

The logo for Red Hat Summit, featuring the words "RED HAT" in a smaller font above "SUMMIT" in a larger, bold font, both in white on a red rectangular background.

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Bare-metal as a service

OpenStack Ironic service deployment

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Our environment

Amadeus in few words



630+ million total bookings processed in 2017
using the Amadeus distribution platform



1.6 billion passengers boarded in 2017
with Amadeus and Navitaire solutions



1 of the world's top 15 software companies
Forbes 2017 global rankings

Why OpenStack

For the R&D environment

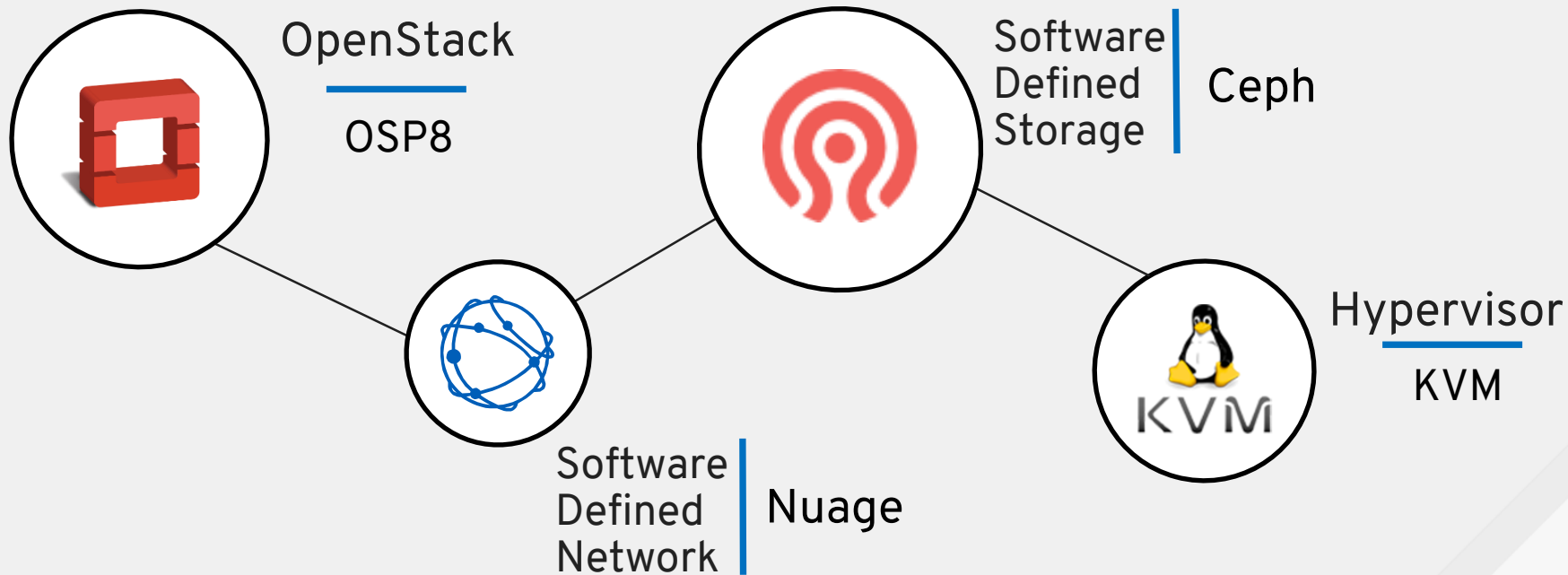


Developers want a platform allowing them to quickly prototype
And a safe place where to test new technologies



They want to easily spawn development and test platforms
And automate infrastructure deployment

