



CLOUD COMPUTING APPLICATIONS

Metal As A Service

Roy Campbell & Reza Farivar

Definition

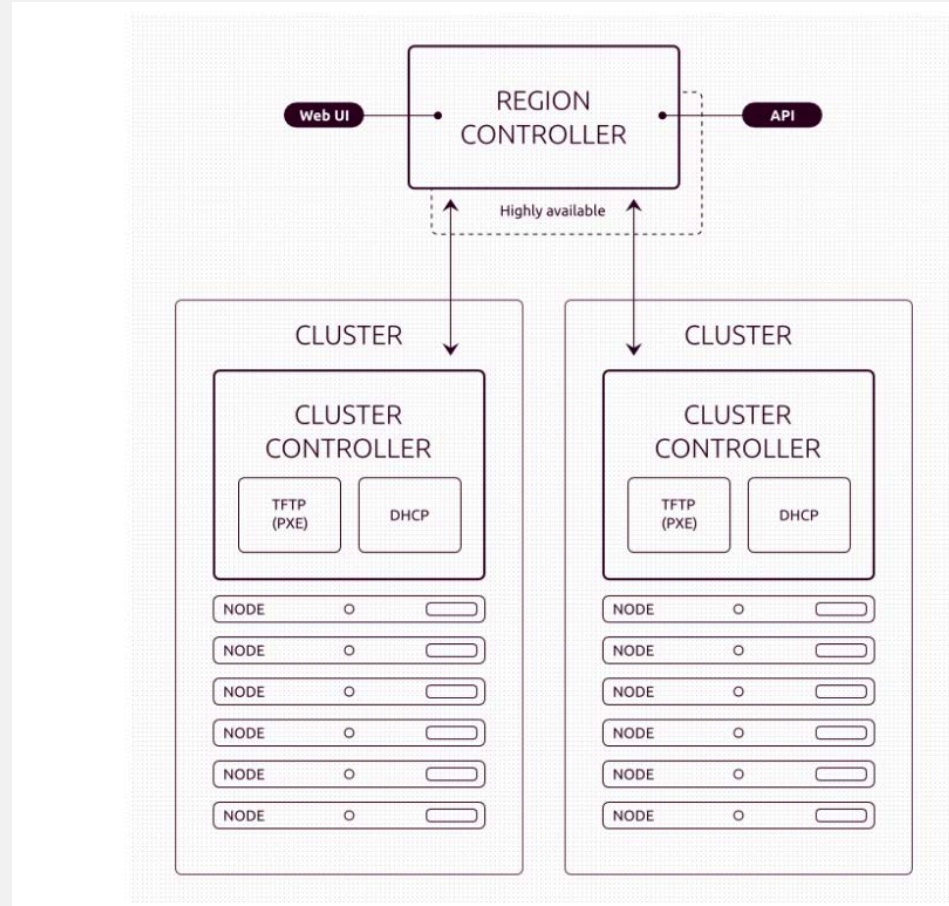
Metal as a Service (MaaS) combines the scalability and flexibility of the cloud with the ability to harness the power of physical servers.

<https://www.openstack.org/summit/vancouver-2015/summit-videos/presentation/bare-metal-beyond-ironic>

Use case

- Give me a new server machine
- Install my chosen operating system
- Configure the drives like this
- Configure the network like this
- Use these credentials
- Don't need the server anymore

