ISC Cloud First Program

Lunchtime Learning - Architecture, Infrastructure, & Migration Team

OCTOBER 13, 2016
Cloud First Lunchtime Learning

Topics:
• What have we done so far
• AWS Infrastructure overview
• AWS App Design Infrastructure
• Application Infrastructure Deploy live demo
• Application DB update
• Lift and Shift VCloud Air Demo
• Q&A
What have we evaluated/tested?

IAM
  AWS AD connector, KITE to the cloud, Shibboleth for AWS UI
  IAM roles: users, db, ec2, ecs tasks

Infrastructure applications
  Backups
  monitoring, alerting – Cloudwatch/BPPM

Security
  IAM roles, policies, groups

Cloud management software/ Automation tools
  Rightscale, Scalr, Vcloud Air, Redhat Cloudforms, etc.
  Puppet
  Jenkins

Applications
  Mule web application/SQS
  ECS/Docker

DB
  Oracle, Mongo, Aurora, PostgreSQL

Network
  VPN to VPC, User VPN access
  Application load balancers
AWS infrastructure

UPENN

VPN Tunnel to 128.91.0.0/16
130.91.0.0/16
165.123.0.0/16

Virtual Private Gateway

10.129.0.0/16

Public Subnet 1 – AZ 1a

Public Subnet 2 – AZ 1b

VPC Subnet

VPC Subnet

VPC Subnet

VPC Subnet

Systems Subnet B – AZ 1b

Systems Subnet C – AZ 1c

Systems Subnet D – AZ 1d

US East
ECS Application Deployment

What is ECS? ECS is the AWS container service for Docker. It provides scalable container management for EC2 Docker instances.

What are we going to demo?
• Deploy ECS cluster
  • Configure autoscaling
  • Deploy an EC2 docker instance
• Deploy application infrastructure.
  • Application load balancer
  • ECR repository
  • Create service
• Create application CNAME in UPenn DNS
• Create application specific database if required
• Create application CI pipeline
Application architecture

UPENN

VPN Tunnel to
128.91.0.0/16
130.91.0.0/16
165.123.0.0/16

Virtual Private Gateway

VPC

Public Subnet 1 – AZ 1a

Elastic Load Balancing

Public Subnet 2 – AZ 1b

Elastic Load Balancing

Amazon CloudWatch

EC2 Instance

Systems Subnet C – AZ 1c

Systems Subnet D – Amazon RDS Database Instance

EC2 Instance

VPC Subnet

VPC Subnet

VPC Subnet

VPC Subnet

EC2 Instance

VPC Subnet

EC2 Instance

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VPC Subnet

EC2 Instance
Databases Tested So Far

• EC2 instance:
  MongoDB standalone instance
  MongoDB with Replication on multi availability zones

• RDS:
  • Aurora
  • PostgreSQL
    • standalone instance
    • High availability multiAZ instance

• Oracle database on prem for data at rest.
MongoDB:

Classified as a NoSQL database, MongoDB avoids the traditional table-based relational database structure. Its is an open-source document database that provides high performance, high availability, and automatic scaling.

Aurora on RDS:

Amazon Aurora is a MySQL-compatible relational database engine that combines the speed and availability of high-end commercial databases with the simplicity and cost-effectiveness of open source databases.

PostgreSQL on RDS:

Classified as an object-relational database (ORDBMS) – i.e. a RDBMS, with additional (optional use) "object" features – with an emphasis on extensibility and standards-compliance.
System Lift and shift

Current evaluations
• AWS migration tools
• vCloud Air
  • Layer2 network extensions