

CloudStack Track@ApacheCon

October 6th 2022

New Orleans

Daan Hoogland
Social media: either DaanHoogland or dahn
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cloudstack



agenda

- Sponsor slides
- History
- Community
- What is ApacheCloudStack
- News.

cloudstack



Sponsor slide



- ShapeBlue Ltd.
- “The CloudStack Company”
- Employee Owned Company
 - looking for extra owners
- mini multinational
 - now and in the past
- Big clients , ...
 - Telcos
 - public cloud providers
 - Enterprises
- Europe
 - Belgium
 - Bulgaria
 - Czechia/2
 - England
 - France/2
 - the Netherlands
 - Serbia
- India
- South America
 - Brasil/2
 - Uruguay



@CloudStack @GilesSirett



* CloudStack history

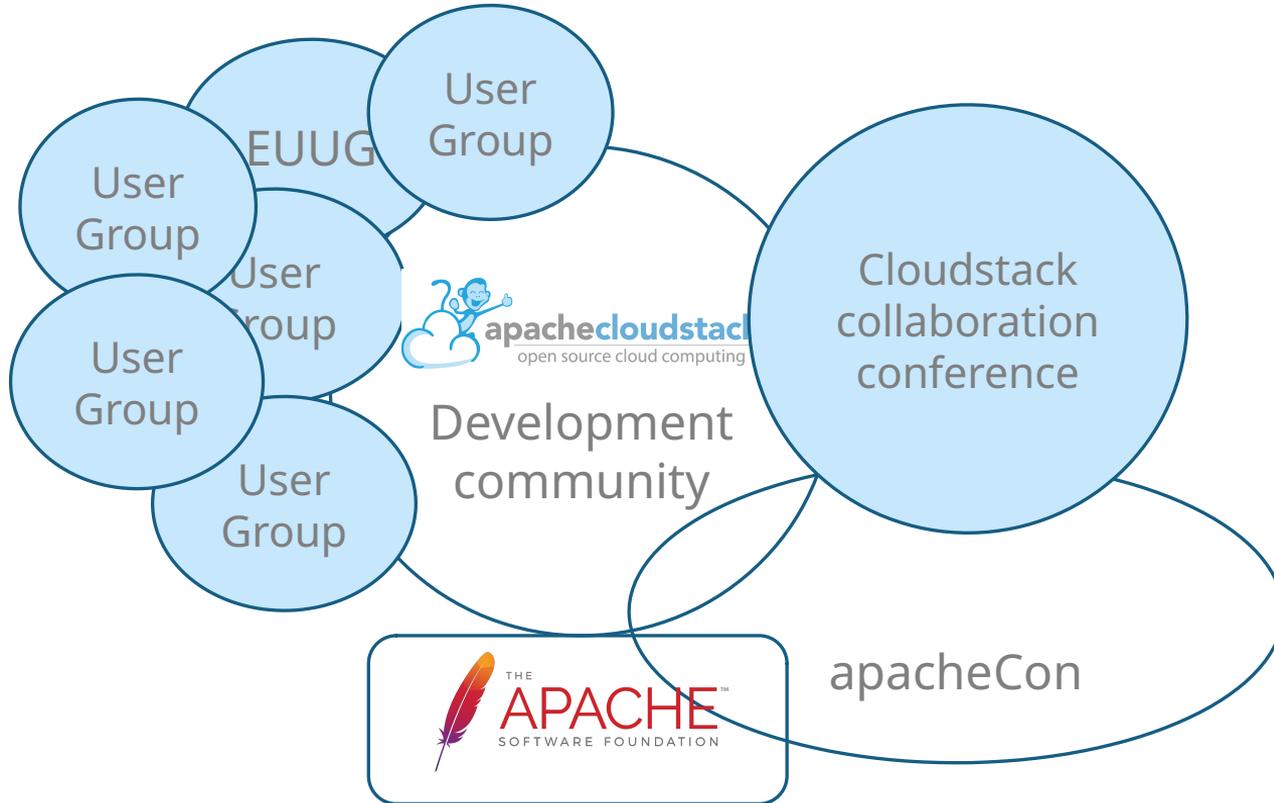
- 2008 – Vmops launches (rebrands Cloud.com)
- April 2010 – Cloud.com Releases CloudStack under GPLv3
- July 2011 - Citrix acquires CloudStack
- April 2012 - CloudStack donated to Apache Software Foundation
- November 2012 – First Apache CloudStack Release
- March 2013 - CloudStack graduates from ASF Incubator
- 2014 – Majority of committers are not from Citrix
- 2016 – Citrix leave the project
- 2014-2022 Lots of releases, adoption continues to grow, feature list as well
-

What is the CloudStack community

- * Collaborative environment for:
 - * All things Apache CloudStack
 - * Related tech: ecosystem products, hypervisors, storage, etc.
- * Online and Meet regularly (twice a year globally and then local chapters)
- * Conferences:
 - * Technical deep-dives, issues & best practice
 - * Case studies & user stories
 - * To showcase complementary technologies
 - * To share ideas & problems with other users

*
 [@CloudStack](https://twitter.com/CloudStack)







- CloudStack European User Group
- CloudStack User Group Germany
- Geneva CloudStack User Group
- CloudStack - Romania
- Australian CloudStack User Group
- CloudStack Brazil User Group
- Vancouver CloudStack Meetup
- Japan CloudStack User Group
- CloudStack India Bangalore Chapter
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*

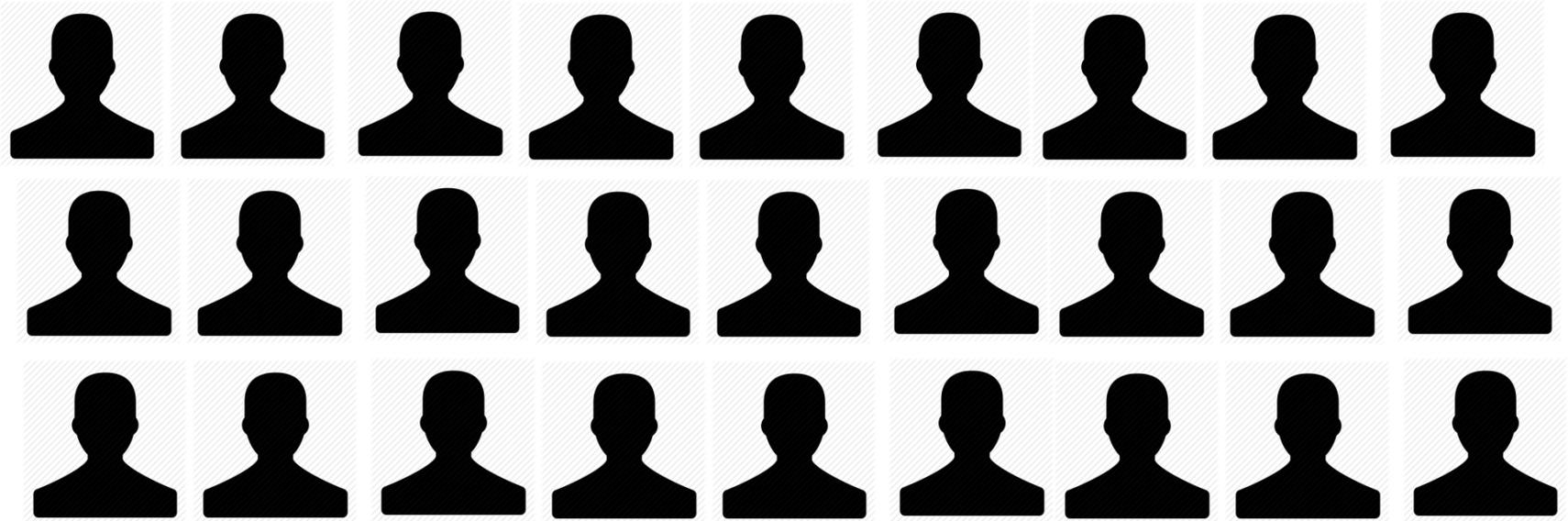
* Cloudstack “known users”



