



Geospatial Segment Architecture and GeoCloud Update

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Background

- ◆ FEA Geospatial Profile was developed for the LoB process to inform agency architectures on how to include/support geospatial capabilities in their agency architectures
- ◆ OMB/FEA and the CIO Council are strongly promoting the Federal Segment Architecture Methodology (FSAM) for systems and solution architecture development



Continued

- ◆ Geospatial Platform evolved as a nexus for new geospatial coordination and development of shared architectural approaches
- ◆ Segment Architecture Analysis of the Geospatial Platform is a resource document that examines the existing and desired states using FSAM



Geospatial Segment Architecture Guidance

- ◆ Developed to assist architects in developing agency segment architectures that include geospatial capabilities, following the FSAM steps
- ◆ Introduces geospatial concepts and history, provides multiple reference annexes for standards, business, and service types, other documents



Request

- ◆ CG member agencies are requested to review the guidance document by appropriate personnel to assess and improve its utility, particularly in the hands of a non-geospatial architect
- ◆ We may also need to seek CIO Council concurrence on this, MPT are checking
- ◆ Review and concurrence is due to the ATWG by October 22, 2010



GeoCloud Initiative

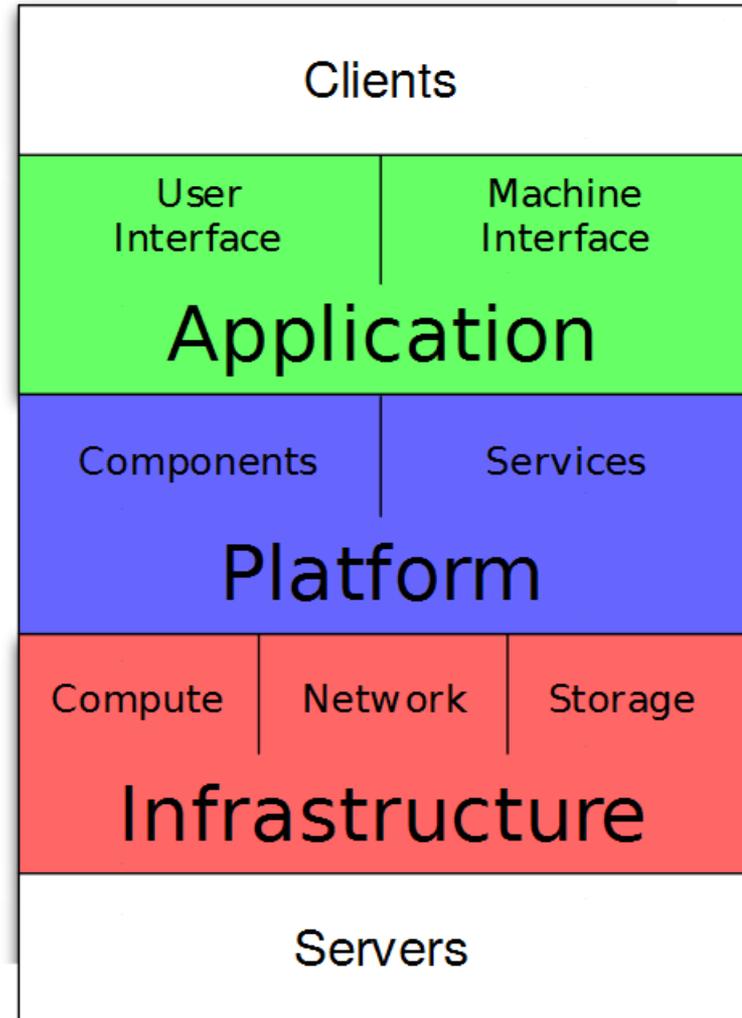
- Over a 12+ month period:
 - Acquire and deploy commercial Cloud hosting capabilities through open market or GSA-facilitated contracts for seven federal geospatial applications
 - Acquire and deploy HW and Cloud infrastructure for agency-hosted solutions not amenable to commercial hosting environments
 - Monitor costs, loads, issues, and options
 - Seek federal C&A (FedRAMP) for infrastructure (IaaS) and geospatial solution packages (PaaS) to facilitate re-deployment in agencies
 - Document Best Practices and guides to agencies on adoption of geospatial Cloud infrastructure



