CLOUD COMPUTING

FSFTN Summer Workshop

IIT - Madras | June 18, 2014

http://fsftn.org

Traditional Computing: Challenges

- ☒ Scaling and Redundancy
- ☒ Manageability & Monitoring
- ☒ Co-location, Power & HVAC challenges
- ☒ Disaster Recovery & Business Continuity
- ☒ More time spent on operations than on development
- ☒ Deploying resources
- ☒ Isolation of components and security
- ☒ Maintenance & Provisioning
- ☒ Compliance to standards & Certifications

VIRTUALIZATION

☑ Many-scale deployment suddenly easier

☑ API based access - LibVirt

☑ Better utilization of hardware

☑ Better Maintenance & Provisioning

But..

☒ Still doesn't scale enough

☒ Backup, DR & BC still tricky

So we need something that..

☑ scales rapidly and to hundreds of nodes

☑ is completely manageable via APIs

☑ is secure with isolatable resources

☑ performs well under extreme changes in load

☑ delivers fast across the globe irrespective of device

☑ is very cheap with disposable resources

☑ is easy to setup a DR/BC plan with

☑ complies with international standards and protocols

Cloud: pseudo-definition

" ..a computing model where computing resources can be automatically provisioned on-demand over the network via API calls.. "

(Let's dissect our definition)

Computing Resources

- RAM, CPU, Network, Disks
- Operating Systems, Software & Libraries, API

Automatic, On-demand provisioning

- Automatic Provisioning based on load

Over the n/w via API

- Everything is controlled by API calls
- Cloud resources are on the Internet

Features

- Rapid scalability under duress
- Performance & Network reach
- Availability & Redundancy
- Automatic provisioning of resources
- Inexpensive - Near zero CapEx and Very Low OpEx
- Manageability via API calls
- Easy to setup DR / BC
- Monitoring & Metrics

Features contd..

- Resource Isolation
- Secure and Open
- Programmable
- Compliance to standards
- Pay-as-you-go model based on telemetry
- Disposability of resources
- Reliability

Cloud Models

Architecture Models

- Public Cloud
- Private Cloud
- Hybrid Cloud

Service Models

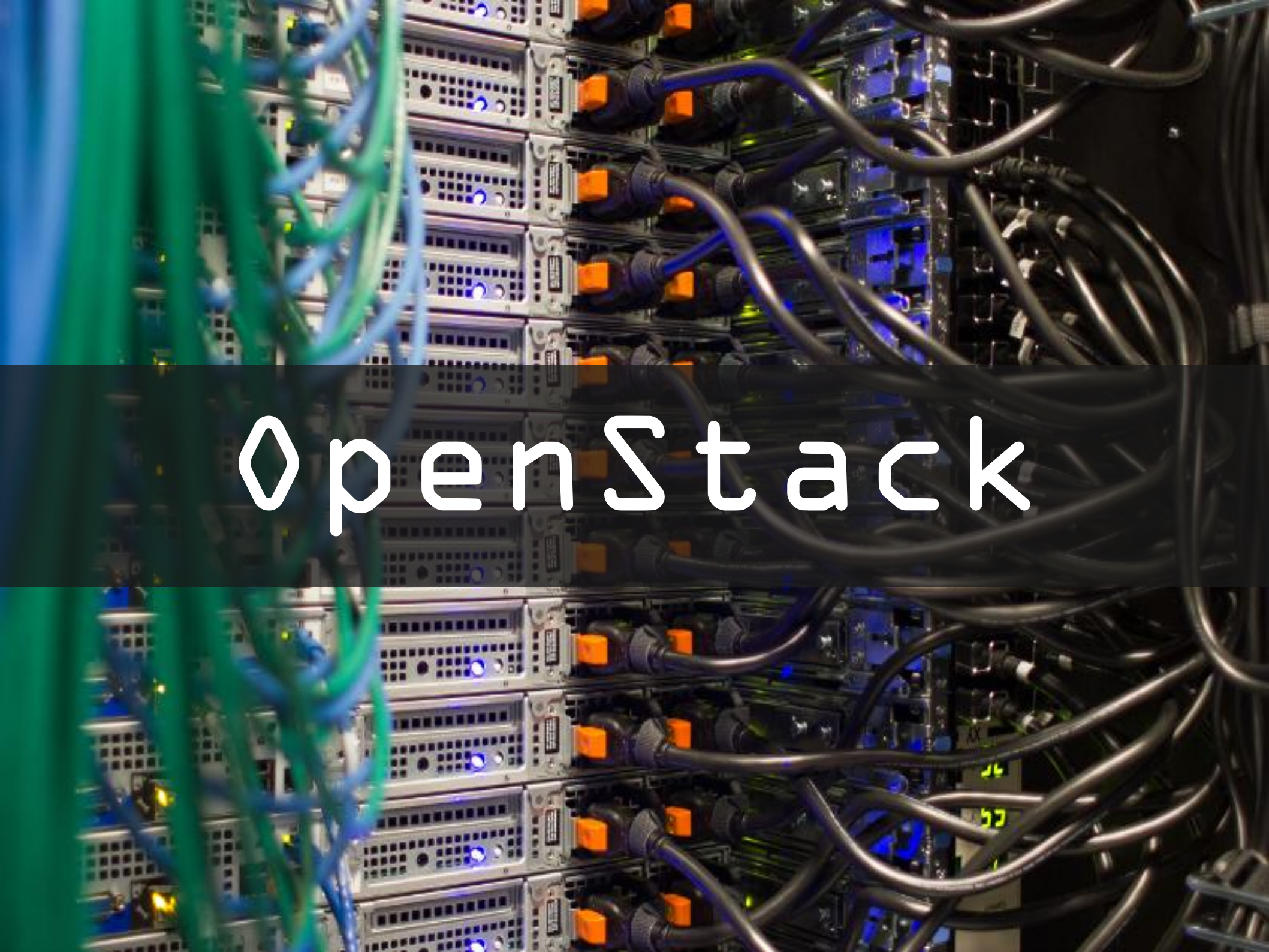
- Infrastructure as a Service - IaaS
- Platform as a Service - PaaS
- Software as a Service - SaaS
- Metal as a Service - MaaS
  (A dumb term coined by shitty people for private servers or VPS)

Issues with Cloud

- ☠ Vendor Lock-In & Interoperability
- ☠ Privacy concerns
- ☠ Data Ownership
- ☠ Non-Compliance to standards
- ☠ Data and Network security risks
- ☠ Cloud Monopoly
- ☠ Government usage of public cloud

Free Software Cloud

- OpenStack - Python
- OpenNebula - C++, etc.
- Apache CloudStack - Java
- OpenShift - Ruby
- CloudFoundry - Ruby, Go
- ownCloud - PHP, JS
- Netflix Asgard
- Scalr
- Foreman
- Paypal Aurora
- HybridFox for Firefox


OpenStack

OpenStack programs

- Nova - compute
- Swift - object store
- Glance - image service
- Keystone - identity
- Horizon - dashboard
- Neutron - networking
- Cinder - block store
- Ceilometer - telemetry
- Heat - orchestration
- Trove - DB service
- Sahara - data processing
- Ironic - bare-metal
- Marconi - queue service
- Barbican - key management
- Designate - DNS service
- TripleO - deployment

Getting Help

Installation

- DevStack
- PackStack
- SaltStack

Seeking Help

- Official Documentation
- OpenStack Wiki and External Blogs
- OpenStack Mailing Lists, Forums, IRC, ask.openstack.org
- Meetups and conferences

fin.

Questions?

Slides and SVG source at GITHUB

http://fsftn.org