

Troubleshooting Your SUSE® Cloud

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SUSE® Cloud ...



SUSE® Cloud Troubleshooting



SUSE® Cloud



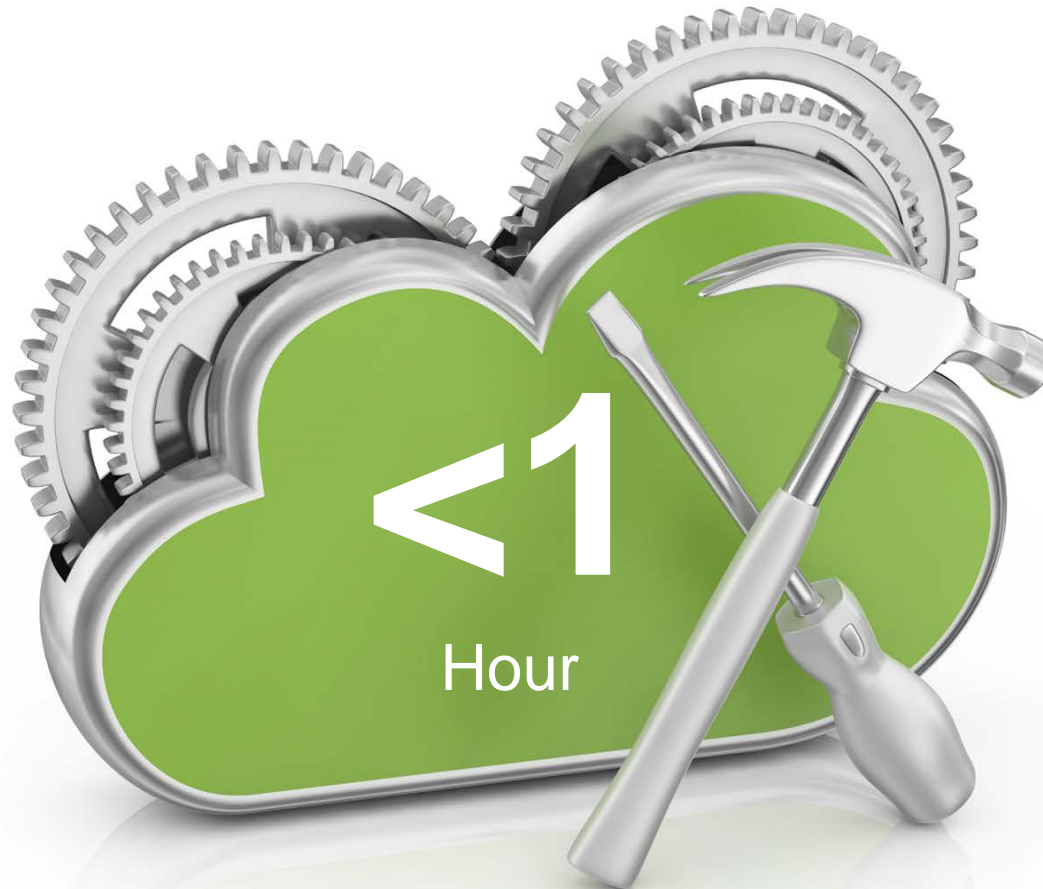
SUSE® Cloud



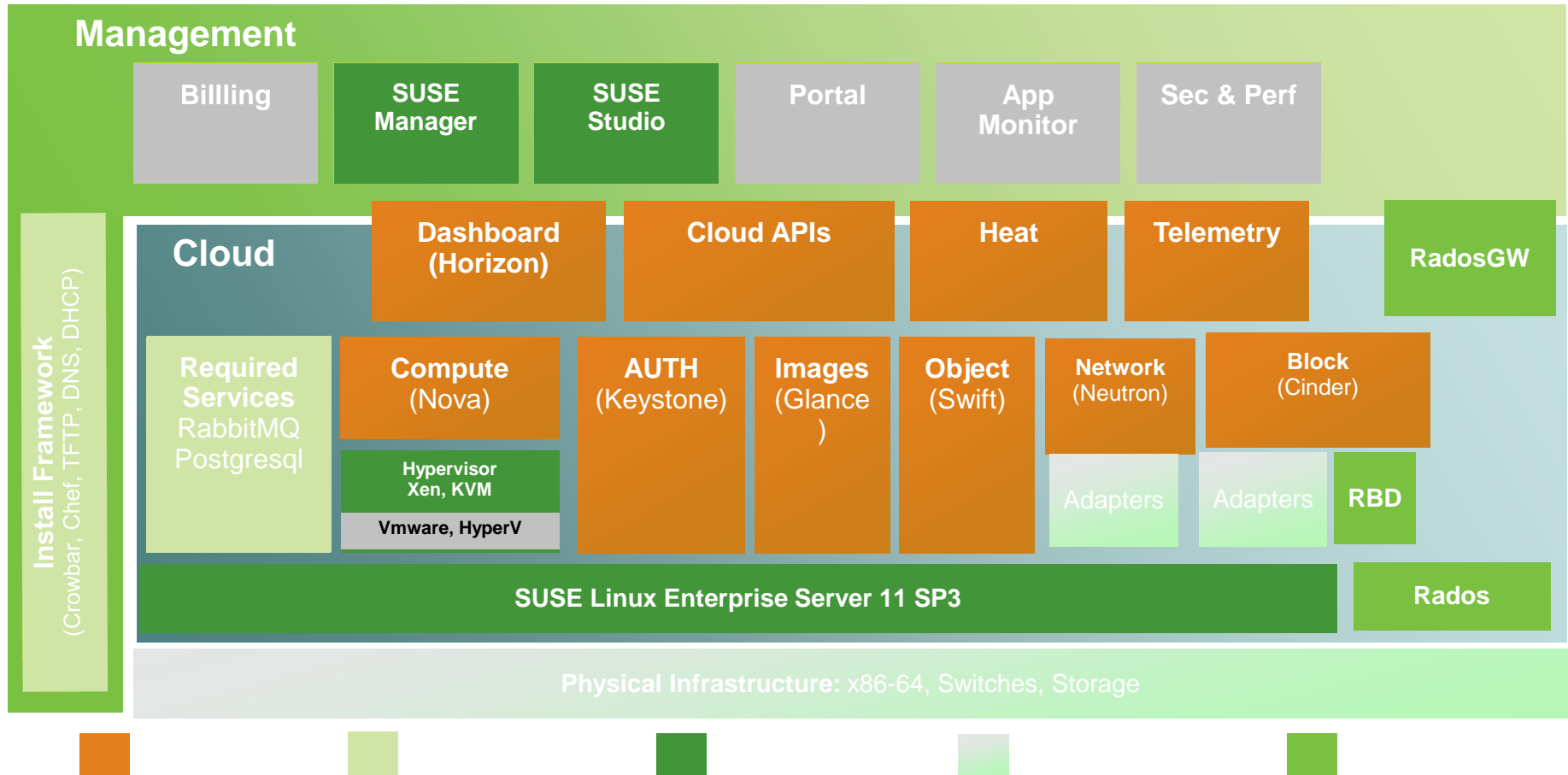
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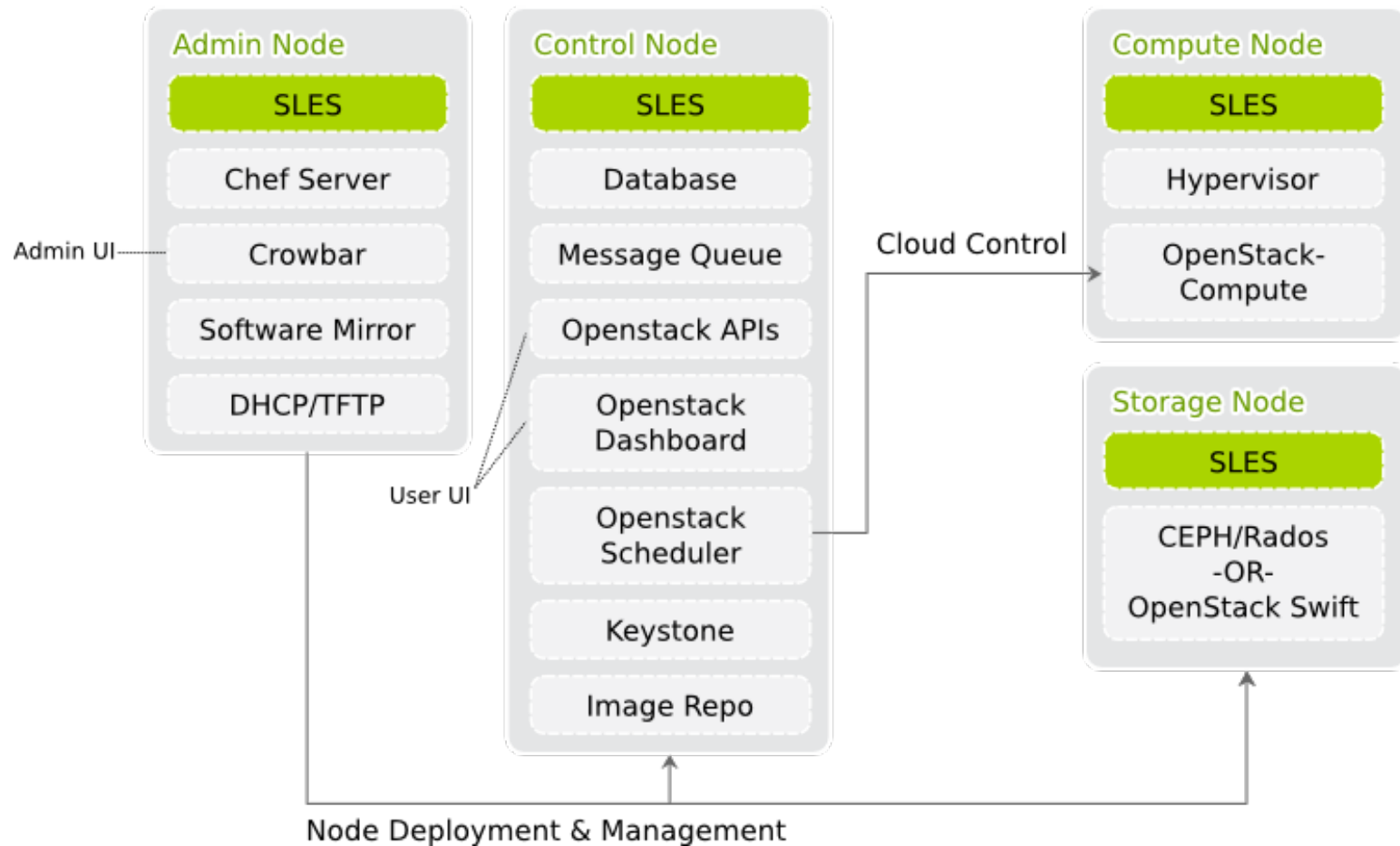
SUSE® Cloud Troubleshooting