Notional Cloud Computing Stack

http://en.wikipedia.org/wiki/Cloud_computing

- GSA apps.gov will be offering Infrastructure as a Service (IaaS) solutions for acquisition
- This is roughly equivalent to “shared-hosting” of raw computers with an operating system in the Cloud domain



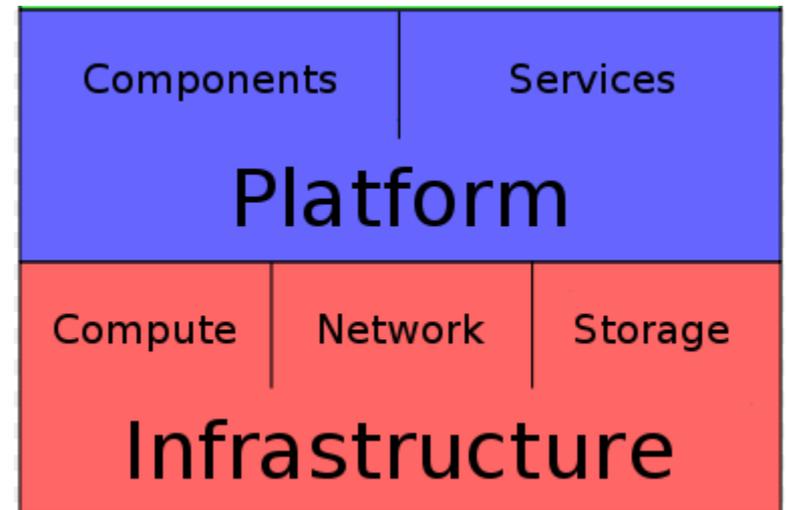
Cloud Computing Stack



Platform as a Service (PaaS)

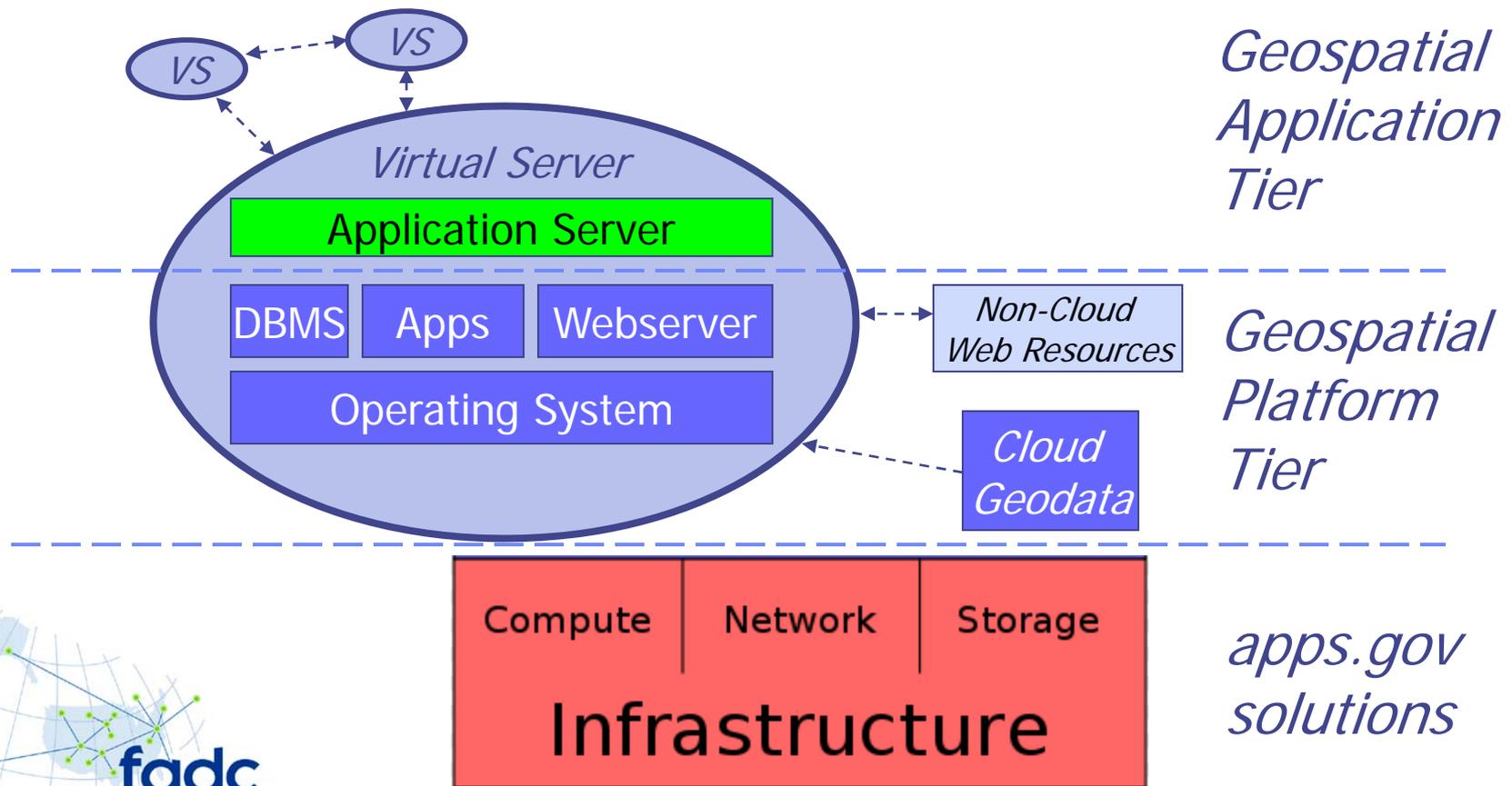
"A *cloud platform* ([PaaS](#)) delivers a computing platform and/or solution stack as a service, generally consuming *cloud infrastructure* and supporting *cloud applications*. It facilitates deployment of applications without the cost and complexity of buying and managing the underlying hardware and software layers."

