DEFENSE INFORMATION SYSTEMS AGENCY
The IT Combat Support Agency

Migrating Applications to the Cloud

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Cloud Migration Steps

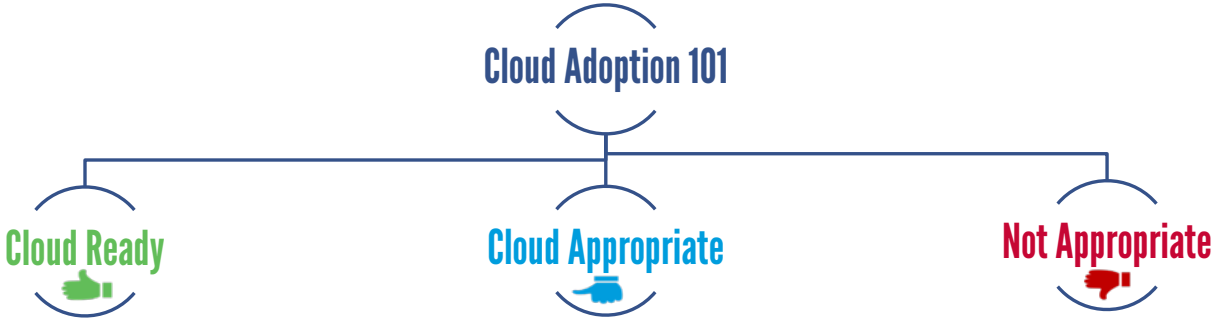
- **Survey Existing Applications**
- **Application Rationalization**
- **Decisions/Funding**
- **Migration Activities**
- **Lesson's Learned**

Rinse, Repeat!

Impact Levels

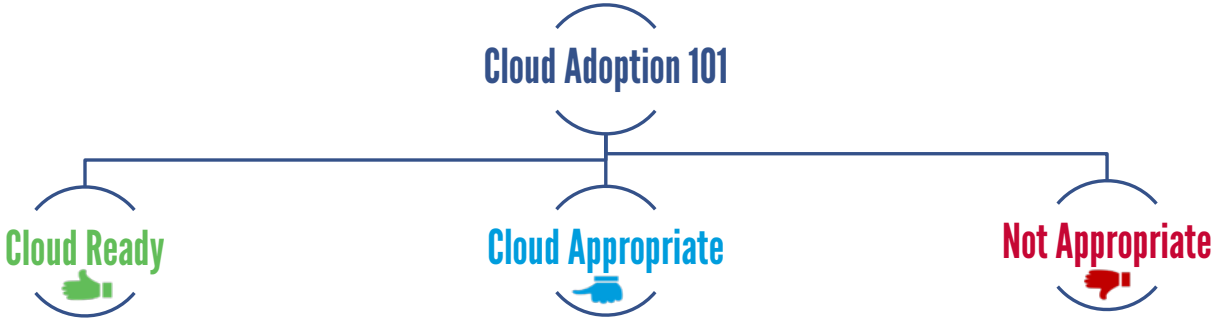
- **Impact Level 2 (IL2) – Unclassified Data (public data) – requires shared or dedicated infrastructure**
- **Impact Level 4 (IL4) – Unclassified Sensitive Data (FOU, CUI, etc) – required shared or dedicated infrastructure with strong evidence of virtual separation controls and monitoring**
- **Impact Level 5 (IL5) – Unclassified Sensitive Data (NSS, PIAA, HIPA) – required dedicated infrastructure**
- **Impact Level 6 (IL6) – Classified Data (Secret, etc) – required dedicated infrastructure approved for classified information**

Application Categorization



	Cloud Ready	Cloud Appropriate	Not Appropriate
Financial	• Application architecture supports cloud adoption without requiring costly changes. • Mission area will break even in costs. • Cloud pricing models can address current application delivery and availability.	• A small investment is needed to update applications. • The application scales and can take advantage of the cloud maintenance model.	• Application would have to be completely re-engineered to make it cloud ready. • The costs to modernize the application are too significant to be beneficial.
Security	• The application's security/impact level is supported by cloud technology. • The application has baked in security or a strong plan to acquire required cloud security.	• Application meets most cloud security standards. • Application can leverage provided cloud security.	• Application does not meet DoD security policy or security standards for on or off premise cloud environments. • Application does not securely operate in the cloud.