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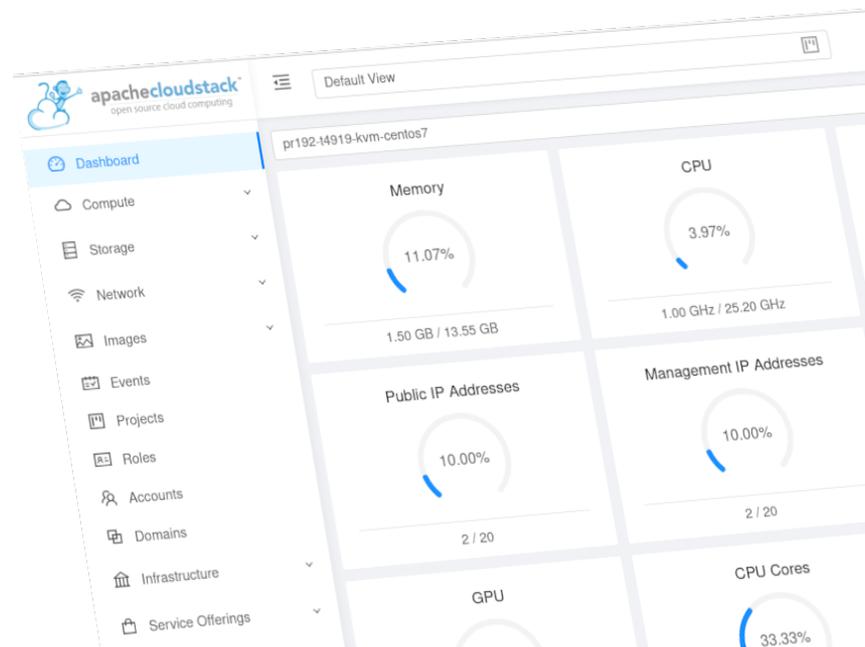


* CloudStack *known* users

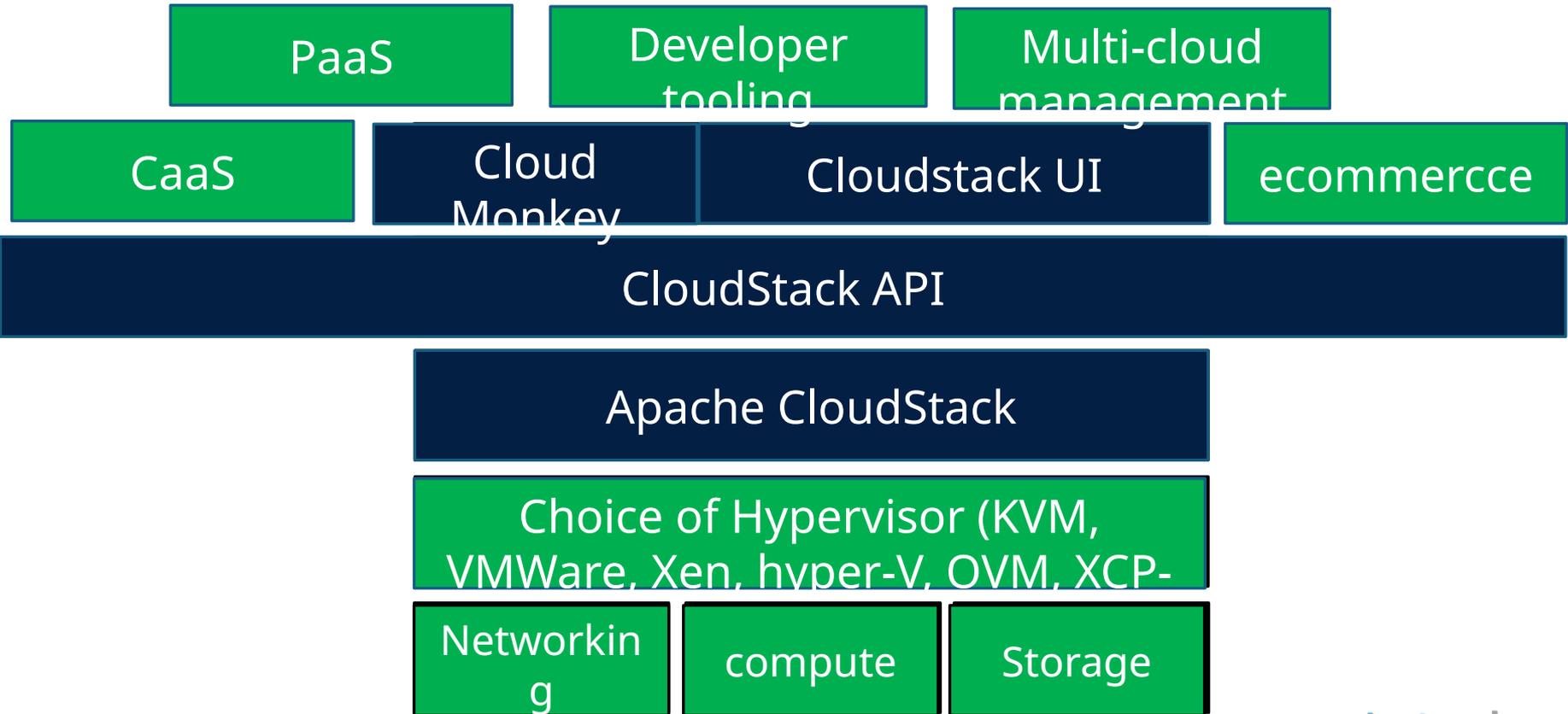


* What is CloudStack? A thingy to do stuff.