MAAS Components





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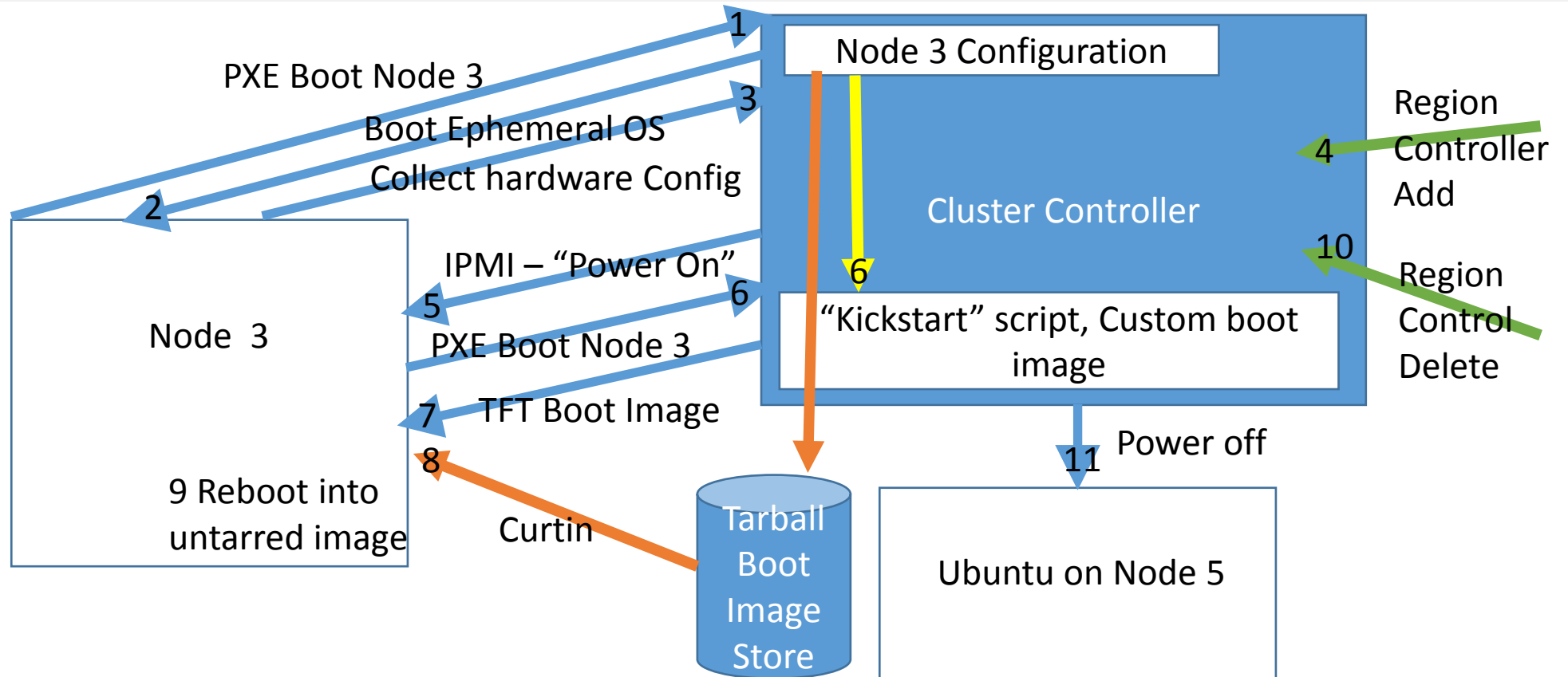
Maas Sequence of Events

