WebLIMS and the Cloud

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Outline

• Background on LIMS Environment at DuPont
• Drivers
• Implementation Strategy
• Testing
• Load Balancing
Background

- Central Research & Development
- Corporate Center for Analytical Science
- Currently using Beckman-Coulter iLIMS
- New Labware Implementation
- 1500 External Customers [DuPont] Globally
- 125 Analysts
- Varying Number of Concurrent Users
- Problem/Project Orientation
Background

- Avoid installing clients on desktops
- WebLIMS for analysts
- Web interface [SIMPLICA] for external customers
- Avoid Citrix environment(s)
- -> Varying system load
- Ideal for a secure cloud [Platform ISF].
Drivers

- Varying demand
- Leveraging existing hardware
- Existing LabWare functionality [WebLIMS & Cluster Manager]
Implementation Strategy

• **4 standalone servers outside the cloud**
  o 2 Application servers [Microsoft Server 2008R2 – 64 bit]
  o WebServer [Tomcat – Linux]
  o Database server - Oracle

• **Complete system image**
  o LabWare Environment
    ▪ Directories
    ▪ Client
    ▪ Modules
  o ODBC connection - Oracle
Implementation Strategy

- Scripts to start up and stop application servers using Cluster Manager (CM)
  - Static set of subnet of IP addresses and names
  - Minimum instances cannot be met
    - Create_MAC_routine fires
  - VM starts
  - VM to join the domain script
  - CM starts services
  - CM manages users
  - Idle VM’s
    - Remove_MAC_routine fires
Cluster Manager

Two cloud instances running both with available services and instances

- **Simplica Service** (4 out of 5 instances available)
- **Full Web Client** (4 out of 5 instances available)

- **Simplica Service** (4 out of 5 instances available)
- **Full Web Client** (4 out of 5 instances available)
Cluster Manager

Original two cloud instances have cannot meet their minimum available requirements.
A subroutine is fired through cluster manager that will begin the process to start a new cloud instance.

- Simplica Service
  (0 out of 5 instances available)

- Simplica Service
  (1 out of 5 instances available)

- Simplica Service
  Starting up
  (5 out of 5 instances available)

- Full Web Client
  (2 out of 5 instances available)

- Full Web Client
  (2 out of 5 instances available)

- Full Web Client
  Starting up
  (5 out of 5 instances available)
Testing

- Image loads?
- Image functions?
- Manually load image
- CM automatically loads image
- Manually shutdown/idle a specific VM
- CM instructs cloud to shut down a specific VM
Load Testing

- Balance of external customers to analysts
- Mass of users
- See how the system reacts
Questions?
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