* *Apache CloudStack is a scalable, multi-tenant, open-source, purpose-built, cloud orchestration platform for delivering turnkey Infrastructure-as-a-Service clouds*

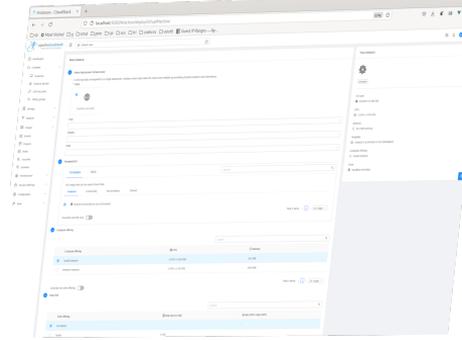


* How to build an IaaS cloud



* Key cloudStack features

- Broad & deep Hypervisor support
 - XenServer, KVM, VMware, OracleVM, Hyper-V, XCP-ng
- Enterprise grade tenant Virtual Networking model
- Scalable architecture
 - Support thousands of hosts and virtual machine guests
 - Largest known production cloud 35k+ physical hosts
- High availability
 - Configurations that provide automatic failover for virtual machines
- Choice of interfaces
 - Web UI, command line, REST-based API



* Simple UI

The screenshot displays the CloudStack Summary page in a browser. The browser address bar shows `localhost:5050/#/infrasummary`. The page features a sidebar on the left with navigation options and a main content area with a grid of resource counts.

Navigation Sidebar:

- Project: Def
- Dash
- Insta
- Cont
- Affini
- Stora
- Netw
- Temp
- Even
- Proje
- Acco
- Infrastructure
 - Summary
 - Zones
 - Pods
 - Clusters
 - Hosts
 - Primary storage
 - Secondary storage
 - System VMs
 - Virtual routers
 - Internal LB
 - Management servers
 - CPU sockets
 - DB/Usage server
 - Alerts
- Service offerings
- Configuration
- Tools

Main Content Area:

Default view

Home / Summary Refresh SSL certificates

Zones 1	Pods 1	Clusters 2	Hosts 4
Primary storage 4	Secondary storage 1	System VMs 2	Virtual routers 0
CPU sockets 0	Management servers 1	Alerts 4	Internal LB 0
DB/Usage server 1			

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CloudStack 4.17.2.0-SNAPSHOT Report issue

* API examples

* Examples of Cloudstack Rest API:

* List VMs for all users:

* <http://localhost:5050/client/api/?listall=true&command=listVirtualMachines>

* List all my templates:

* <http://localhost:5050/client/api/?listall=true&templatefilter=all&command=listTemplates>

* Create new network "bla"

* <http://localhost:5050/client/api/?zoneId=38101e2e-3814-4082-b2be-fa7f80111506&name=bla&displayText=bla&networkOfferingId=cde91081-6e31-44c2-a7f2-fd391c10485c&command=createNetwork>

- * Note: for simplicity, these commands are being run over an unauthenticated port (8096)
- this is not recommended for production use and would usually be disabled

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* Create a new VM attached to net "bla"

* <http://localhost:5050/client/api?command=deployVirtualMachine>

* "zoneid": "38101e2e-3814-4082-b2be-fa7f80111506",

* "templateid": "857b8039-441a-11ed-8b3d-e884a5ebaa69",

* "startvm": "true",

* "serviceofferingid": "f196c74d-5599-42f7-9d43-1034a4d012f6",

* "iptonetworklist[0].networkid": "236e90b1-07d0-4a4f-8e8e-b0127d107d9e",

* "name": "blob",

* "displayname": "blob"

* ^ post

* Cloudmonkey CLI

```
$ cmk list templates templatefilter=all filter=name,id,templatetype
{
  "count": 2,
  "template": [
    {
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      "name": "SystemVM Template (simulator)",
      "templatetype": "SYSTEM"
    },
    {
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      "name": "CentOS 5.6 (64-bit) no GUI (Simulator)",
      "templatetype": "BUILTIN"
    }
  ]
}
~
$
```

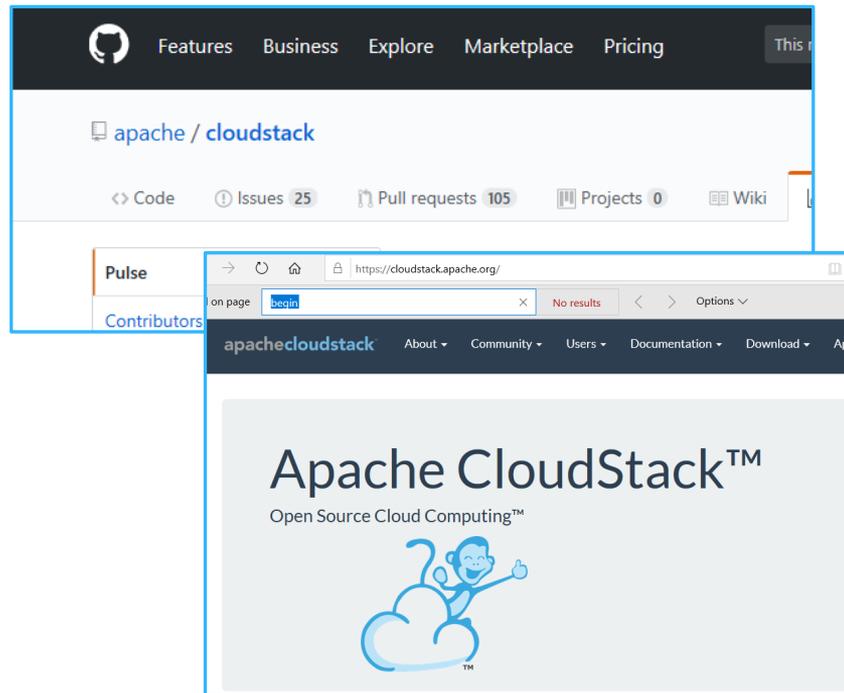
* CloudStack today

- 3-4 releases per year
- Widespread production deployment
 - Public cloud providers
 - Private cloud use-cases
- LTS releases
- Diverse mostly user* driven developer community.....

