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Baremetal as a Service within the Enterprise: An SAP use-case

Carmelo Ragusa, Tariq Ellahi, SAP
April 26, 2016

Outline

Objective

- SAP work to adopt OpenStack as a single management solution for baremetal as well as virtualized environments
- Main focus of this presentation is the baremetal as a service solution

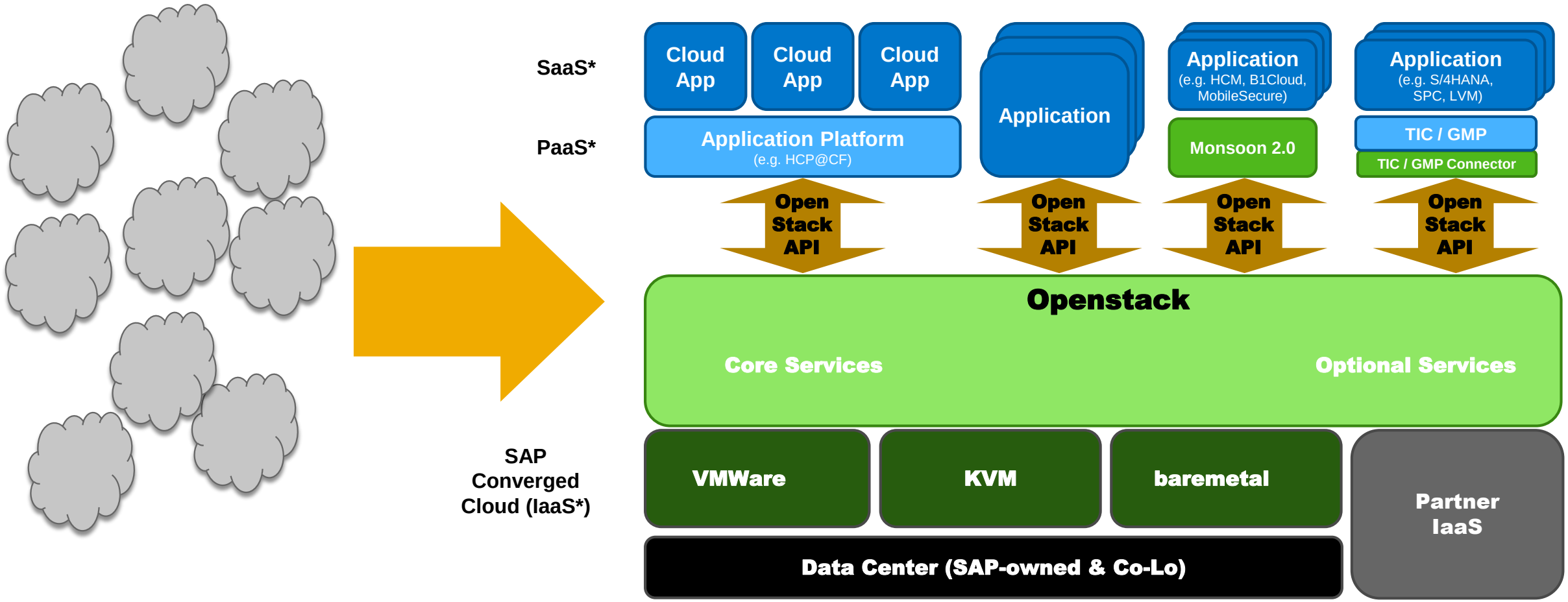
Audience

- Companies and enterprises sharing similar requirements

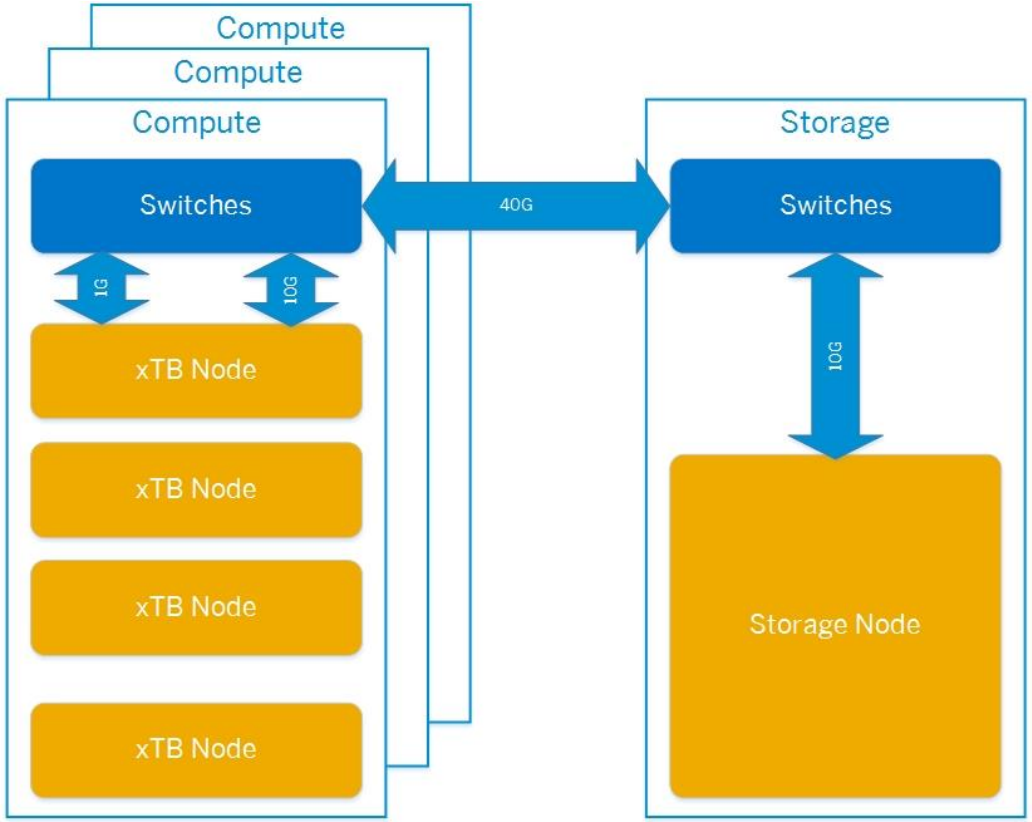
Content

- Background on SAP converged cloud plan
- Current in-house solution
- Enterprise requirements
- OpenStack evaluation
- Ironic integration into BMaaS
- Future work

