



EPA Virtual Hosting and Cloud Futures

**EPA's National Computer Center
Research Triangle Park, NC**

**OEI Symposium
May 13, 2010**



Presenters

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Agenda

- ✓ Current Infrastructure Services and Environment
- ✓ Hosting Service Offerings
- ✓ Hosting Optimization Initiatives
- ✓ Private Cloud Services
- ✓ Brokered External Cloud Services

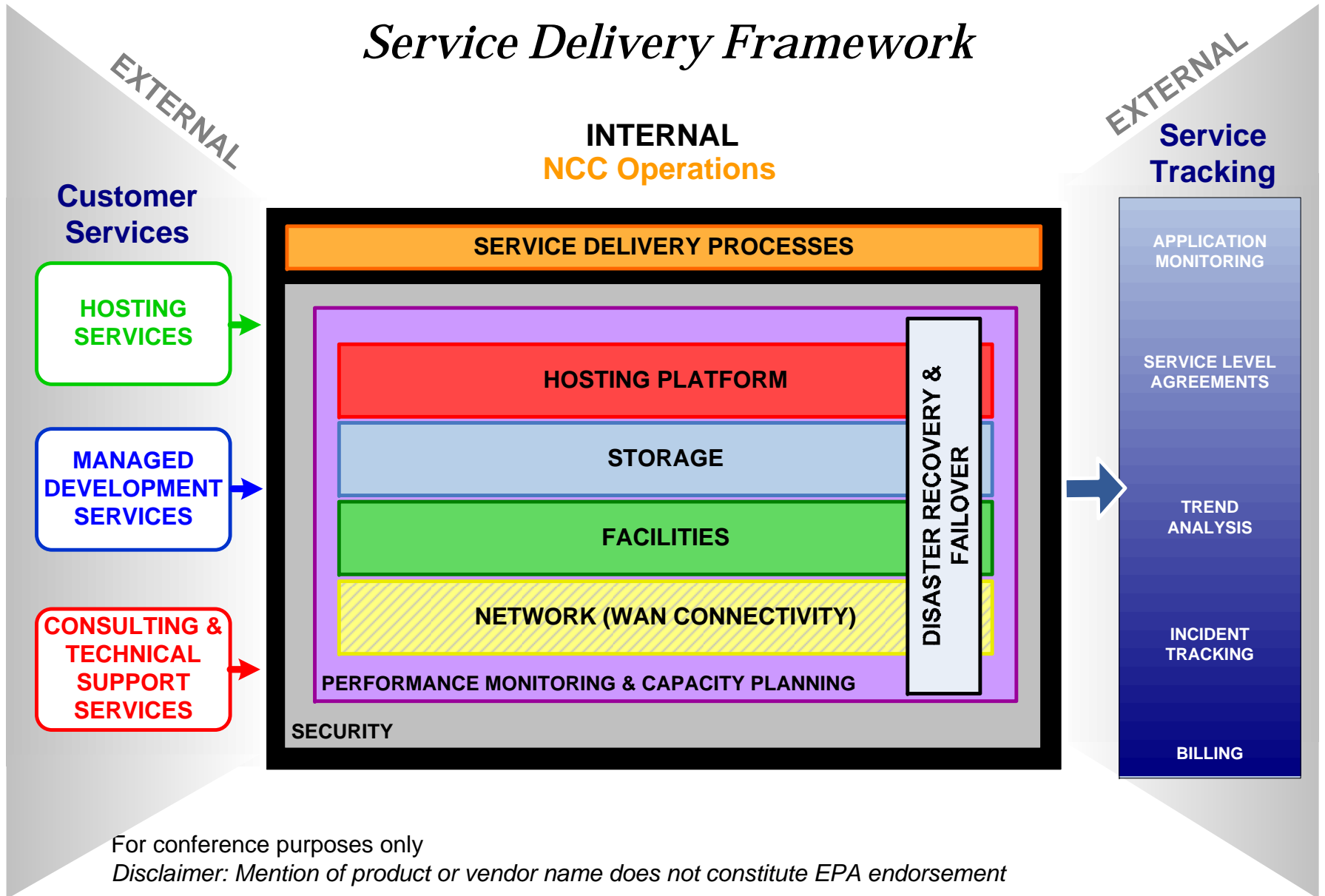
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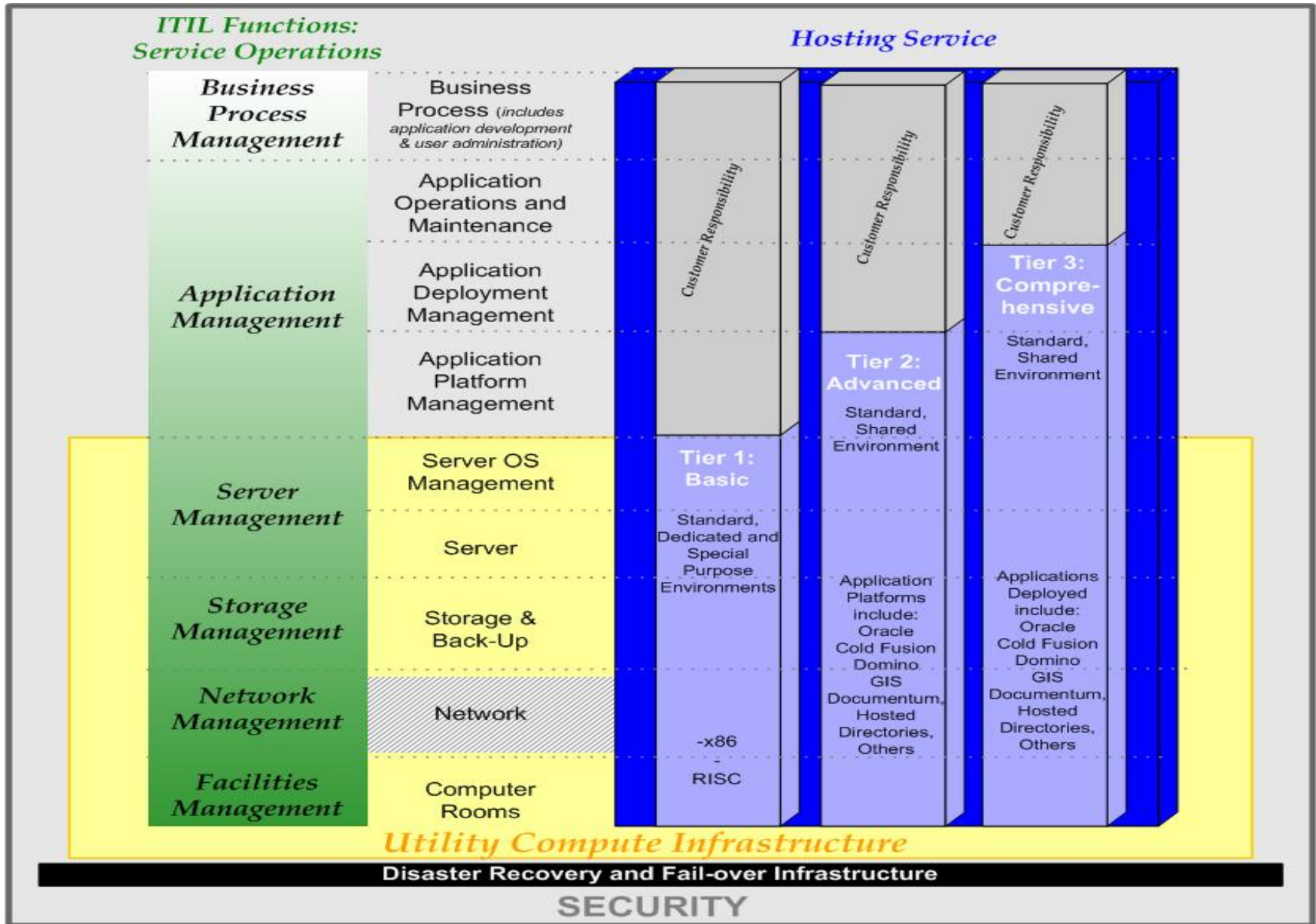
Service Delivery Framework