* users in this case means mostly companies using ACS

* CloudStack today

- Governed by Apache Software Foundation
- Ca. 200 project committers (130 on the cleaned list)
- Diverse PMC
- Last 4 weeks (to 25 February)
 - 300 mailing list msgs (not commit related)
 - 70 mailing list contributors
 - 11 merged pull requests
 - 948 forks
 - ??? downloads
- Lots of meetups & events



CloudStack News

Releases

- * 4.17.1 released (September 2022)
 - * 4.17.x is an LTS branch
 - * c. 200 fixes and enhancements 4.17.0.1 (last sec. release)
- * 4.18.0 Release in process (planned first RC end Oct.)
 - * 4.18 will be an LTS branch
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*CloudStack 4.18 Release - Headline features

- 47 closed PRs
- 34 open Prs
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Shape

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The Cloud Specialists

cloudstack



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- Feature Request: Ability to define IP address beside of choosing VMs in Static NAT,...
- L2 Guest Networks: exclusive VLAN range
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- CloudStack API does not allow to set domain for templates via "createTemplate" nor...
- feat: Kubernetes multiple worker groups
- Improve Guest OS additions and mappings
- User from domain can't deploy VM in dedicated to that domain pod
- TCP load balancer ability to set custom connect/client/server
- Support for new Feature: Clone a Virtual Machine (#4818)
- UI: Keyboard label shortcut
- New feature: Add retry option for VMs in Error state/Option to retry failed VM instan...
- Add volume group handling
- Feat/global vm search
- KVM automatically adds ballooning
- Can't add Netscaler VPX
- Add Support IPAM object to Allow Load Balancer or Port-forward map to floating IP...
- Integrate Tungsten Fabric with CloudStack
- Support to resize uploaded volume during attach
- Allow upload volume with custom size
- Quota custom tariffs
- Advanced Zone with SG: Add L2 networks and shared networks with Account/Project...
- Improve global settings UI to be more intuitive/logical
- Configurable MTU for VR
- UI: Upgrade ant-design-vue to version 3.x
- Guest OS hypervisor mapping improvements
- volume import and export when using swift as secondary storage
- Enable live volume migration between StorPool's primary storages

Already in:

- UserData as first class resource
- Prometheus exporter enhancement
- Volume encryption feature
- Allow option of exposing VM domain info via instance metadata
- Resource reservation framework
- Console access enhancements
- api,server: custom dns for guest network
- VM stats history visualization
- Chinese language pack
- Add usermode interface option to Libvirt Domain XML builder
- Fix spelling
- List service offerings without host tags when filtering VM
- Improved login time
- add global setting to allow parallel execution on vmware
- Reserve memory for host
- HAproxy based load balancer customization
- Faster SystemVM Template Builds
- Make DB upgrade queries idempotent for convenience age:2years_plus



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*CloudStack 4.18 Release - Hoped for Headline features

- Backup and Recovery Framework plugin for Netwoker
- CloudStack Kubernetes API: CAPI
- Volume encryption
- Tungsten fabric integration
- Autoscale VMs
- Userdata as first class citizen
- Oh, and finally.....

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* Cloudstack Backup and Recovery Framework

- Cloudstack Backup and Recovery Framework
 - In since 4.14
 - Modular framework
 - Can exploit any 3rd party backup platform
 - Provider created for Veeam



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* Cloudstack Backup and Recovery Framework

Specifically:

- Support for:
 - Operator created 'policy based' backups (RPOs)
 - Scheduled backups (similar to snapshot scheduling)
 - Ad hoc backups
- Backups as first class citizens
- 'In-place' restoration of entire VM including data disks
- Restoration of VM backup after original VM is destroyed
- Restoration of individual VM volumes (can then be attached to another VM)
- Full integration into the CloudStack API, UI, usage service (recording both protected and on-disk data metrics)

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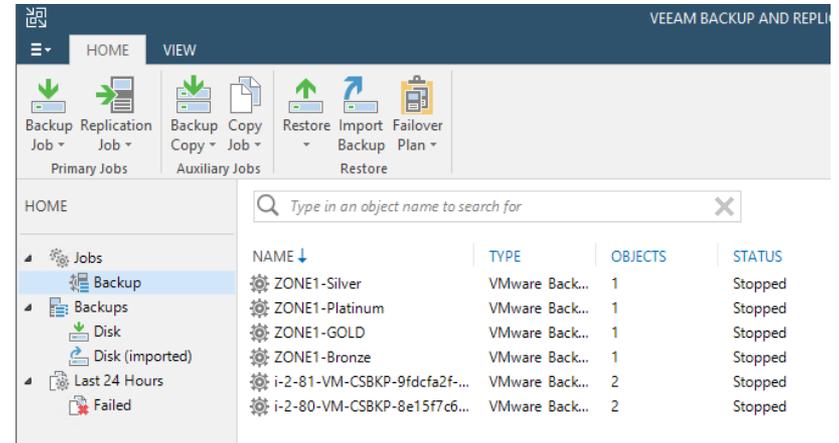
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* Cloudstack Backup and Recovery Framework

‘Policy Based’ Backups

-
- `listBackupPolicies external=true`
Returns ‘template’ jobs.
- `importBackupPolicy` Creates a policy (with a name and description) in CloudStack and maps it to a Veeam template job.
ie.
GOLD – 6hr RPO
SILVER – 24hr RPO
BRONZE – 7 day RPO



The screenshot shows the Veeam Backup and Replication console interface. The top navigation bar includes 'HOME' and 'VIEW'. Below the navigation bar are several action buttons: 'Backup Job', 'Replication Job', 'Backup Copy', 'Copy', 'Restore', 'Import Backup', and 'Failover Plan'. The main content area is divided into a left sidebar and a main table. The sidebar shows a tree view with 'Jobs' expanded to show 'Backup', 'Backups', 'Disk', 'Disk (imported)', and 'Last 24 Hours'. The main table displays a list of backup jobs with columns for NAME, TYPE, OBJECTS, and STATUS.

NAME	TYPE	OBJECTS	STATUS
ZONE1-Silver	VMware Back...	1	Stopped
ZONE1-Platinum	VMware Back...	1	Stopped
ZONE1-GOLD	VMware Back...	1	Stopped
ZONE1-Bronze	VMware Back...	1	Stopped
i-2-81-VM-CSBKP-9fdca2f...	VMware Back...	2	Stopped
i-2-80-VM-CSBKP-8e15f7c6...	VMware Back...	2	Stopped

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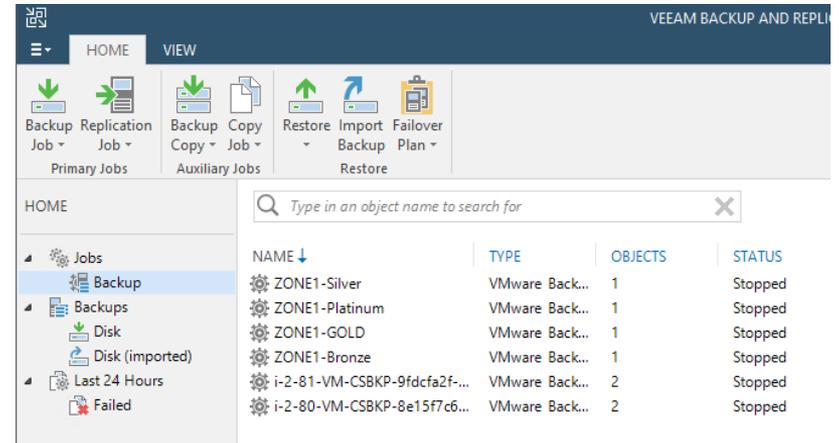
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* Cloudstack Backup and Recovery Framework

'Ad-hoc' & Scheduled Backups

-
- CloudStack will send command to carry out an ad-hoc run of the policy based job or create one as required.
- Ad-hoc and scheduled jobs will be driven by CloudStack
- One VM to one Veeam job mapping allows for simpler accounting and unified incremental backups



The screenshot shows the Veeam Backup and Replication console interface. The top navigation bar includes 'HOME' and 'VIEW'. Below the navigation bar are icons for 'Backup Job', 'Replication Job', 'Backup Copy Job', 'Copy Job', 'Restore', 'Import Backup', and 'Failover Plan'. The main content area is divided into a left sidebar and a main table.