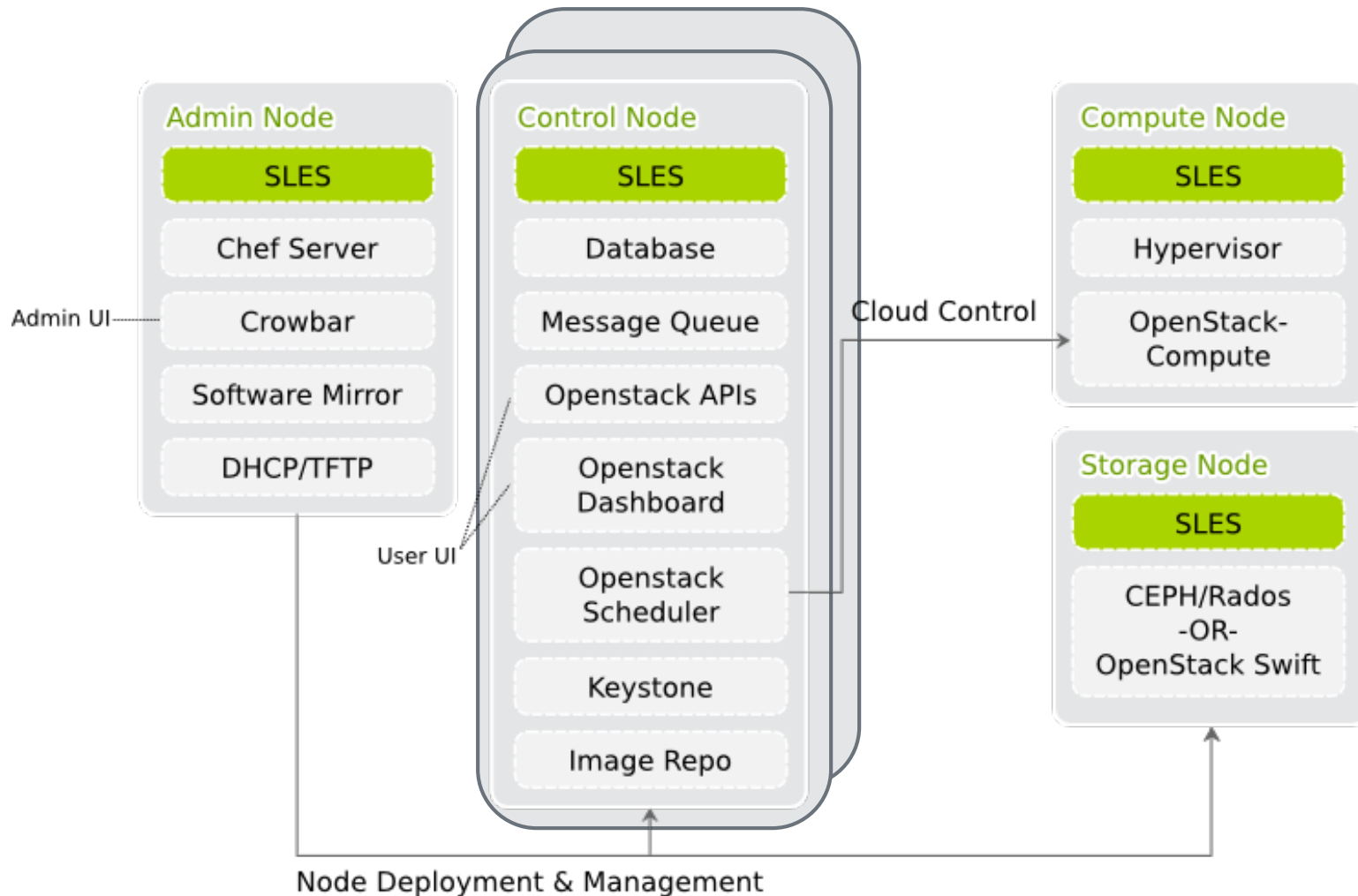
SUSE® Cloud Building Blocks



Non-HA SUSE® Cloud Installation



HA SUSE® Cloud Installation



Just Enough HA for Troubleshooting

- `crm resource list`
- `crm_mon`
- `crm resource restart <X>`
- `crm resource cleanup <X>`

More About HA...

https://www.suse.com/documentation/sle_ha/

SUSE Linux Enterprise High Availability Extension 11 SP3 SLEHA 11 SP3 High Availability Guide

Publication Date 26 May 2014

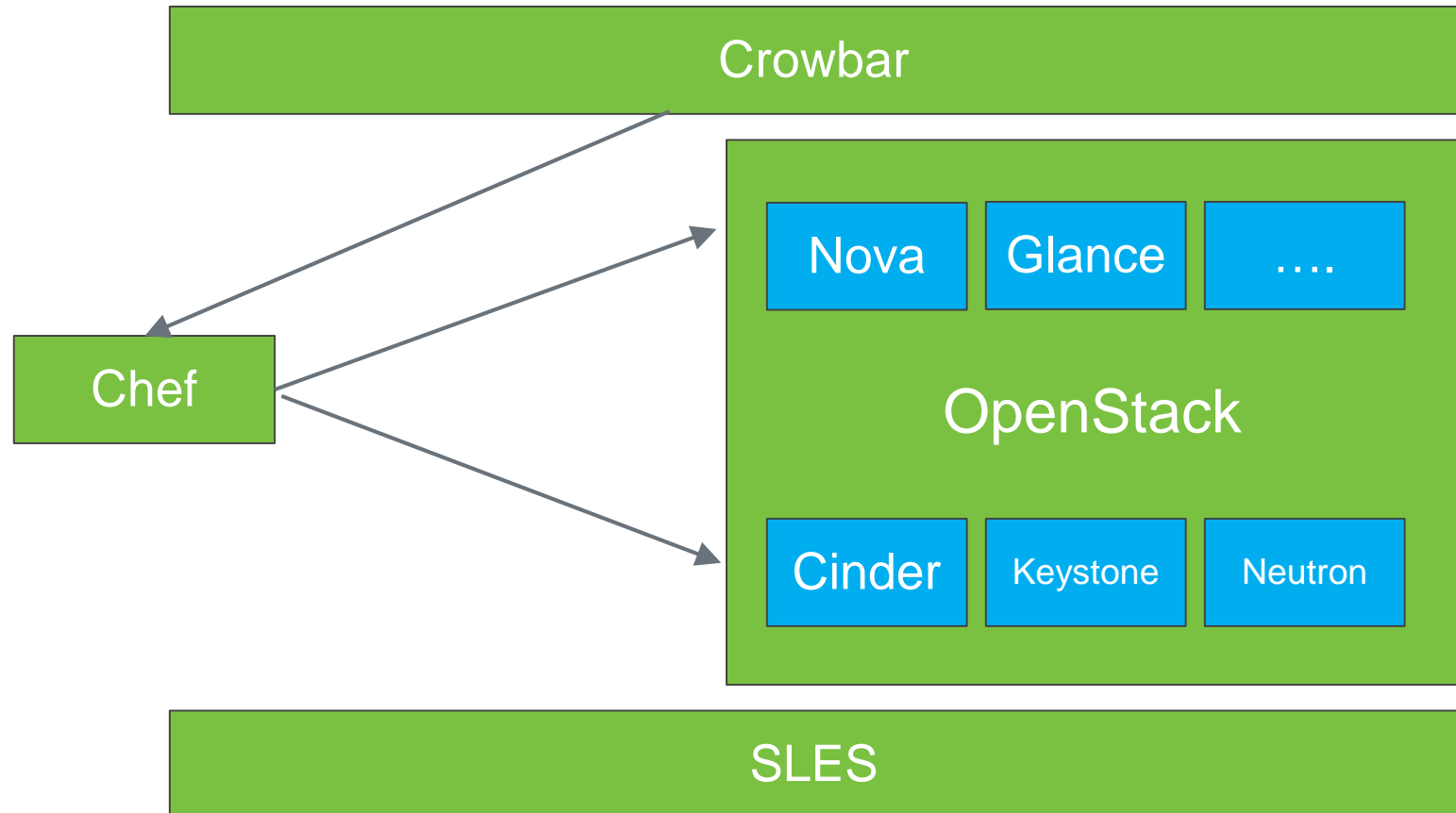
Authors Tanja Roth, Thomas Schraitle

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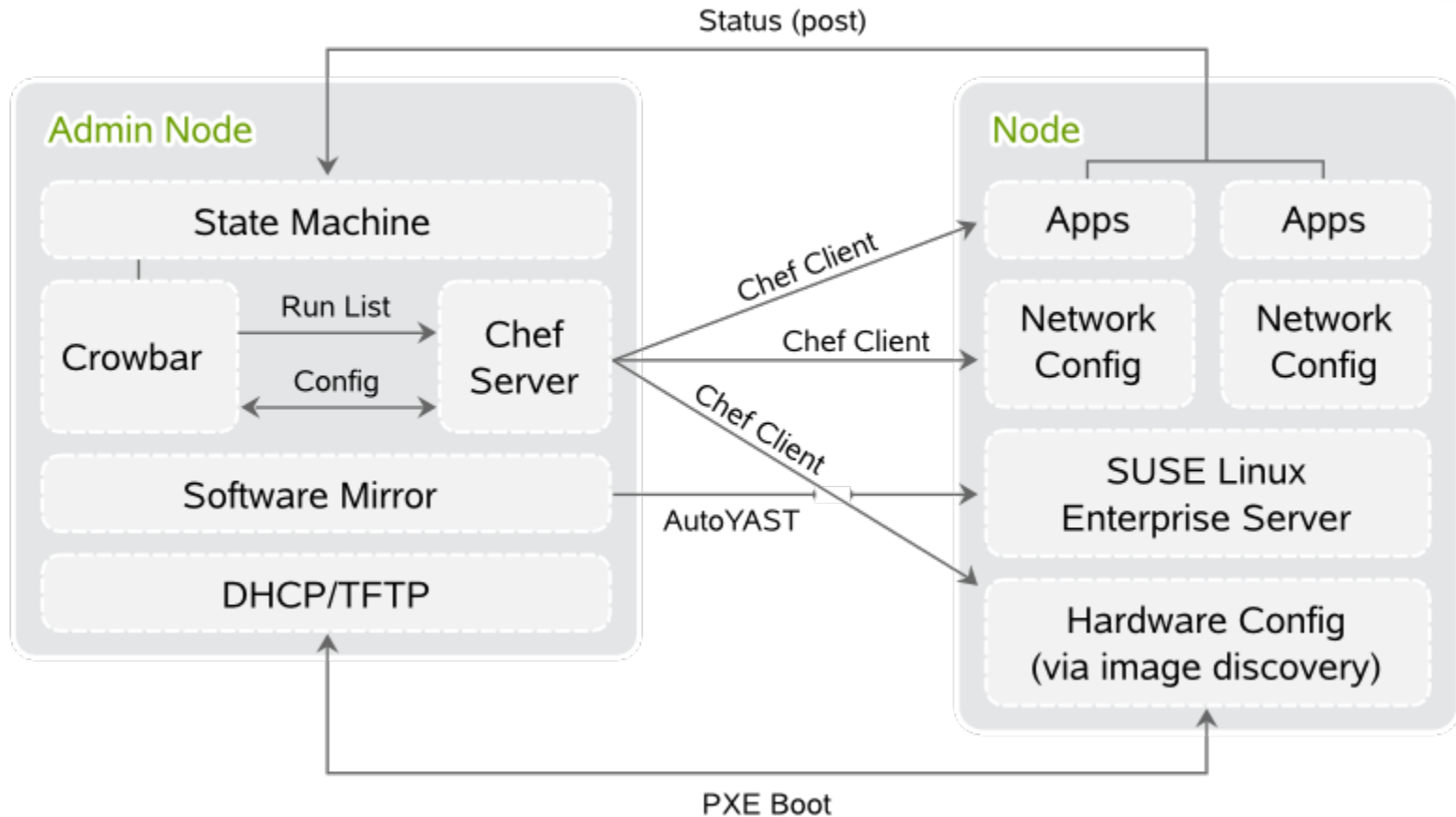
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SUSE® Cloud Functional Blocks