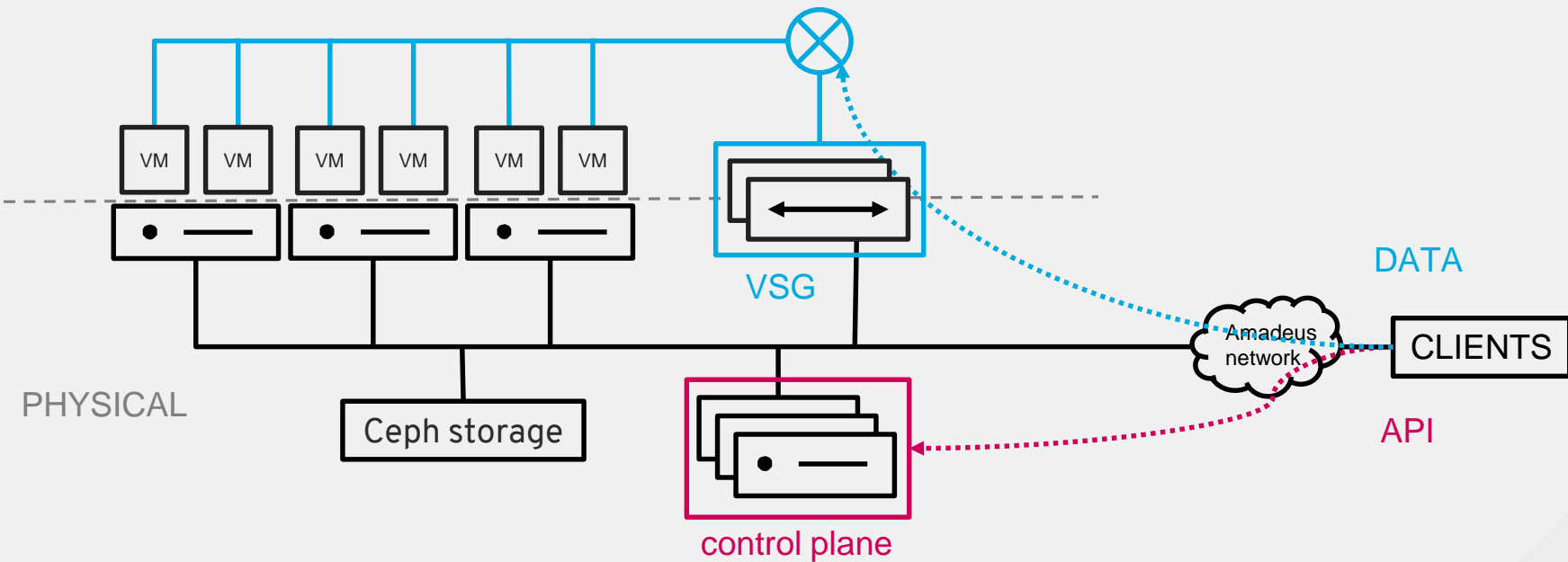
R&D cloud platform anatomy



Under the hood

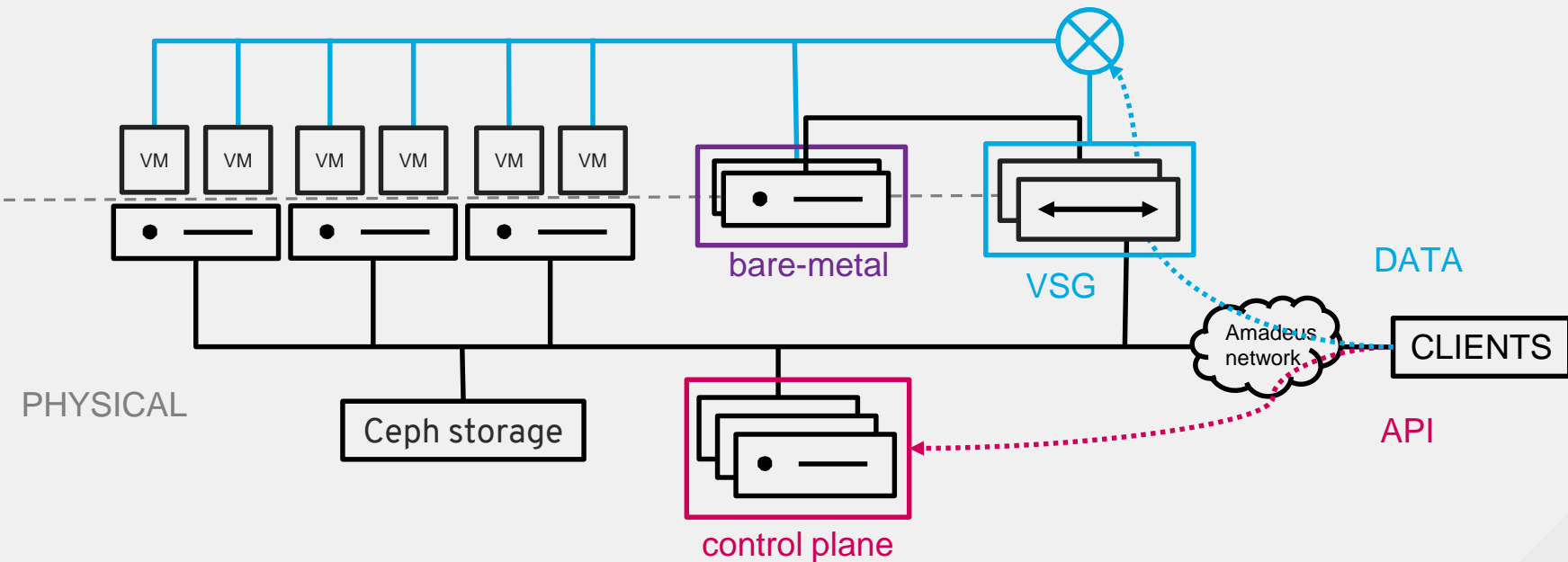
The platform

LOGICAL



What do we want?

