Cloud Computing: A Perspective

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Computing Services
Defense Information Systems Agency: Vision & Mission

**Vision**

Leaders enabling information dominance in defense of our Nation

**Mission**

DISA, a Combat Support Agency, engineers and provides C2 capabilities and enterprise infrastructure to continuously operate and defend a global net-centric enterprise in direct support to joint warfighters, National level leaders, and other mission and coalition partners across the full spectrum of operations

- Network Services
- Program Executive Offices
- Computing Services
Defense Enterprise Computing Centers (DECC)

- 4,000,000+ users
- 2,900+ team members
- 14 facilities
- 445,000 sq ft raised floor
- 34 mainframes
- 6,100 servers
- 3,800 terabytes of storage
- 2,800 application / database instances
- 215 software vendors
DISA Cloud Services Portfolio

- Data-as-a-Service
- Software-as-a-Service
- Platform/Infrastructure-as-a-Service

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Software Development

RACE
Compute/Store
GCDS
Content Delivery
Rapid Access Computing Environment (RACE)

1 October 2008

Development/Test
- 24-hour automated provisioning
- Customer root access
- Ability to promote from Dev to Test
- Standard CSD Operating Environments
- Minimized and streamlined accreditation
- Increase capacity ~ 24 hours
- Month-to-month service
- Reduced cost

Today

Production
- User self-service provisioning within the PRODUCTION environment
- Ability to promote from test to production
- Streamlined/Automated accreditation
- Pre-established inherited IA controls

FY10 Initiatives
- SIPRNet deployment
- Complete integrate accreditation automation processes
- Continue to refine RACE Portal
- Interface with Forge.Mil Projects
- Complete integration with DISA standardized configuration management system (BladeLogic)

User Self-Service ~ Highly Standardized ~ Cost Effective ~ Fast
RACE Screenshots
GIG Content Delivery Service (GCDS)

- The Global Information Grid (GIG) Content Management System (GCDS):
  - DoD designated content delivery service
  - Managed by the Defense Information System Agency (DISA's) Computing Services Directorate (CSD).
  - GCDS is a global platform
    - Uses Akamai™ technology, that provides intelligent routing and caching of web-based content.
    - Interfaces with web-based applications and portals.
    - Requires the local system be configured to allow GCDS to handle communications between it and the Defense Information Systems Network (DISN).

<table>
<thead>
<tr>
<th>DISN CLOUD</th>
<th>ARMY</th>
<th>NAVY</th>
<th>AIR FORCE</th>
<th>MARINES</th>
<th>DoD</th>
<th>Pending</th>
<th>TOTAL</th>
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<td>2</td>
<td>8</td>
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<td>0</td>
<td>9</td>
<td>1</td>
<td>23</td>
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<tr>
<td>SIPRNET</td>
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<td>0</td>
<td>1</td>
<td>2</td>
<td>15</td>
<td>7</td>
<td>27</td>
</tr>
<tr>
<td>TOTAL</td>
<td>4</td>
<td>8</td>
<td>4</td>
<td>2</td>
<td>24</td>
<td>24</td>
<td>50</td>
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A collaborative platform to improve DoD’s ability to rapidly deliver dependable software and services in support of net-centric operations and warfare.

Available Now
- Collaborative software development and reuse

Q1 FY10
- On-demand application development tools

Future
- Agile certification process
- Common test and evaluation environment
- Collaborative development of IT standards

Driving Innovation Through Collaboration
Challenges and Barriers

Current
- Balancing Security and Usability
  - User Validation
  - Virtualization; servers, firewalls, networks
  - Access
- Business processes
  - Flexible funding; credit cards, speeding MIPR process
- Cultural inertia
  - Sharing the vision
  - Convincing “Box Huggers”
- Controlling expectations
  - “Why can’t it…..”

Future
- Security optimization
  - “Shared” accreditation
  - Validation of customer applications
  - Integrating Software as a Service
  - Accessing federated and shared services
  - Varying interpretations of security guidelines
- Business streamlining
  - Each Service and Agency has unique processes
  - Funding hurdles – Capital (Procurement) vs. Operating
Lessons Learned

• Recommendations:
  – Understand that it’s a journey
  – Recognize that the infrastructure fundamentals matter
  – Know your “marketplace” – recognize that this is a different marketplace than normal IT operations
  – Clearly define the marketplace offering
  – Adjust the launch to satisfy requirements not timelines ensure
  – Engage with the software developers much earlier in the design

• What critical success factors?:
  – Which portion of cloud computing?
  – How will you define and measure the return on value analysis?
  – How will you define and measure the return on investment analysis?
Backups
Enabling the Cloud Environment

- Infrastructure
  - Standardization
  - Consolidation
  - Capacity Services
  - Virtualization
  - Content Delivery
  - Rapid Provisioning

- Services
  - Software (SaaS)
  - Applications
  - Communications

- Processes
  - Metrics & benchmarking
  - ITIL
  - Service Level Management (SLM)
  - Security (Certification & Accreditation (C&A))

It's A Journey
Consolidations and Savings

Service/Agency consolidation under DMRD 924

1990

• Reduced number of mainframe sites from 194 to 71
• Saved $320M/year

DISA Megacenter consolidation – DMRD 918/BRAC

1993

• Reduced number of mainframe sites from 71 to 16
• Saved $206M/year

DISA “SMART” consolidation under QDR and DRI

1998

• Reduced mainframe sites from 16 to 5
• Saved $203M/year

DISA combat support computing transformation

2005

• Mainframe & Server consolidation
• 4 primary sites w/ remote system mgmt
• Centralized all business functions
• Saved $143M/year

