

**Kennedy Space Center
I3P Site Visit
May 5, 2009**



Rad Ostoski



Agenda

Office of the Chief Information Officer

- Administrative Information
- I³P Overview
- Center Overview
- Center IT Infrastructure Today
 - End User Environment
 - Communication Environment
 - Data Center Environment
- Center Tour



“ONE NASA”

Ames Research Center

Glenn Research Center

Goddard Space Flight Center

Glenn Research Center Plum Brook Station

White Sands Test Facility (JSC)

Marshall Space Flight Center

Wallops Flight Facility

Dryden Flight Research Center

NASA Headquarters Washington, DC

Langley Research Center

Jet Propulsion Laboratory (NASA Contractor)

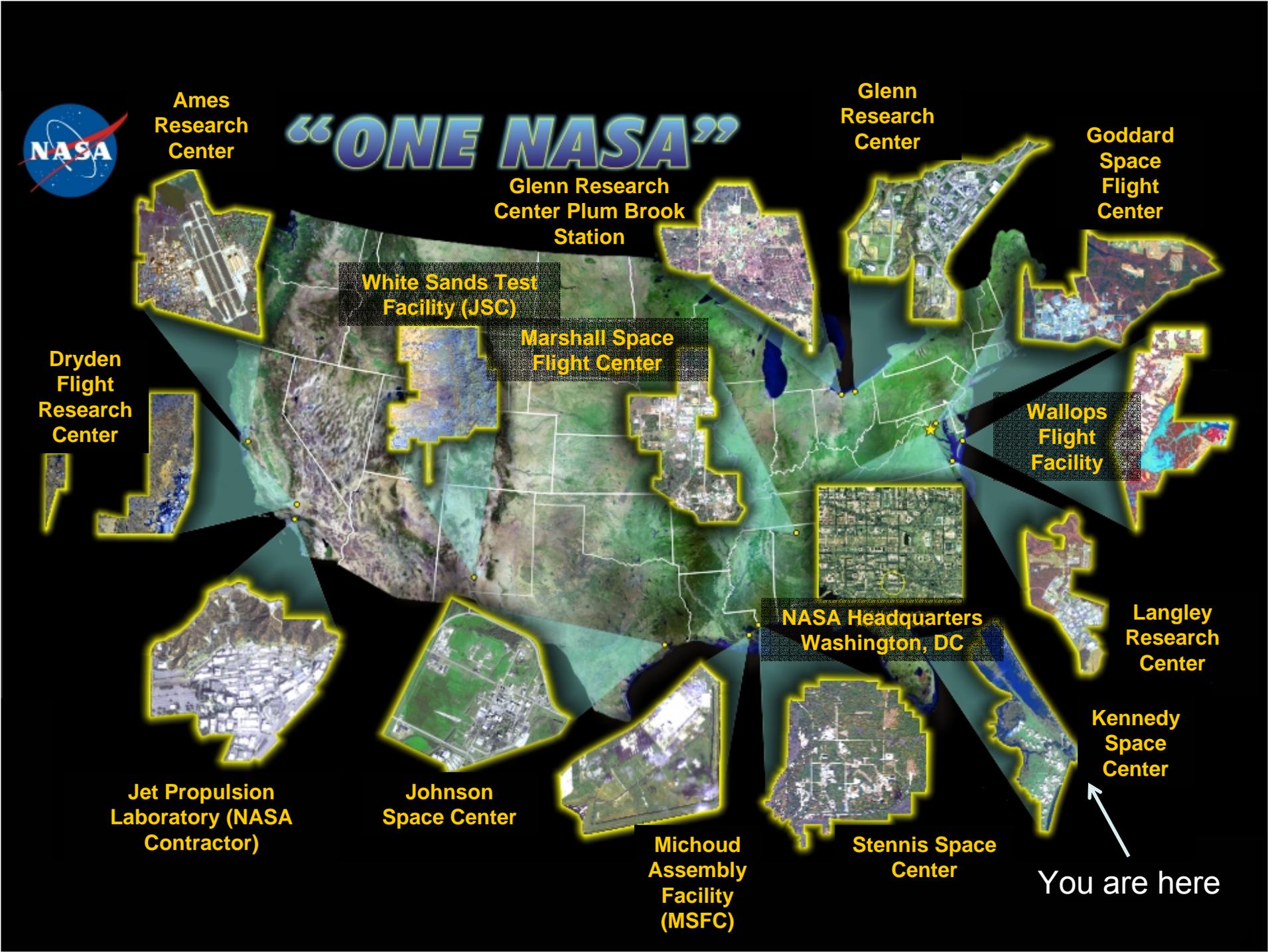
Johnson Space Center

Michoud Assembly Facility (MSFC)

Stennis Space Center

Kennedy Space Center

You are here





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 I³P 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



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.



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I³P Overview: Why I³P?

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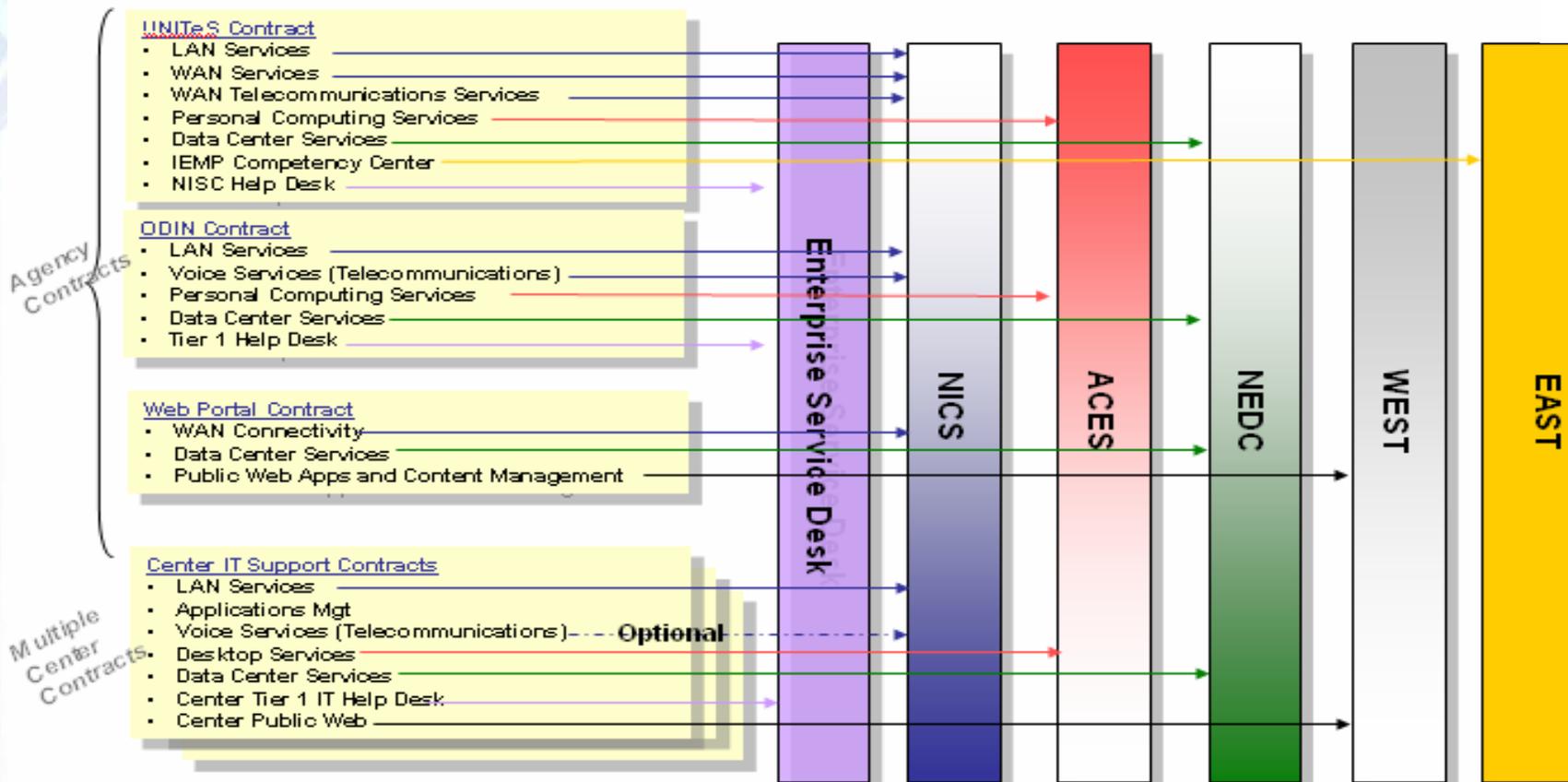
- NASA's commitment to the strategy of Agency-wide IT services and Agency-wide procurement aligns with:
 - NASA's need for IT security, efficiency, and collaboration for mission support
 - Industry and business best practices
 - New Administration's priorities of effectiveness, efficiency, transparency, 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





I³P 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-I³P services
- Uses a single Enterprise Service Desk and Enterprise Service Request System for reporting/tracking Incidents and for requesting I³P defined services
- Primary purpose is to provide better IT security, collaboration, efficiencies to accomplish NASA mission





I³P 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 I³P service ordering



I³P 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.