Crowbar and Chef



Generic SLES® Troubleshooting

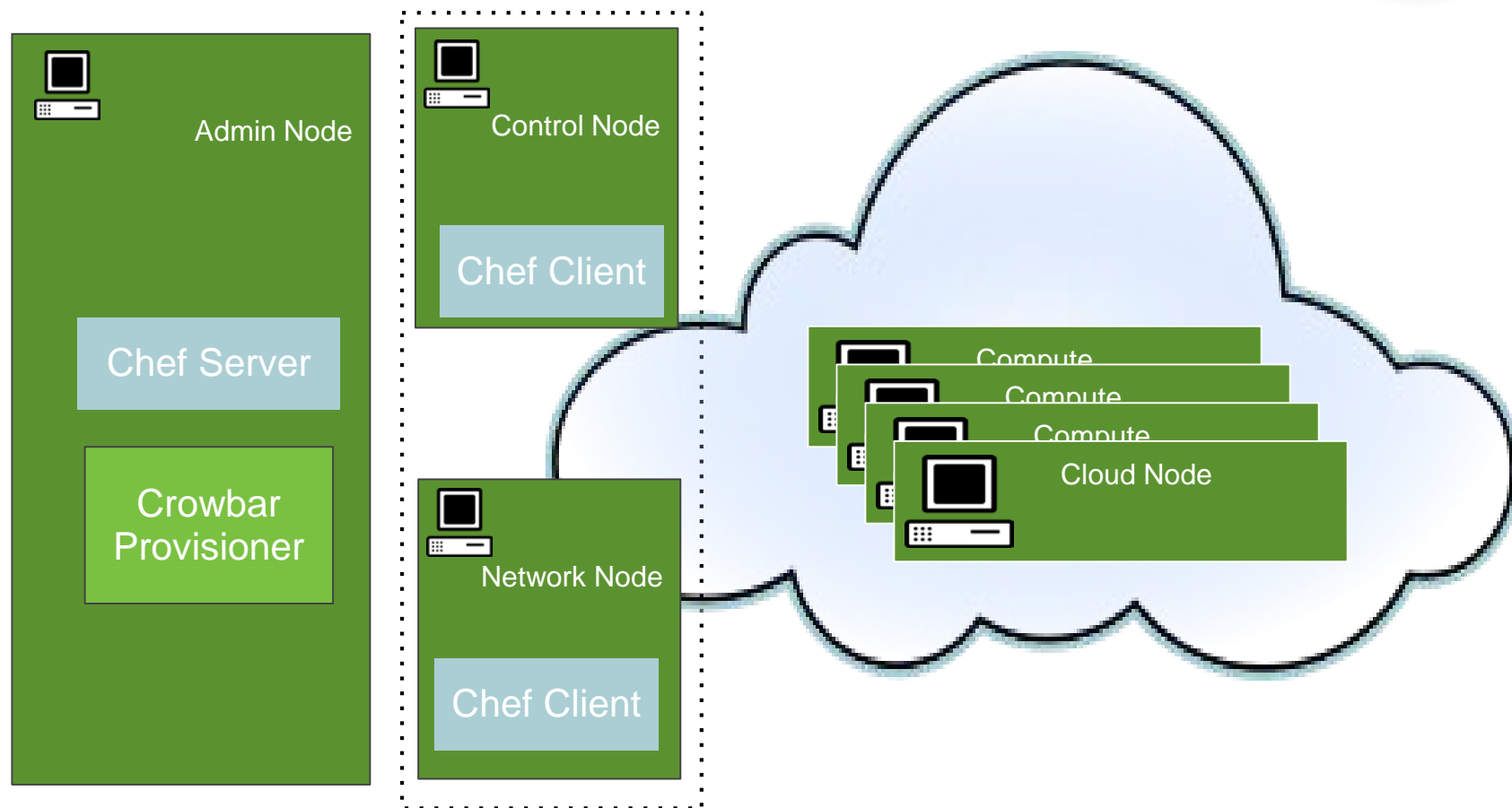
- All Nodes in SUSE® Cloud are SLES11 SP3
- Watch out for typical issues:
 - `dmesg` for hardware-related errors, OOM, interesting kernel messages
 - usual syslog targets, e.g. `/var/log/messages`
- Check general node health via:
 - `top`, `vmstat`, `uptime`, `ps`, `free`
 - core files, zombies, etc

Supportconfig

- `supportconfig` can be run on any cloud node
- `supportutils-plugin-susecloud.rpm`
 - installed on all SUSE Cloud nodes automatically
 - collects precious cloud-specific information for further analysis



Typical Deployment Schema





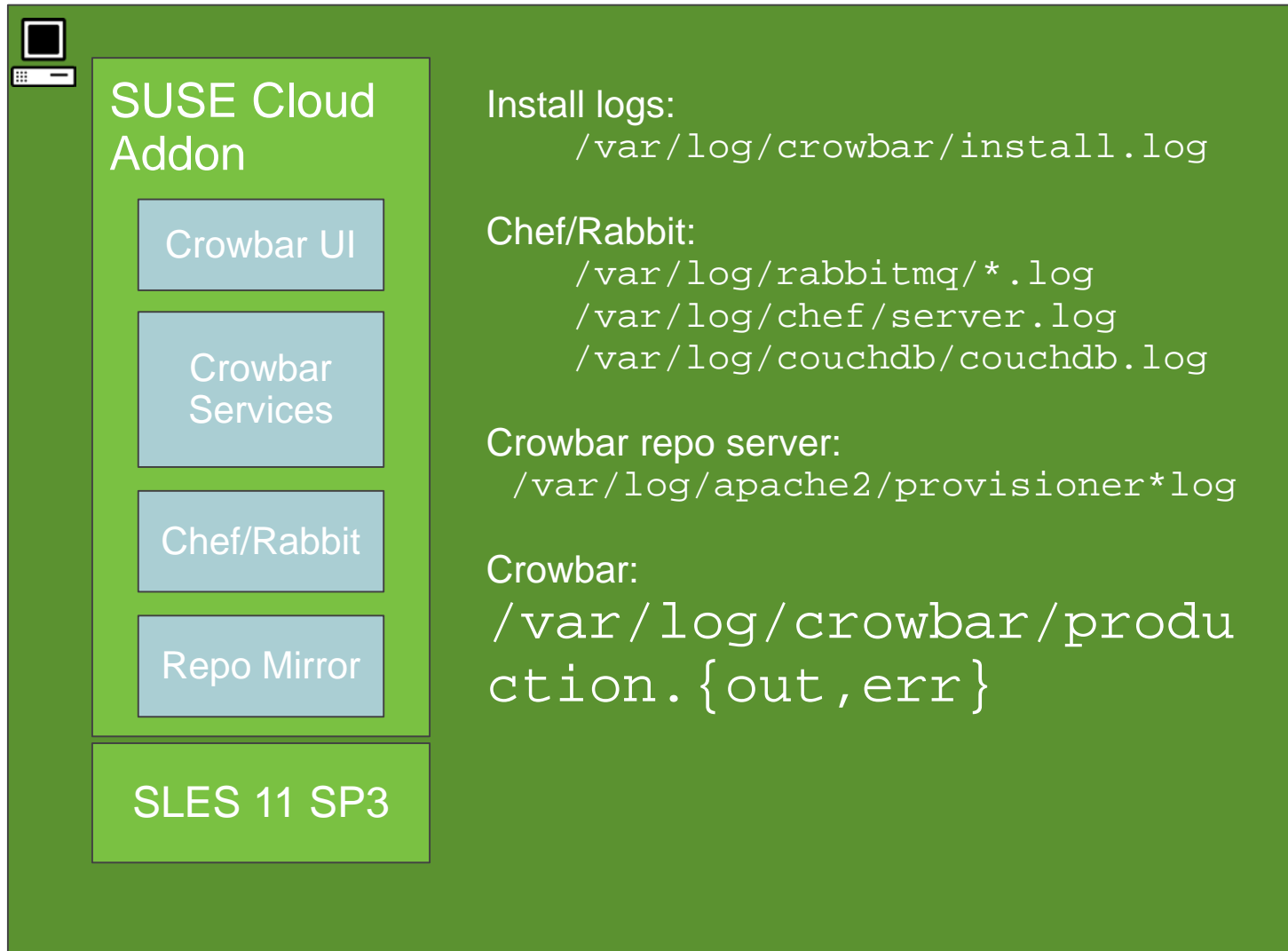
Cloud Install

```
screen install-suse-cloud --verbose
```

```
/var/log/crowbar/install.log
```

```
/var/log/crowbar/barclamp_install/*.log
```


SUSE® Cloud Admin Node





Chef

- Cloud uses Chef for almost everything:
 - All Cloud and SLES non-core packages
 - All config files are overwritten
 - All daemons are started
 - Database tables are initialized

http://docs.getchef.com/chef_quick_overview.html



Admin Node: Using Chef

```
knife node list
```

```
knife node show <nodeid>
```

```
export EDITOR=/usr/bin/vim; \  
knife node edit -a <nodeid> node
```



SUSE® Cloud Admin Node

- Populate `~root/.ssh/authorized_keys` prior install

- Barclamp install logs:

`/var/log/crowbar/barclamp_install`

- Node discovery logs:

`/var/log/crowbar/sledgehammer/d<macid>.<domain>.log`

- Syslog of crowbar installed nodes sent via rsyslog to:

`/var/log/nodes/d<macid>.log`

Useful Tricks

- Root login to the Cloud installed nodes should be possible from admin node (even in discovery stage)
- If admin network is reachable:

```
~/ .ssh/config:
```

```
host 192.168.124.*
```

```
    StrictHostKeyChecking no
```

```
    user root
```




SUSE® Cloud Admin Node

- If a proposal is applied, chef client logs are at:

```
/var/log/crowbar/chef-client/<macid>.<domain>.log
```

- Useful crowbar commands:

```
crowbar machines help
```

```
crowbar transition <node> <state>
```

```
crowbar <barclamp> proposal list|show <name>
```

```
crowbar <barclamp> proposal delete default
```



Admin Node: Crowbar Services

- Nodes are deployed via PXE boot:

```
/srv/tftpboot/discovery/pxelinux.cfg/*
```

- Installed via AutoYaST; profile generated to:

```
/srv/tftpboot/nodes/d<mac>.<domain>/autoyast.xml
```