- Discovery or Enlisting
- Enrolling
- Commissioning
- Deploying

SRG Demonstration of MAAS

- <http://192.17.176.2/MAAS/#/nodes>

MAAS



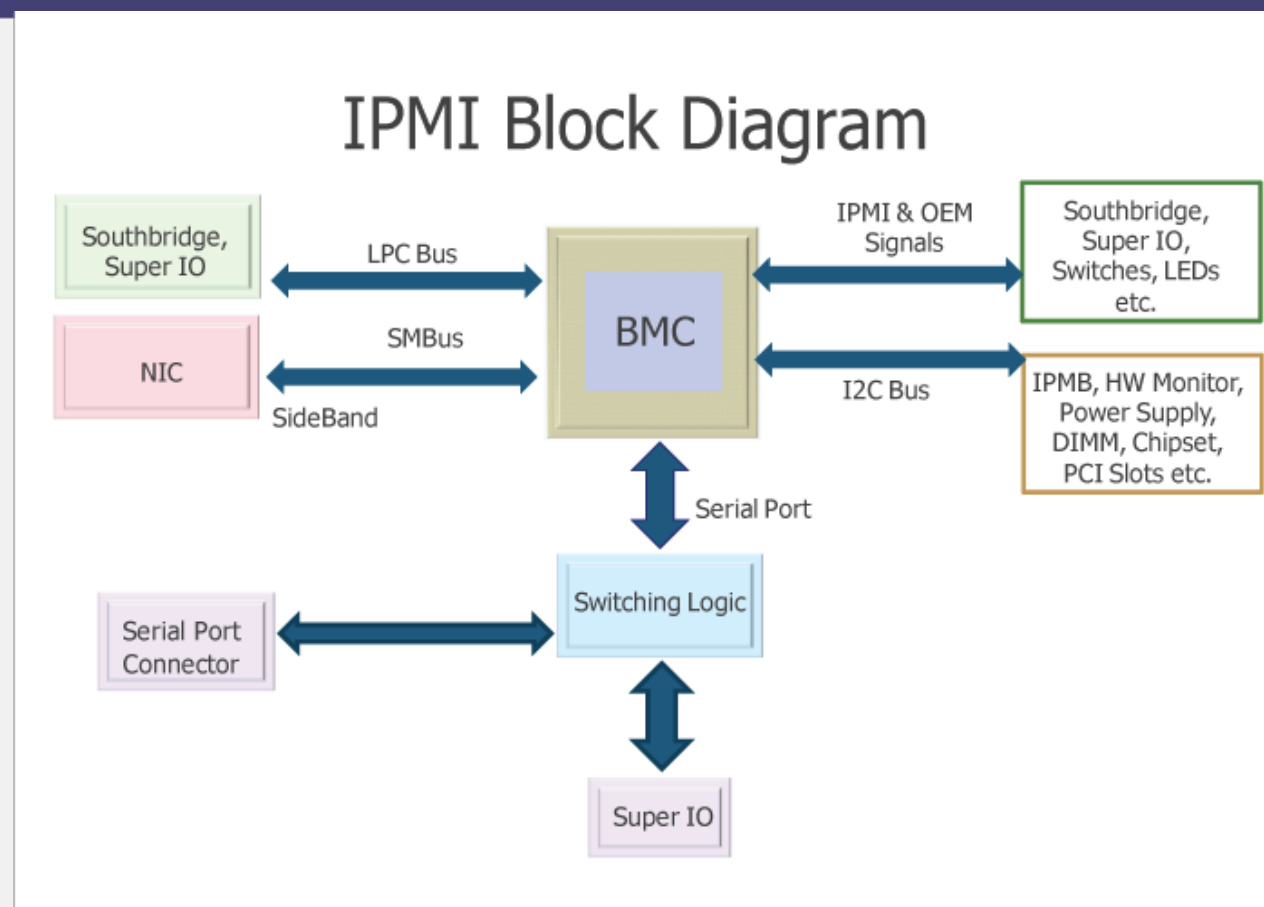
MaaS use

- Pool of nodes
- Nodes can be allocated to users with user authentication credentials for remote access using queries like memory size and numbers of cores
- Users can choose the operating system and application to run on a node(s)
- When finished with nodes, they can be returned to pool