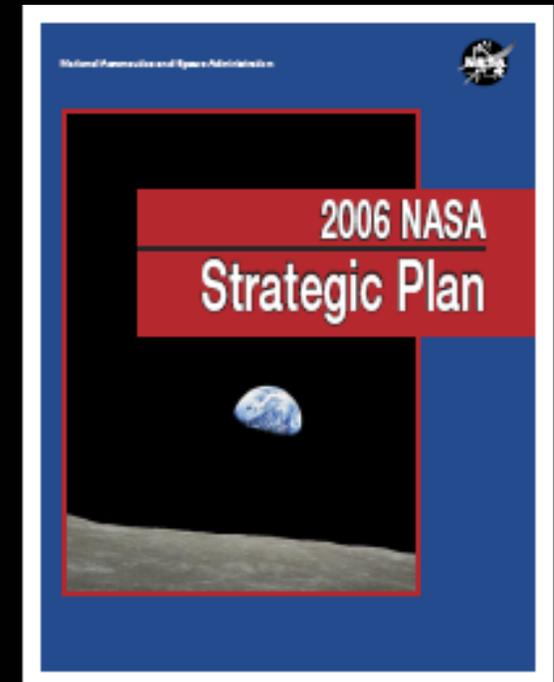
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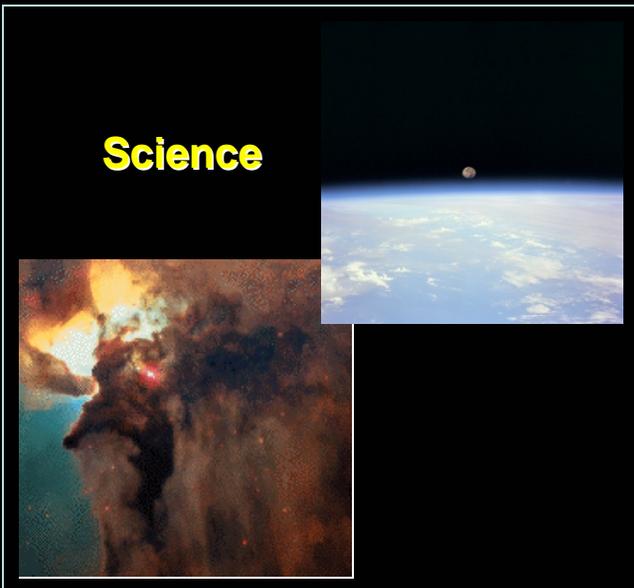
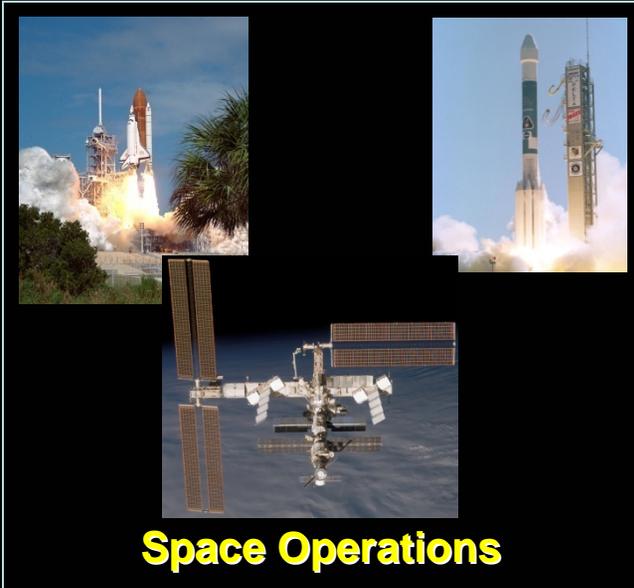
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NASA's Strategic Goals

- **Fly the shuttle as safely as possible** until its retirement, not later than 2010
- **Complete the International Space Station** in a manner consistent with NASA's international partner commitments and the needs of human exploration
- **Develop** a balanced overall **program of science, exploration, and aeronautics** consistent with the redirection of the human spaceflight program to focus on exploration
- Bring a new **Crew Exploration Vehicle** into service as soon as possible after Shuttle retirement
- **Encourage** the pursuit of appropriate **partnerships** with the emerging commercial space sector
- **Establish a lunar return program** having the maximum possible utility for later missions to Mars and other destinations



NASA Mission Directorates



Kennedy Space Center



Supporting Four Major Programs

- ❖ Space Shuttle
- ❖ International Space Station
- ❖ Launch Services
- ❖ Constellation

Multiple Commercial Ventures

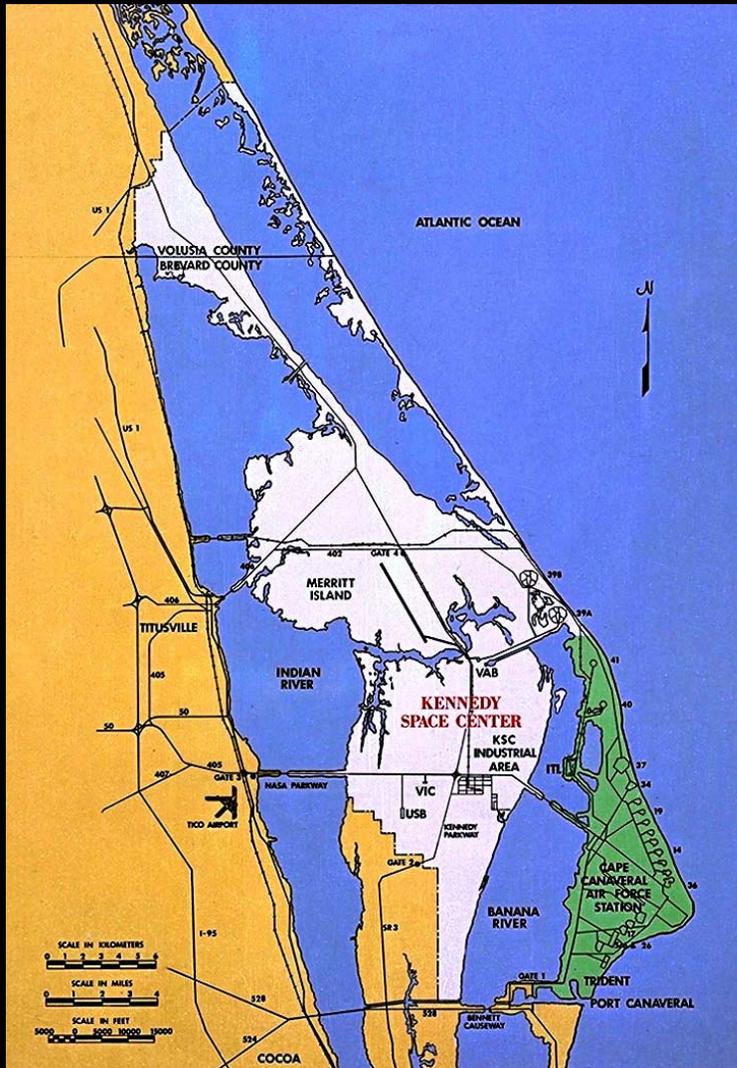
- ❖ COTS
- ❖ Orion Production

Employing 15,000

- ❖ 2,000 NASA Civil Servants
- ❖ 13,000 Contractors/Tenants



Kennedy Space Center



- **Land:**

- 140,000 acres (218 square miles)
 - 70,000 acres of estuary deemed a system of National Importance

- **Infrastructure:**

- Over 900 Facilities/ 6.9 million sq. feet of Building Area
 - 2 Launch Pads
 - 3 Fire Stations
 - 3 Medical Facilities
- Energy and Gases
 - 3 Central Cooling/Heating Plants
 - 2 Primary Substations
 - 270 miles of Electrical Distribution Lines
 - 60 miles of high pressure Helium/Nitrogen Pipelines
- Shuttle Landing Facility (15,000 foot runway)
- 213 miles of Roadway
- 2 Sea Docks
- 40 miles of Railroad
- 5 Major Bridges





Cape Canaveral Rockets



Space Shuttle



Delta 2



Atlas 5



Delta 4 Heavy

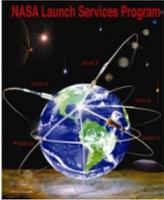
*=NET **=Under Review

Changed information

KSC Big Picture

April 20, 2009

POC: Erin Drohan 7-6159

| | Apr | May | June |
|---|--|---|--|
|  | <p>10 STS-127 Roll to VAB 17 STS-127 Roll to Pad-B</p> | <p>12* STS-125 Launch 23** STS-125 Landing 29 STS-127 Roll to Pad-A</p> | <p>13 STS-127 Launch 23 STS-128 ET/SRB Mate 29 STS-127 Landing</p> |
|  | <p>18 HST Payload to Pad 20 JEM EF Wt&CG 21 JEM EF & ES ICD Walkdown 29 HST Integrated IVT</p> | <p>07 2 J/A PRR 08 17A MPLM CBM Ops. Start 12 HST Launch 21** Node 3 O/D at SSPF 20 2 J/A Payload to PAD</p> | <p>06 17A MPLM Closeouts Start 13 2 J/A Launch 18 Node 3 NH3 Loading 22 17A MPLM Hatch Closure 26** 17A PRR</p> |
|  | <p>02 LRO/LCROSS Atlas V LVRR</p> | <p>05 STSS – ATRR Delta II Launch (CA) 12* GOES-O Delta IV Launch (FL) 29 STSS – DEMO Delta II LVRR</p> | <p>02* LRO/LCROSS Atlas V Launch (FL)</p> |
|  | <p>01 GO PDR Checkpoint 02 CxP Range Steering Panel 03 CxP PDR Checkpoint 13-17 CxP Integrated Prog Rev</p> | | <p>26 Spacecraft Processing Element Preliminary DRB</p> |









STS-124 Launch (5/31/08)