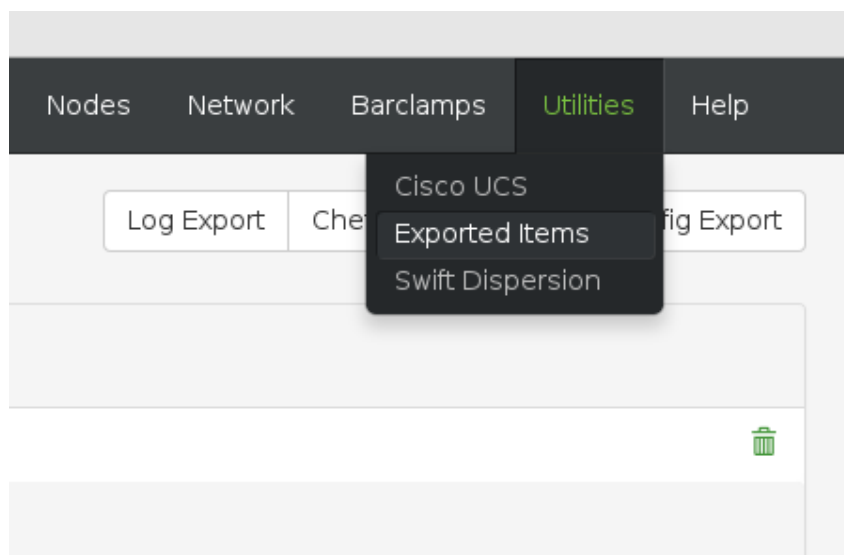
- Can delete & rerun chef-client on the admin node
- Can add useful settings to autoyast.xml:

```
<confirm config:type="boolean">true</confirm>
```

(don't forget to `chattr +i` the file)



Admin Node: Crowbar UI



Useful Export Page
available in the
Crowbar UI in order to
export various log files
from a customer
installation



Admin Node: Crowbar UI

Save Apply Delete Cancel

Raw

Raw settings in barclamp proposals allow access to "expert" (hidden) options

Most interesting are:

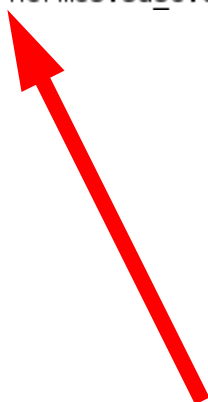
`debug: true`

`verbose: true`



Admin Node: Crowbar Gotchas

```
admin:~ # ntpq -p
      remote           refid      st t when poll reach  delay  offset  jitter
=====
LOCAL(0)        .LOCL.         10 l    6   16  377   0.000   0.000   0.001
*hermes.suse.de 131.188.3.222   2 u   190 256  377   0.339   0.305   0.067
```

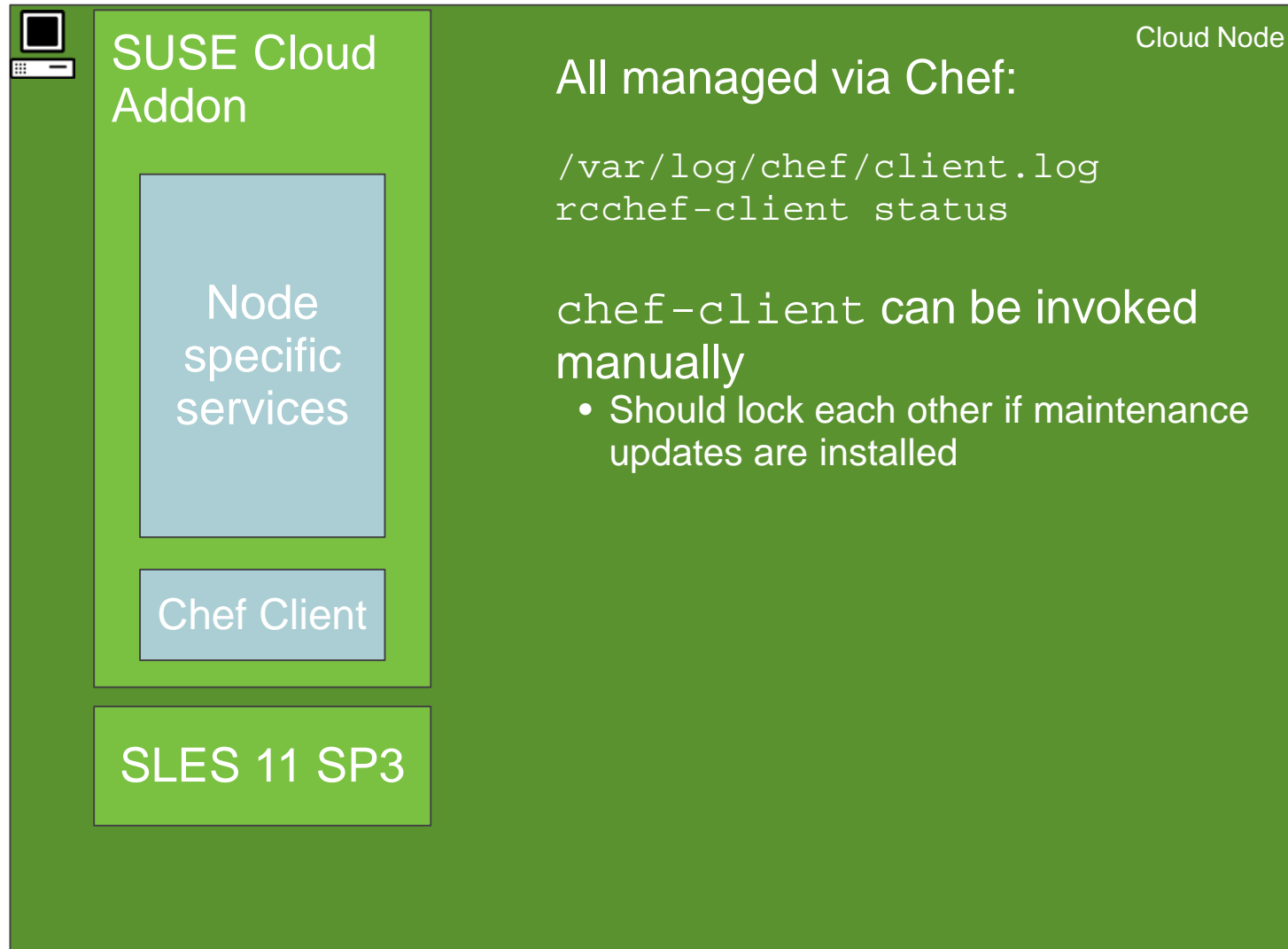




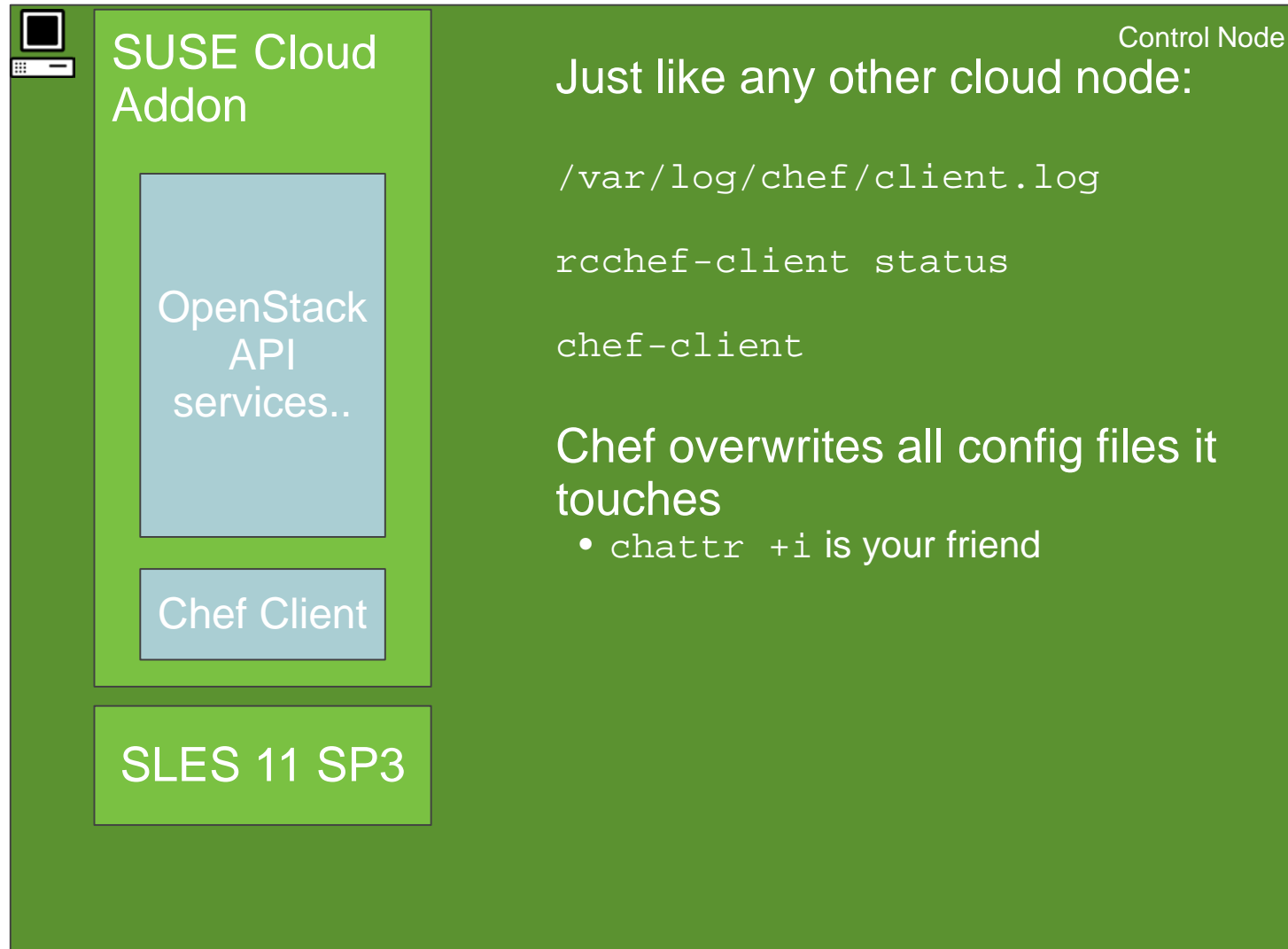
Admin Node: Crowbar Gotchas

- Be patient
 - Do not multiple transition nodes from one state to another
 - Do not apply proposals while a proposal is applying
- Cloud nodes should boot from:
 1. Network
 2. First disk