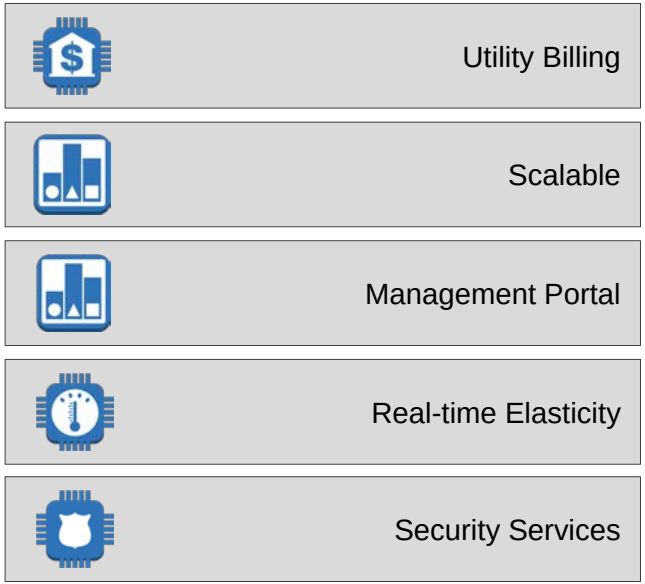
Application Categorization (Cont.)



	Cloud Ready	Cloud Appropriate	Not Appropriate
Operations	• Modernized backup and recovery standards and processes. • Software-based resiliency model. • Application management is not host-based. • Application functions can be sustained in the cloud successfully.	• Evolving application architecture that will address rapid infrastructure changes and failovers.	• Application has too many dependencies on other systems and/or interfaces. • Complicated hardware. • Application is hardware dependent for failovers and redundancy.
Contracting	• There are vendors with cloud capabilities that meet mission requirements. • There is a contracting vehicle that support capability acquisition.	• Application Requirements are clearly identified.	• No contract available to move the application to the cloud. • Undefined application requirements.

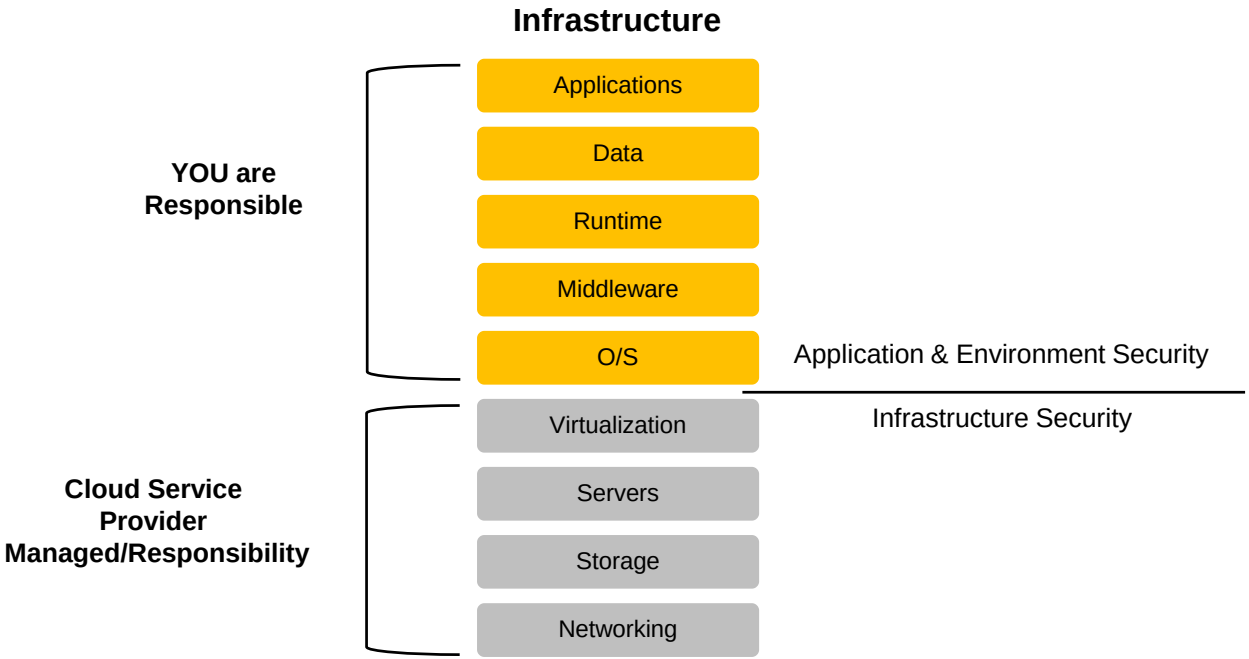
What is cloud?