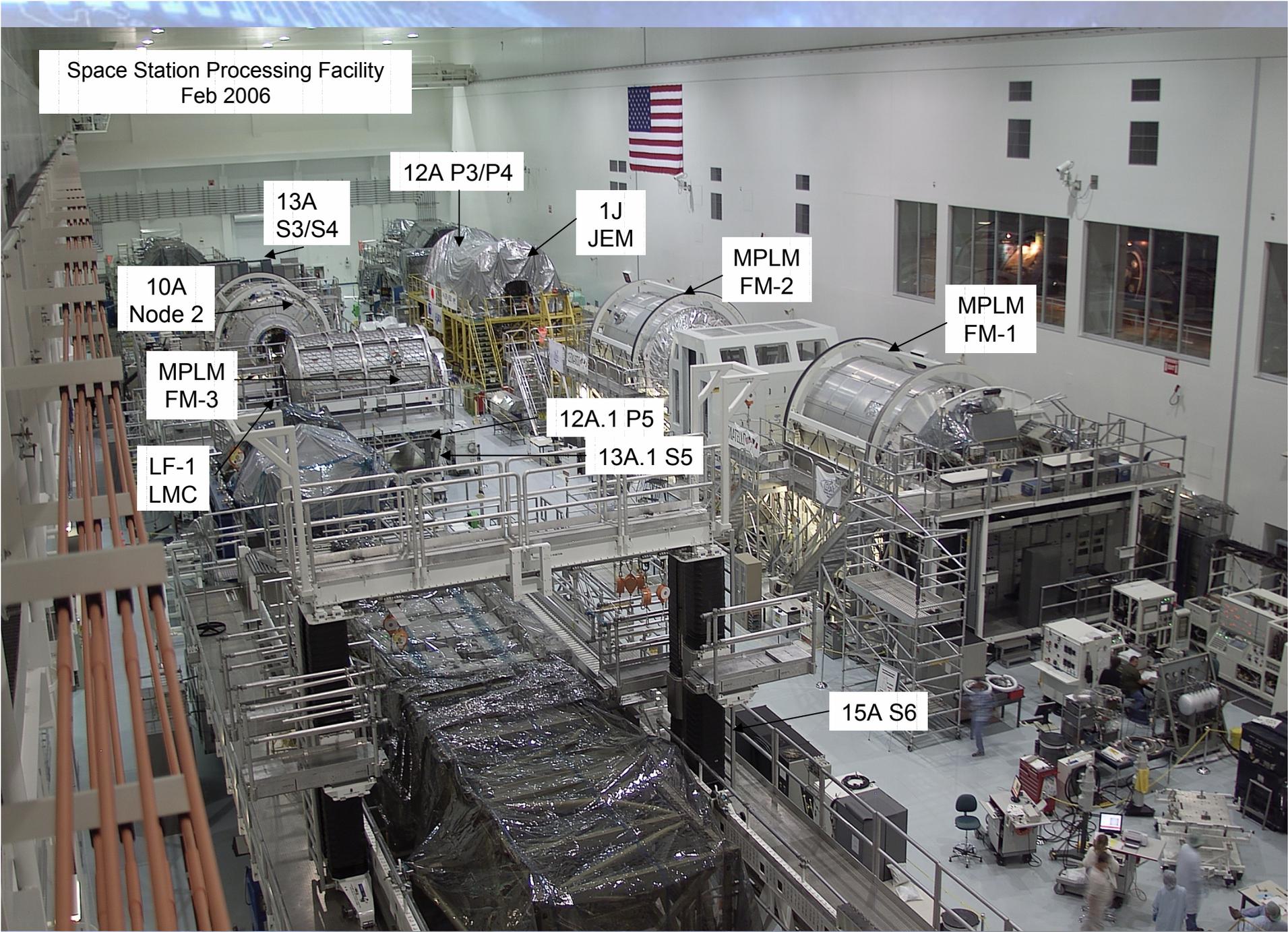




Space Station Processing Facility
Feb 2006



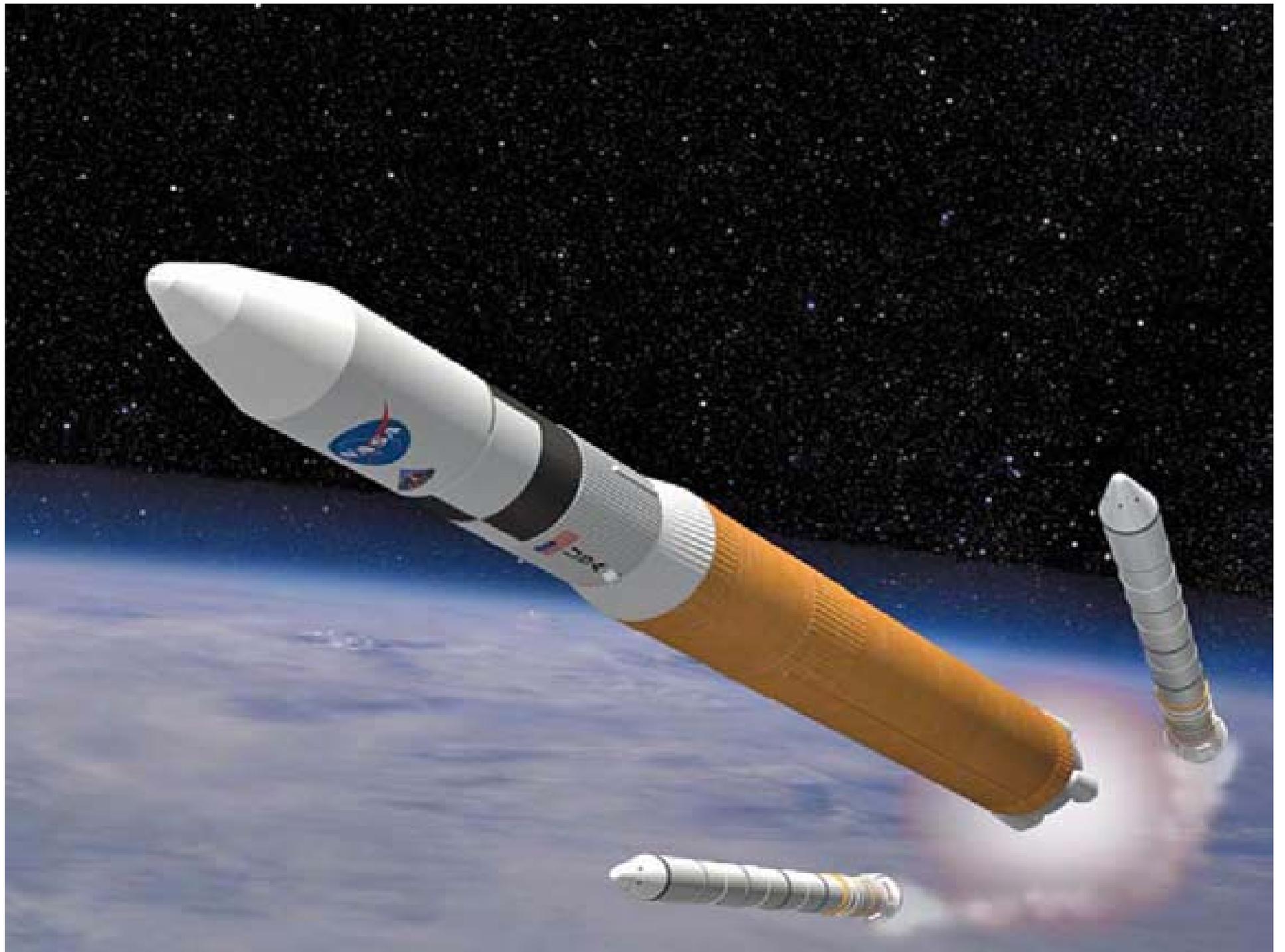
- 10A Node 2
- MPLM FM-3
- LF-1 LMC
- 13A S3/S4
- 12A P3/P4
- 1J JEM
- MPLM FM-2
- MPLM FM-1
- 12A.1 P5
- 13A.1 S5
- 15A S6



Delta II Rocket carrying Phoenix Mars lander lifts off from CCAFS Pad 17A







KSC IT Vision

Capability
Partnership
Service
Agility
Process
Simplicity
Innovation
Openness
Security



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National Aeronautics and Space Administration



Outsourcing Desktop Initiative for NASA (ODIN)

Office of the Chief Information Officer

- End User Services at KSC -





Agenda

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- What is ODIN?
- Services Concept
- Services Provided
- Catalog/Property
- Metrics
- Agency Initiatives
- Service Demographics
- KSC Service Areas



What is ODIN?

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- **Outsourcing Desktop Initiative for NASA (ODIN)**
 - IT services contract which provides desktop, workstation, laptop, server and intra-center communication assets and services for the Agency
- **Scope of ODIN at KSC**
 - Desktop services (e.g., desktop, laptop, and workstation support, Windows, Mac and UNIX platform are available)
 - Mobile computing services (e.g., cell phones, BlackBerrys, and pagers)
 - Administrative and back office server support (e.g., file, print, e-mail, application, and internal web servers)
 - Additional services include network printers, backup services, web conferencing, file shares, etc.



Services Concept

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- Services provided for:
 - KSC Civilian servants and Contractor employees
 - e.g., Resident Offices, JSC Astronaut Crew Quarters (ACQ) and Vehicle Integration Testing on NASA Networks
 - Tenants on NASA or NASA-supported sites
 - e.g., KSC support at Patrick Air Force Base



Services Concept

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- Service Model
 - Model includes "seats" for each of the services (e.g., desktop seats, workstation seats, laptop seats, and mobile computing seats)
 - Each seat has a pre-defined set of standard services included in the seat price
 - Seats may be ordered with hardware augmentations
 - If the standard services do not meet the user's requirements, the user may order optional service levels to provide the necessary services at an additional price
 - Catalog items can be ordered to supplement seat services



Services Provided

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- Each seat includes the necessary IT support services
 - Hardware and software support e.g., installation, maintenance, and technology refresh
 - Administration, relocation, and network access
 - Customer support and training
 - Server services (e.g., file, print, e-mail, and application servers)
 - Exchange 2007, SQL 2000, Cold Fusion, Etc.
 - Supports HSPD-12 compliance for two factor authentication and SmartCard readers



Services Provided

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- Standard services for all computer seats
 - Hardware technology refreshment every three (3) years
 - Software tech refresh within one year of latest release from vendor, with concurrence from NASA
 - ODIN Help Desk
 - Single point of contact
 - Tracks problem from initial call through resolution, including support redirected to other service providers



Services Provided

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- Additional Services
 - Multifunctional Devices (MFDs)
 - MFDs are provided by Xerox Corporation
 - Allow for Print, Fax, Scan and Copy
 - IDIQ Contract with a period of performance through April 30, 2010
 - Approx. 352 devices supporting the KSC user community
 - 208 are networked (includes print and scan capabilities)
 - 992,000 copies per month
 - Four hour Return to Service on support tickets
 - 95% MFD service availability metric



