# mbx
Local CI/CD for CloudStack

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$ whoami: Rohit Yadav

- **Principal Engineer** @ ShapeBlue
- From Gurugram, India
- Background:
  - 9+ years CloudStack Committer and PMC
  - RM and maintainer for several releases
  - Specialize in design and architecture, development work, framework/plugins, tooling; leadership, mentoring, training
  - Author of several flagship features and tools
  - CloudStack ARM64/RaspberryPi maintainer
  - Love cats 🐱 and programming
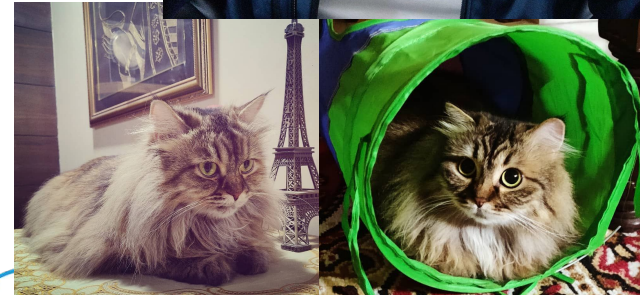
Topics

- What is mbx?
- Story
- Design & Implementation
- How it works
- Demo!

What is mbx?

`mbx` is a CI/CD tool that allows building of CloudStack packages, deployment of Dev/QA environments and running of smoke tests.

But Why?

We've Travis, Trillian/BO - all's well, why another tool?

There's a story… but first, some history!

History

- (1st Gen) BVT (marvin/XenServer based, dogfood on phy servers) https://cwiki.apache.org/confluence/display/CLOUDSTACK/Automated+Tests+Rules+and+Guidelines
- (1st Gen) DevCloud (on VirtualBox, runs XenServer) https://cwiki.apache.org/confluence/display/CLOUDSTACK/DevCloud
- (1st Gen) DevCloud-kvm (on KVM, runs KVM) https://cwiki.apache.org/confluence/display/CLOUDSTACK/devcloud-kvm
- (2nd Gen) Jenkins/Travis: Checks PR (runs Simulator) https://app.travis-ci.com/apache/cloudstack
- (3rd Gen) Trillian + BO: General-purpose CI/CD (on vSphere, runs *) https://github.com/shapeblue/Trillian
- (3rd Gen) MonkeyBox (on KVM, runs *) https://github.com/rhtyd/monkeybox

How People do Dev & QA

Dev: (write/execute unit + marvin tests)

- Maven + Simulator (Developers)
- DevCloud / MonkeyBox / DIY nested-setup

QA: (execute unit + marvin tests)

- Travis (Simulator, Github + Pull requests)
- Trillian/BO (Github/PRs, tags), manual QA

Here Goes the story...

- Triggers:
  - Once lost London Lab due to hardware failure, tons of effort in re-creating the lab
  - Q1 '21: migrate/setup new Sofia Lab
- "Secret" backup plan B:
  - Limit 2 weeks: dev (Rohit), QA (Vladi)
  - *((didn't have to use it))*

Design & Implementation Goals

- Should take less effort to set up, automated if possible
- Should allow building CloudStack Packages
- Should allow "test matrix" env + run smoketests:

  1x CentOS 7 mgmt server

  2x hypervisor (KVM CentOS7, VMware 6.7u3, XenServer 7.1, XCP-ng 7.6/8.2

  NFS/local storage in Adv. Zone

- Good to have: runs on own hardware (laptop/desktop), VPN access to colleagues

`mbx`

mbx is 4th-Gen CI/CD tool that learns and iterates over all previous tools and allows to:

- Build CloudStack packages (CentOS 6/7/8, Ubuntu, Suse...)
- Launch Dev environments (1 x hypervisor host)
- Launch QA environments (1 x mgmt server host, 2 x hypervisor hosts)
- Runs marvin tests and gathers report
- Supports
  - Hypervisors: VMware, KVM, XenServer/XCP-ng
  - NFS, local storage
- Automatic VLAN, IP range allocation/management
- Dev/QA: deploy -> launch -> start/stop/destroy/test operations

