CERES Science Team Meeting

Atmospheric Science Data Center
May 15, 2018
CERES Data Orders
(June 2010 – April 2018)

Total Orders: 63,157
CERES Data Distribution
(June 2010 – April 2018)

Total data distributed
• 779.6 TB
• 3,669,698 data months
• 9,301 users
Number of Users by Product
(June 2010 – April 2018)

- **BDS**: 107
- **ES8**: 160
- **FLASH_SSF**: 120
- **FLASH_TISA**: 118
- **MISR-MODIS**: 30
- **NEWS**: 340
- **SSFlevel2**: 1690
- **CldTypHist**: 360
- **ES4**: 201
- **ES9**: 81
- **SFC**: 93
- **SSF1deg**: 1246
- **SYN1deg**: 2951
- **EBAF-Surface**: 2401
- **EBAF-TOA**: 3685
- **ESG**: 496

Total: 14,079
Users by Country
(June 2010 – April 2018)
## ASDC Staffing
### 2017

<table>
<thead>
<tr>
<th>Category</th>
<th>Terra/Aqua</th>
<th>SNPP</th>
</tr>
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<tr>
<td>Infrastructure</td>
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<tr>
<td>Mission Support</td>
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<tr>
<td>Administration</td>
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<td>0.01</td>
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<td><strong>Total</strong></td>
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<td><strong>3.44</strong></td>
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<td><strong>Total</strong></td>
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<td><strong>2.1</strong></td>
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ASDC Cloud Vision & Strategy

- **Vision**: Serve as a full-service cloud broker for NASA LaRC Science Directorate (SD), LaRC Distributed Active Archive Center (DAAC), and LaRC Science Investigator-Led Processing Systems (SIPS)

**What is the ASDC Cloud?**

- Highly configurable, on-premise private cloud environment
- *Future* Integrated broker to access public cloud service providers
- Deliberate strategy for long-term data center optimization and customer service
- Forward-thinking approach with cloud operating model for holistic cloud management
- Full-service catalog of support, onboarding, and professional services to ensure differentiated offerings for customers with a wide range of requirements
ASDC Cloud Service Benefits (1 of 2)

IT Efficiencies

- Long-term ASDC data center optimization
- Increased uniformity regarding development, operations, and management of resources
- Quickly provision processing, storage, and networking resources
- Rapidly deploy application stack without burden of managing the underlying infrastructure

Potential for Enhanced Performance (with proper optimization)

- Operational agility and scalability for increased efficiency
- Potential for superior performance for latency-sensitive and data processing applications (with the proper optimization)
- Elasticity to automatically adjust compute resources during times of high demand
- Enhanced fault-tolerance and resiliency of individual components
ASDC Cloud Service Benefits (2 of 2)

Increased Security and Control Over Local Data
- Access over private networks and control over infrastructure
- Applications inherit security already in place for the platform
- Data sets remain local for continued control
- Co-location of data with processing resources minimizes the cost risk for certain applications
- Centralized management of enterprise compute resources

Knowledgeable & Dedicated Mission Partner
- Full-service cloud broker offering professional services by experienced cloud engineers
- Staff knowledgeable about NASA and Science Community missions and challenges
- Dedicated to your success
- Enable ability to take advantage of benefits offered by both private and public cloud services
What is OpenShift

• Open Source PaaS
  • RH enterprise

• Kubernetes + Docker + DevOps tools
  • Containers
  • Container Orchestration
  • Automated build tools, CI/CD tools
  • Self-service
DMZ-C Infrastructure Services

- Database Support
  - mysql 5.7, postgresql 9.6
- Monitoring & Log Collation
  - nagios, splunk
- Storage
  - EMC Isilon, GPFS, Gluster
- Backups
  - Bacula & HPSS
- Orchestration
  - RedHat CloudForms, Ansible
Cloud Infrastructure Update

- Internal OpenShift PaaS (dev/test/internal prod)
  - In production
- DMZ OpenShift PaaS (external prod)
  - In production
- DMZ Ceph Object Store
  - In burn-in phase
- DMZ OpenStack IaaS
  - In burn-in phase
Future Iterations

• Additional Infrastructure Node
• Automated CI/CD Pipelines
• Training / Plenaries
• Capacity monitoring & planning
• Scale-out clusters utilizing IaaS
Process & Governance

- Based on updates to the environment, updated the following to accurately reflect our current PaaS solution offering

- ASDC Cloud Service Documentation:
  - ASDC Cloud Service Catalog & Quick Reference
  - ASDC Cloud Service Agreement Template (for external)
  - ASDC Cloud Service Pipeline (new)

- ASDC Cloud Onboarding Framework:
  - Cloud Onboarding Request Process (Int & Ext) for a consistent user experience
  - ASDC Cloud Service Desk (onboarding and support requests)
  - ASDC Cloud Knowledge Base
  - ASDC Cloud 101 / Getting Started Guide (starting point)

- Clarity, Consistency, User Empowerment, Customer Satisfaction, Reduction of Burden on Limited ASDC Resources