Background – SAP converged Cloud



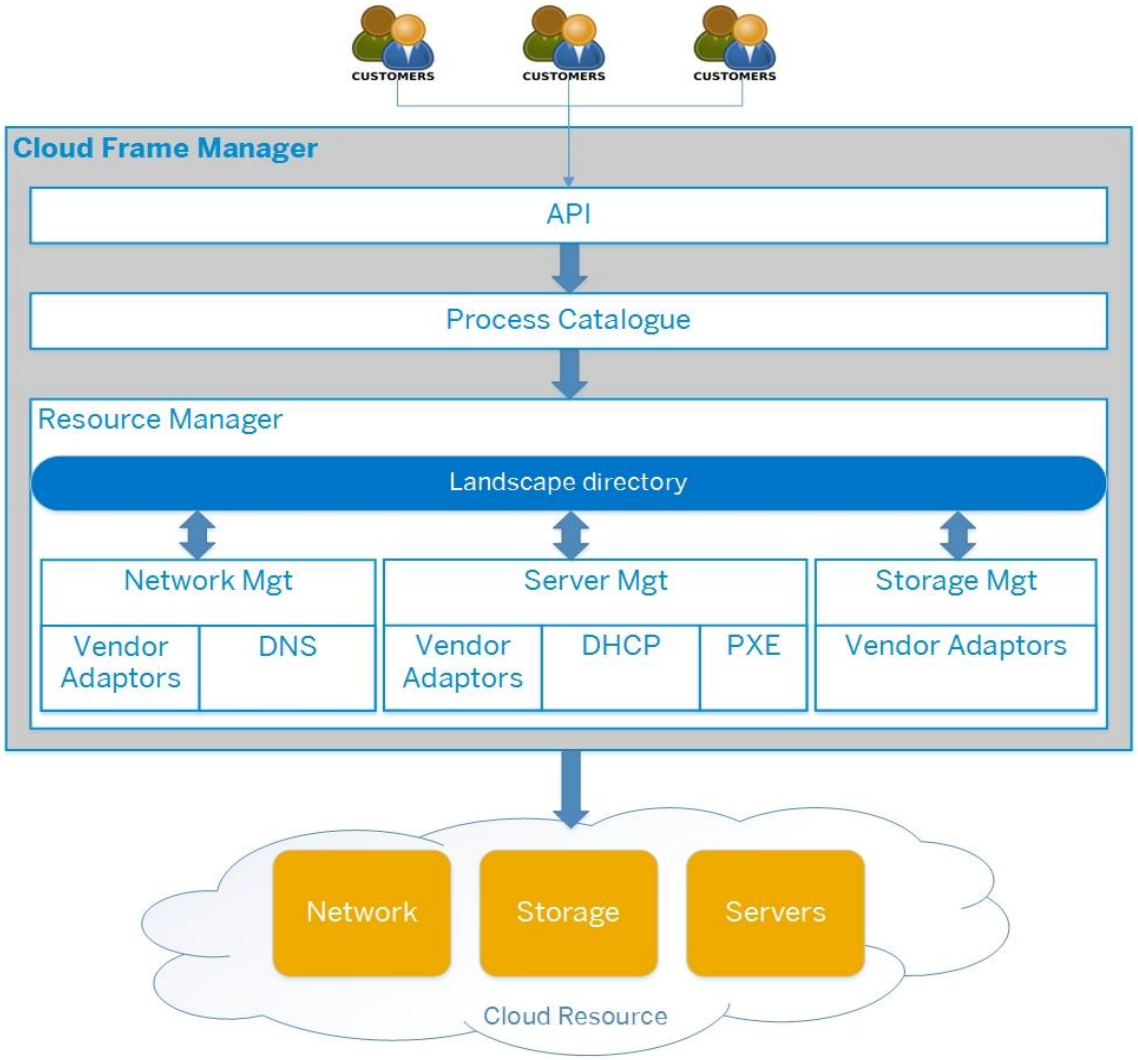
HANA Cloud Cell



- A standardized infrastructure platform
- Designed to deliver HANA landscapes in cloud environments
- Optimised for performance, scalability, reliability and security needs of SAP customers

Cloud Frame Manager (CFM)

- Manage lifecycle of the infrastructure resources in the HANA Cloud Cell and HANA landscapes
- Acts as the control plane of the baremetal infrastructure including
  - server provisioning automation
  - network automation
  - storage management



Enterprise requirements

- Baremetal Infrastructure Management
- Vendor-agnostic Control Plane
- Open API
- Multi-tenant networking
- Network reliability
- Multiple deployment models