The GeoCloud intends to pilot the deployment of candidate services or solutions architectures (suites of software) on top of the GSA IaaS to provide common geospatial capabilities. GSA will venture into PaaS next.



Geospatial solutions – 4. Solution case

- Bundled system images: virtual servers with software
- Instantiable in Cloud as single or multiple instances
- *Example: Amazon Machine Images of GI service suites*



Deployment analysis

- ◆ Performed monthly cost estimates for each of ten projects in Amazon and most were cost-competitive for AWS hosting. High data and traffic use cases were not.
- ◆ Two target environments:
 - GSA-brokered access to Amazon Web Services (AWS) EC2 and EBS for seven projects
 - VMWare vCloud hosting on-site at USGS EROS Data Center for select data/services



Project Synopsis

NWI Wetlands Mapper	AWS, Windows 2008, ArcGIS Server
US Census TIGER/Line Downloads	AWS, Linux64 (CentOS)
Integrated Ocean Observing System Catalog and Viewer (NOAA)	AWS, Linux64 (CentOS), GeoNetwork
NOAA ERDAP	AWS, Linux64 (CentOS), THREDDS
EPA Lakes and Ponds	AWS, Windows 2008, ArcGIS Server



Project Synopsis, Continued

USGS National Elevation Dataset (NED) service and data	VMWare vCloud on Dell HW, Windows 2008, ArcGIS Server
USGS National Map Map Tile Cache	VMWare vCloud on Dell HW, Windows 2008 or Linux64
Particles in the Cloud (NOAA) (particle tracking computational service for air or water dispersion)	AWS, Linux64 (CentOS)
GEOSS Clearinghouse Catalog	AWS, Linux64 (CentOS)
USDA FSA or NRCS data service application	AWS, Linux64 (CentOS)

Status

- ◆ Providing login credentials to *AWS* and *enStratus* management interface to all project members using *AWS* in the next two weeks
- ◆ Starting installation and monitoring of the deployment environment with agency-facing Web services (October)
- ◆ Initial public-facing Web Services (November)