Services Provided

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- **Public Key Infrastructure (PKI) Support**
 - Support the implementation and deployment of the PKI
 - Desktop seats - ODIN and non-ODIN users
 - Mobile computing seats – ODIN users
 - Interface with Ames Research Center (ARC) to report and resolve PKI problems
- **Priority Services**
 - Government identified 3% of ODIN users for priority services
 - Government can identify up to 3% of ODIN users for priority service (on as needed basis)
 - Government may expedite service on a case-by-case basis



Services Provided

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- Printer Services
 - Contract provides a networked B/W printer within 60 feet of a user
 - Contract provides one color printer per floor*
 - Provide print queues for Xerox MFDs
- Integration with other KSC service providers
 - Ensure processes are in place with other IT Service providers for user support
 - Coordinate and collaborate to ensure quality service to end users

** Users can augment via catalog purchases*



Catalog/Property

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- **Catalog Services**
 - Supports ordering of additional services including, but not limited to hardware, software outside the standard load, consumables, input devices, and storage
 - Request for Quote: If the Catalog does not have what is needed, a request for quote can be submitted
 - Response is provided within 2 days
- **Property**
 - Property is tagged with a unique numerical identifier for management, tracking, and audit purposes



Metrics

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- Achieve or Exceed performance metrics
 - Customer Satisfaction rating meets/exceeds 92.0%
 - Customer satisfaction reflects above average satisfaction
 - Availability rating meets/exceeds 99%
 - Seats and associated services have been fulfilled 99%
 - Services Delivery rating meets/exceeds 98.0%
 - Products and services are delivered in accordance with contract requirements



Agency Initiatives

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- Agency Initiatives
 - SmartCard Integration
 - NASA Consolidated Active Directory (NCAD)
 - Data at Rest (DAR)
 - Operating System changes (e.g., MS Vista, Windows 7, Mac OS)
 - User privilege management
 - Virtual Machine Technology



Service Demographics

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- End users
 - NASA and contractor employees on the main campus of KSC
 - Approx. 6000 users
 - Other users will come in as contracts expire (approx .12,000)
- Computing seats (e.g., Desktops, laptops, workstations)
 - Approximately 5000
- Mobile Computing seats (e.g., cell phones, BBs, Pagers)
 - Approximately 2800



Service Demographics

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- Locations of Users
 - LC 39, KSC Industrial Area, Cape Canaveral Air Force Station
 - Off-Center Supported Personnel
 - Titusville, FL - 250
 - Vandenberg, CA - 51
 - Littleton, CO – 14
 - Decatur, AL - 5
 - Huntington, CA - 2
 - Sterling, VA - 1
 - Chandler, AZ – 1
 - Coordinated support at other NASA Centers and DOD Installations (Los Angeles AFB, Glenn Research Center)
 - Trans-Atlantic Landing Sites (International)



KSC Service Areas





Network and Firewall Overview

**By:
Stephen Tam**

**May 5, 2009
Kennedy Space Center**



Agenda

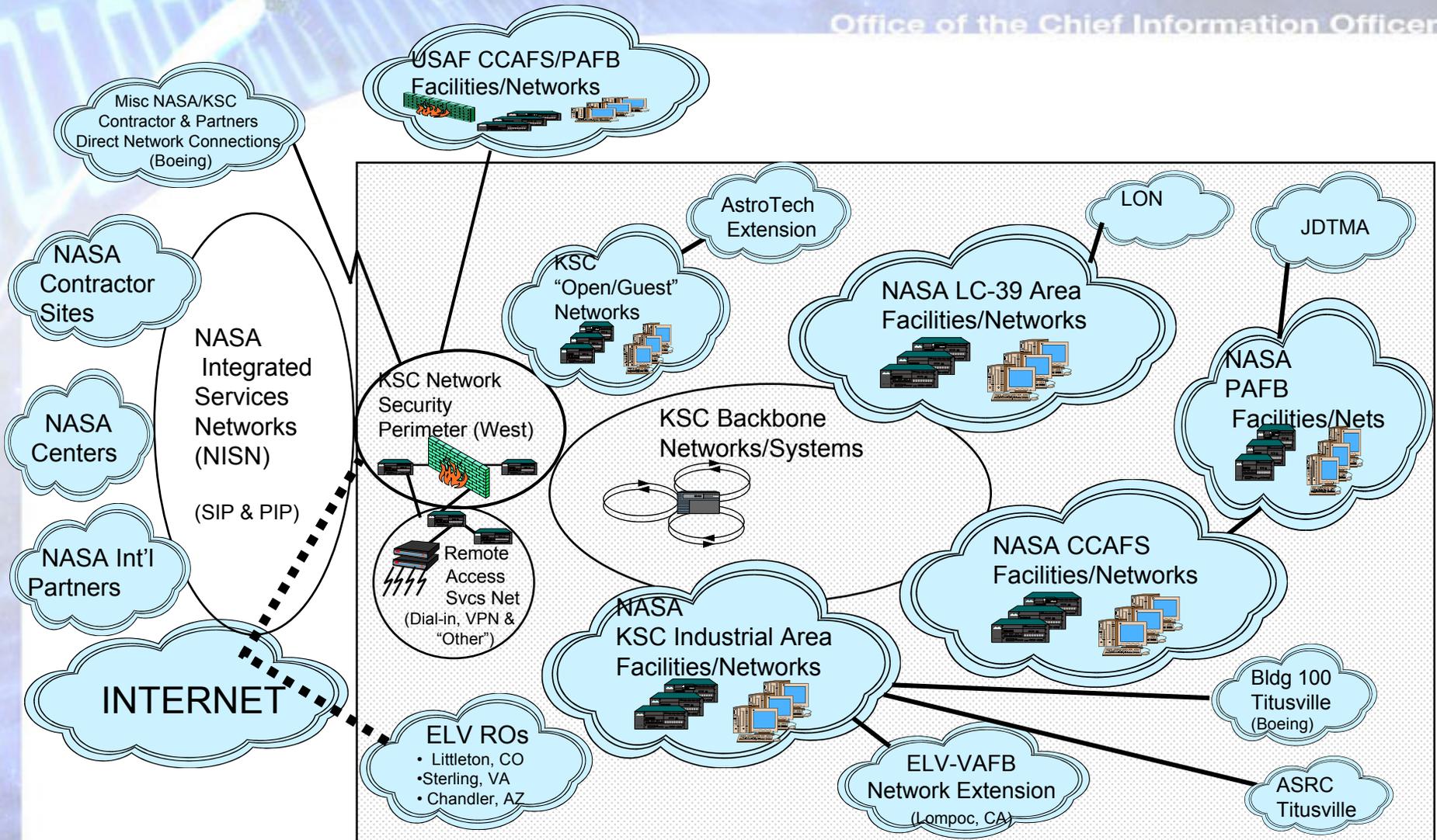
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- Kennedy Network (KNET)
- Network Security Perimeter (NSP)
- NASA Integrated Services Network (NISN)
- Launch Processing System Operational Network (LON)



KSC Network Overview

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Kennedy Network (KNET)

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- Description of System/Services
 - KNET provides approximately 20,000 network connections across the multiple campuses that it supports. KNET currently supports exclusively IP based protocols and is controlled using approximately 30 routers, 600 switches/hubs and 550 access points. KNET also provides the network infrastructure to support KSC's IP Telephony (VoIP) service.

- Customer Locations
 - Majority of the customers are located within KSC's 140,000 acres in over 240 buildings and trailers.
 - Other customers include:
 - Fish and Wildlife and National Park Service
 - NASA Facilities at Cape Canaveral AFS/Patrick AFB & Vandenberg AFB
 - Kennedy Area Recreation (KARS) I
 - TEL IV
 - Remote Resident Offices (Littleton, CO, Sterling, VA, and Chandler, AZ)
 - Near-site Facilities (ASRC Titusville & Boeing VectorSpace)



Kennedy Network (KNET)

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- KNET Interfaces
 - Network Security Perimeter (NSP) to access external resources (including the Internet & other NASA facilities)
 - KSC telephone system for VoIP service in selected facilities
 - Remote sites such as VAFB and NASA Expendable Launch Vehicle (ELV) Resident Offices (through NISN).
 - Near Site facilities (via KSC transmission systems & cabling)
 - Internal & External network connectivity for Customer Managed Network (CMN) environments within KSC.



Kennedy Network (KNET)

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- System Functions
 - KNET provides network connections for administrative users at KSC. Using the Cable Plant's Category 3/5e/6a wiring provided by the IMCS contract, KNET provides 10/100/1000Mbps wired Ethernet service. KNET also provides IEEE 802.11b/g wireless service in all major facilities and many smaller facilities.
 - KNET provides operational support in areas such as VAB, OPF's, and Launch Pads.
 - To meet NASA security requirements, KNET supports the Open (Guest) Network for users who only need access to the Internet and the Internal (Private) Network for users who also need access to internal KSC resources.
 - KNET serves as the transport for the KSC VoIP system.
 - KNET provides many typical network services such as, but not limited to: DNS, DHCP, AAA, and NTP.
 - KNET's Network Control Center (NCC) operates from a primary location at the CIF. A limited functional backup NCC is located at the O&C. Management tools within the NCC include, but not limited to: Ciscoworks LMS, Cisco WCS, Network General Sniffer, and What's Up Gold.



Kennedy Network (KNET)

Office of the Chief Information Officer

- System Capabilities
 - KNET supports approximately 20,000 network service ports for the KSC community.
 - Approximately, 40% of users are running at 10Mbps service, 50% at 100Mbps service, and 10% at Gbps service.
 - KNET's Cisco Catalyst 6500/2970 series switches provide redundant 1Gbps backbone connectivity. The Cisco Catalyst 4000/4500/6500 series switches provides industry standard layer 3 routing features and functionality. KNET's access switches consists primarily of Cisco switches of all shapes and size with the default standard of Cisco 4500/3560 series switches.
 - Digital Subscriber Line (DSL) technology by Tut Systems, PairGain Technologies, and Cisco Systems connects remote areas via copper cables where fiber is unavailable.
 - KNET's wireless system consists of Cisco lightweight and autonomous access points. The lightweight access points are controlled and managed using the Cisco 4400 series wireless LAN controllers.