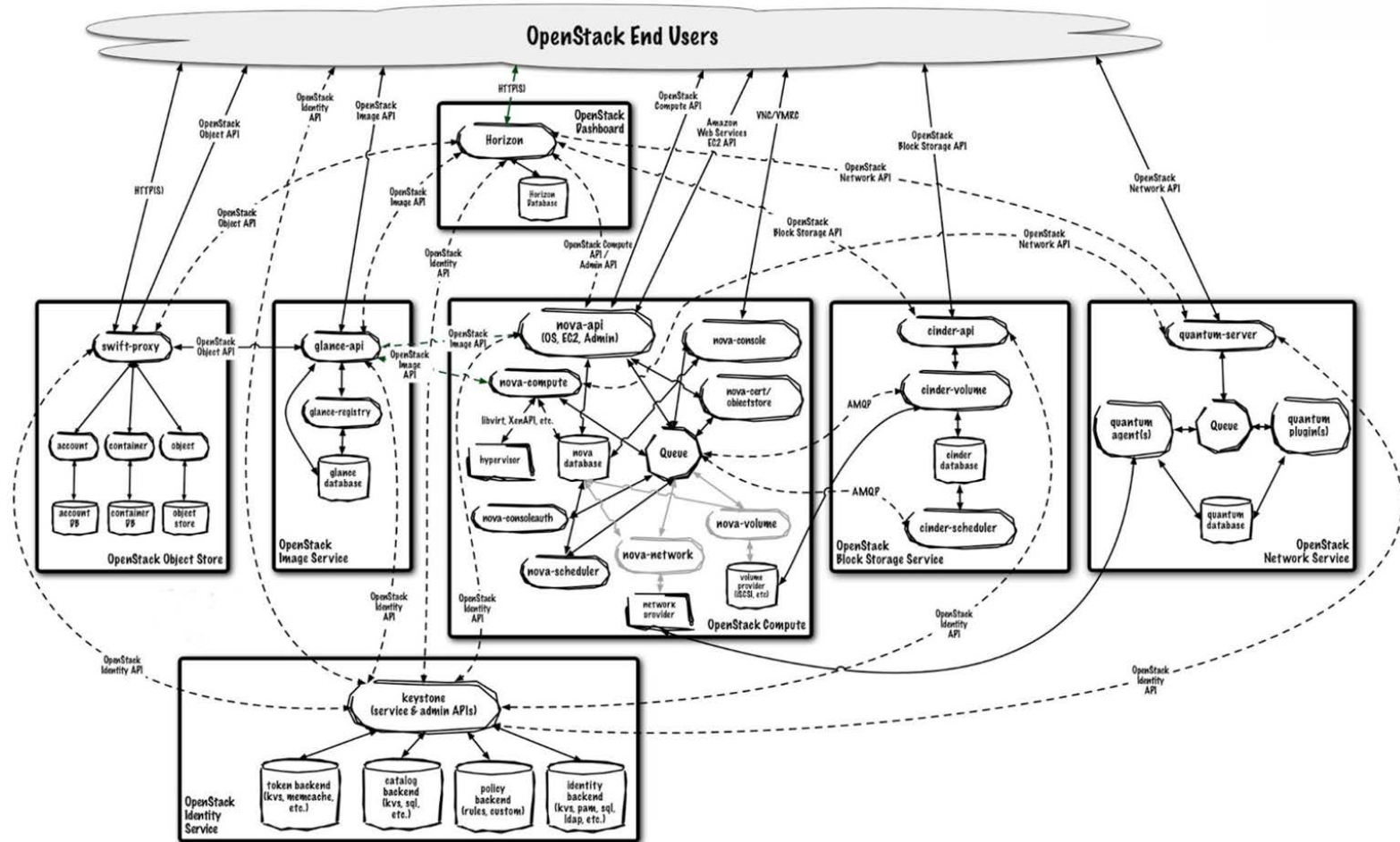
SUSE® Cloud Nodes



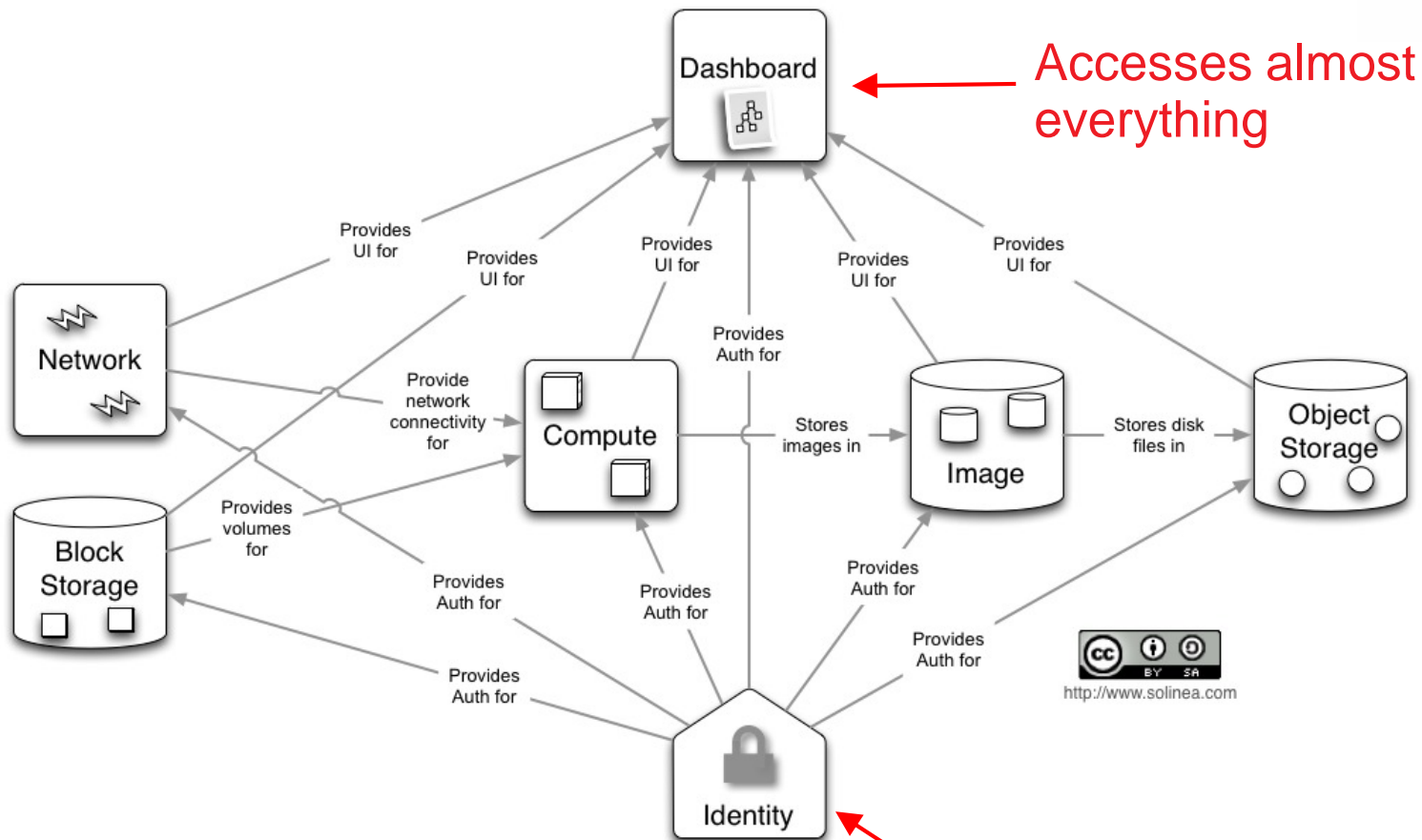
SUSE® Cloud Control Node



OpenStack Architecture Diagram



OpenStack Block diagram



Keystone: SPOF





OpenStack Architecture

- Typically each OpenStack component provides:
 - an API daemon / service
 - one or many backend daemons that do the actual work
 - command line client to access the API
 - `<proj>-manage client` for admin-only functionality
 - dashboard ("Horizon") Plugin providing a graphical view on the service
 - uses an SQL database for storing state





OpenStack Packaging Basics

- Packages are usually named:

`openstack-<codename>`

- usually a subpackage for each service (`-api`, `-scheduler`, etc)
- log to `/var/log/<codename>/<service>.log`
- each service has an init script:

```
dde-ad-be-ff-00-01:~# rcopenstack-glance-api status
```

```
Checking for service glance-api                ...running
```



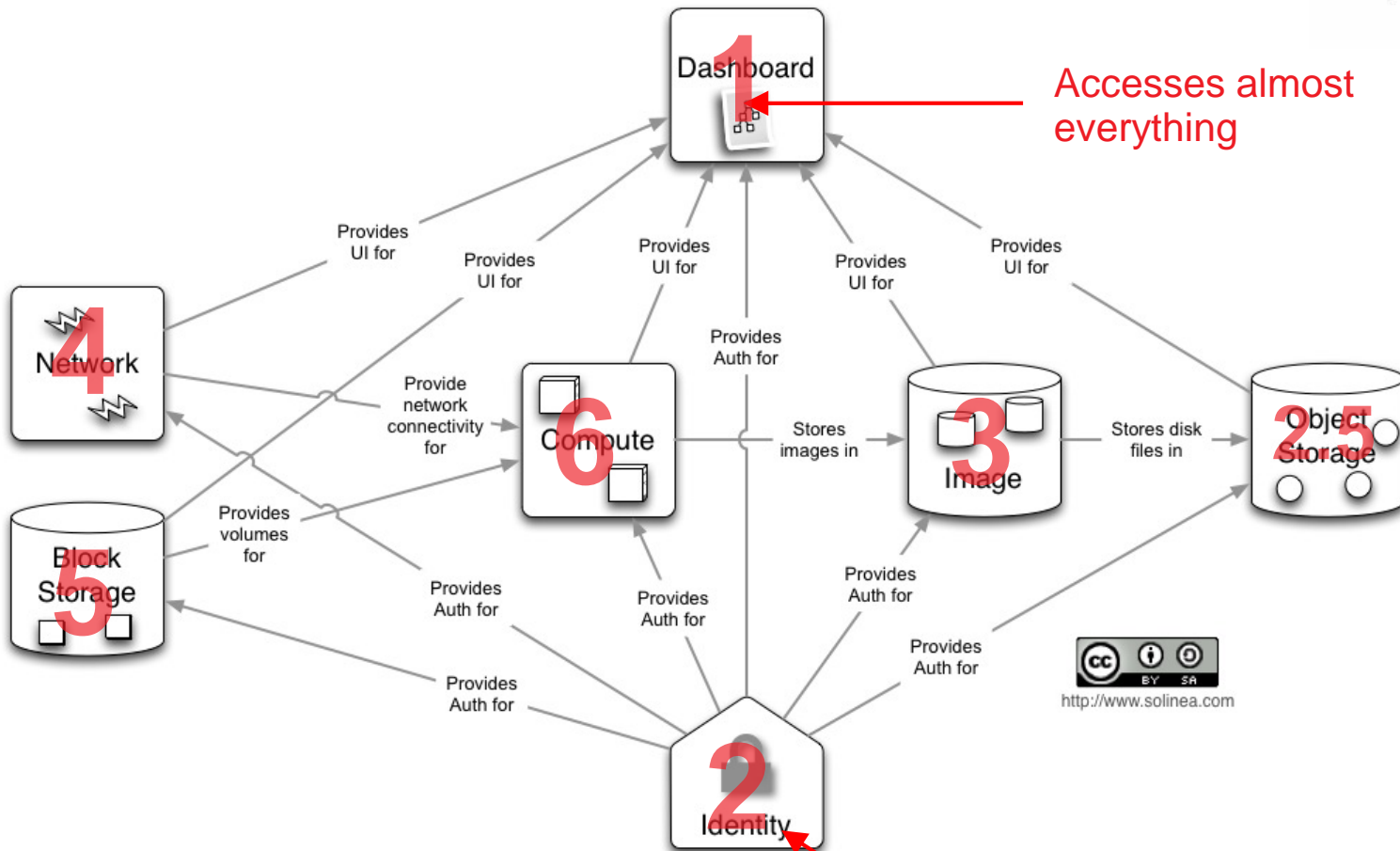
OpenStack Debugging Basics

- Log files often lack useful information without verbose enabled
- TRACEs of processes are not logged without verbose
- Many reasons for API error messages are not logged unless debug is turned on
- Debug is very verbose (>10GB per hour)