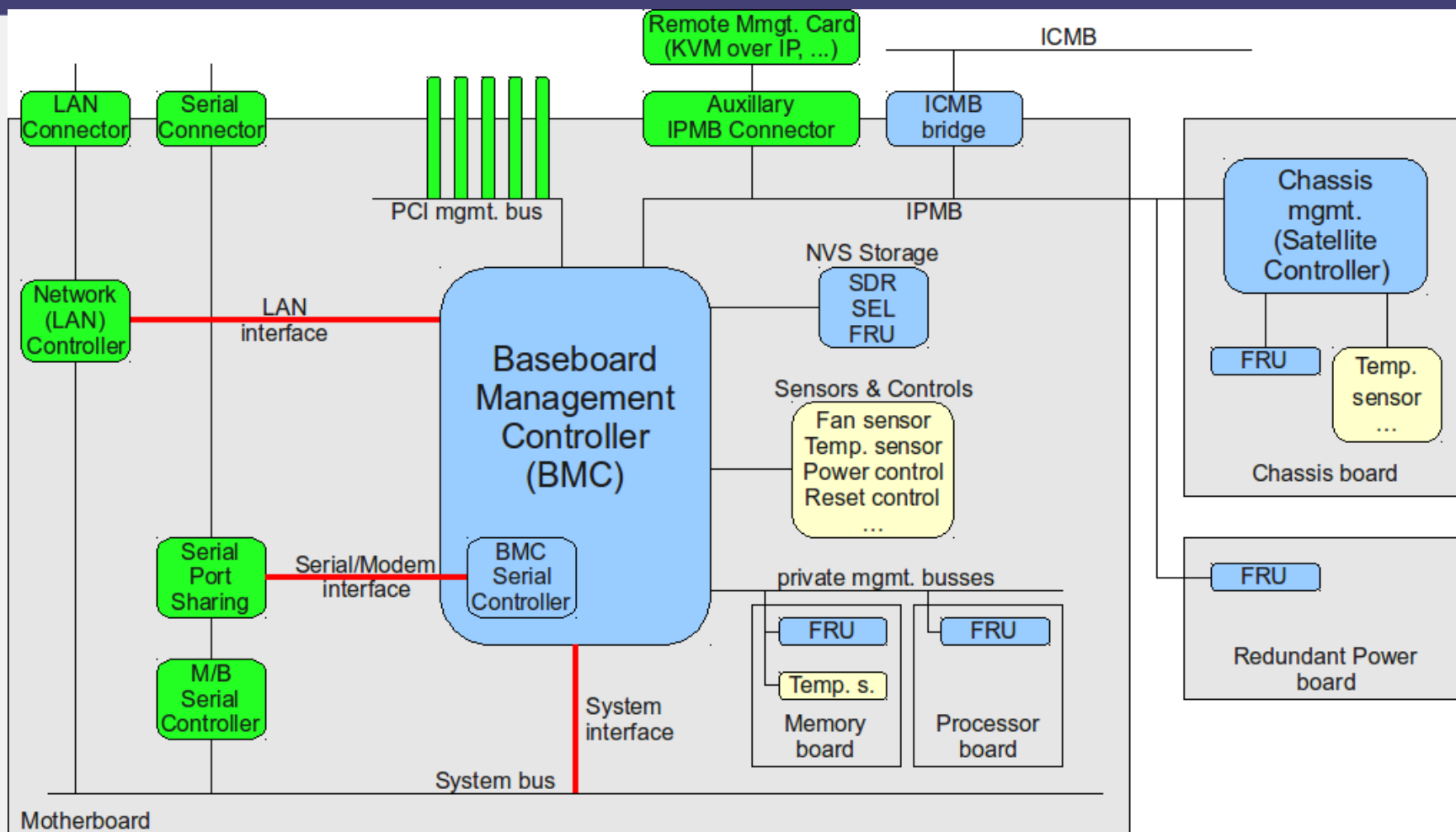
Intelligent Platform Management Interface (IPMI)

- autonomous computer subsystem
 - set of computer interface specifications
- management and monitoring capabilities
- independent of the host system's CPU, firmware (BIOS or UEFI) and operating system.