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Hosting Service Delivery Model





Basic & Advanced Hosting

- Basic Hosting provides fixed cost service offering for
 - Physical and logical servers (x64 and IBM P-series LPARS)
- Advanced Hosting provides cost plus service for application platform management
- General Support Systems (GSS) with C&A for medium sensitivity
- Targeted at very large or complex applications

Functionally, Infrastructure as a Service (IaaS) except...

- ➡ Not orderable on-line
- ➡ Not scalable on-demand
- ➡ OS is managed to FISMA compliance



Comprehensive Hosting

- Fixed cost service offerings for open source and COTS platforms
 - Apache, Tomcat, Java, Oracle Application Server, Oracle Database
- Customers choose application components
- Standardized, medium sensitivity GSS for all layers up to the OS
- Targeted at small and medium applications

Functionally, Platform as a Service (PaaS) except...

- ➔ Not orderable on-line
- ➔ OS and platform managed to FISMA compliance
Leverages shared capacity and drives high utilization

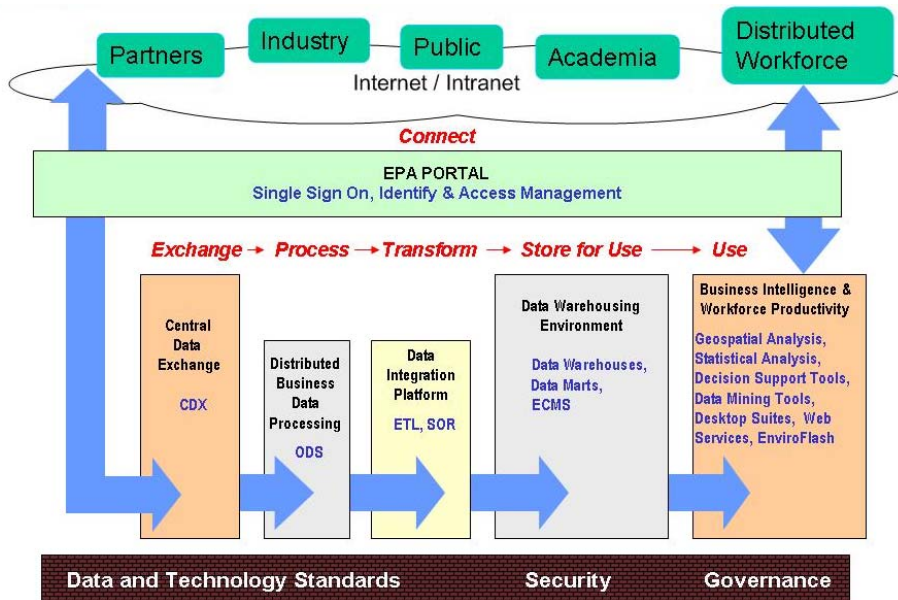


Supported Application Hosting Environments

- Enterprise Tools: CDX, ETL, Registries, ECMS, Geospatial, Web Access Management, Portal

Technologies:

- Static Web pgs >1M
- Domino 200
- ListServer 145
- ColdFusion 129
- Mapping 58
- Java/JEE 111
- Oracle Application Server 183
- Oracle Database 150
- Business Intelligence 60



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Shared Storage Services

- Fixed price offering includes active storage and standardized off-site backup
- Virtualized multi-tier storage
- Shared platform supports all hosting infrastructure
- Off-site replication for disaster recovery
- Servers configured to boot from SAN (storage area network)



