Getting Started as a CloudStack Developer

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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 bossTM
- 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!

















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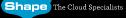












Agenda

- 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?