The left sidebar shows a tree view under 'HOME' with the following items: Jobs, Backup, Backups, Disk, Disk (imported), Last 24 Hours, and Failed. The 'Backup' item is selected.

The main table displays a list of backup jobs with the following columns: NAME, TYPE, OBJECTS, and STATUS. The table contains the following data:

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i-2-81-VM-CSBKP-9fdcf2f...	VMware Back...	2	Stopped
i-2-80-VM-CSBKP-8e15f7c6...	VMware Back...	2	Stopped

* CloudStack 4.18 Release – Headline feature

- **CloudStack Kubernetes Service**
 - Allows easy creation of CaaS service on top of Cloudstack
 - A plugin to create and manage Kubernetes cluster
 - CoreOS templates for nodes, kubeadm for cluster provisioning
 - Offline installation of k8s and docker binaries on cluster nodes for selected k8s version via ISO (uploaded by admin)
 - Gracefully scale up or scale down
 - Access kube.config for cluster for accessing k8s dashboard
 - Delete cluster while removing nodes and k8s service

- **CAPI**
- **A CloudStack KAPI**
- **Should work on “old” versions**



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* User data as a first class citizen
* CloudStack 4.18 Release - Headline feature

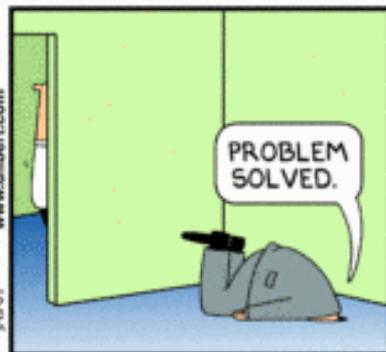
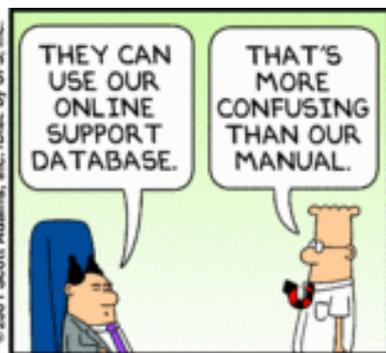
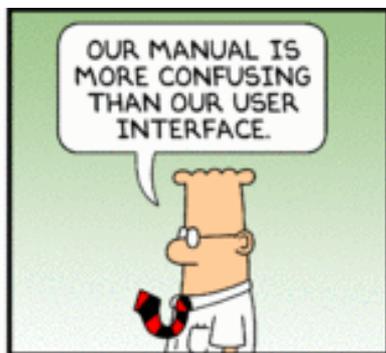
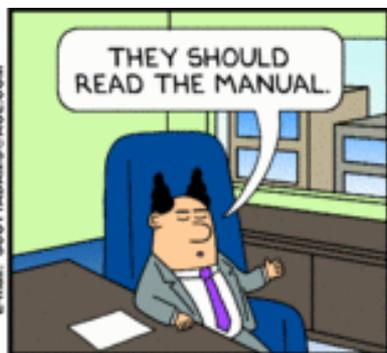
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CloudStack Events

- * Now, here, ongoing
 - * At apachecon
- * CCC
 - * Sofia 14 – 16 November 2022
 - * Registration open – hubilo:
<https://www.cloudstackcollab.org/>
- * CSEUG:
 - * Plan is in february/march 2023, London
 - * Registration usually on Eventbrite

~~CloudStack Collaboration Conference 2020~~

- * New Orleans
- * ~~28 September — 2 October~~
- * More Information
 - * <http://cloudstackcollab.org>
 - * <http://apachecon.org>
- *
- *



Apachecon 2022

CloudStack Collaboration Conference 2022

- * New Orleans (USA)
 - * 3 October – 6 October
 - * More Information
 - * <http://apachecon.org>
- * Sofia (Bulgaria)
 - * hybrid
 - * 14 November – 16 November
 - * More Information
 - * <http://cloudstackcollab.org>



- * If you're new: join the Users@ mailing list
- * Get your organisation to be public about their use of ACS
- * Get on the "known user" list*
- * Offer to do a case study with PMC/ASF
- * Go and talk about it !

- *

- *

*Known user list: <http://cloudstack.apache.org/survey.html>



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Who am I? Not technical ops, don't ask me any detailed techie questions!

agenda

- Sponsor slides
- History
- Community
- What is ApacheCloudStack
- News.



Sponsor slide



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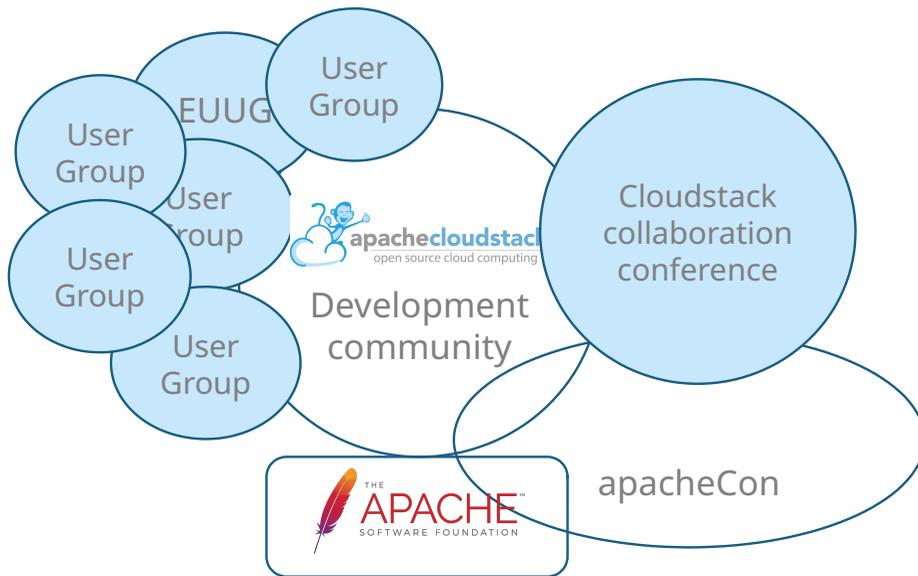
Over the eras different companies have been dominant in the community