LOGICAL



Introducing Ironic



“*Ironic* aims to *provision bare metal machines* instead of virtual machines, forked from the Nova bare-metal driver. By default, it will use *PXE and IPMI* in concert to provision and turn on/off machines”

Why using Ironic

and what are the requirements?



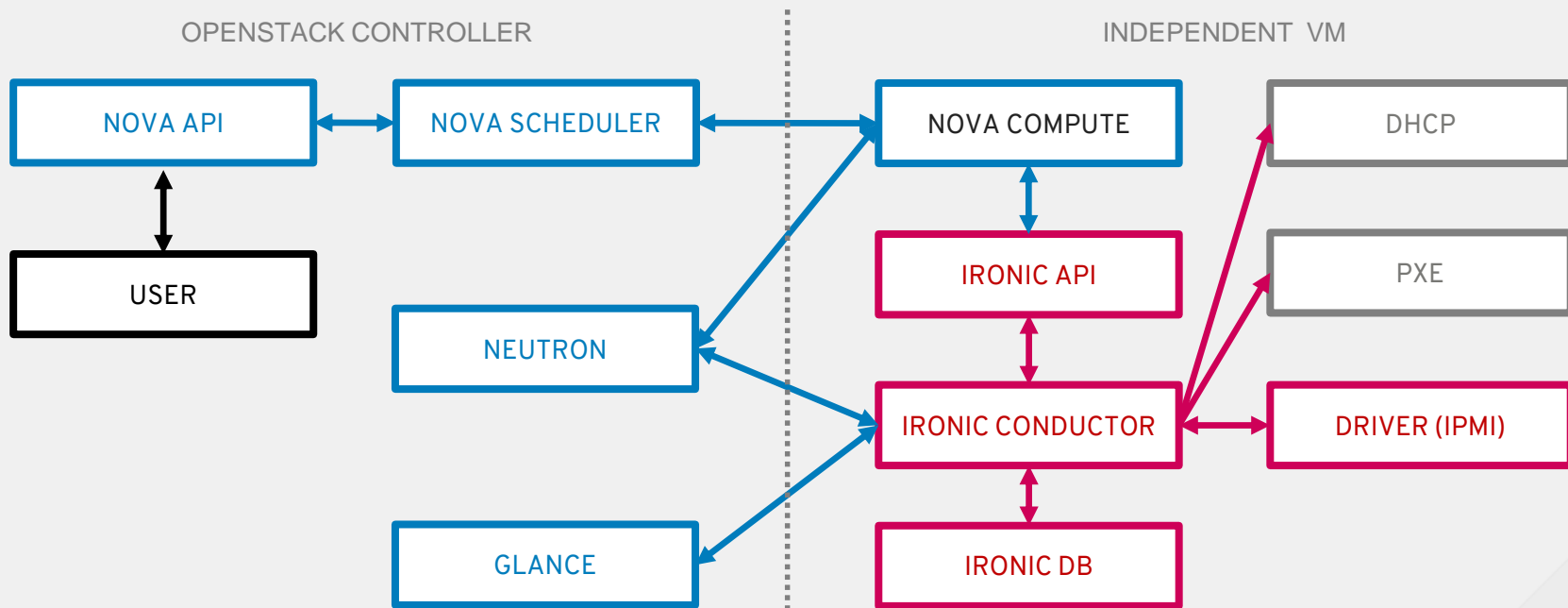
Performance testing of applications
Hosting applications with **built-in redundancy**



Multi-tenancy for bare-metal
Standard **Nova API** for manipulating bare-metal servers
Images stored in **Glance**

How does it work?

<https://docs.openstack.org/ironic/pike/user/> - section 1.2



Implementation and usage

Let's deploy Ironic!

Liberty version

#1 Configure Nuage SDN

Let's deploy Ironic!

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#2 Deploy a VM with nova compute and all Ironic services

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#3 Reconfigure OpenStack controllers

Let's deploy Ironic!

Liberty version

#1 Configure Nuage SDN

#2 Deploy a VM with nova compute and all Ironic services

#3 Reconfigure OpenStack controllers

#4 Create Keystone service catalog entries for OpenStack service

Let's configure IroniC!

#5 Register and configure the bare-metal nodes

Let's configure Ironic!

#5 Register and configure the bare-metal nodes

```
$ openstack baremetal create nceosp01bms663.yaml
$ openstack baremetal node set --property capabilities=boot_option:local\
--driver-info deploy_kernel=de99de5d-341d-4c8a-bc72-2cd04416f77f\
--driver-info deploy_ramdisk=86a2aa1f-3b04-4f3d-9330-dcac08a283e8 nceosp01bms663

$ openstack baremetal port set dd7428df-3f8b-4867-a633-d590ebade831 --extra
gateway_name=10.255.110.248 --extra gateway_port=1/1/5 --extra gateway_vlan=0
```

Let's configure Ironic!