Technical Consulting

- Cost plus fixed fee services for technical support and consulting
 - Average cost \$110/hr including all fees
- Application development, deployment and operations
- Web Content Management
- Business Intelligence
- Network engineering
- Infrastructure and network security
- IT Project Management

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Hosting Services Future

- More Agile
 - Expedited provisioning for virtual servers...days...not weeks or months
 - Dedicated windows and Linux servers will move to VMware virtual machines with core and memory charges
 - High performance databases will remain in Pseries virtual machines (LPARS)
- Faster process for security plan review
 - Leverage application owner's security oversight
 - Expedited firewall rule authorization for standard communications
 - More options for low sensitivity applications
- More options for high availability
- Lower Cost

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Development Environment Hosting

- NCC will offer two distinct development environments:
- Development hosting environment:
 - For standard and supported EPA technologies and applications
 - Will ensure smooth transition from development to production environment
 - Will mimic the production environment to avoid configuration issues when moved
- Sandbox hosting environment:
 - For the evaluation and research of emerging or emerging technologies and software
 - Will be “hosted” in an isolated area, preventing the application from affecting other Agency applications



Brokered External Cloud Services

- External cloud services used since 2006 for www.epa.gov via Akamai failover
- Path Forward
 - Understand true costs
 - Align pricing and services across private and public services
 - Understand external cloud C&A framework
 - Establish C&A standards and compliance with FedRAMP



EPA Cloud Services Present

- www.epa.gov failover hosted in Akami cloud since 2006
- NCC hosted Oracle databases in private cloud since 2005
- NCC storage is virtualized storage platform commonly used by private cloud providers
- Over 180 virtual servers operated
 - >150 Intel based windows/Linux VM's
 - >30 AIX LPARS
- Over 100 terabytes virtualized on-line storage



Hosting Technologies: System P - UNIX

- Highly Scalable
 - 88 cores/processors
 - 450 GB RAM
- Dynamic LPARing
- Virtualization
 - Micro-partitioning
 - Over 30 Virtual Host
- High availability
- Management features
- Supports database processing



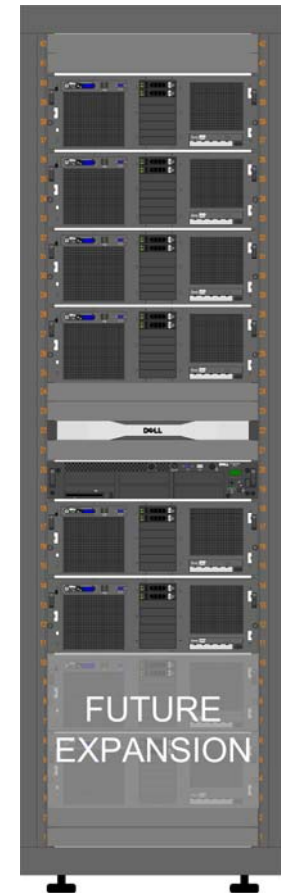
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Hosting Technologies: NCC Virtual Environment

- 6 ESXi hosts – Dell R900
 - 128 Cores producing 323 GHz
 - 768 GB RAM
 - 10 TB SAN
 - 154 virtual machines hosted
 - Fully vMotion, Dynamic resource scheduling, and High Availability
 - Under 50 network cables



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Establishing EPA's Private Cloud Services

