

Integration of Citrix XenDesktop and XenApp with CloudStack

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Agenda

- An engineer's introduction to XenDesktop and XenApp
- Why CloudStack?
- Development highlights
- Development challenges

An Engineer's Introduction to XenDesktop and XenApp

Hosting Infrastructure (Virtual Machines)

Hypervisors/Storage/Network



Management Infrastructure



Studio



Delivery Controller



Delivery Controller



Database

Storefront/Gateway



Users and Endpoints



XenDesktop vs XenApp

- What's the difference?
- For the purposes of this discussion, there is none
- XenApp was an older project with a different architecture
- XenDesktop introduced a newer architecture known as FMA
- Both products now use the newer architecture
- The only difference is the in the use cases: VDI or applications (single-session or multi-session VMs)
- The two distinct brands are maintained to characterize these use cases



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Why CloudStack?

Why CloudStack?

- Open standards mean choice of hypervisor, storage and network technologies
- Storage tiered into local/shared/secondary layers
- Flexibility to build in premise or use public infrastructure
- Able to use client Windows OS (not available on AWS)
- Expand on demand
- Build at any scale
- Single management console, regardless of scale
- For example...

Scale Test Rig: 1000 Desktops

zone

cluster



cluster



Dev Rig: About 5 Desktops

zone

cluster



Development Highlights

Development Highlights

- Similarity to AWS
- The project resulted in several CloudStack enhancements
- Flushed out useful bugs

Similarity to AWS

- We ran two integration projects in parallel: CloudStack and AWS
- It was helpful that CloudStack followed the AWS model
- Many concepts in common: regions, zones, security groups, templates, service offerings, VPCs, networks
- Similar semantics and APIs
- Service offerings can even be enumerated!
- Allowed for a useful amount of code sharing
- Allowed for similar user experience between the platforms

CloudStack Enhancements

- XenDesktop team had an excellent dialog with CloudStack engineers within Citrix
- This allowed for some more streamlined integration patterns, compared with AWS
- API to reset machines to their base template, or update to a new one *in situ*
- Create machines in stopped state
- Implicit dedication
- 16k user data allowance

Flushed out bugs

- Over 100 bugs reported throughout the project so far
- 63 fixed and closed in the 4.3 and 4.2.1 branches at time of writing
- 11 reported by me!
- A few examples...
- DNS registrations not forwarded by virtual router
- Custom disk offerings created disks of the wrong size
- Data disk IDs changed on cluster migration

Development Challenges

Development Challenges

- Understanding storage performance
- API documentation
- Error reporting
- Hypervisor-specific behaviour

Storage Performance

- XenDesktop/XenApp works with Windows images
- Templates typically 30GB or bigger
- Copying to primary storage is significant overhead
- Many components contribute to this overhead
- Pinpointing bottlenecks is difficult
- Non-obvious linearization constraints in multi-user system
- Some test rigs needed a lot of work to be useable
- Sometimes taking 90mins to start an instance

Documentation

- API coverage is complete
- Behaviour specifications are very brief
- Parameter specifications sometimes unclear
- Page/pagesize parameters not documented for list requests
- Enumerations not always documented
- String length/content constraints not always documented
- Sometimes not clear how HTTP request should be structured
- For example...

Documentation

apachecloudstack™

Apache CloudStack v4.2.0 User API Reference

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createTags

Creates resource tag(s)

Request parameters

Parameter Name	Description	Required
resourceids	list of resources to create the tags for	true
resourcetype	type of the resource	true
tags	Map of tags (key/value pairs)	true
customer	identifies client specific tag. When the value is not null, the tag can't be used by cloudStack code internally	false

Error Reporting

- Distinct problems often covered by single error code (eg. 530)
- Sometimes needed to parse error strings, which was a source of bugs
- Need to consult management logs to debug VM deployment failures

Hypervisor-specific Behaviour

- We encountered cases where the hypervisor abstraction wasn't complete
- Cases that tested successfully on XenServer failed on Vmware
- Disk device position mapping was an example

The logo features a stylized blue cloud icon above the text "cloud" in white and "STACK" in blue. Below this, the words "COLLABORATION" and "CONFERENCE" are stacked in white.

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Thank You

The Linux Foundation logo consists of a small square icon followed by the text "LINUX FOUNDATION".

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