

Working Group Outbrief

Ground System Architectures Workshop

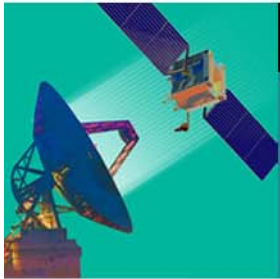


Session 11D

Data Center Migration for Ground
Systems: Geospatial Clouds

Craig Lee, lee@aero.org

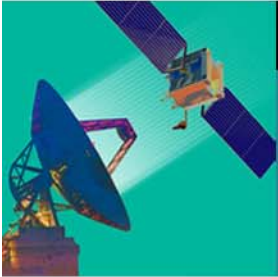
The Aerospace Corporation



Session Goals

- Cloud computing offers the potential for significant economies of scale, improved utilization of servers, more flexible allocation of resources, and workload management
 - Cloud computing entails the dynamic provisioning of processing, storage, and networks in a data center to essentially become a generic hosting environment, prompting the concept of "Data Center Migration" for ground system operators
- How do we apply cloud computing in support of satellite ground systems?
 - Serious challenges concerning security, performance management, portability, interoperability, costing models, lack of standards, etc.
- How do we integrate geospatial standards and tooling with dynamically provisioned resources?
 - Geospatially referenced data are central to many ground systems

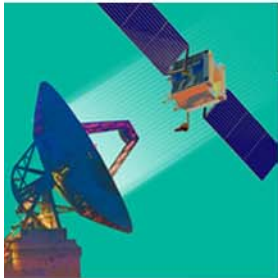
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Presenters/Panelists

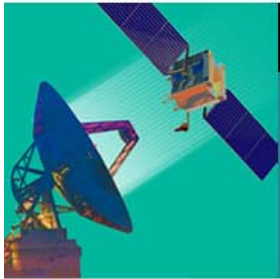
- Cloud Computing in Ground Segments: Earth Observation Processing Campaigns
 - Fabrice Brito, Terradue, s.r.l.
- Geoprocessing in the Cloud
 - Brian Levy, Open Solutions Group & DIA
- OGC Standards to Enable SensorWebs for Disaster Management
 - Dan Mandl, NASA Goddard & Open Geospatial Consortium
- Eucalyptus-based Event Correlation
 - Nehal Desai, The Aerospace Corporation
- Developing Cloud Standards
 - Craig Lee, Open Grid Forum & The Aerospace Corporation
- Open Floor Discussion

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Key Points

- **Enormous Interest in Clouds -- inside and outside of Gov**
 - Government organizations mentioned during workshop: NASA Ames, JPL, 12 Federal Reserve Banks, US Postal Service, DIA, DARPA, NSF, Missile Defense, DISA, Army, AF JSPOC, NRO, NSA, Consolidated Data Centers of the DNI
 - Informal GSA survey identified >50 government cloud projects
- **Hot Button Issues:**
 - Security -- Information Assurance
 - Increased functionality increases threat
 - Traceability, auditing, cleansing of systems in a virtualized environment
 - Can we handle DCID 6.3 in a cloud?
 - Performance Management
 - NUMA shared memory at scale
 - Unique IO devices
 - Communication demands



Conclusions

- Cloud Computing offers tremendous economies of scale and flexibility
 - Data Center Migration concept
 - ... but Cloud Computing is not for every application or mission
- Private clouds are much more attractive for initial adoption
 - Many traditional security methods can be applied
 - Policy can be decided by the cloud owners
- Possible Testbeds
 - ADF-X -- converged utility computing infrastructure
 - NASA Ames Nebula
 - Open Cloud Consortium testbed
- Possible Demonstrations
 - Data Reprocessing Campaigns
 - NASA sensor web projects for disaster mitigation/response