DoD Cloud Computing
Security Challenges

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This Briefing is Unclassified
Improved Situational Awareness Enables Small Agile Force

Growth of the Information Environment

99 Mb/s  3.6 Gb/s

36x Bandwidth

1/4th Number of Troops

500,000 Troops 1991

123,000 Troops 2003-2004

Source: Defense Systems “filling the SATCOM Gap” May 2008

Right Information, at the Right Time, at the Right Place, and Displayed in the Right Format
DoD’s Use of the Cloud

• Potential Cloud Applications (lots of them!)
  – Cyber Network Defense
    • Sensor data storage, analysis, situational awareness
  – Battlespace Awareness -- Common Operating Picture
    • Status of troops, missions, vehicles, weapons, supplies
      – In the future – autonomous (unmanned) weapons systems
    • Storage/processing of tactical Intelligence, Surveillance, Reconnaissance (ISR) feeds
    • Creating a tailored picture based on a user’s access privileges
  – Simulation and Visualization
    • Mission planning and training
  – Plus all the emerging “corporate/business” applications
DoD’s Use of the Cloud

- Potential Implementation Models
  - Use of commercially provided cloud services
  - DoD deployment within DoD networks (build our own)
    - “Monolithic” cloud (serves a single purpose), statically provisioned
  - Dynamically provisioned across DoD clouds
    - Multi-agency “Federated” processing and storage
    - DoD/Commercial “Mashup”
- From a security perspective, above the line is hard – below the line is really hard!
DoD’s Use of the Cloud

• Early Adopters
  – trooptube.tv
    • “YouTube” for troops and their families
  – Rapid Access Computing Environment
    • Computing Capacity on Demand
    • Virtual Machine based
  – Many more in the works
“Gartner Group” security risks certainly apply to DoD
- Protection of sensitive data, regulatory compliance, data location, data segregation, recovery, etc…

Other things to consider
- Security standards for cloud computing (SAML, WS* equivalent)
- Secure provisioning of applications into the cloud
  - Ensuring integrity of applications
  - Controlling/restricting what applications can run in which cloud instances
  - Binding specific platforms/virtual machines to applications
  - Ability to control how many resources an application can consume
- Protecting the cloud computing platforms from cyber attack
- Ability for cloud to attest to its security configuration/properties
Unique DoD Challenges

- Processing information at multiple classification levels and under multiple authorities (e.g. DoD, DHS)
  - Sanitization/purging of local storage
  - Data labeling
  - Privilege-based access control to data stored in the cloud
  - Tailoring “common operating picture” presented to a user based on their privileges

- Certification and Accreditation
  - Approves system Hardware/Software configuration
  - Extremely difficult in dynamically provisioned environment
    - Must trust system to enforce a security policy and accredit the policy