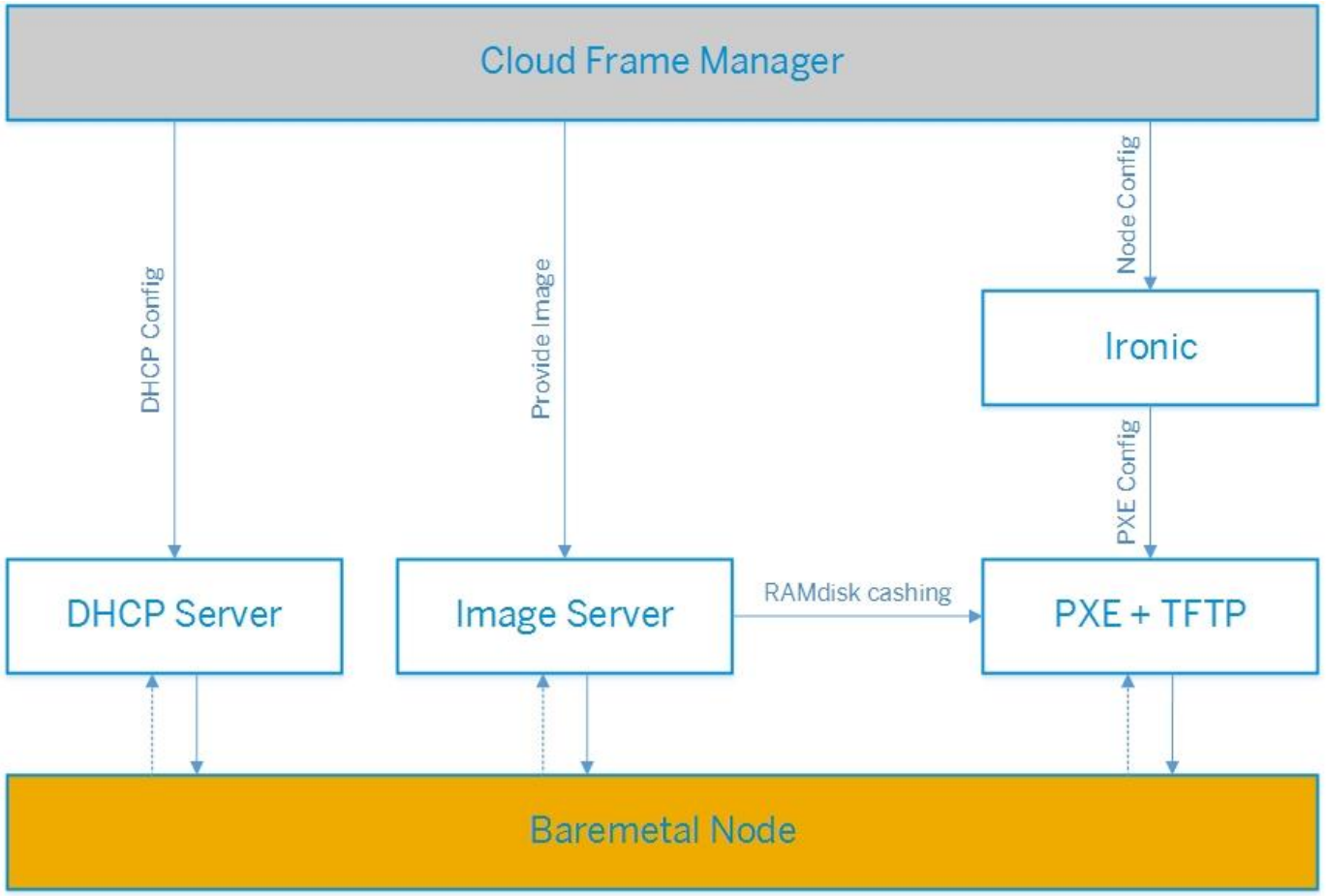
Openstack evaluation – Out of the box

- Active support from multiple vendors
- Standardised API
- Multiple deployment models
  - Local boot was already in CFM future plans
  - Ironic supported it out of the box
- Active community support on new features and bugs
  - E.g. From bug report in IPA to patch committed to the master branch within hours
- Ironic standalone mode

Openstack evaluation - Findings

- RAID support
  - Already being implemented in Ironic
- Multi-tenant networking
  - Ironic only supported flat networks
  - Neutron supports VLAN segmentation, but Ironic didn’t integrate with neutron to provision servers on tenants networks
- Lack of support of NFSroot in Ironic
- Logging can be not easy to follow
- No Hardware discovery at the time of evaluation