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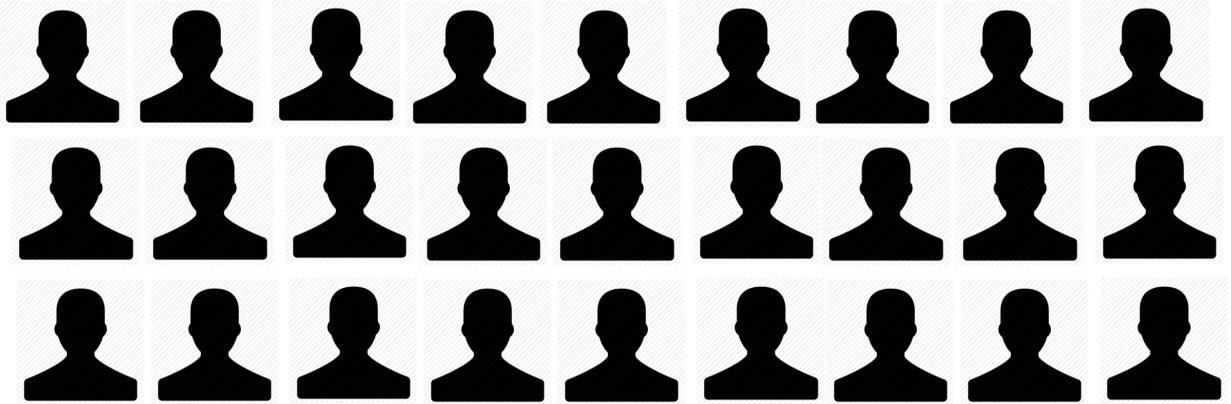
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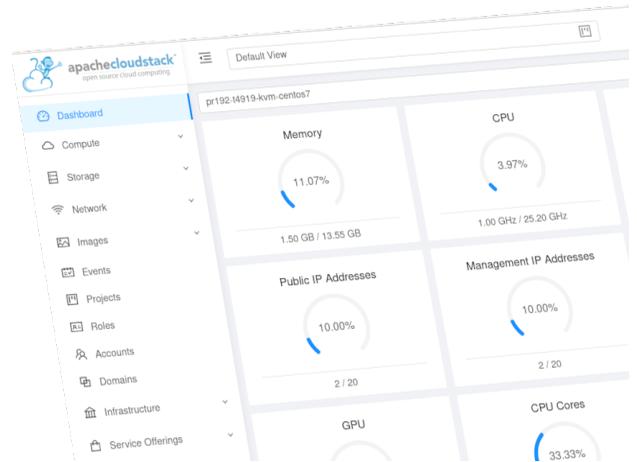


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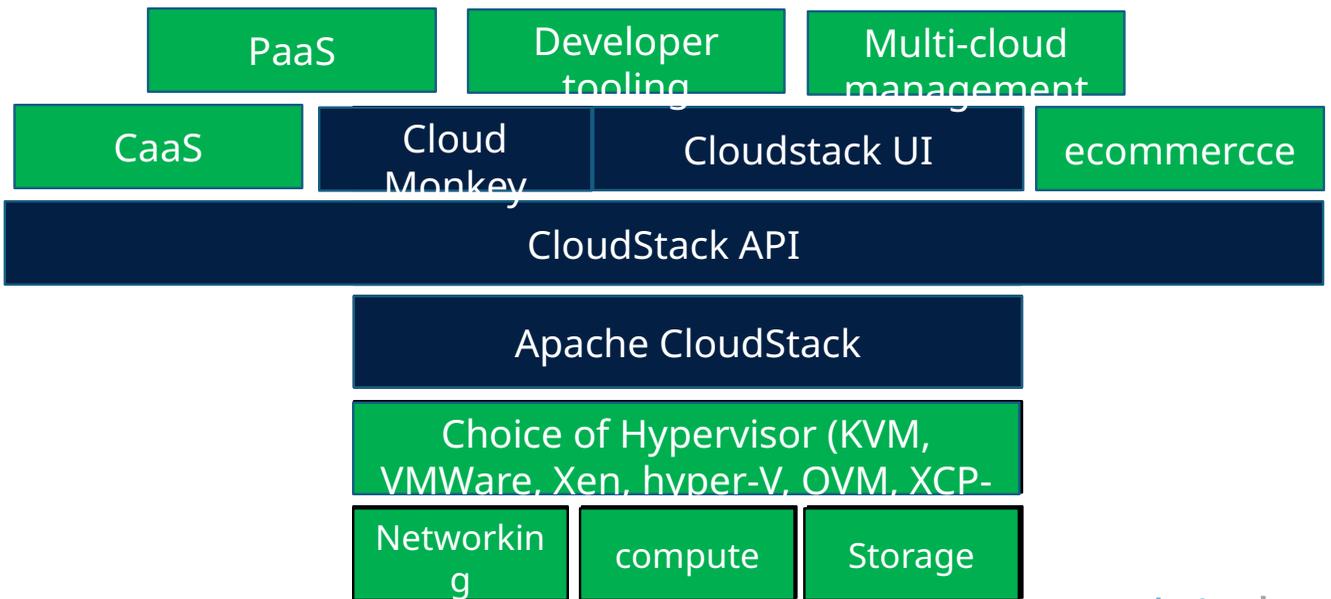
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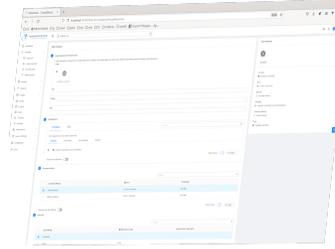


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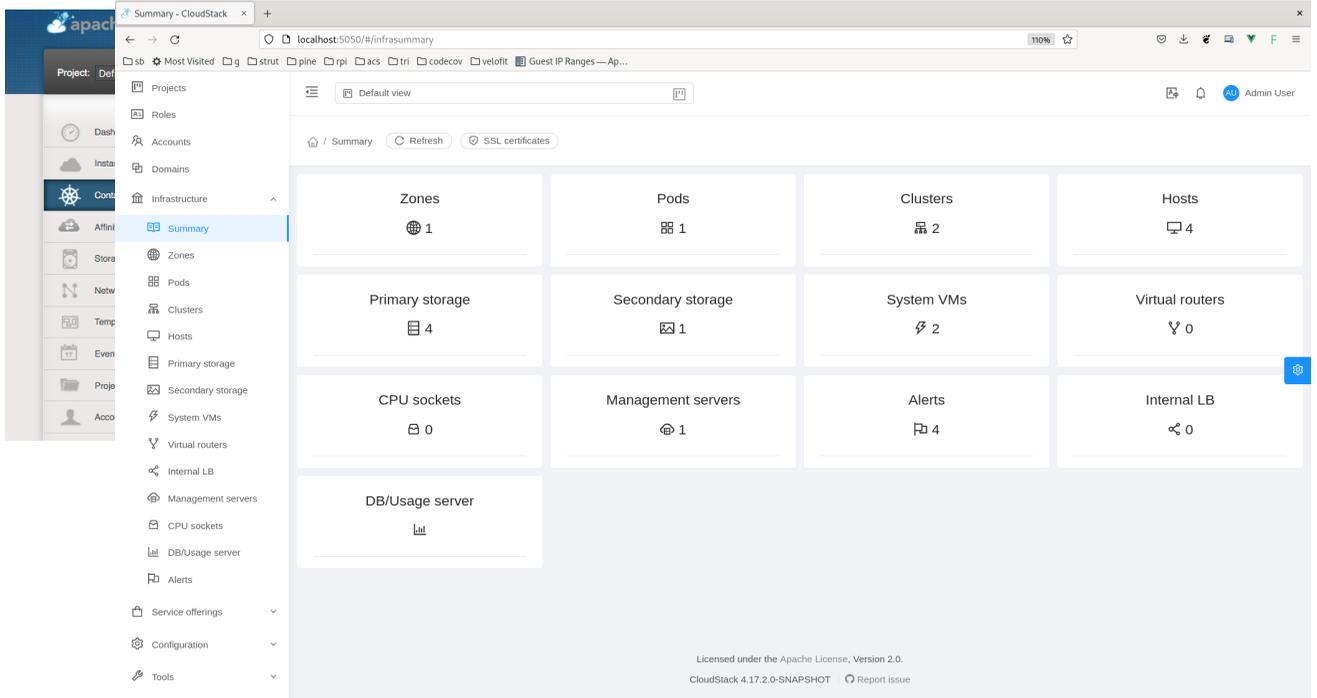
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Replace image