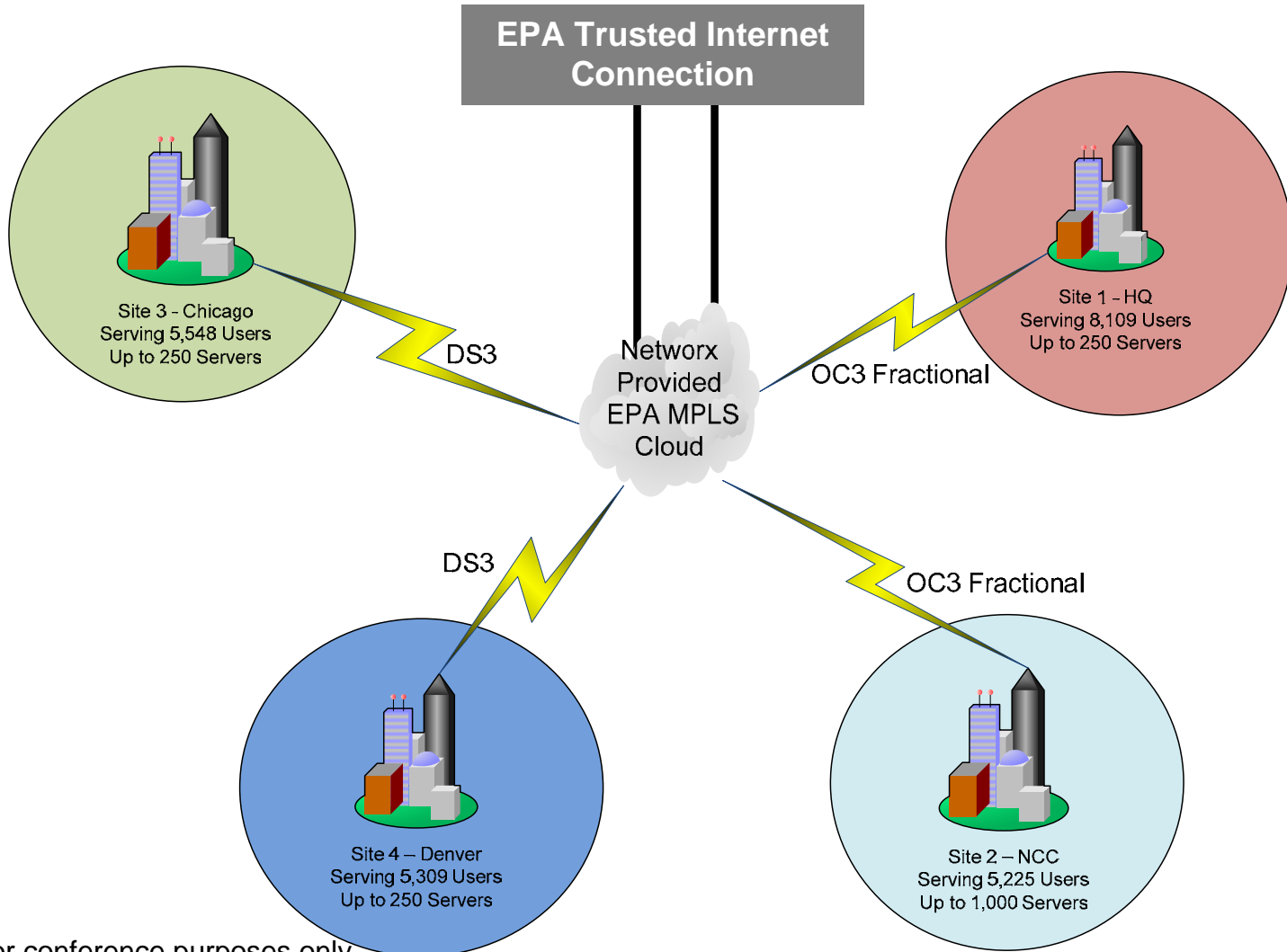
- 4 EPA data centers for enterprise application hosting
 - EPA National Computer Center (Up to 1,000 servers)
 - Potomac Yards Virginia (Up to 250 servers)
 - Chicago (Up to 250 servers)
 - Denver (Up to 250 servers)
- Establishes a standardized cloud platform in each of the data centers
- Targeted at medium sensitivity enterprise applications and local Continuity of Operations Planning (COOP)
- Leverages email optimization investment to establish foundation infrastructure
- Improves resiliency for enterprise applications