Continuing computing transformation

2005

• Reduced sites from 18 to 13
• Saved $XXXXM/year
Virtualization & Tech Refresh

One Customer Infrastructure

FY08

BEFORE

Annual Sustainment: $25.9 M

- Increased server utilization
- Significant savings
- Faster provisioning

FY09

AFTER

Annual Sustainment: $14.3 M

Virtualized Is Not In Itself A “Cloud”
RACE: Self-Provisioned Hosting

1. Need
2. Log into portal
3. Drop down menu with catalog of services
4. Choice of service
5. Funds transferred (MIPR/gov’t credit card)
6. Services provisioned and customized
7. Software provisioned and customized
8. Warfighter uses services

- Warfighters determine what & how much they use
- Pay for what you use – scale up & down in minutes

Rapid, standard, self-service capabilities
Applications-As-A-Service: Forge.mil (Software Development)

**Systems Development Life Cycle (SDLC)**

- **Analysis**
- **Design**
- **Planning**
- **Implementation**
- **Maintenance**

- The logical process used to develop an information system
- Includes requirements validation, training, and user ownership
- Works like a library – Code checked out, worked on, & checked in

**DoD SDLC**

- First standardized approach to an enormous problem
- Proven development model
- Based on the open source community’s approach

**Forge.mil “Bits & Pieces”**

- **Public:** Freely available to all DoD users
- **Shared:** All DoD users can access the same code development environment for DoD open source and community source software
- **Available:** General availability on March 27, 2009

- **Common evaluation criteria and an agile certification process to accelerate the certification of reusable, net-centric solutions**
- **Limited Operational Availability:** October 2009

- **Private:** Allows a closed development environment for DoD projects and programs
- **Fee-for-service**
- **Availability:** October 2009

**DoD’s Software Development Life Cycle**
Software as a Service (SaaS)

Customer Facing

- User self-service provisioned
- Possible competing offerings
- Vendor partnership

Internal Facing

- DISA role:
  - Capacity services
  - IA
  - Netops
  - Systems administration
- Software planning and acquisition lead time challenges
- Large number of software vendors
- Large mainframe inventory
- Significant licensing complexity

Common Characteristics and Benefits

- Software managed on “usage” basis
- Negotiated prices established
- Future versions/releases included
- Maintenance and patches provided
- Ability to rapidly grow/change/reduce baseline
- Technology infused on timely basis
- No out-year capital projections required
- Partnership with vendor(s)
**A Simple Idea**

<table>
<thead>
<tr>
<th>User:</th>
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<tbody>
<tr>
<td>Builds a web application,</td>
</tr>
<tr>
<td>Using a standard platform</td>
</tr>
<tr>
<td>Using a standard database</td>
</tr>
<tr>
<td>Upload this application to a cloud provider</td>
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<tr>
<td>Only pays for what s/he uses when s/he needs it.</td>
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Cloud provider automatically
- Provisions the services
- Scales the application and the database together

**Clear Tenets**

<table>
<thead>
<tr>
<th>Application Flexibility</th>
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<tbody>
<tr>
<td>Standardized</td>
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<tr>
<td>Increasing “click to run” services</td>
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<tr>
<td>Live in remote Internet data centers</td>
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<td>Scalable to millions</td>
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<table>
<thead>
<tr>
<th>Procurement</th>
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<tbody>
<tr>
<td>Efficient</td>
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<tr>
<td>Rapid</td>
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<tr>
<td>Commoditized</td>
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<tr>
<td>“Pay by the sip”</td>
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<table>
<thead>
<tr>
<th>Security</th>
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<tbody>
<tr>
<td>Simplified</td>
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<tr>
<td>Streamlined</td>
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**Multi-faceted Enablement**

<table>
<thead>
<tr>
<th>Infrastructure</th>
<th>Software</th>
<th>Processes</th>
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<tbody>
<tr>
<td>Consolidation</td>
<td>Network-centric Services</td>
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<tr>
<td>Global Information Grid</td>
<td>Saas</td>
<td>Security (C&amp;A)</td>
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<td>Capacity Services</td>
<td>Forge.mil</td>
<td>Computing Service Provider (CSP)</td>
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<tr>
<td>Virtualization</td>
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<tr>
<td>Rapid Provisioning</td>
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<tr>
<td>Facility Analysis</td>
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Capacity Services: Processing & Storage

**Concept**
- Acquire capacity as a service provided by vendor partners
- Pay much like a homeowner pays for utilities, e.g., by CPU-hours or megabytes consumed

**Processor Orders to date**
- 439 total orders completed, with a $31.5M annualized value
- Average delivery timeline of 11 days
  - 14 days for mainframe; 10 for server
  - 113 orders took less than 5 days
  - 208 orders took between 5 – 14 days

**Storage Orders to date**
- 157 Total Orders Completed
- $9.6M Annualized Value
- Average delivery timeline of 14 Days
  - 7 Days for Disk
  - 11 Days for Network Ports
  - 24 Days for Tape Slot Capacity

Speed, Agility, Utility Pricing, Reduced Overhead & Technology Currency