* API examples

* Examples of Cloudstack Rest API:

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Replace “screenshot”

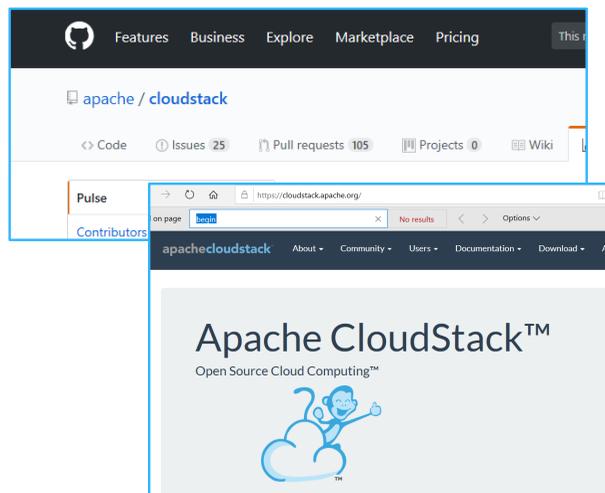
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1. Since the last event in Sofia (March) we've been busy...
2. What is LTS?

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Shape

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* Still in development, we extended the original planned design, lowered the priority due to other things, and it's still not GA - but will be for 4.14!

CloudStack Kubernetes Service = evolution of CloudStack Container Service from few years ago

A plugin for CloudStack to create, manage Kubernetes cluster through CloudStack management server API and UI, disabled by default.

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- TCP load balancer ability to set custom connect/client/server
- Support for new Feature: Clone a Virtual Machine (#4818)
- UI: Keyboard label shortcut
- New feature: Add retry option for VMs in Error state/Option to retry failed VM instan...
- Add volume group handling
- Feat/global vm search
- KVM automatically adds ballooning
- Can't add Netscaler VPX
- Add Support IPAM object to Allow Load Balancer or Port-forward map to floating IP...
- Integrate Tungsten Fabric with CloudStack
- Support to resize uploaded volume during attach
- Allow upload volume with custom size
- Quota custom tariffs
- Advanced Zone with SG: Add L2 networks and shared networks with Account/Project...
- Improve global settings UI to be more intuitive/logical
- Configurable MTU for VR
- UI: Upgrade ant-design-vue to version 3.x
- Guest OS hypervisor mapping improvements
- volume import and export when using swift as secondary storage
- Enable live volume migration between StorPool's primary storages

Already in:

- UserData as first class resource
- Prometheus exporter enhancement
- Volume encryption feature
- Allow option of exposing VM domain info via instance metadata
- Resource reservation framework
- Console access enhancements
- api,server: custom dns for guest network
- VM stats history visualization
- Chinese language pack
- Add usermode interface option to Libvirt Domain XML builder
- Fix spelling
- List service offerings without host tags when filtering VM
- Improved login time
- add global setting to allow parallel execution on vmware
- Reserve memory for host
- HAproxy based load balancer customization
- Faster SystemVM Template Builds
- Make DB upgrade queries idempotent for convenience age:2years_plus

Shape

Blue The Cloud Specialists

cloudstack

* Still in development, we extended the original planned design, lowered the priority due to other things, and it's still not GA – but will be for 4.14!

CloudStack Kubernetes Service = evolution of CloudStack Container Service from few years ago

A plugin for CloudStack to create, manage Kubernetes cluster through CloudStack management server API and UI, disabled by default.

*CloudStack 4.18 Release - Hoped for Headline features

- Backup and Recovery Framework plugin for Networker
- CloudStack Kubernetes API: CAPI
- Volume encryption
- Tungsten fabric integration
- Autoscale VMs
- Userdata as first class citizen
- Oh, and finally.....

Shape

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* Cloudstack Backup and Recovery Framework

- Cloudstack Backup and Recovery Framework
 - In since 4.14
 - Modular framework
 - Can exploit any 3rd party backup platform
 - Provider created for Veeam



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* Cloudstack Backup and Recovery Framework

Specifically:

- Support for:
 - Operator created 'policy based' backups (RPOs)
 - Scheduled backups (similar to snapshot scheduling)
 - Ad hoc backups
- Backups as first class citizens
- 'In-place' restoration of entire VM including data disks
- Restoration of VM backup after original VM is destroyed
- Restoration of individual VM volumes (can then be attached to another VM)
- Full integration into the CloudStack API, UI, usage service (recording both protected and on-disk data metrics)

The logo for Shape, featuring the word "Shape" in white text inside a blue cloud-like shape.

Blue The Cloud Specialists

The logo for CloudStack, featuring the word "cloudstack" in blue lowercase letters with a red and yellow feather graphic to the right.