- **In reality, cloud is:**



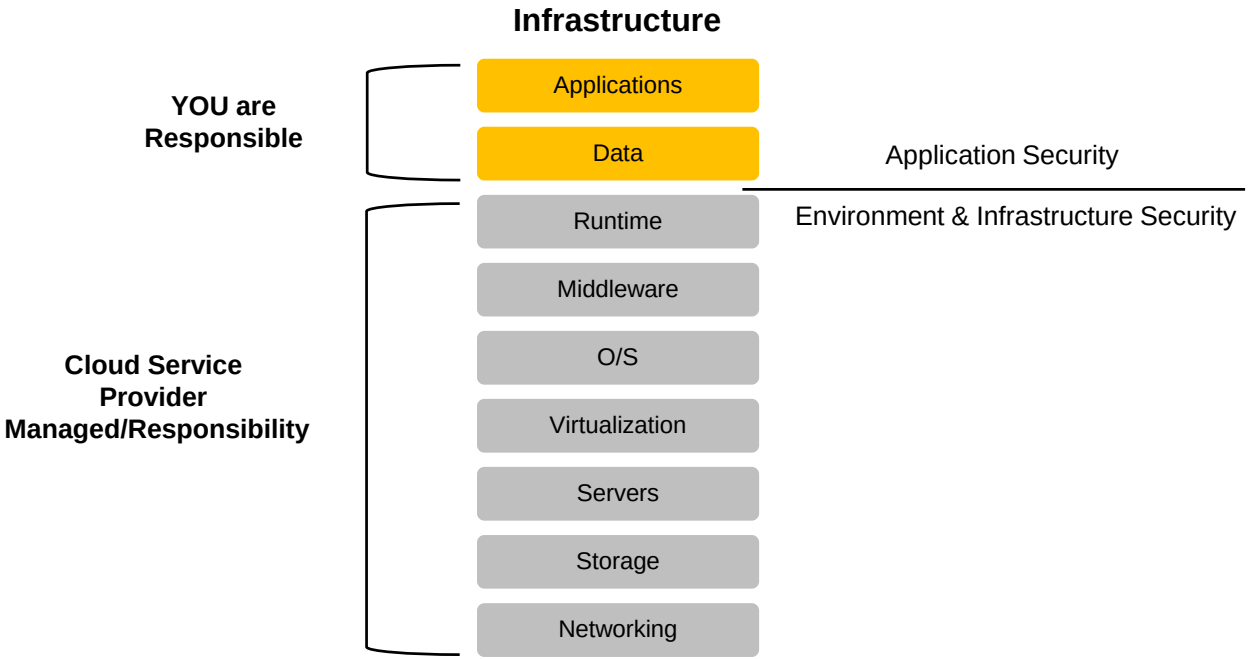
Cloud Models

Infrastructure as a Service (IaaS)



