Computing Services

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Compute

Features

- Fast provisioning of VMs, with low latency start-up

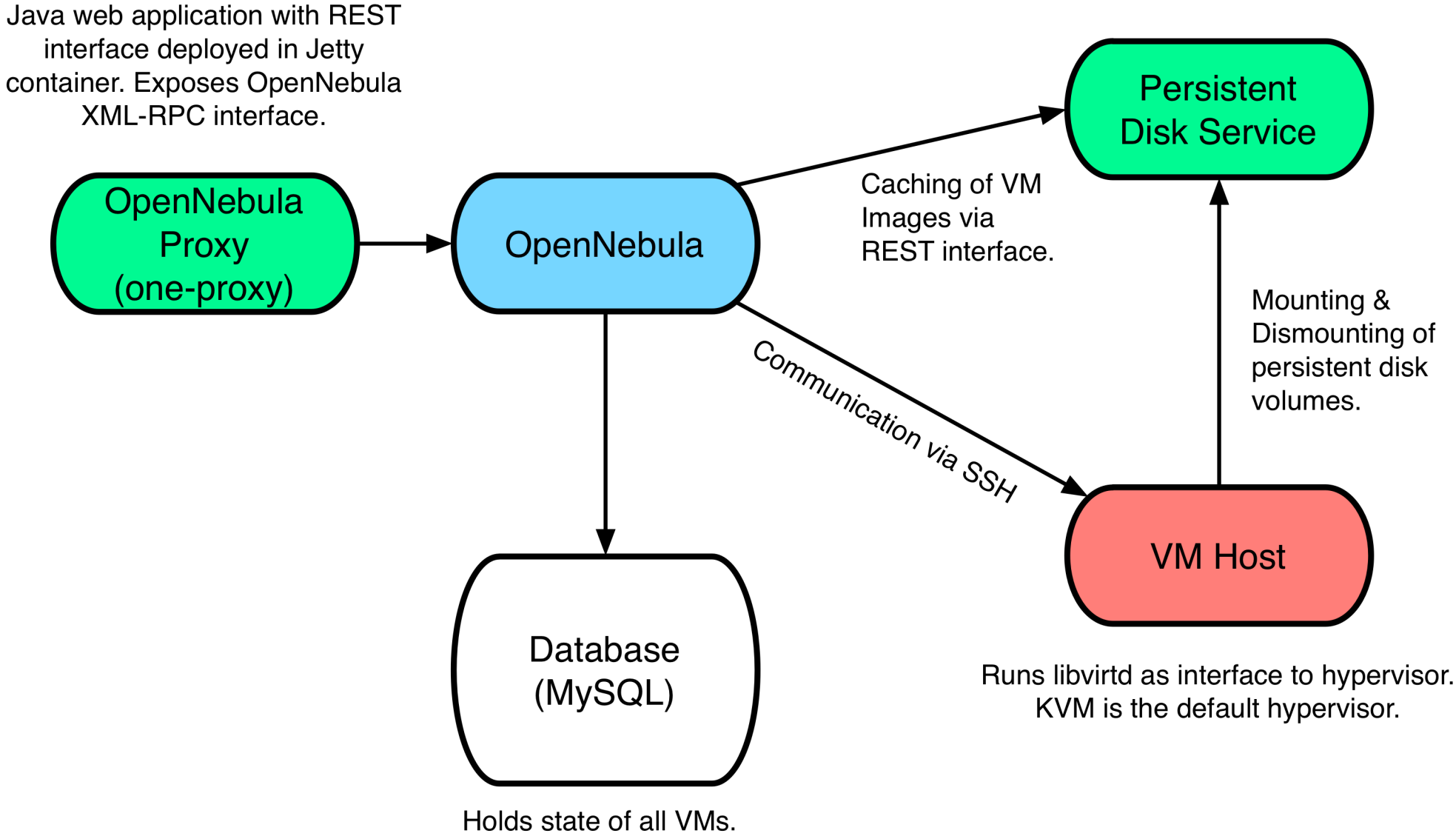
Contextualization

- HEPiX & OpenNebula CDROM contextualization by default
- CloudInit (disk based) also supported

Implementation

- Authentication proxy sitting in front of OpenNebula
- API: XML-RPC interface of OpenNebula
- OpenNebula (C++, Ruby) with customized hooks
- Hooks primarily for caching, snapshots, and storage access
- On VM hosts, libvirtd is used as interface to hypervisor

Architecture



Authentication Proxy (one-proxy)

Authentication Proxy	
daemon	one-proxy
purpose	authn proxy for OpenNebula
ports	2634
language	java (deployed in Jetty container)
external requirements	none
config. files	`/etc/stratuslab/authn/*`
logs	`/opt/stratuslab/one-proxy/logs/*`

OpenNebula

OpenNebula	
daemon	oned
purpose	interface to libvirtd
ports	2633
language	C++, scripts in ruby, bash, …
external requirements	database (MySQL)
config. files	`/etc/one/*`
logs	`/var/log/one/*`

Services to Configure

OpenNebula

- Installed on the front end
- Usually also installs MySQL, but this is already done in our case

“Node”

- Host for virtual machines
- Done via SSH from front end (password-less access required!)