Network Security Perimeter (NSP)

Office of the Chief Information Officer

- Description of System/Services:
 - The KSC Network Security Perimeter (NSP) System is comprised of Wide Area & Internal Local Area Network Routing subsystems, Firewalls, Intrusion Detection/Monitoring systems, Remote Access Gateways (including VPN & Dial-in systems), and Network Authentication capabilities to provide a wide spectrum of networking services to the Kennedy Space Center.
- Location
 - Primary Location is CD&SC Room 106B, with some smaller support areas co-located with other KNET support functions across KSC.
- Interfaces
 - The Network Security Perimeter interfaces with the NASA Integrated Services network (NISN) which functions as the center's "Internet Service Provider" and to multiple near-site partners (such as the US Air Force) and contractor sites/facilities.
 - The Internal connections are to the KSC Metropolitan and Local Area Networks for distribution to the users across the center.



Network Security Perimeter (NSP)

Office of the Chief Information Officer

- System Functions:
 - The KSC Network Security Perimeter (NSP) System provides the primary network interconnection to the outside world and other NASA facilities. It also provides the first line of network security and monitoring capabilities to the Institutional Networks, and interconnects the KSC Secure Remote Access Services (SRAS), which are used by remote and traveling center personnel. This system also remotely supports several remote firewalls that provide minimal protections to off-site locations.

 - The system is comprised of a number of subsystems being operated as a single logical entity:
 - Routing & Transit network
 - Network (Firewalls & Access Control Lists)
 - Perimeter Monitoring & Management
 - Secure Remote Access Services
 - Strong Authentication systems



Network Security Perimeter (NSP)

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- System Capabilities
 - The system provides:
 - 300Mbps+ Throughput from the NASA Wide Area Networks to the Kennedy Space Center Local Area Network (LAN) Environments
 - Firewall & Protective Services for multiple network environments (including the Internal KSC & Open/Guest networks & remote resident offices)
 - Remote Access Services, including Client-Server Virtual Private Networking (VPN) , Secure Sockets Layer (SSL) VPNs & legacy Plain old Telephone Services (POTS) Dial-in services
 - Strong Authentication services using SecurID 2 Factor Authentication Tokens, and RADIUS servers.
 - Intrusion Detection Monitoring & Alerting (in addition to Agency capabilities)
 - Network Analysis & Troubleshooting support for network traffic leaving the Center networks.



NASA Integrated Services Network (NISN)-Wide Area

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- Description of System/Services
 - NASA Integrated Service Network (NISN) provides standard NISN services across the Wide Area
 - Premium Internet Protocol (PIP) & Standard Internet Protocol (SIP)
 - Wide Area Transmission (including Networx delivered interfaces)
 - Mission Networks
 - Agency video conferencing capabilities in over 30 locations
- Locations
 - Primary NISN Gateway facility is located in Room 123 of the CD&SC facility.
 - Video Conferencing facilities primarily in HQ, SSPF & OSB II facilities
- Interfaces
 - Currently connected to the NISN WAN backbone with a 2.5 Gigabit link to Marshall Space Flight Center and a 2.5 Gigabit link to Johnson Space Center
 - Tail circuit connectivity to multiple on-site, near-site & off-site facilities
 - NASA Shuttle Logistics Depot (NSLD) & USA Titusville
 - Multiple NASA Contractor Facilities across the state of Florida
 - KSC On-site locations (European Space Agency (ESA), NWS)



LPS Operational Network (LON)

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- Description of System/Services
 - Launch Processing System (LPS) Operational Network (LON) provides a secure network environment to support LPS processing and business systems.
 - Systems supported includes Shuttle Data Center, USA IM servers, Shuttle Data Stream, and other LPS development sets.
 - LON is comprised primarily of Cisco firewalls, routers, and switches.
- Locations
 - Primary LON system is located in the LCC facility.
 - Secondary locations include the PCC, OSB I, and HMF facilities.
- Interfaces
 - LON currently connects to KNET with a single 100Mbps link. (Project in work to upgrade the link to dual 1Gbps links.)



KNET Network Control Center (CIF Facility)

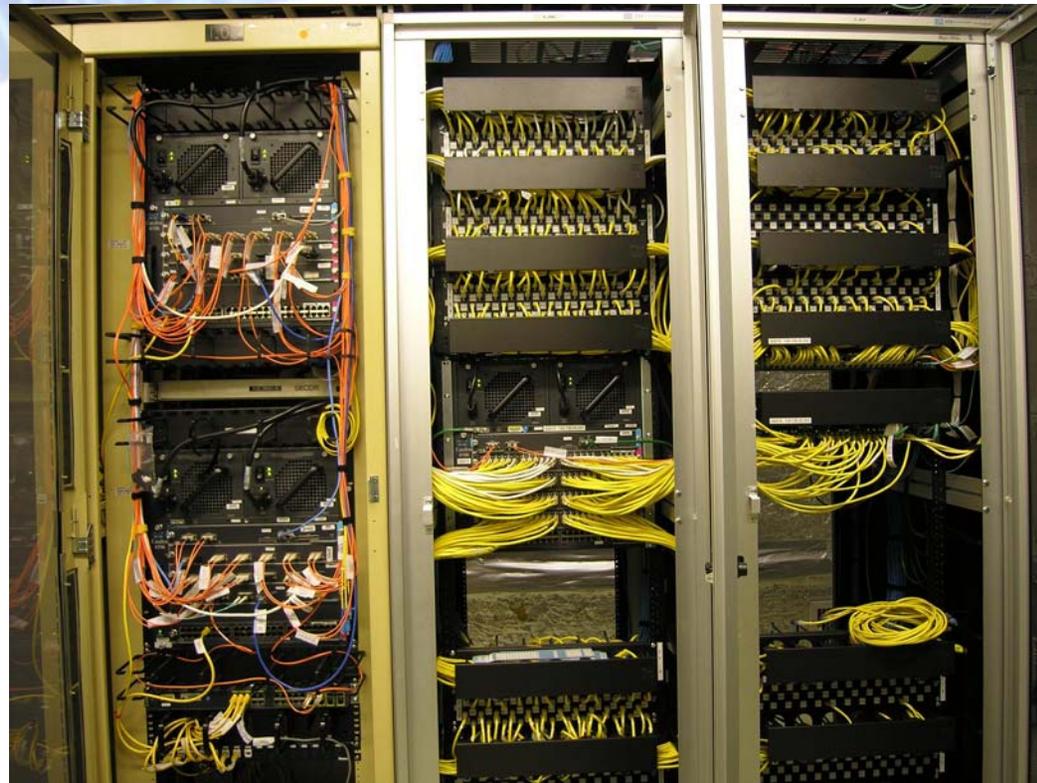
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KNET Rack (CIF Facility)

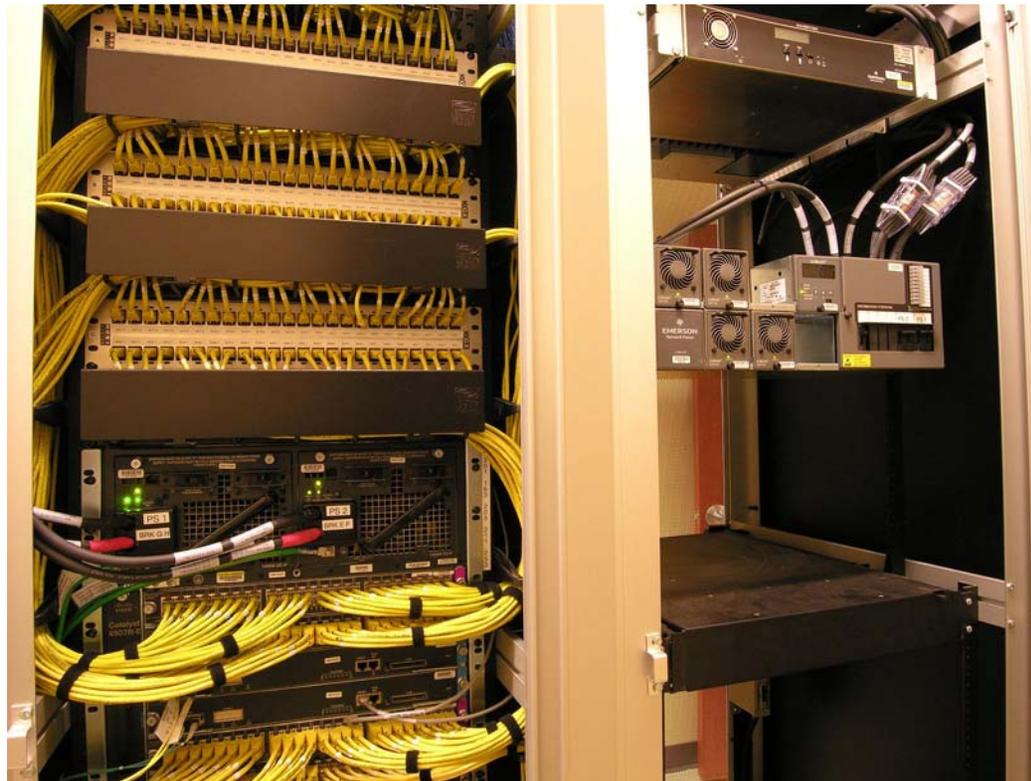
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KNET Rack with DC Power (O&C Facility)

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Network Security Perimeter Racks (CD&SC Facility)



Information Officer



NISN Gateway Racks (CD&SC Facility)