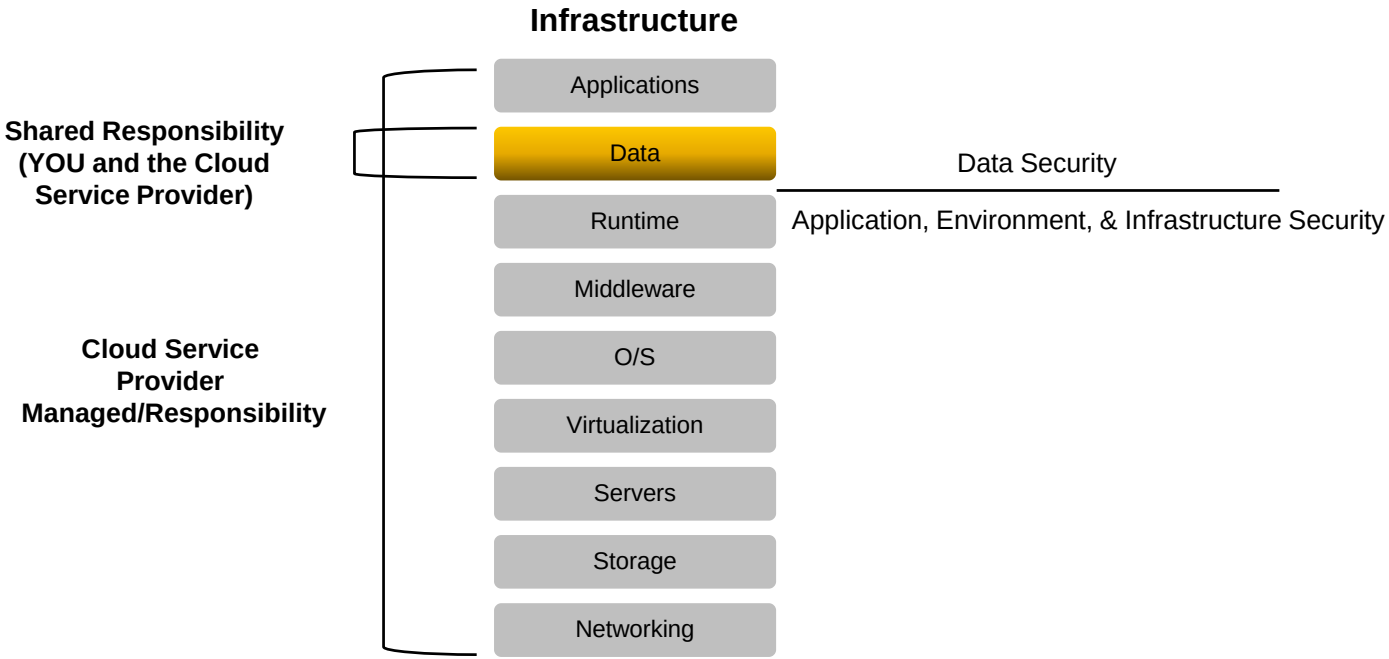
Cloud Models (Cont.)

Platform as a Service (PaaS)



Cloud Models (Cont.)

Software as a Service (SaaS)



Lessons Learned

Technical Challenges

- **Applications not cloud ready - some may never be ready due to cost to modernize**
  - **Not all app owners have access to skills and resources to modernize apps for the cloud – milCloud 2.0**
- **Commercial cloud business model not always aligned to DoD heavy transactional data I/O requirements... easier for isolated applications or minimal I/O to legacy systems. (High I/O drives cost)**
  - **DoD working to provide direct network connection to small number of commercial cloud providers to offset this cost and eliminate data "meters"**
- **Applications Existing DoD Security Solutions are not cloud aware**
  - **Secure Cloud Computing Architecture (SCCA) deployed January 2018 to provide basic security services in a shared cloud environment**

Lessons Learned (Cont.)

Business Management Roadblocks

- **Business decisions challenging**
  - **Lack of a single place for application owners across DoD to find all available Cloud solutions and understand which one to choose (features, price, etc.)**
  - **App owners don't understand new paradigm and responsibilities with commercial IaaS missing key cost in analysis (i.e. system administration, application of security, etc.)**
  - **Current hosting costs don't show subsidized component costs (electric, HVAC, building space, etc.) making apples to apples comparison difficult**

- **Funding not available for application owners to modify apps to be cloud-ready**
  - **Application rationalization data should help to decide which apps get funding for modernization**

- **Policies for specific types of data (NC3, OCO) protect where data can be processed and/or stored for mission assurance**
  - **App owners don’t always understand how to translate requirements to commercial facilities (search and seizure of commercial property, data sovereignty, etc.)**

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