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EPA Private Cloud

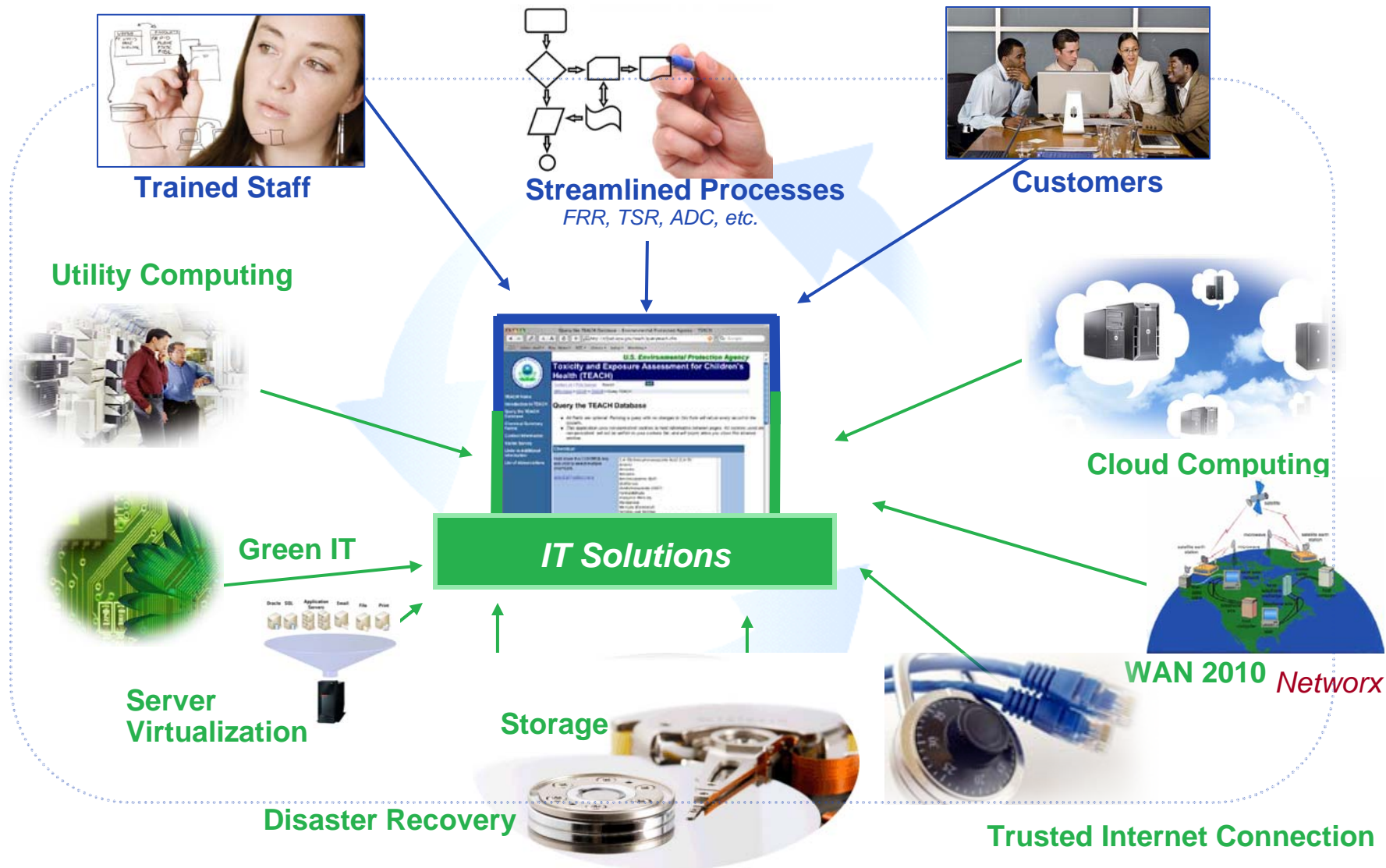
EPA Enterprise Hosting Centers



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Aligning People, Processes, and Technologies



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Questions and Discussion



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