DHCP

- Installed on the front end
- Turn off if using an external DHCP server
- Must still provide network addresses, etc. for OpenNebula

Configuration

Setup Node Parameters

```
$ stratus-config node_system centos
$ stratus-config node_bridge_name br0
$ stratus-config node_bridge_configure True
$ stratus-config default_gateway ${FRONTEND_IP}
$ stratus-config frontend_ip ${FRONTEND_IP}
$ stratus-config frontend_system centos
$ stratus-config network_addr 134.158.75.0
```

Quotas

```
sudo stratus-config quota_cpu 5
sudo stratus-config quota_memory 1GB
```

VM Network Configuration

Private

```
$ stratus-config one_private_network 192.168.0.0
$ stratus-config one_private_network_addr 192.168.0.1
```

Public

```
$ stratus-config one_public_network_addr \
   134.158.75.42 134.158.75.43 134.158.75.44 \
   134.158.75.45 134.158.75.46 134.158.75.47 \
   134.158.75.48 134.158.75.49 134.158.75.50 \
   134.158.75.51
$ stratus-config one_public_network_mac \
  0a:0a:86:9e:49:2a 0a:0a:86:9e:49:2b 0a:0a:86:9e:49:2c \
  0a:0a:86:9e:49:2d 0a:0a:86:9e:49:2e 0a:0a:86:9e:49:2f \
  0a:0a:86:9e:49:30 0a:0a:86:9e:49:31 0a:0a:86:9e:49:32 \
  0a:0a:86:9e:49:33
```

VM Network Configuration

Local

```
$ stratus-config one_local_network_addr \
   172.17.16.43 172.17.16.44 172.17.16.45 \
   172.17.16.46 172.17.16.47 172.17.16.48 \
   172.17.16.49 172.17.16.50 172.17.16.51

$ stratus-config one_local_network_mac \
   0a:0a:86:9e:50:2b 0a:0a:86:9e:50:2c 0a:0a:86:9e:50:2d \
   0a:0a:86:9e:50:2e 0a:0a:86:9e:50:2f 0a:0a:86:9e:50:30 \
   0a:0a:86:9e:50:31 0a:0a:86:9e:50:32 0a:0a:86:9e:50:33
```

NAT (Optional)

```
NAT_GW=172.17.16.2
$ stratus-config nat True
$ stratus-config nat_network 172.17.16.0
$ stratus-config nat_gateway $NAT_GW
$ stratus-config nat_netmask 255.255.255.0
$ stratus-config nat_network_interface eth0
```

DHCP

```
$ stratus-config dhcp True
$ stratus-config dhcp_subnet 134.158.75.0
$ stratus-config dhcp_netmask 255.255.255.0
$ stratus-config dhcp_lease_time 3600
```

```
$ stratus-config dhcp_one_local_network True
$ stratus-config dhcp_one_local_network_subnet 172.17.16.0
$ stratus-config dhcp_one_local_network_broadcast \
      172.17.16.255
$ stratus-config dhcp_one_local_network_netmask \
      255.255.255.0
$ stratus-config dhcp_one_local_network_routers $NAT_GW
$ stratus-config dhcp_one_local_network_domain_name \
      lal.in2p3.fr
$stratus-config dhcp_one_local_network_domain_name_servers\
      134.158.91.80, 134.158.88.149
```

Persistent Disk

Turn off since this is already done!

```
$ stratus-config persistent_disk False
```

Installation

Normal Install Command

```
$ stratus-install -n {NODE_IP} -vvv
```

Check

- Look carefully at output to see if there are any errors
- Correct them if there are!
- Can find state of OpenNebula from oneadmin account

```
$ su - oneadmin
$ onehost list # VM hosts and status
$ onenet list  # defined networks
$ onevm list   # running VMs
```

Exercises

1. Configure parameters for front end and node
2. Verify the parameters with `stratus-config --keys`
3. Launch the installation
4. Check carefully for errors in output
5. Check that everything looks OK in OpenNebula

Setup Normal User

Setup test accounts using the root account.

Create Normal Unix Account

- Usual `adduser` command
- Use any username that you'd like

Create Associated Account for StratusLab

- Add account to `/etc/stratuslab/login-pswd.properties`
- Username and password are independent of the unix account

Configure StratusLab Client

Log into the unix account you created.

SSH Configuration

- Generate new ssh key pair using `ssh-keygen`

StratusLab Client Configuration

- Create a default configuration file: `stratus-copy-config`
- Edit file `$HOME/.stratuslab/stratuslab-user.cfg`
  - Replace “username” and “password” values
  - Replace “endpoint” value

Verify Configuration

- Try: `stratus-describe-instance`

Launch a Virtual Machine

Log into the unix account you created.

Create CentOS VM

```
$ CENTOS=H8dg0ssw_j4jg67FTwXysCUrJPl
$ stratus-run-instance --type m1.large ${CENTOS}
```

Follow Status

```
$ stratus-describe-instance
```

Log into VM

```
$ ssh root@machine-ip
```

Exercises

1. Verify that you can start a virtual machine
2. Check out the ways of controlling allocated resources
3. Try connecting LDAP server to one-proxy service
4. Verify that account in LDAP works

Questions and Discussion

website	http://stratuslab.eu
twitter	@StratusLab
support	support@stratuslab.eu
StratusLab source	http://github.com/StratusLab
SlipStream source	http://github.com/slipstream

http://stratuslab.eu/