Information Officer



Office of the Chief Information Officer

Kennedy Space Center Data Centers Overview

Ben Bryant IT-C

**May 5, 2009
Kennedy Space Center**



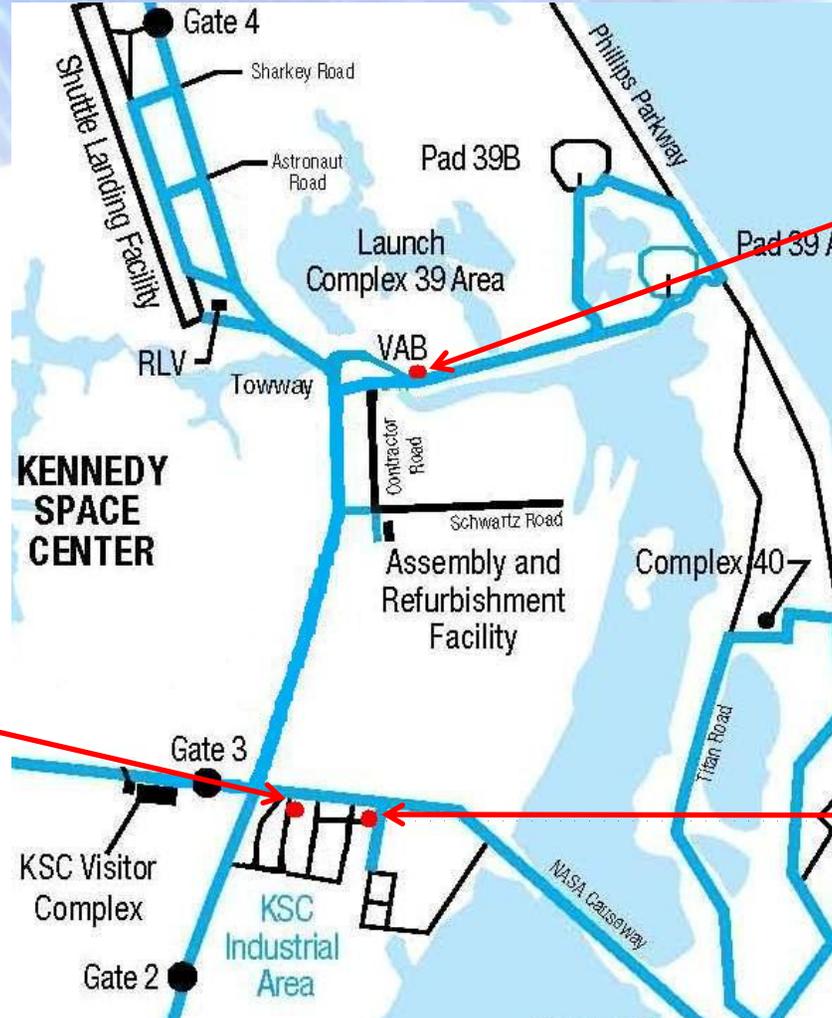
Data Center Locations

Chief Information Officer

VAB
Data Center

CIF
Kennedy
Data Center

SSPF
CIMS Data Center





Kennedy Data Center (KDC)

Provides hosting and data storage services for Center administrative applications and websites.



Kennedy Data Center (KDC) Overview

- Main site located in room 243 of the Central Instrumentation Facility (CIF)
 - ~ 7000 Square Feet of Raised Flooring
 - Operated by IMCS Contractor (ABACUS) for IT Directorate
- Infrastructure services include the following
 - Controlled Physical Access
 - Rack Housing
 - Backup Battery Power
 - Environmental Monitoring
 - Network Connectivity (within Data Center), Management, and Monitoring
 - Storage
 - Backup/Recovery
 - Server Hosting
 - Server Performance, Health, Availability Monitoring
 - System Security Plan Development/Maintenance

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KDC Infrastructure

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- Servers
 - 275 Physical Servers
 - Database, web, application, management, specialized
 - Mix of Dell, HP/Compaq, IBM, Sun, SGI
 - 12 Virtual Hosts
 - 50 Virtual Machines
 - Predominately Windows 2003
 - Some specialized services utilize Sun Solaris, various Linux flavors
- Storage
 - Multiple, disparate Storage Area Networks (SAN), Network Attached Storage (NAS), and Direct Attached Storage (DAS)
 - Approximately 65 TB raw capacity (ODIN has additional ~20 TB)
 - SAN hardware includes EMC and HP



KDC Infrastructure (continued)

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- Backup
 - Ten multi-slot, single/multi drive backup libraries
 - No single library provides backup/restore capability for the entire Data Center
 - Largest library has 126 slots and six drives
 - Formats include LTO and Super-DLT
 - Currently backup approximately 25TB weekly
- Network (within Data Center)
 - Dual gigabit connections to KSC networks
 - Internal gigabit backbone for Data Center-specific traffic
- Power
 - Two 80-amp feeds power two 40kW Power Distribution Units/Uninterruptible Power Supplies (PDU/UPS)
 - Single 150-amp feed in work for one 80kW PDU/UPS
 - All other power from individual circuits
 - Rack-mounted UPS



KDC Services

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- Application Hosting
 - Currently hosting 200-plus in-house developed and COTS applications
 - Application Hosting Platforms
 - ASP.Net 1.x, 2.0, 3.x
 - Cold Fusion 5, MX 7
 - PHP
 - Java
 - Ruby on Rails
- Database Hosting
 - The majority of web-enabled and client-server applications include a back-end database component
 - Hosting Platforms
 - Microsoft SQL Server 2000
 - Microsoft SQL Server 2005
 - MySQL 5.x
 - Oracle 10/11
 - Postgres



KDC Services (cont)

Office of the Chief Information Officer

- Internet/Intranet Web Hosting
 - Publicly-Accessible Content
 - KSC Intranet Portal
 - Directorate/Division/Branch Sites
- Collaboration Services
 - Windows SharePoint Services Version 3
 - Wikis
 - Blogs
- Custom-Built/Tailored Services
 - Maximo
 - Windchill
 - Geographical Information System (GIS)
 - Personal Access & Security System (PASS)
 - Many more

