Getting Started as a CloudStack Developer

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cloud STACK COLLABORATION CONFERENCE

Shape Blue The Cloud Specialists

apachecloudstack open source cloud computing

About Me

- Software Architect with ShapeBlue
- Specialise in….
  - 3rd party integrations and features in CloudStack
  - KVM, API, DB, Upgrades, SystemVM, Build system, various subsystems
- Contributor and Committer since 2012
- Author and maintainer of CloudMonkey
- Rides castorboards like a boss™
- Loves to experiment with woodwinds such as Bansuri, Concert Flutes. Rusty beatboxing skills

About ShapeBlue

"ShapeBlue are expert builders of public & private clouds. They are the leading global Apache CloudStack integrator & consultancy"

… and we're hiring!


AcenTek
Ascending Technology
coredesktop
Business Cloud Synergy
თბილისის მერია
TBILISI CITY HALL
eSkyCity
LSP
Trader Media Group
PADDYPOWER
paragus
SWISS TXT
Ascenty
csg
Tomorrow's Technology Today
sagepay
orange
SCHUBERG PHILIS
pacific interactive
USS
inps
BT
EVRY
cloudera
CSN GROEP
TEAM CYMRU
Klarna
sky
cloudcentral
DSS
interoute
from the ground to the cloud
SUNGARD AVAILABILITY SERVICES
TOMTOM
CISCO
Vonage
colt
nodilex
IaaS Cloud Computing
Kumo
wateen
جـــو چاهـــو
Virtela
An NTT Communications Company
Penn
University of Pennsylvania
FOUR Js
The Power of Simplicity
Flemish Government
control circle
The Datacentre People
M5 INTERNET HOSTING
EveryWare
eCommunications
ASG
your it
GLOBAL
IP SOFT
SURFBOXX
IT-SOLUTIONS
Guzool

Agenda

- Getting started with CloudStack
- Knowing the Basics
- Joining the community
- Setting up a development environment
- Building CloudStack
- Development walkthrough
- Contributing to CloudStack
- Q&A

Getting Started with CloudStack

- CloudStack: What, why, who, how, where?
- Apache Top Level Project
- Head over to http://cloudstack.apache.org
- Used by over 200 organizations
- Start as a user, setup a test environment on a VM or real machine
- Read install and admin docs
- Other places of interest: Cwiki, JIRA, ML archives, IRC

Getting Started with CloudStack: Resources

- Join mailing lists: http://cloudstack.apache.org/mailing-lists.html
- Docs: http://docs.cloudstack.apache.org/
- Issues: https://issues.apache.org/jira/browse/CLOUDSTACK
- CloudStack 101: https://cwiki.apache.org/confluence/display/CLOUDSTACK/Development+101
- Wiki: https://cwiki.apache.org/confluence/display/CLOUDSTACK/Home
- API docs: http://cloudstack.apache.org/api.html
- Downloads: http://cloudstack.apache.org/downloads.html
- Jenkins: http://jenkins.buildacloud.org/
- Travis: http://travis-ci.org/apache/cloudstack
- Github (Mirror/PRs): http://github.com/apache/cloudstack

Getting Started with CloudStack: As a User

- Using DevCloud (Xen or KVM)
- Using KVM on a Linux box (Example, peppercorn: https://github.com/bhaisaab/peppercorn, langur: http://packages.shapeblue.com/langur/templates/)
- Custom setup on real machines, building a test lab
- Yum/Apt repositories (http://www.shapeblue.com/packages/)
- Installing CloudStack
- Setting up CloudStack

Apache CloudStack Project Integration tools

- Travis CI on Github PRs
- License: RAT job
- Coding style: checkstyle (Java), pep8 (Python)
- SSA: Findbugs, Coverity
- BuildACloud Jenkins jobs: branch builds, apidocs, systemvm template, etc.
- JIRA: Issue Tracker
- Cwiki: Confluence wiki

Setting up a development environment

- Java 1.7 (openjdk or oracle-java)
- Maven 3.0.5+
- MySQL server 5.5/5.6
- Python, bash, openssh-clients, mkisofs/genisoimage
- Git (Github account for sending pull requests)
- Editors: vim/emacs, Eclipse/IntelliJ Idea
- Platforms: GNU/Linux, OSX, Windows
- Optional: Ruby 1.9+, Vagrant/Veewee, VirtualBox (for building SystemVM template)

Building CloudStack: Getting the source

- Git clone from the main repository:

  git clone https://git-wip-us.apache.org/repos/asf/cloudstack.git

- Or, fork the mirror on Github: github.com/apache/cloudstack (note: the Github mirror may sometimes be behind the main ASF repository)

  git clone <git@github.com:your-username/cloudstack.git>

Guided tour of CloudStack source code

- Various directories, filesystem structure
- Maven projects and sub-projects
- Codebase layout
- Demo

Building CloudStack Source with Maven

- Download and install Maven 3.0.5+ such that mvn is available on $PATH. Install nonoss dependencies from: https://github.com/bhaisaab/cloudstack-nonoss
- Building CloudStack:
  mvn clean install -P developer,systemvm
- CloudStack management server “war” built in client/target/

Building CloudStack Source with Maven

- Building CloudStack with nonoss components:

  mvn clean install -P developer,systemvm -Dnoredist

- Building CloudStack the fastest way: (-T accepts threads)

  mvn clean install -P impatient –DskipTests –T8

Building CloudStack Source: Maven Options

- MAVEN_OPTS can be configured to increase heap size to avoid OOM issues:
  export MAVEN_OPTS="-Xmx1024m -XX:MaxPermSize=500m”
- Running CloudStack with debug mode (for example, debug using Eclipse or IntelliJ or jdb, on localhost:8787):
  export MAVEN_OPTS="-Xmx1024m -XX:MaxPermSize=500m –Xdebug -Xrunjdwp:transport=dt_socket,address=8787,server=y,suspend=n”
- Profiles (-P): developer, systemvm, impatient, vmware, disablecheckstyle, enablefindbugs
- Projects (-pl): select only certain projects to be built

Running CloudStack

- Seeding database: (override MySQL root user password in utils/conf/db.properties.override if password is not empty)

  mvn -Pdeveloper -pl developer –Ddeploydb

- Running CloudStack Management server:

  mvn -pl client jetty:run

- Logs in root source code directory: api.log, (awsapi.log), vmops.log

Developing CloudStack

- JIRA issue to track a change/bug/feature -> dev@ ML discussions -> Github PR
- Fixing a bug: JIRA, dev@ ML, IRC
- Refactoring existing codebase
- Writing unit tests and integration tests
- Developing a new feature: dev@ ML discussion, Cwiki FS for review, development in a branch, merging the feature via a Github PR

CloudStack Project Release Management

- 4.5 and older release management
- 4.6+ release management
- Source code tarball is created, signed against projects' KEYS file
- RC cuts + votes
- Lazy voting
- Announcements, release notes and doc changes (admin docs etc)

Contributing to CloudStack

- Github PR based workflow
- Make changes, send a PR
- Each review requires two positive reviews: +1, or LGTM
- PRs Merged using git-pr tool, previous merged manually
- PRs are closed once they are merged by asf-git bot, or could be manually closed by the PR creator

Thank You

Questions?