mbx: What it's not

- Not meant to replace any existing tools
- Supplementary, for different use-cases:
  - Quick Dev-QA env
  - Distributed ACS CI/CD
  - Serve as backup in the event of Lab failure
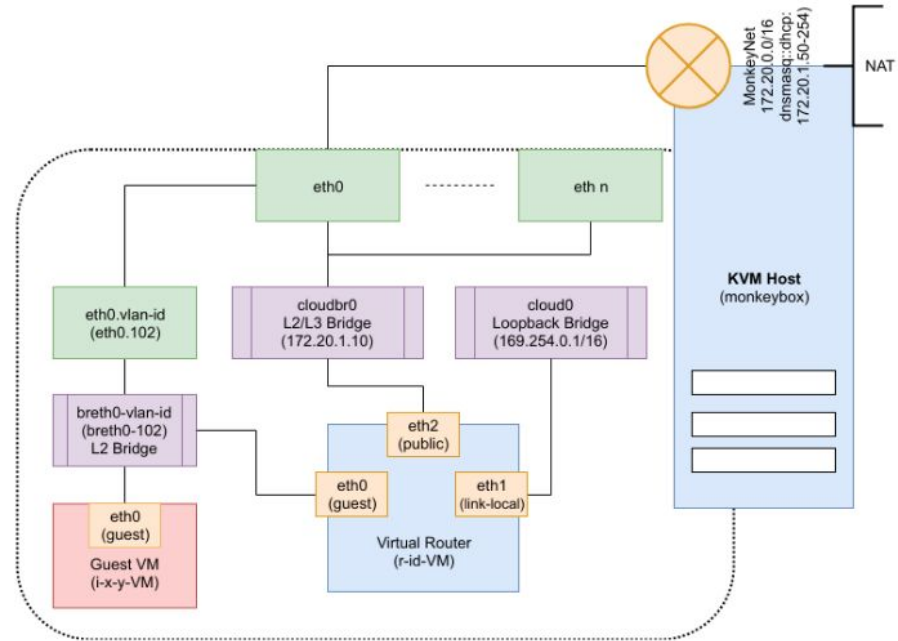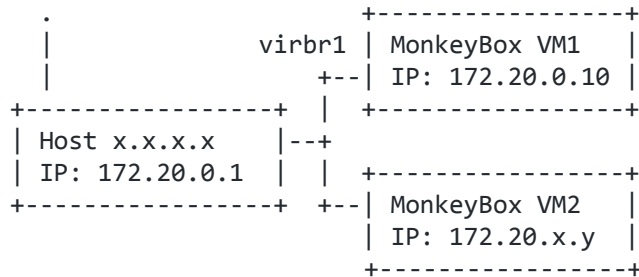
mbx: who can use it?

- Anyone starting out with CloudStack: Students, Junior Devs, User...
- Developers and QA
- Anyone needing a CI/CD or dev-test system for their ACS integration/testing
- Something that works out of the box, before they go with a custom/complex setup...

How mbx works

- Creates and uses a virtual NAT-ed host-only network in RFC1918 (172.20.0.1/16)
- Deploys nested env using DHCP-enabled VM/hypervisor templates
- Uses KVM hypervisor and NFS storage
- Uses docker for packaging only
- Optional: vpn support
- Fast, automated and set up under 30mins
- Hackable: ~500-1000 lines of code

Networking

```
External Network
   .                      +------------------+
   |           virbr1 |   MonkeyBox VM1    |
   |                  +--|  IP: 172.20.0.10  |
+------------------+  |  +------------------+
| Host x.x.x.x     |--+
| IP: 172.20.0.1   |  |  +------------------+
+------------------+  +--|   MonkeyBox VM2   |
                      |  | IP: 172.20.x.y   |
                      +------------------+
```

Get `mbx` !

https://github.com/shapeblue/mbx

Requirements:

- x86_64 machine w/32GB RAM, w/4 Cores
- Host OS: Ubuntu 20.04/LTS (preferred) or CentOS7
- Storage: NFS
- Hypervisor: KVM/qemu (docker for packaging)

Demo!

> mbx

MonkeyBox 🐵 v0.2

Available commands are:

  init: initialises monkeynet and mbx templates

  package: builds packages from a git repo and sha/tag/branch

  list: lists available environments

  deploy: creates QA env with two monkeybox VMs and creates marvin cfg file

  launch: launches QA env zone using environment's marvin cfg file

  test: start marvin tests

  dev: creates dev env with a single monkeybox VM and creates marvin cfg file

  agentscp: updates KVM agent in dev environment using scp and restarts it

  ssh: ssh into a mbx VM

  stop: stop all env VMs

  start: start all env VMs

  destroy: destroy environment

Future

- Support other hypervisors (VMware fusion/workstation, VirtualBox) and platforms (Windows, Mac)
- Explore multi-machine setups
- Distributed community CI/CD system
- Revisit configuration limitation
- 100% smoketests pass
- In pipeline: 100% smoketests pass, support EL8, Ubuntu mbx mgmt server & KVM templates

Thanks | Q&A