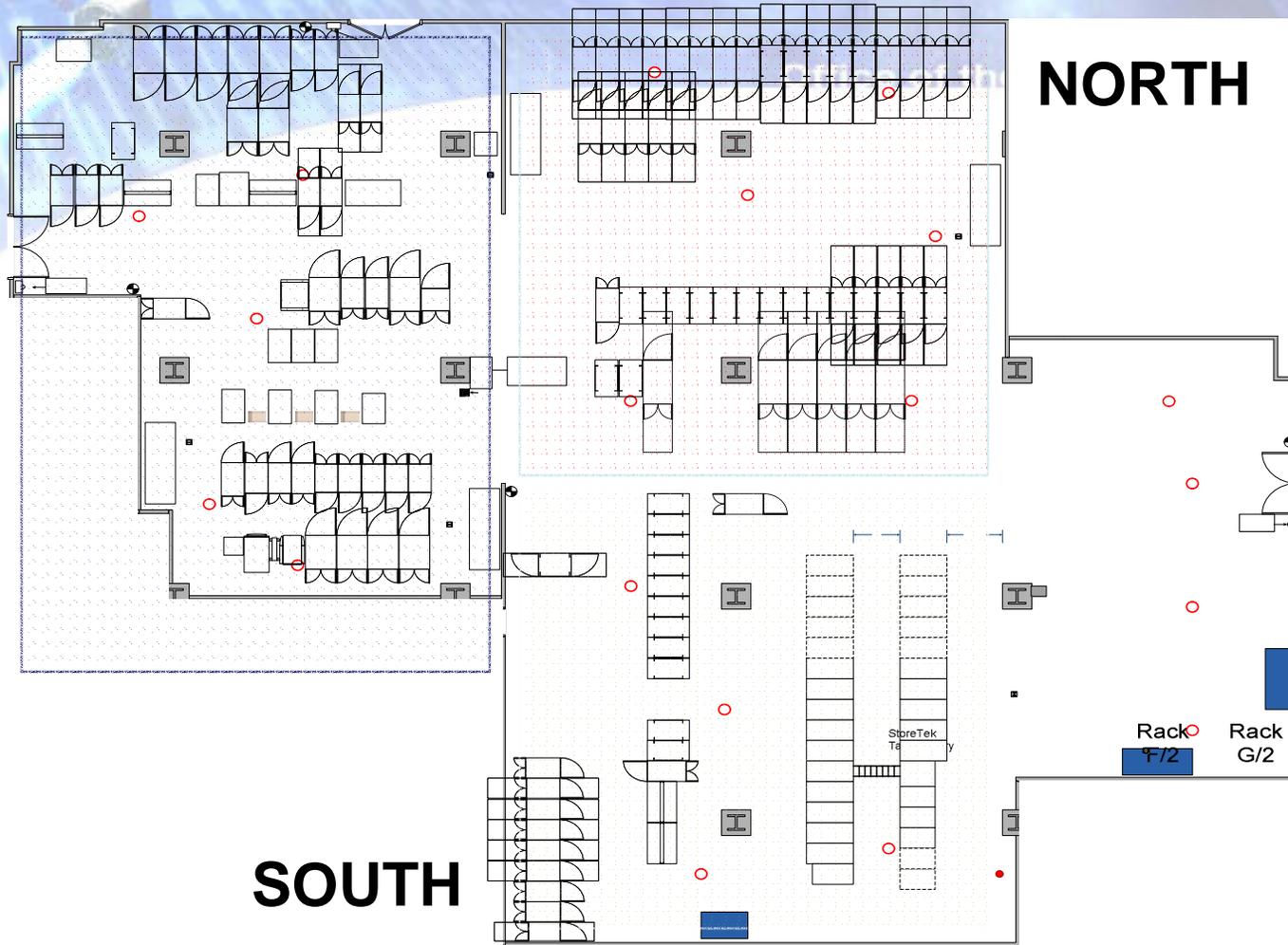


KDC Layout Overhead View

WEST

NORTH

SOUTH



Shelf B1

Rack E/6

Rack F/2

Rack G/2

Rack I/2

Rack K/2

Rack L/2

Fire Ext

Rack M/2

Rack K/6

Rack L/6

Under Floor
Smoke Detector
M/8

75

Rack C/9

Rack D/9

Rack E/9

Shelf C4

Rack I/9

Rack J/9

Shelf C6

SD

SD

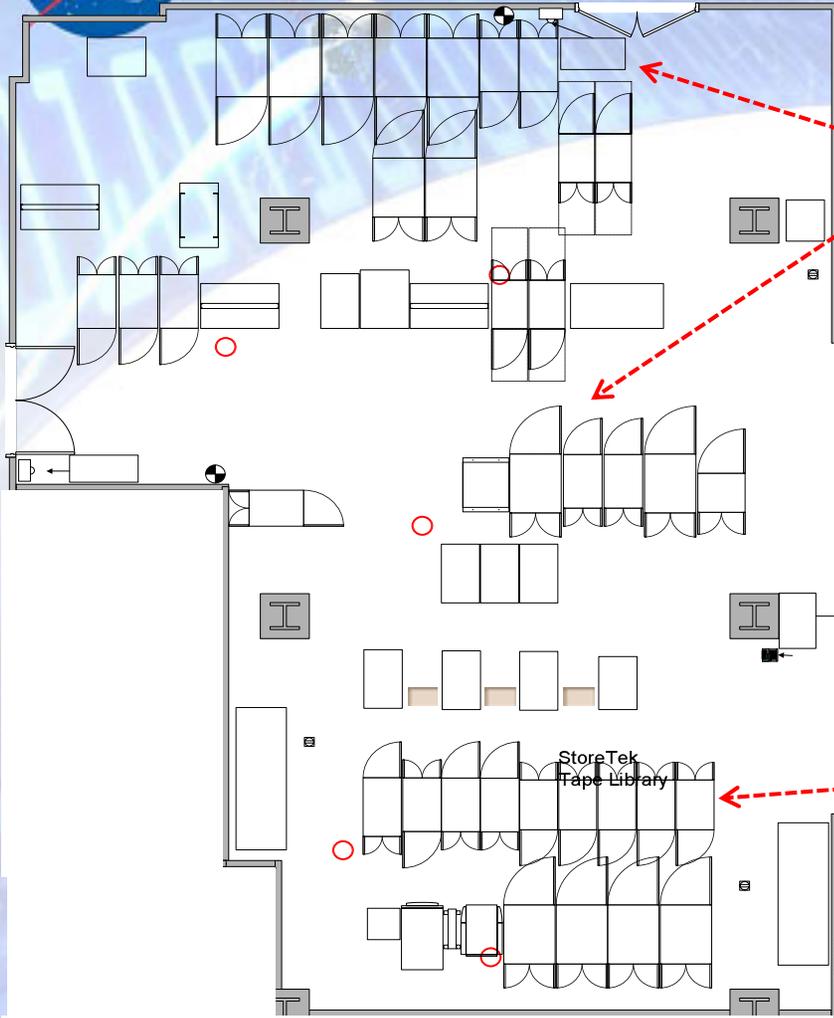
Rack M/8



KDC Layout West View

Office of the Chief Information Officer

GIS, TechDoc, PASS,
CBACS, DDMS



Rack J/2
Rack K/2
Rack L/2
JBOSC Closeout

Fire Extinguisher

Rack M/2
Rack N/2

Rack K/6
Rack L/6

Shelf B1

Rack F/6

Under Floor
Smoke Detector



KDC layout North View

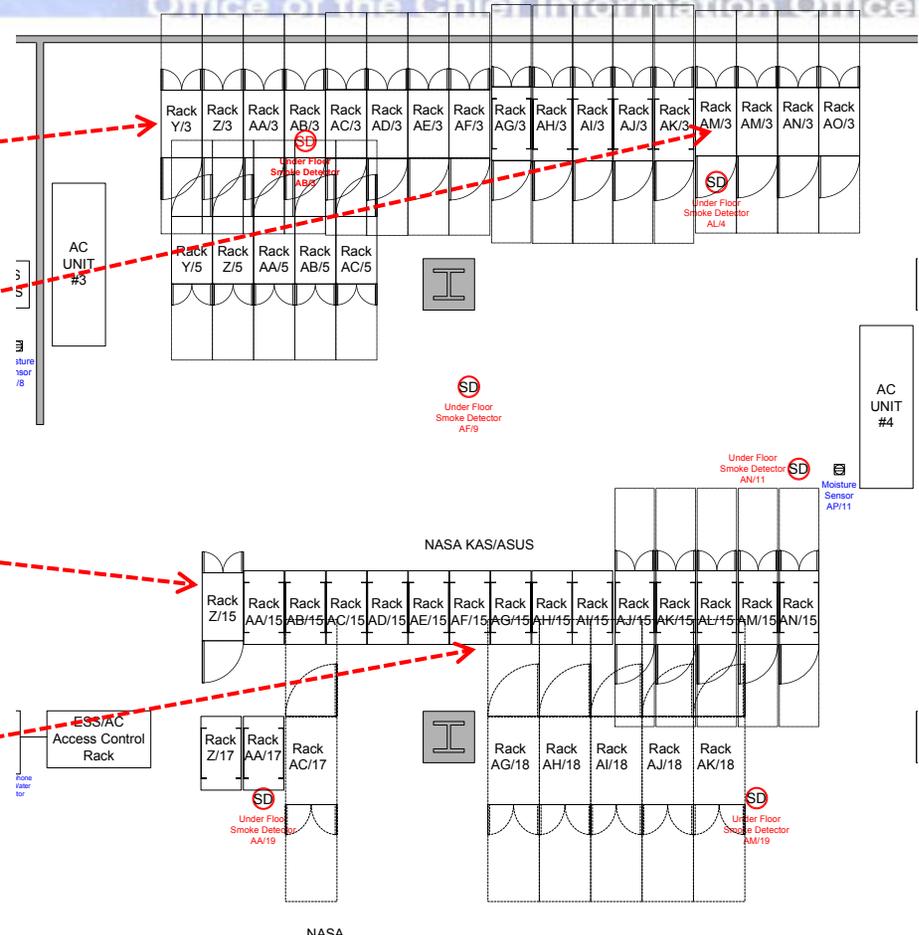
Office of the Chief Information Officer

Public Web/Application Hosting

Virtual Hosting Infrastructure

Internal Web/Application Hosting

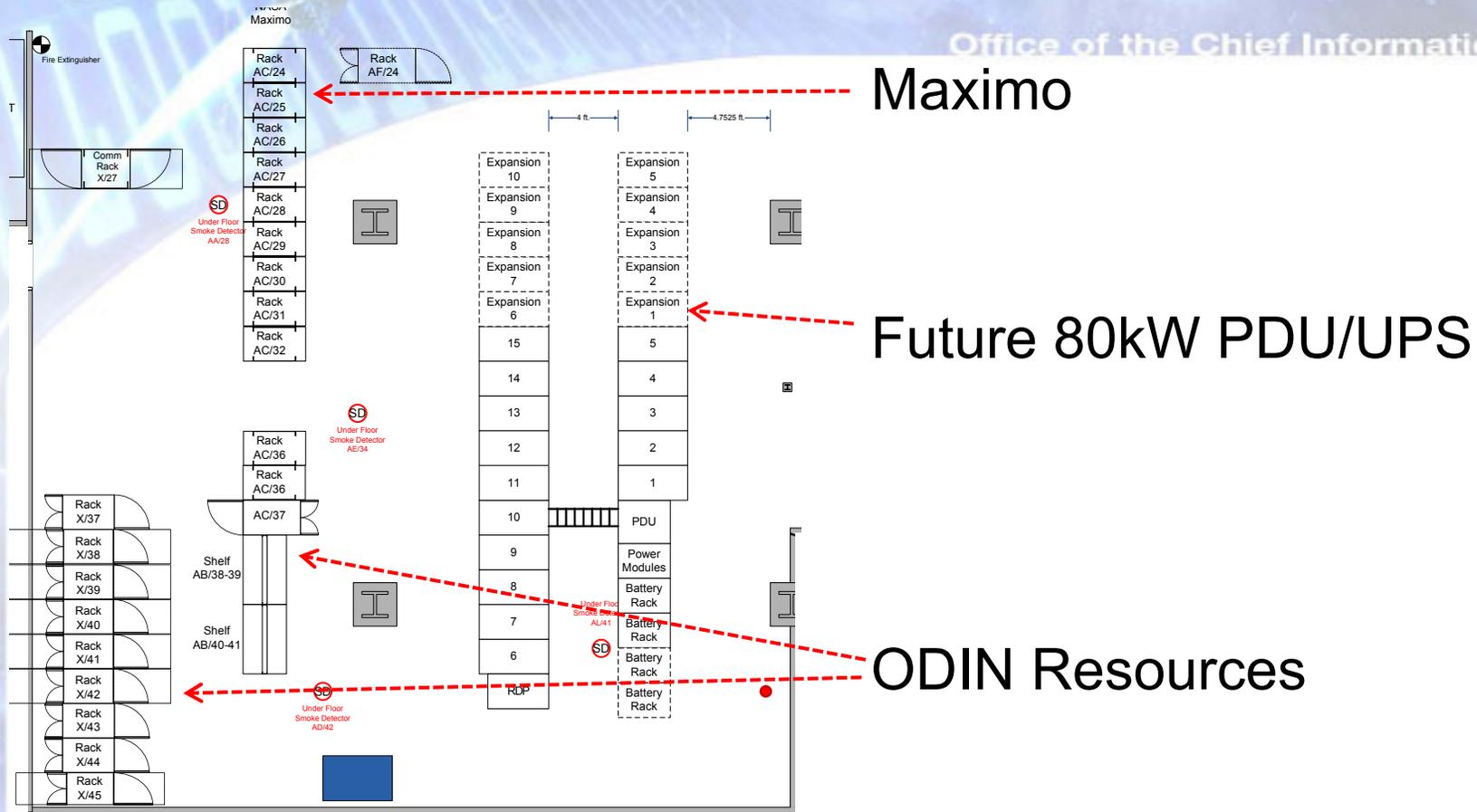
Agency Security Update Services
Agency Risk Management System





KDC Layout South View

Office of the Chief Information Officer





KDC Pictorial Tour



**40kW
PDU/
UPS**



**Rack-
Mounted
UPS**



**Future Site of
80 kW
PDU/UPS**



KDC Pictorial Tour (cont)

Chilled Water Air Handler (9 Total)



Emergency Power Off System (EPO)



Physical Access Control



Wet Pipe Fire Suppression System





KDC Pictorial Tour (cont)

Application Servers

Maximo



Information Officer

- GIS**
- TechDoc**
- PASS**
- CBACS**
- DDMS**



**Agency Security Update System
Risk Management System**





KDC Pictorial Tour (cont)

ODIN Servers



Information Officer

JBOSC Closeout

**Internal Web/
Application
Hosting**



**Virtual
Hosting
Infrastructure**





KDC Pictorial Tour (cont)

Office of the Chief Information Officer



**Rack-Mounted
Keyboard/
Mouse/Monitor**



**EMC CX 3-40 Storage Area
Network**



CAPPS Information Management Systems (CIMS) Data Center

Provides hosting services for systems required for performance of the ISS Checkout and Payloads Processing System (CAPPS) contract at KSC.



