Towards an automated testing environment

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Agenda

- Motivation
- Architecture
- Implementation
- Replication
- Proposal
- Enhancements
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  • Enhancements
Motivation

• Master is invariably unstable
• Unchecked commits
• No provision for developer to test feature branch
• Testing is not yet a community effort
• Not easy to test plug-ins privately
• CloudStack set-up is involved – Management server, hypervisor, network, storage
### Just for laughs

<table>
<thead>
<tr>
<th>Who are we</th>
<th>Cloudstack Community</th>
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<tbody>
<tr>
<td><img src="image1.png" alt="Image" /></td>
<td><img src="image2.png" alt="Image" /></td>
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<tr>
<td>What do we want</td>
<td>Testing and Code Quality</td>
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<tr>
<td><img src="image3.png" alt="Image" /></td>
<td><img src="image4.png" alt="Image" /></td>
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<tr>
<td>How do we want do it</td>
<td>........</td>
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<td><img src="image5.png" alt="Image" /></td>
<td><img src="image6.png" alt="Image" /></td>
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Goals

- Continuously running BVTs
- Enable community testing
- Keep master stable
- Isolate test-runs from each other, and from other infrastructures
- Easy to replicate and set-up
- Provide commits to cherry pick / buggy commits
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Architecture

1. Launch Jenkins job to set up infra
2. Provision MS + Hypervisor(s)
3. Notify Infra Failure
   - If Provisioned: Jenkins job to launch tests
     - If BVT Pass:
       - Collect system + MS logs
       - Provide possible bad commits
     - If BVT Pass:
       - Provide commits to cherry pick
Architecture

Phase 1 : Set-up infrastructure
• Provision management server from scratch
• Provision hypervisor from scratch
• Storage and networking set-up

Phase 2 : Run Marvin tests
• Track bad commits
• Cherry-pick good commits

Need to isolate test-runs

Based on Prasanna’s effort (Big Thanks!!)
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Implementation

- Jenkins for integration
- Glue to hold all together
- Reporting, alerting etc.
- Separate jobs for phases 1 and 2
Implementation
Provisioning management server & hypervisors

• Need a way to deploy an OS
• Need a way to configure the systems
• Need a way to provision storage and networking in an isolated manner
Implementation

Quick overview of technologies involved

- Cobbler
- IPMI tool
- Puppet
- DNSMASQ
- Squid
Cobbler

- Open source OS installation server
- Provides baremetal provisioning via PXE
- Components
  - Distro – the OS to provision
  - Profile – associate kickstart / configuration with OS
  - System – MAC to profile mapping. Additional configs
- Snippets to run post install scripts etc
- Manages TFTP and PXE seamlessly
Others…
Puppet
• Management server configuration
• Hypervisor configuration like KVM agent etc.
IPMI tool
• To bootstrap baremetal provisioning
Squid
• HTTP proxy server (needed for isolated network requirement)
DNSMASQ
• DHCP / DNS management underneath Cobbler
Implementation

- Put all these and related technologies on a single VM
- May contain additional storage (NFS server)
- Seed system VMs
- Python code acting as launcher script
Implementation
Implementation
Minimum Requirements

• XenServer to host VM and management server
• Hosts for hypervisors
• Isolated network
• IPMI network
Implementation

Phase 2

- Run Marvin tests
- Track commits from previous stable build to current build
- If fails, one of the commits broke BVT
- If pass, auto cherry-pick commits to (stable) master
- All code in Python
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Replication

Setting up from scratch requires

- Familiarity with CI tools
- Familiarity with CloudStack specifics
- Lots of time
- Many DHCP / network configs
Replication

Propose to push VM like DevCloud (QACloud?)

Thus, steps become

- Load VM on XenServer
- Provision network using conf provided
- Add IPMI network
- Change MAC addresses for Cobbler (has easy to use interface)
- Add to Jenkins master
- Optionally add NFS volumes
- Optionally change domain name for hosts
Replication
To set-up from scratch

https://cwiki.apache.org/confluence/display/CLOUDSTACK/QA+Infra+from+scratch
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Proposal
To keep master stable

- Maintain a staging branch
- Developer commits go to staging
- If all BVTs pass, push commits
- May need more BVTs
- Reduce BVT running time (Simulator?)
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Enhancements

1. Better integration of VMWare hypervisor
2. Pull latest systemvm templates
3. Make VM size manageable
4. Scheduling mechanism for resource pools
5. Throw open to developers via a service

(Thanks to Bharath for 2,3,4,5)
Only the first step

Let's all keep master stable!!
Let's all test together!!

Big Thanks to AlexH for guiding 😊