IMPI Hardware



Baseboard Management Controller



IPMI Usage

- before an OS has booted (allowing, for example, the remote monitoring or changing of BIOS settings)
- when the system is powered down
- after OS or system failure – the key characteristic of IPMI compared with in-band system management such as by remote login to the operating system using [SSH](#)

PXE

- When using PXE the boot process is changed from the normal order to:
- Power on → BIOS → Network Card's PXE stack → Network Boot Program (NBP) downloaded using TFTP from server to Client's RAM → NBP's responsibility to perform the next step (a.k.a. 2nd stage boot).
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Juju

Roy Campbell & Reza Farivar

Juju

- Services as atoms that can be instantiated
- Depends/Provides
- Abstracts and maintains Elasticity
- Services loosely coupled but highly cohesive
- Works at user level to deploy system software like Hadoop on machines owned by user
- Allows fast devops for users of MAAS and OpenStack
- Supports Openstack as well

Juju Charms

- Charms are shareable, re-usable, and repeatable expressions of DevOps best practices
- Use them unmodified or easily change them to meet needs
- Like a package: ask install it or remove it
- Works across Clouds: OpenStack, EC2, ...

Charms for over 300 Services



Ceph



Hadoop



IBM DB2



Kubernetes



MariaDB



MongoDB



MySQL



Nagios



PostgreSQL



Redis

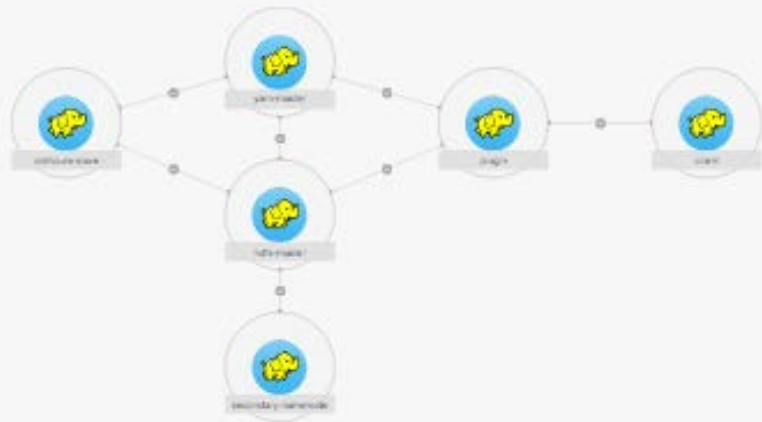


Spark

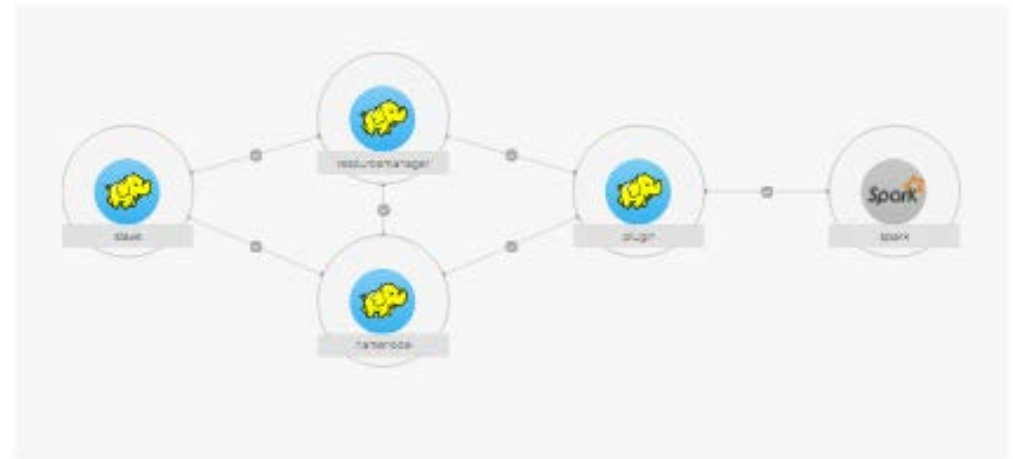


Wordpress

Bundles



Apache MapReduce
by **charm**ers • trusty



Apache Spark
by **charm**ers • trusty

Open Stack and Web Infrastructure Charms



OpenStack
by **charm**ers • trusty



Web infrastructure in a box
by **charm**ers • trusty

Canonical Group Demonstration

- Interactive Construction
- <https://demo.jujucharms.com/>