CAPPS Information Management Systems (CIMS)

Data Center Overview

Office of the Chief Information Officer

- Located in the Space Station Processing Facility (SSPF)
 - 3100 Square Feet of Raised Floor
 - Operated by CAPPS Contractor (Boeing) for ISS Program

- Infrastructure services include the following
 - Controlled Physical Access
 - Dual Independent Power Sources/Facility Rotary UPS/Facility Generator
 - Environmental Monitoring
 - Storage
 - Backup Tape Storage
 - Staging Area
 - Server Housing/Hosting
 - Application/Database Hosting



CIMS Data Center Overview (cont)

Office of the Chief Information Officer

- Security
 - Biometrics entry with photo capture
 - Motion sensor and stationary cameras
 - Email alert with image upon entry
 - Full room video monitoring
 - Walls extend below raised floor and above suspended ceiling

- Environmental Control
 - Temperature, humidity, smoke and water intrusion sensors
 - Redundant Lieberts
 - Environmental sensor email and Dialogic phone alert
 - Central monitoring control area



CIMS Data Center Overview (cont)

Infrastructure and Applications

Hardware

- HP ProLiant Servers
 - Total 149: App (62), Citrix (8), Database (22), Domain Controllers (7), Email (10), File/Print (27), VMWare Hosts (4), Web (9)
- EMC and HP SANs
- HP LTO Tape Libraries
- Rack mount UPS units
- Cisco 6509 series switches

Operating Systems

- Microsoft Windows Server 2003
- VMware ESX 3.5

Databases

- Oracle
- SQL Server

Major Applications (Types)

- Web-based
- Client Server (Citrix)
- Cobra/OPP (Cost/Scheduling)
- MAXIMO (Work Control)
- Velocity/Solumina (Work Order Processing)
- Appian (Work Flow)
- ANDON (Work Floor Notification)
- RFID (Item Tracking)
- Web Focus (Reporting)
- Crystal Reports (Reporting)
- TD Archive (Document Storage)
- Tech Doc (Document Management)

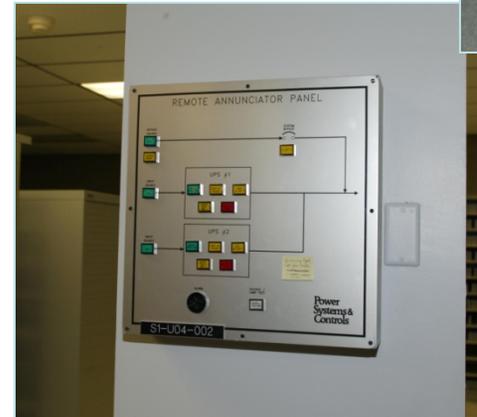


CIMS Pictorial Tour

Security

Environment Control

Office of the Chief Information Officer





CIMS Pictorial Tour (cont)

Servers/Storage

Office of the Chief Information Officer





VAB Data Center

Provides hosting of systems supporting Shuttle processing activities (SPOC) and USA processes



VAB Data Center Overview

Office of the Chief Information Officer

- Located in the Vehicle Assembly Building (VAB)
 - 4th Level
 - Cement Roof
 - 10,000 Square Feet of Raised Floor, 1000 Square Feet Normal Floor
 - Operated by SPOC Contractor (USA) for Shuttle Program
- Infrastructure services include the following
 - Controlled Physical Access
 - Dual (redundant) UPS/Backup Generators
 - Environmental Monitoring/Control
 - Network/System Monitoring
 - Storage
 - Backup Tape Storage
 - Server Housing/Hosting
 - Application/Database Hosting



VAB Data Center Overview (cont)

Office of the Chief Information Officer

- Security
 - VAB F Gate
 - Cipher Controlled Access
- Environmental Control
 - 6 Chillers (high degree of redundancy), Data Center can direct-connect portable
 - Under Floor Air Handlers, provides approximately 150 Tons cooling capacity
- Disaster Recovery
 - Houston Data Center serves as backup
 - Custom equipment covers which are more waterproof, durable, and safe
 - Offsite Storage – CCAFS Complex 19



VAB Data Center Overview (cont)

Infrastructure and Applications

Office of the Chief Information Officer

Hardware

- Primarily HP Servers (~185)
- Unisys Mainframe
- Matterhorn Robotic Tape Arm System

Operating Systems

- Microsoft Windows 2003
- Hewlett Packard HPUX-11

Storage Area Network

- SAN Storage
- Internal Fibre Channel Network
- Virtual Server Connection
- Tape Drives

Services

- E-Mail
- Remote Access System (RAF)
- Public Web Services (PUBWS)
- Production Development Web Services (PDWS)
- Desktop Services Facility (DSF)
- File Servers (FSS)
- Print Services Facility (PSF)

Infrastructure

- Extranet
- Identity Management System (iDMS)
- Core Domain Controllers (CDC)
- USA Network Infrastructure System (NIF) – Firewall/Routers/Switches
- Infrastructure Domain Services Facility (IDSF)



VAB Data Center Overview (cont)

Infrastructure and Applications (cont)

Office of the Chief Information Officer

Databases

- Oracle
- SQL Server

Applications (examples)

- Enterprise Application System (EAS)
- Financial, Distribution, and Manufacturing System (FDM)
- Enterprise Document Management System (EDMS) – Documentum
- Advanced Data Acquisition & Management (ADAM)
- Maximo (Work Control)
- Integrated Problem Reporting and Corrective Action (iPRACA)
- Integrated Work Control System (IWCS)
- Logistic Automated Work Control System (LAWCS)
- Propulsion System Advisory (PSA)
- Shuttle Drawing System (SDS)

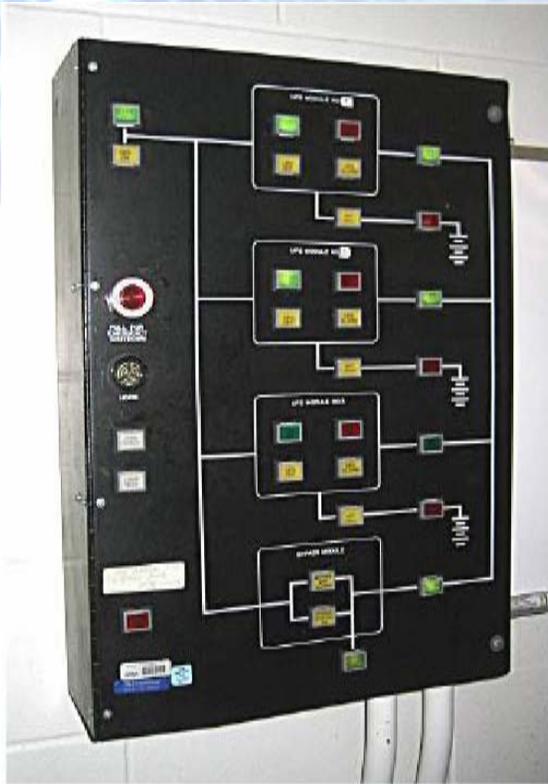


VAB Pictorial Tour

Dual UPS

Under Floor Air Handlers

Office of Information Officer

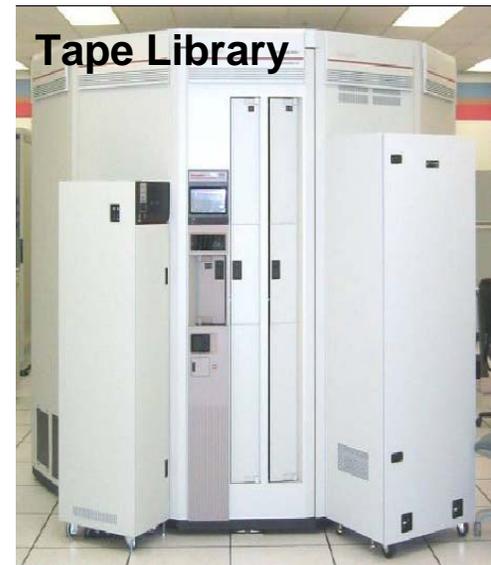




VAB Pictorial Tour (cont)

Servers/Storage/Overhead Cabling

Office of the Chief Information Officer





VAB Pictorial Tour (cont)

Offsite Storage – CCAFS Complex 19

7x24x365 Control Room





Submit comments/questions to

<http://I3P.nasa.gov>

Final RFPs are the authoritative source
for the Government requirements of the
I3P Procurements.



Agenda

Office of the Chief Information Officer

- Administrative Information
- I³P Overview
- Center Overview
- Center IT Infrastructure Today
 - End User Environment
 - Communication Environment
 - Data Center Environment
- **Center Tour**



Center Tour

Office of the Chief Information Officer

- *The Site Tour of KSC will take approximately 2 ½ hours.*
- *Buses will be in front of the hotel at 12:45 PM.*
- *We will leave the Radisson at 1 PM and return to the Radisson following the tour.*
- *During the tour you will not be allowed to leave the bus, so please visit the restroom before you board the bus.*
- *Drinks and cameras are permitted.*