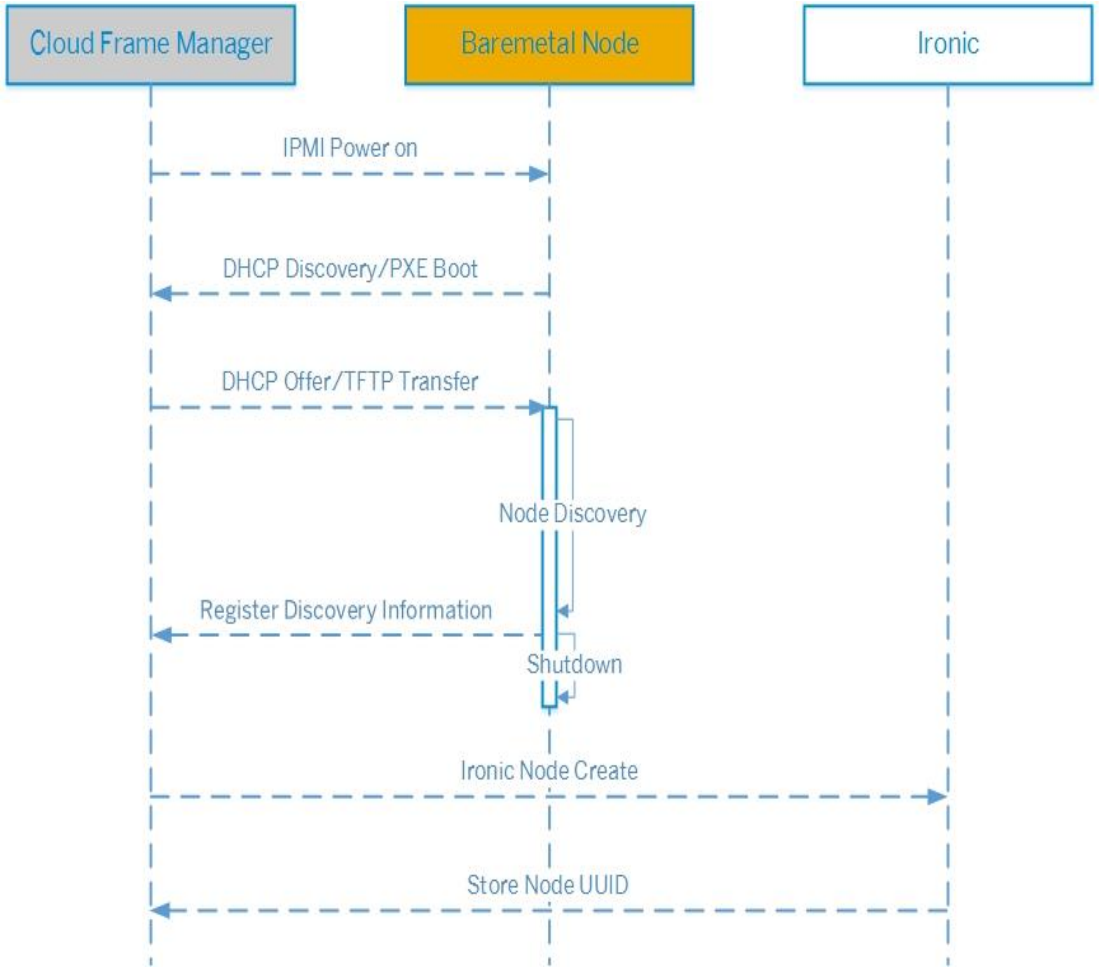
Ironic integration into BMaaS



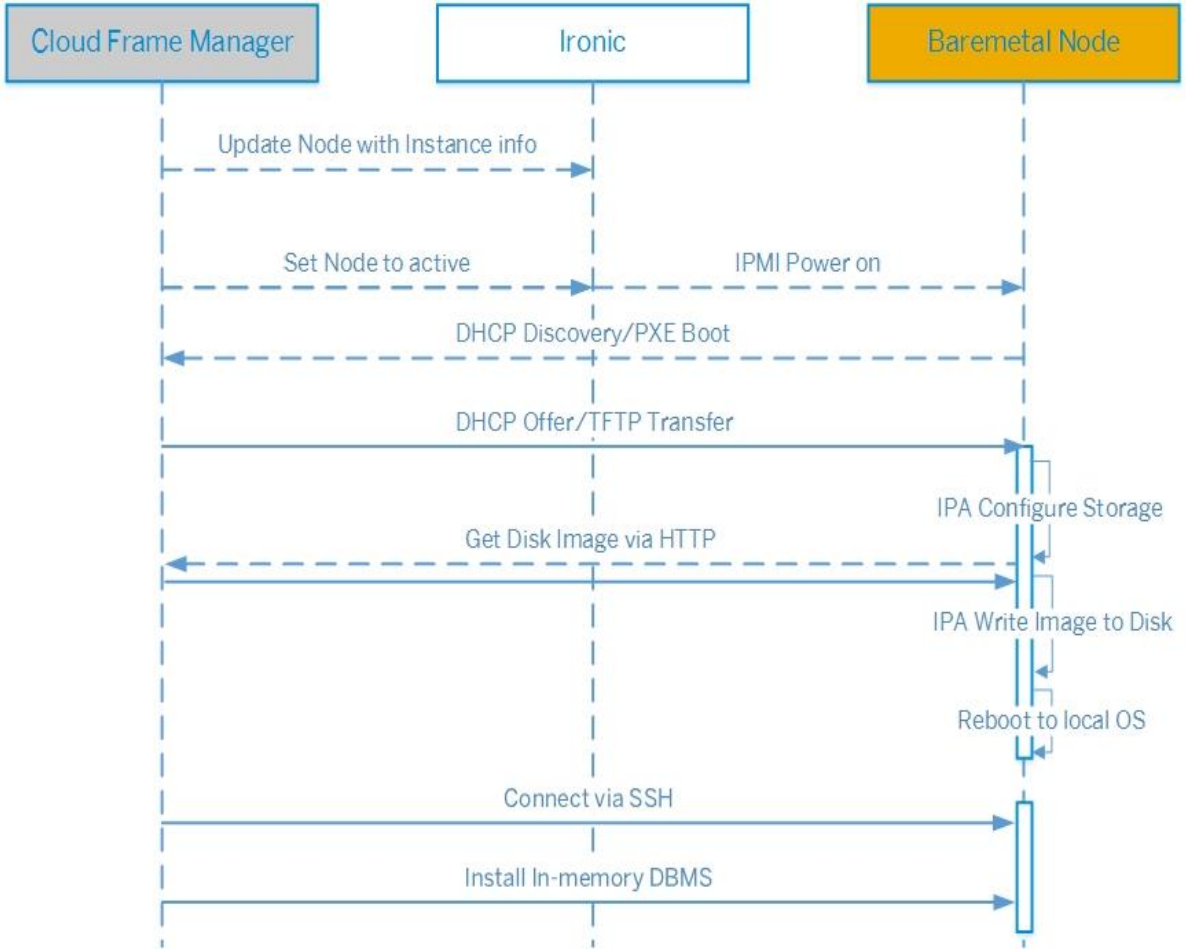
- Integrated Ironic standalone
- Wrapped Ironic API calls in order to be able to call them asynchronously from CFM
- Discovery, networking and image provisioning was kept in CFM

Node Discovery in CFM & Registration in Ironic

- The current discovery script collects node information
- CFM invokes Ironic API to create a node at the end of the discovery process
- UUID from Ironic API response is stored in CFM database
- Node UUID is used by CFM in later operations



Node Deployment & Configuration



- Use of Ironic Python Agent to do baremetal node configuration
  - RAID configuration
  - writing the image to disk
- Node customisation is done using cloud-init
- CFM dynamically generates configdrive user-data

Future work

- Neutron/Ironic integration for managing network provisioning in CFM
  - Joint work with Arista, which is now in Mitaka
- Keystone for authentication and authorisation
- Ironic Inspector in order to unify our discovery and deployment processes by using a single RAMdisk
- Nova for scheduling, availability zones, affinity/anti-affinity
- Ability for Ironic to configure nodes using an NFSroot filesystem, by decoupling deployment from booting operations in Ironic

Thank you

Carmelo.Ragusa@sap.com
Tariq.Ellahi@sap.com