<https://ask.openstack.org/>

<http://docs.openstack.org/icehouse/>

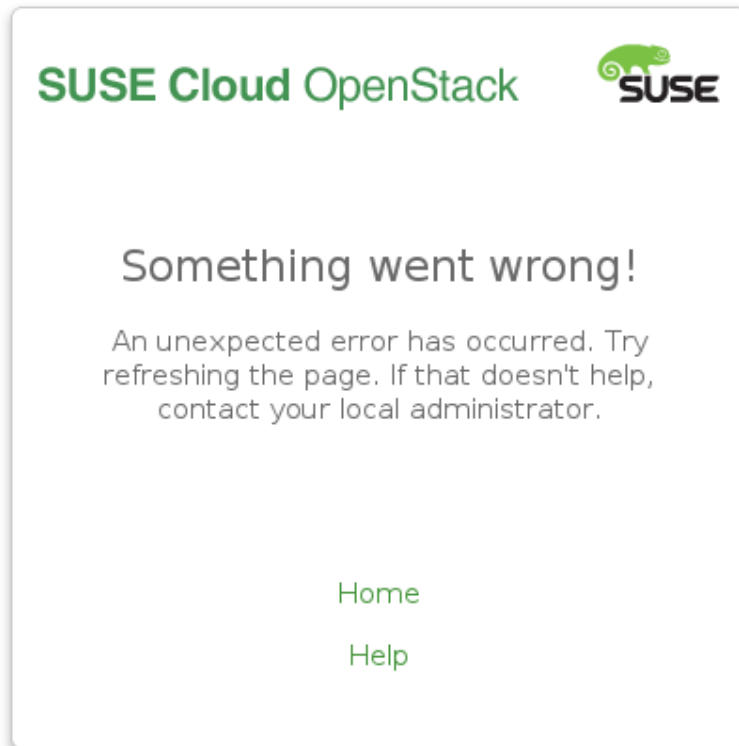
OpenStack Architecture



Keystone: SPOF



OpenStack Dashboard: Horizon



`/var/log/apache2/openstack-
dashboard-error_log`

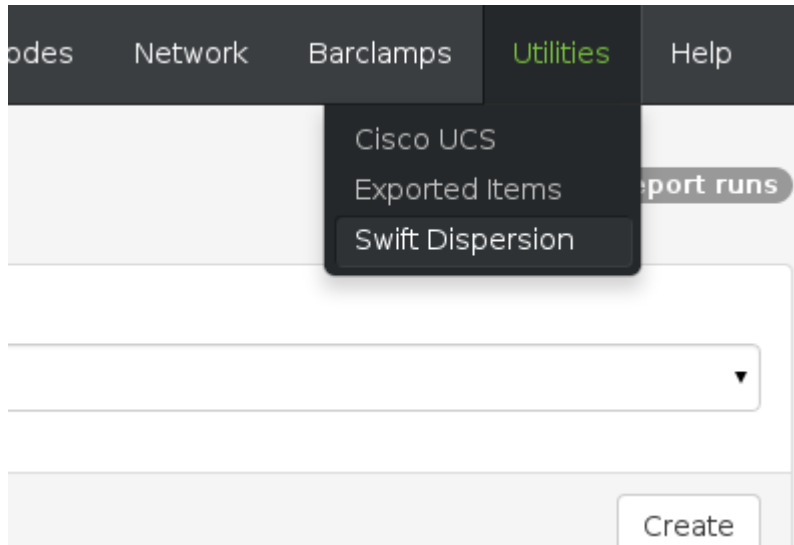
- Get the exact URL it tries to access!
- Enable “debug” in Horizon barclamp
- Test components individually



OpenStack Identity: Keystone

- Needed to access all services
- Needed by all services for checking authorisation
- Use `keystone token-get` to validate credentials and test service availability

OpenStack Object Store: Swift



`swift stat`

- swift dispersion in Crowbar
- uses regular syslog for many messages:

`/var/log/messages`

`console`

- easiest to debug using `curl`



OpenStack Imaging: Glance

- To validate liveness:

```
glance image-list
```

```
glance image-download <id> > /dev/null
```

```
glance image-show <id>
```

OpenStack Networking: Neutron

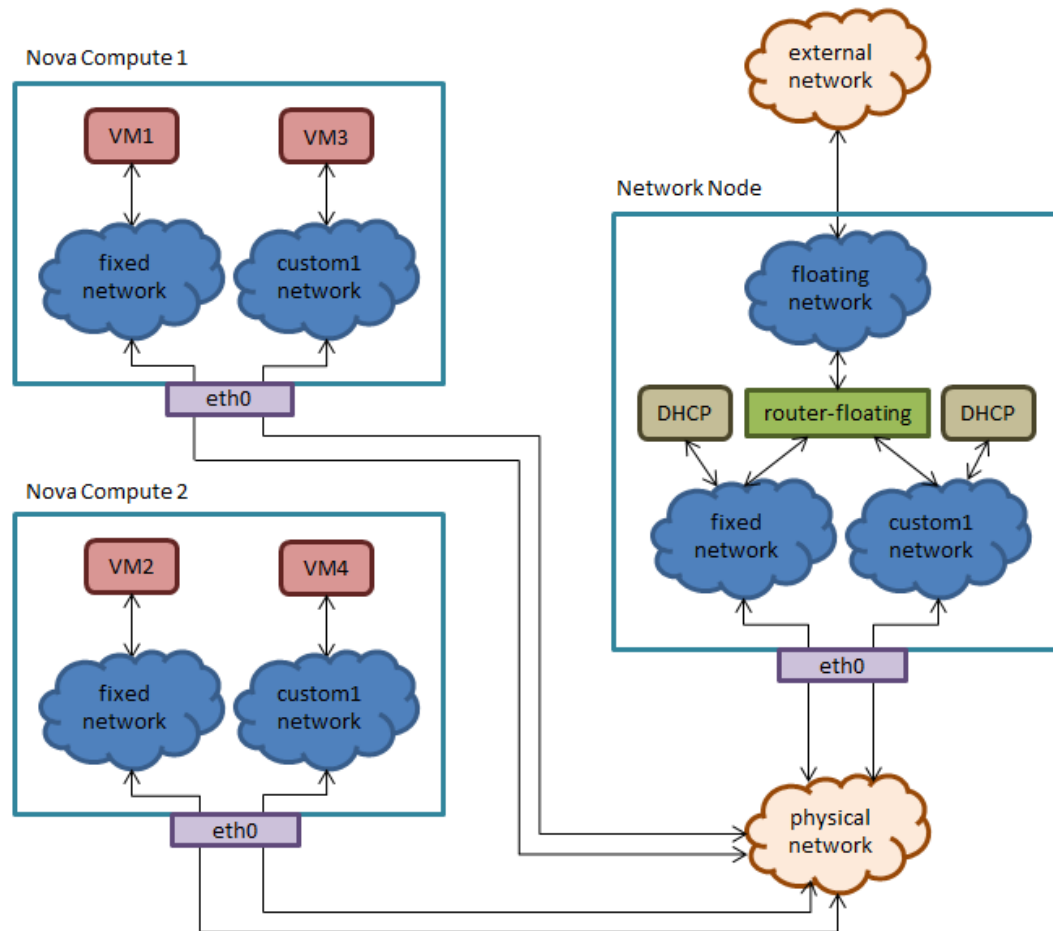


- Swiss Army knife for SDN
 - `neutron agent-list`
 - `neutron net-list`
 - `neutron port-list`
 - `neutron router-list`
- There's no `neutron-manage`

