticipated to depart from the Auditorium at ~5 minute intervals
    - Please have your tour pass available when your tour group number is called
    - Tour groups will be formed immediately outside of the Auditorium
  - Tours are anticipated to take ~30 min
  - At the completion of the tour you will be returned to the main lobby, visitor passes will be collected at that time
  - Please ensure that you bring all your personal and corporate property with you on the tour, they are “your” responsibility