Support for different policies that dictate different RPOs
Scheduled and ad-hoc backups

Restoration of full VMs or individual volumes

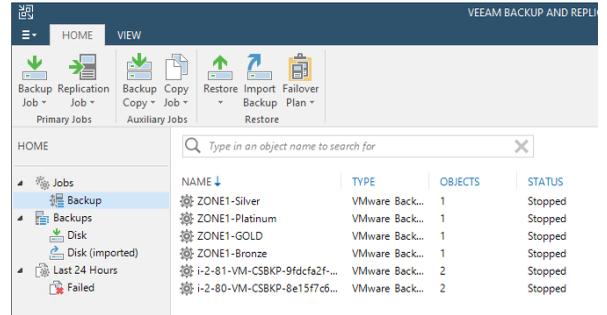
Restoration of the deleted VM

Full usage-server integration, so no orphaned VMs (restored but not visible in usage)

* Cloudstack Backup and Recovery Framework

'Policy Based' Backups

-
- `listBackupPolices external=true`
Returns 'template' jobs.
- `importBackupPolicy` Creates a policy (with a name and description) in CloudStack and maps it to a Veeam template job.
ie.
GOLD – 6hr RPO
SILVER – 24hr RPO
BRONZE – 7 day RPO



The screenshot shows the Veeam Backup and Recovery console interface. The top navigation bar includes 'HOME' and 'VIEW'. Below the navigation bar, there are several icons for 'Backup Job', 'Replication Job', 'Copy Job', 'Restore Job', 'Import Backup', and 'Failover Plan'. The main content area displays a table of backup jobs under the 'HOME' tab. The table has columns for 'NAME', 'TYPE', 'OBJECTS', and 'STATUS'. The jobs listed are:

NAME	TYPE	OBJECTS	STATUS
ZONE1-Silver	VMware Back...	1	Stopped
ZONE1-Platinum	VMware Back...	1	Stopped
ZONE1-GOLD	VMware Back...	1	Stopped
ZONE1-Bronze	VMware Back...	1	Stopped
i-2-81-VM-CSBKP-9fdcf2f...	VMware Back...	2	Stopped
i-2-80-VM-CSBKP-8e15f7c6...	VMware Back...	2	Stopped

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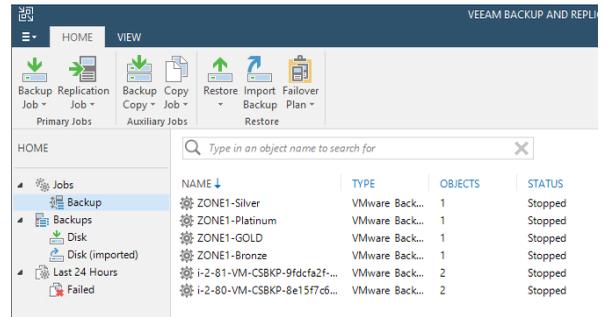
cloudstack

Different RPOs – since space consumed on storage will differ greatly

* Cloudstack Backup and Recovery Framework

'Ad-hoc' & Scheduled Backups

-
- CloudStack will send command to carry out an ad-hoc run of the policy based job or create one as required.
- Ad-hoc and scheduled jobs will be driven by CloudStack
- One VM to one Veeam job mapping allows for simpler accounting and unified incremental backups



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NAME	TYPE	OBJECTS	STATUS
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Shape

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Jobs are driven by ACS, but executed by backup provider i.e. Veeam

* CloudStack 4.18 Release - Headline feature

- **CloudStack Kubernetes Service**

Allows easy creation of CaaS service on top of CloudStack

A plugin to create and manage Kubernetes cluster

- CoreOS templates for nodes, kubeadm for cluster provisioning
- Offline installation of k8s and docker binaries on cluster nodes for selected k8s version via ISO (uploaded by admin)
- Gracefully scale up or scale down
- Access kube.config for cluster for accessing k8s dashboard
- Delete cluster while removing nodes and k8s service

- **CAPI**
- **A CloudStack KAPI**
- **Should work on “old” versions**



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CKS – cloudstack Kubernetes service

CKP – cloudstack Kubernetes provider

A Cloud Controller Manager to facilitate Kubernetes deployments on Cloudstack.

Based on the old Cloudstack provider in Kubernetes that will be removed soon

Future idea is to integrate CKS and CKP for seamless deployment and management

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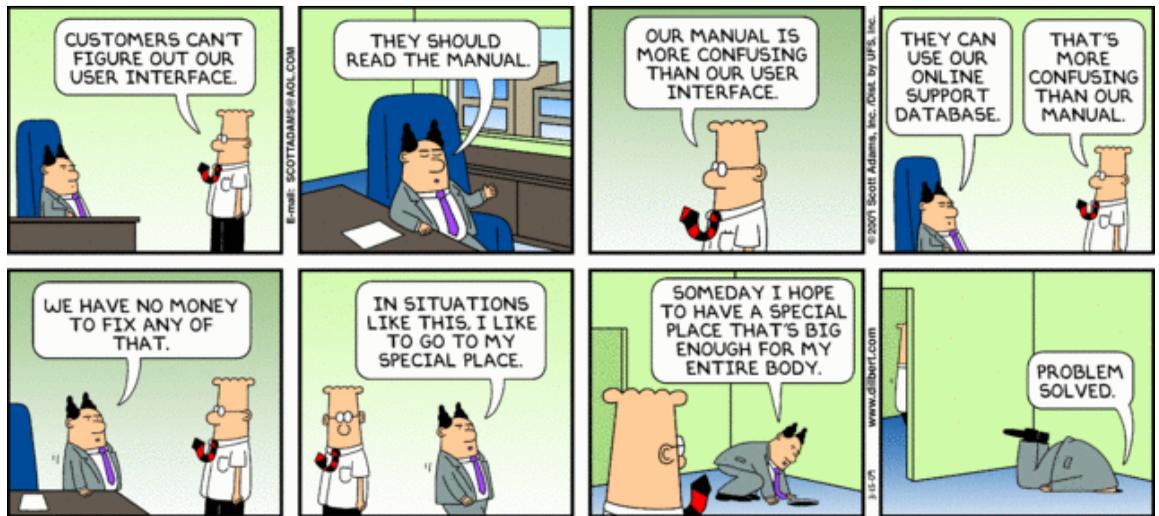
cloudstack

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CloudStack Events

- * Now, here, ongoing
 - * At apachecon
- * CCC
 - * Sofia 14 – 16 November 2022
 - * Registration open – hubilo:
<https://www.cloudstackcollab.org/>
- * CSEUG:
 - * Plan is in februari/march 2023, London
 - * Registration usually on Eventbrite

Also ApacheCon Europe is now (in Berlin)!

CloudStack Collaboration Conference 2020

- * New Orleans
- * ~~28 September — 2 October~~
- * More Information
 - * <http://cloudstackcollab.org>
 - * <http://apachecon.org>
- *
- *



Back in Las Vegas – 1st ever CCC was at the Venetian in 2012

Apachecon 2022

CloudStack Collaboration Conference 2022

- * New Orleans (USA)
- * 3 October – 6 October
- * More Information
 - * <http://apachecon.org>
- * Sofia (Bulgaria)
- * hybrid
- * 14 November – 16 November
- * More Information
 - * <http://cloudstackcollab.org>



Back in Las Vegas – 1st ever CCC was at the Venetian in 2012

- * If you're new: join the Users@ mailing list
- * Get your organisation to be public about their use of ACS
- * Get on the "known user" list*
- * Offer to do a case study with PMC/ASF
- * Go and talk about it !

*

*

*Known user list: <http://cloudstack.apache.org/survey.html>