Basic Network Layout

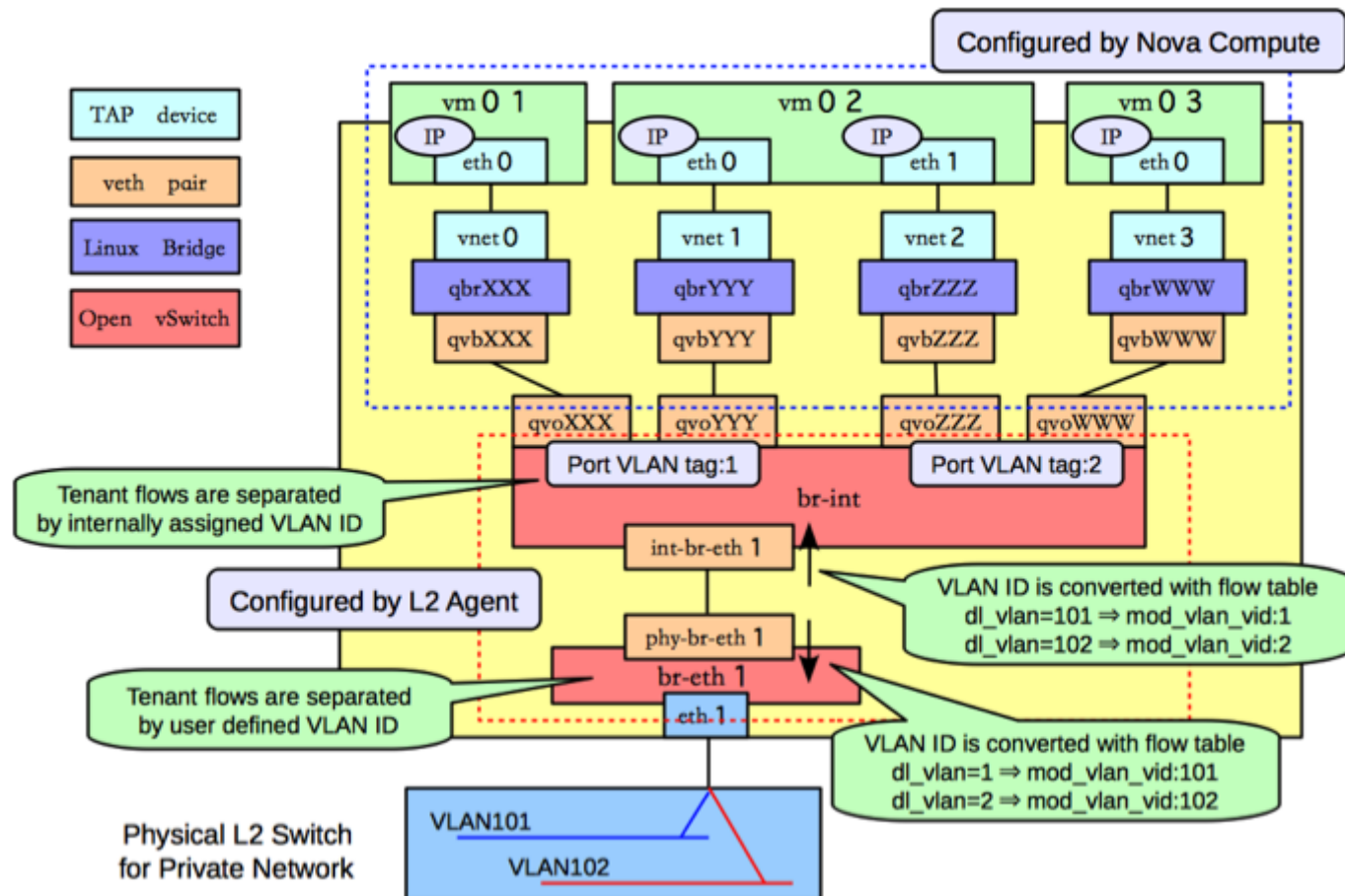


Functional Network View



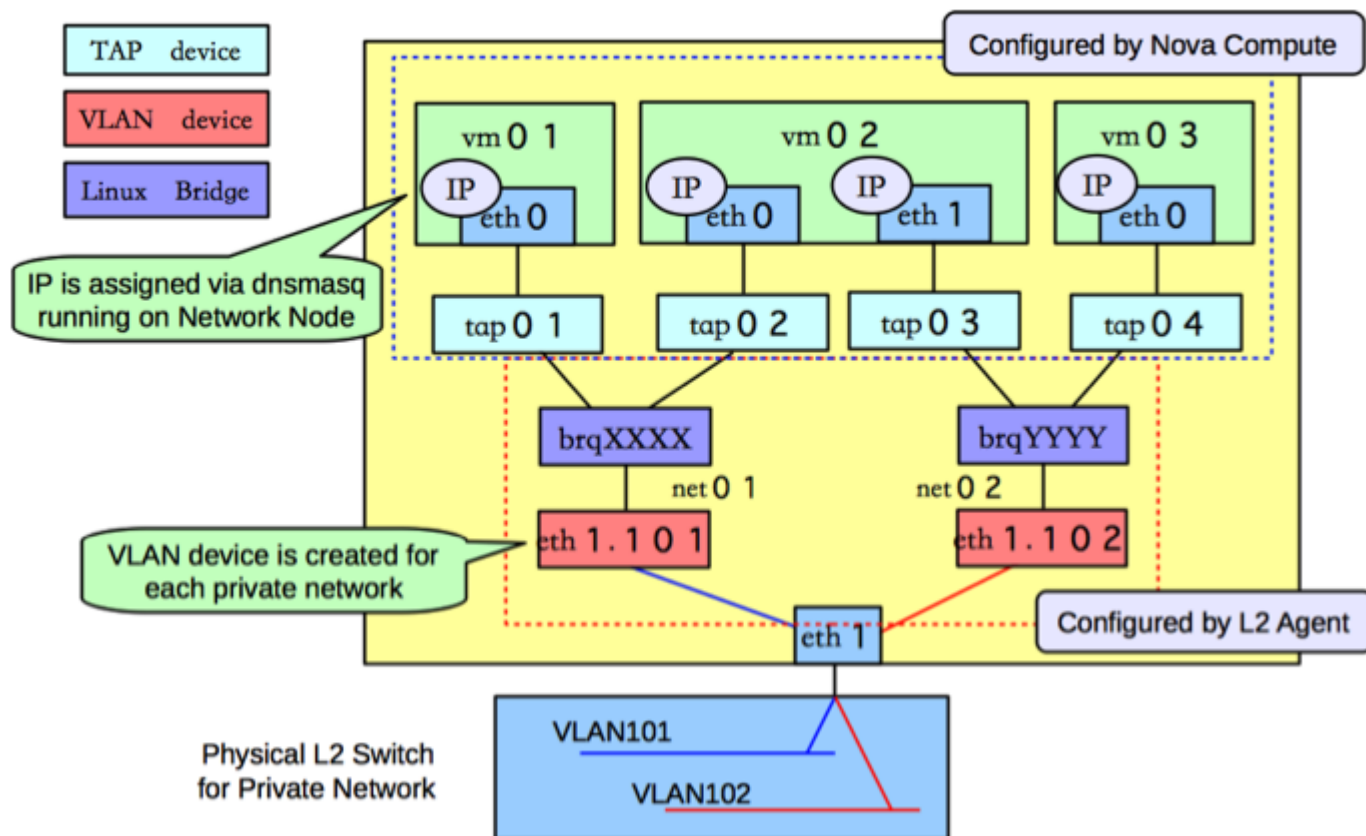
- Note that this diagram assumes the custom1 network is connected to the virtual router.

Networking with OVS: Compute Node



http://docs.openstack.org/havana/config-reference/content/under_the_hood_openvswitch.html

Networking with LB: Compute Node





Neutron Troubleshooting

Neutron uses IP Networking Namespaces on the Network node for routing overlapping networks

```
neutron net-list
```

```
ip netns list
```

```
ip netns exec qrouter-<id> bash
```

```
ping.. arping.. ip ro.. curl ..
```



OpenStack Compute: Nova

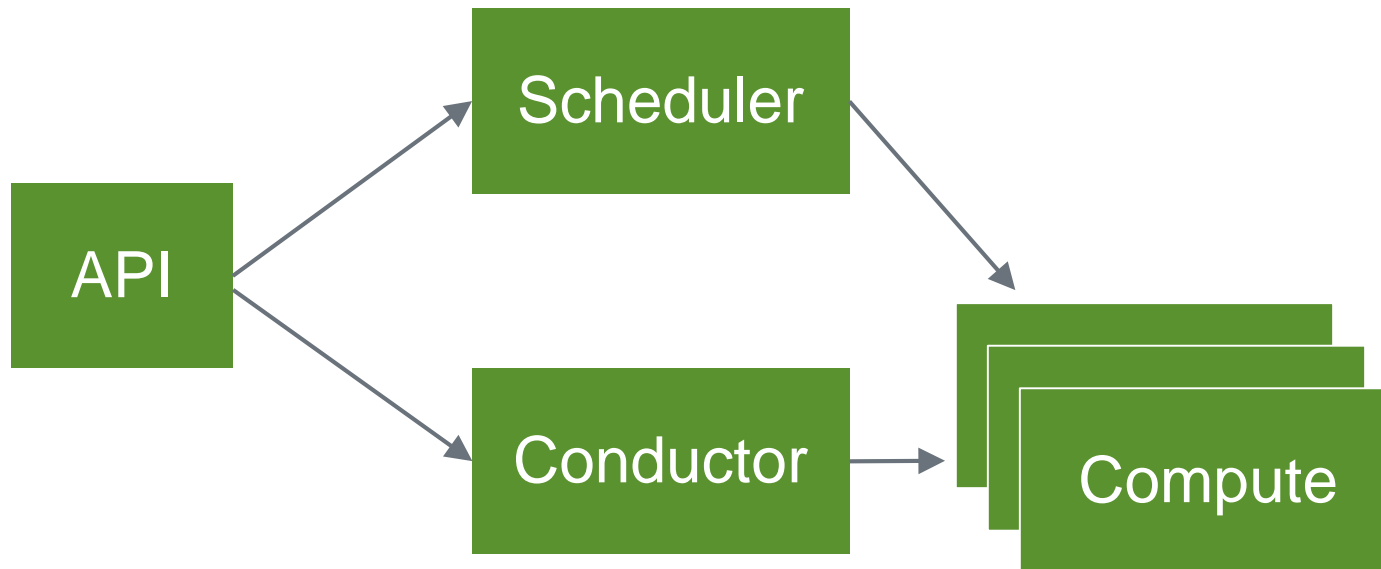
```
nova-manage service list
```

Binary	Host	Zone	Status	State
nova-cert	dde-ad-be-ff-00-01	internal	enabled	:-)
nova-scheduler	dde-ad-be-ff-00-01	internal	enabled	:-)
nova-conductor	dde-ad-be-ff-00-01	internal	enabled	:-)
nova-compute	dde-ad-be-ff-1e-01	nova	enabled	:-)
nova-consoleauth	dde-ad-be-ff-00-01	internal	enabled	:-)
nova-compute	dde-ad-be-ff-1e-02	nova	enabled	:-)

`nova show <id>` with admin privileges shows compute node

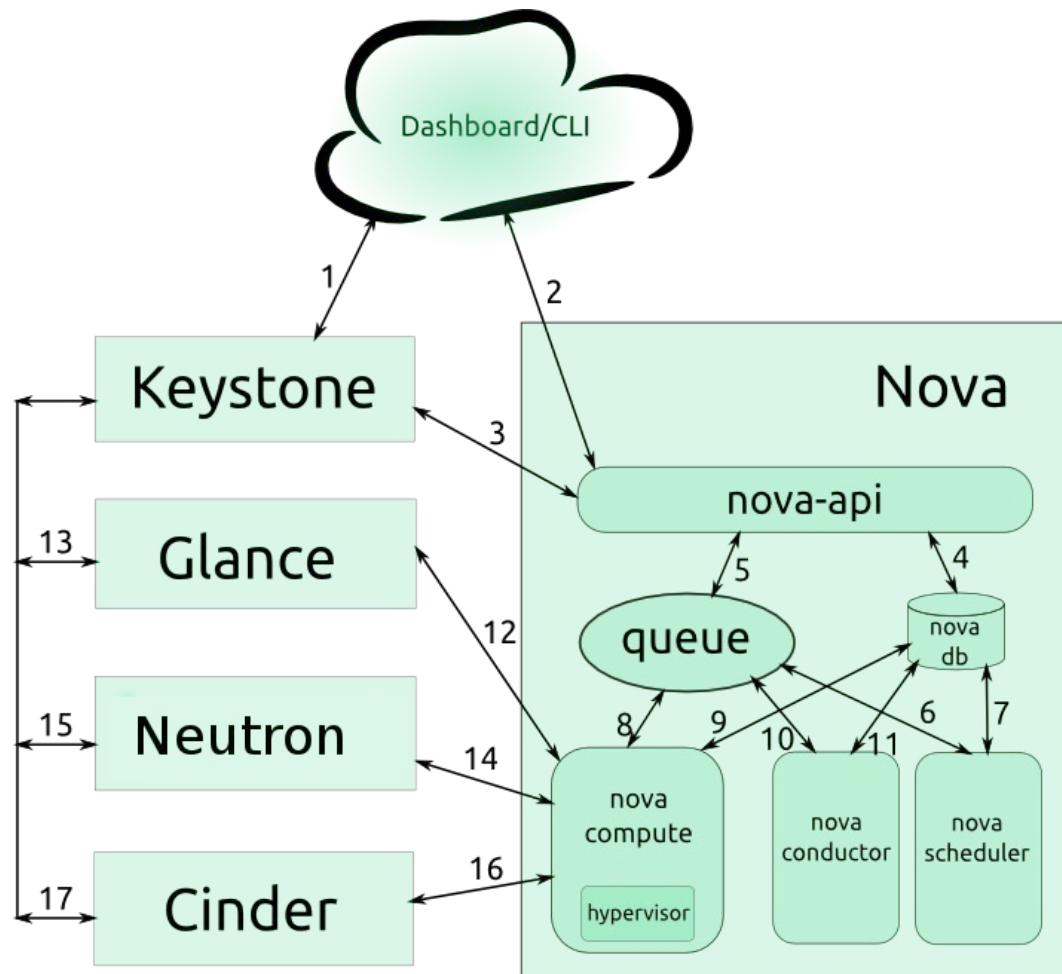
`virsh list` or `virsh dumpxml` can be used to analyze state of VM

Nova Overview



"Launches" go to Scheduler; rest to Conductor

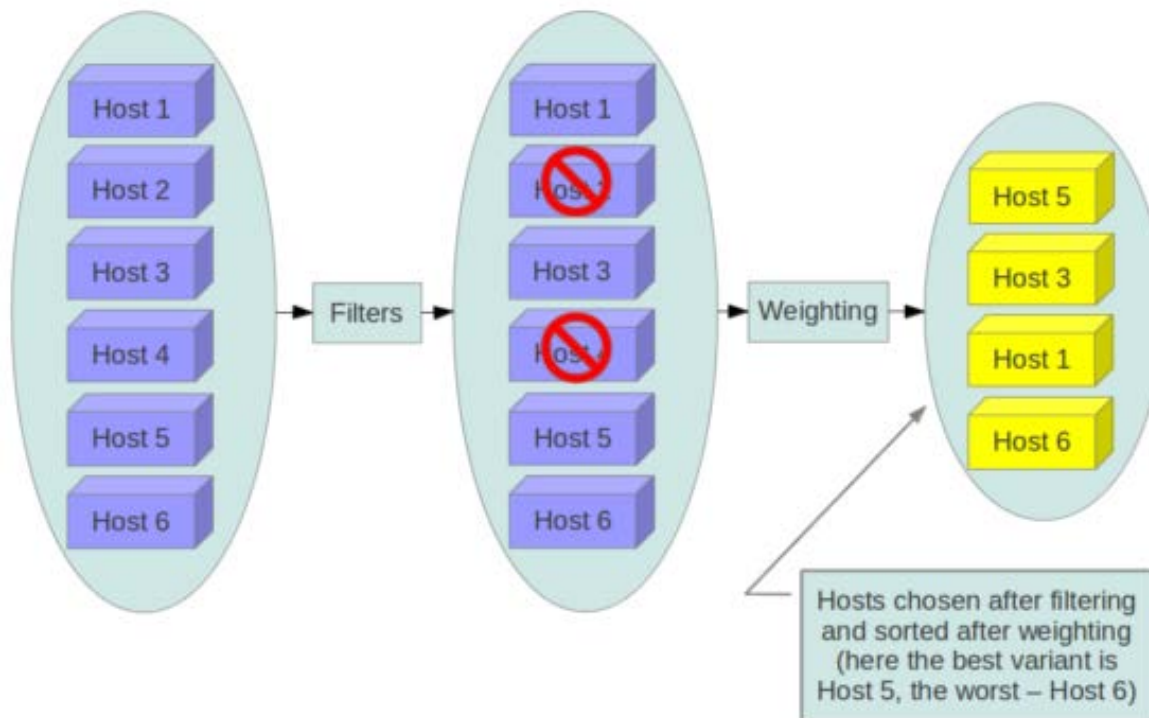
Nova Booting VM Workflow





Nova: Scheduling a VM

- Nova scheduler tries to select a matching compute node for the VM



Nova Scheduler



Typical errors:

- No suitable compute node can be found
- All suitable compute nodes failed to launch the VM with the required settings
 - nova-manage logs errors

```
INFO nova.filters [req-299bb909-49bc-4124-  
8b88-732797250cf5  
c24689acd6294eb8bbd14121f68d5b44  
acea50152da04249a047a52e6b02a2ef] Filter  
RamFilter returned 0 hosts
```



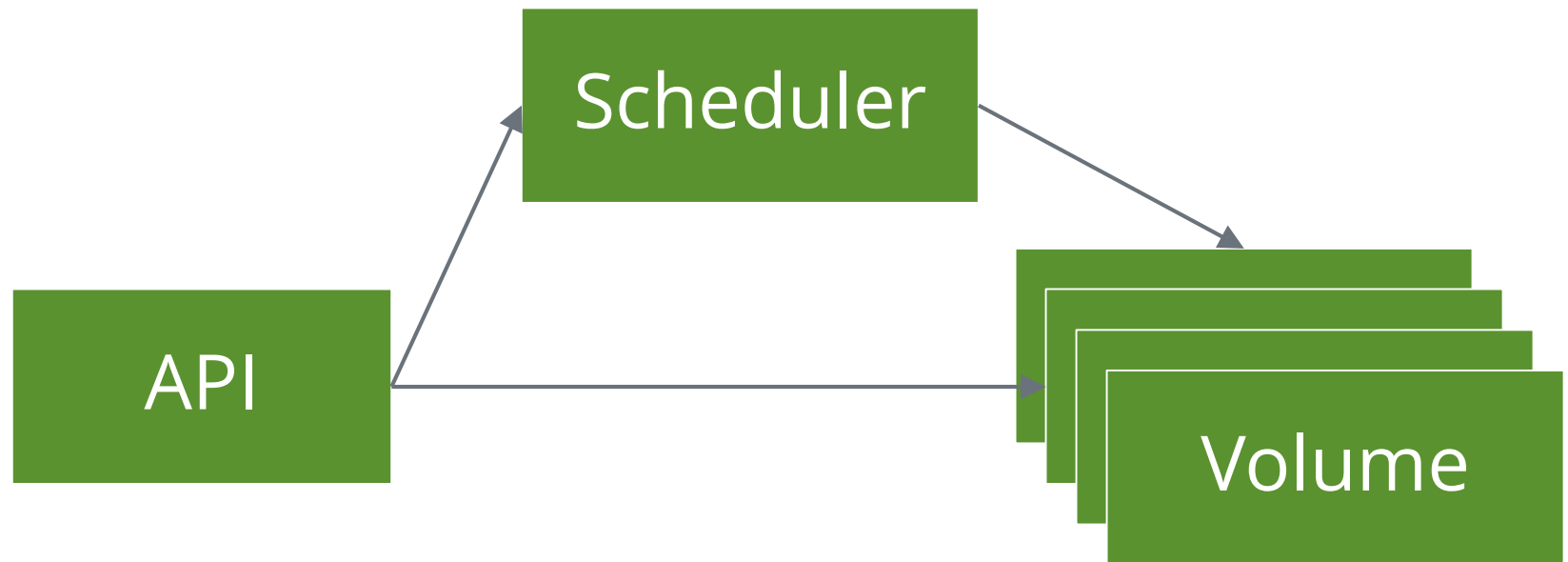
Nova Scheduler

Typical errors:

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```
INFO nova.filters [req-299bb909-49bc-4124-8b88-732797250cf5 c24689acd6294eb8bbd14121f68d5b44  
acea50152da04249a047a52e6b02a2ef] Filter  
RamFilter returned 0 hosts
```


OpenStack Volumes: Cinder





OpenStack Cinder: Volumes

Similar syntax to Nova:

```
cinder-manage service list
```

```
cinder-manage logs errors
```

```
cinder-manage host list
```

```
cinder list | show (with admin privs) shows volume-host
```

Troubleshooting Cloud-Init

- OpenStack Services like Heat or Nova depend on cloud-init
 - sets host name, ssh keys, resizes disks, launches custom scripts on boot
- Heat uses scripts to launch cfntools
- use `curl` on the metadata server inside the VM

`/var/lib/cloud/`

`/var/log/cloud-init.log`

Q&A

- <http://ask.openstack.org/>
- <http://docs.openstack.org/>
- <https://www.suse.com/documentation/suse-cloud4/>

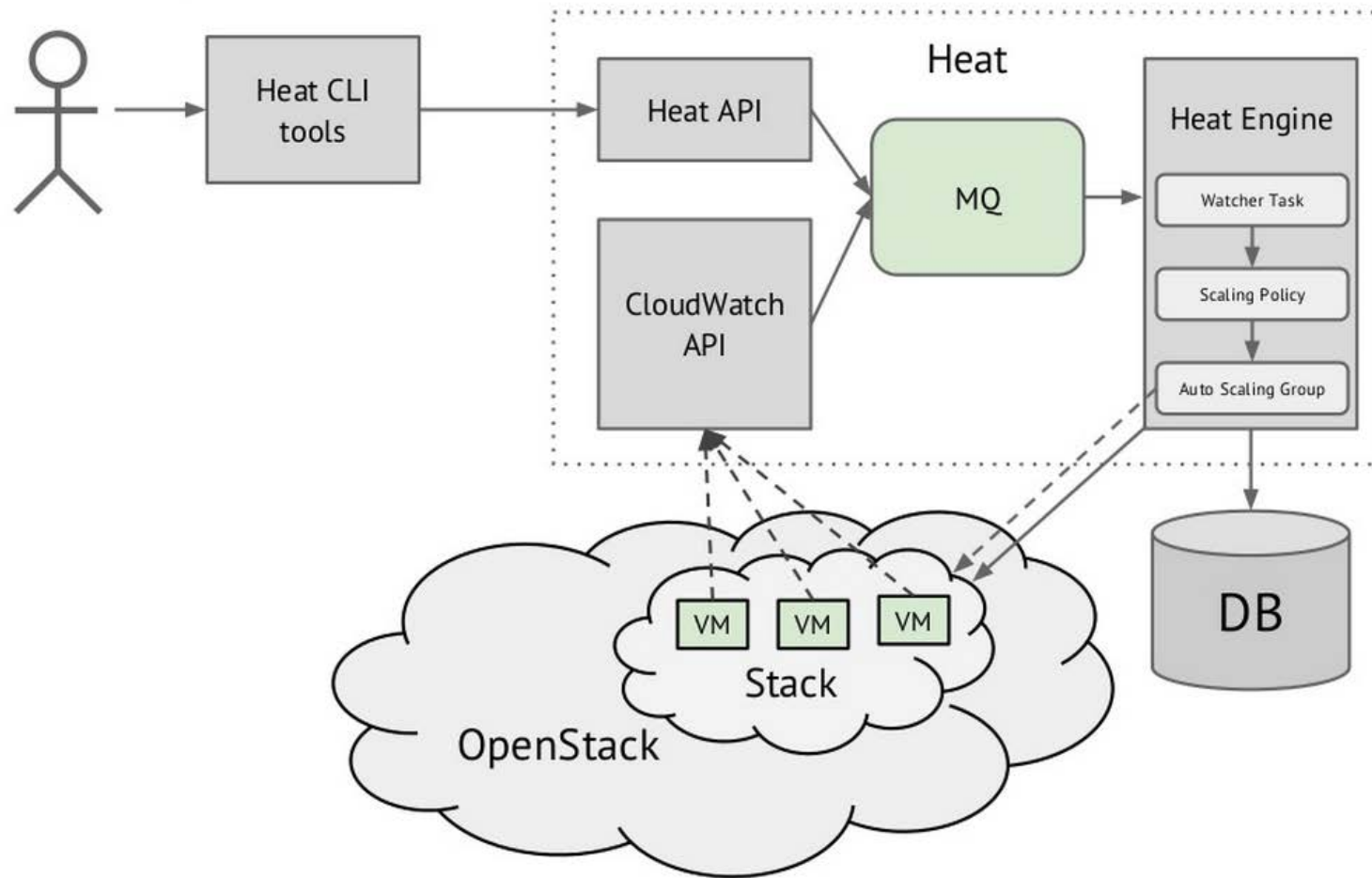


Thank you



Bonus Material

OpenStack Orchestration: Heat



OpenStack Orchestration: Heat

- Uses Nova, Cinder, Neutron to assemble complete stacks of resources

```
heat stack-list
```

```
heat resource-list|show <stack>
```

```
heat event-list|show <stack>
```

- Usually necessary to query the actual OpenStack service for further information

OpenStack Imaging: Glance

- Usually issues are in the configured glance backend itself (e.g. RBD, swift, filesystem) so debugging concentrates on those

- Filesystem:

```
/var/lib/glance/images
```

- RBD:

```
ceph -w
```

```
rbd -p <pool> ls
```


SUSE® Cloud





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