#5 Register and configure the bare-metal nodes

```
$ openstack baremetal create nceospp01bms663.yaml
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```

```
$ openstack baremetal port set dd7428df-3f8b-4867-a633-d590ebade831 --extra
gateway_name=10.255.110.248 --extra gateway_port=1/1/5 --extra gateway_vlan=0
```

```
$ ironic node-list --fields name power_state provision_state instance_uuid
```

Name	Power State	Provisioning State	Instance UUID
nceospp01bms651	power on	active	79148cc7-f375-4b98-a5f0-fe96c587b406
nceospp01bms663	power off	available	None
nceospp01bms664	power on	deploying	a4dc68ab-9bbe-4ff7-b5a5-d18df81f7400

Let's configure IroniC!

#6 Create the appropriate flavor

Let's configure Ironic!

#6 Create the appropriate flavor

```
(openstack) flavor show bm1.c6420
```

Field	Value
disk	200
id	7e961875-3cae-4e4d-ac3a-ca8e369f010b
name	bm1.c6420
os-flavor-access:is_public	True
properties	aggregate_instance_extra_specs:baremetal='true', capabilities:boot_option='local'
ram	60000
rxtx_factor	1.0
vcpus	10

Pixie boots rockin'



The first bare-metal server

Launch Instance

Details * Access & Security Networking * Post-Creation Advanced Options

Availability Zone
baremetal

Instance Name *
BMS-CENTOS-RAW

Flavor * ⓘ
bm1.c6420

Instance Count * ⓘ
1

Instance Boot Source * ⓘ
Boot from image

Image Name *
centos-bms-qlogic (851.2 MB)

Specify the details for launching an instance.
The chart below shows the resources used by this project in relation to the project's quotas.

Flavor Details

Name	bm1.c6420
VCPUs	10
Root Disk	200 GB
Ephemeral Disk	0 GB
Total Disk	200 GB
RAM	60,000 MB

Project Limits

Number of Instances	26 of 201 Used
Number of VCPUs	75 of 500 Used
Total RAM	271,136 of 1,102,400 MB Used

Cancel Launch

```
$ nova boot bms-centos-raw --image centos-bms-qlogic\  
--flavor bm1.c6420 --config-drive true\  
--nic net-id=b08e83b8-f9b0-4922-9b63-149dc7fdc79c\  
--key-name mykey
```

The first bare-metal server

```
nceosp01bms664rib, PowerEdge C6420, User: root, 6.6 fps
File View Macros Tools Power Next Boot Virtual Media Help

DHCP 0x1e4c4 DHCPPOFFER from 192.168.192.1:67 for 192.168.192.20
DHCP 0x1e4c4 DHCPPOFFER from 192.168.192.1:67 for 192.168.192.20
DHCP 0x1e4c4 DHCPPOFFER from 192.168.192.1:67 for 192.168.192.20
DHCP 0x1e4c4 DHCPPOFFER from 192.168.192.1:67 for 192.168.192.20
DHCP 0x1e4c4 DHCPPOFFER from 192.168.192.1:67 for 192.168.192.20
DHCP 0x1e4c4 DHCPPOFFER from 192.168.192.1:67 for 192.168.192.20
DHCP 0x1e4c4 DHCPPOFFER from 192.168.192.1:67 for 192.168.192.20
DHCP 0x1e4c4 DHCPACK From 192.168.192.1:67 for 192.168.192.20
ok
net0: 192.168.192.20/255.255.255.0 gw 192.168.192.1
Next server: 192.168.192.1
Filename: http://192.168.192.1:8088/boot.ipxe
http://192.168.192.1:8088/boot.ipxe... ok
boot.ipxe : 810 bytes [script1]
pxelinux.cfg/f4-e9-d4-ee-a2-e0... ok
DHCP 0x1ec84 entering discovery state
Configuring (net0 f4:e9:d4:ee:a2:e0)...DHCP 0x1ec84 DHCPDISCOVER
DHCP 0x1ec84 DHCPPOFFER from 192.168.192.1:67 for 192.168.192.20
...DHCP 0x1ec84 entering request state
DHCP 0x1ec84 DHCPREQUEST to 192.168.192.1:67 for 192.168.192.20
DHCP 0x1ec84 DHCPACK From 192.168.192.1:67 for 192.168.192.20
ok
http://192.168.192.1:8088/fc1bd1a2-ec60-4425-9410-876281b1d474/deploy_kernel...
ok
http://192.168.192.1:8088/fc1bd1a2-ec60-4425-9410-876281b1d474/deploy_ramdisk...
-
Current User(s): root:172.16.215.29
```

```
nceosp01bms664rib, PowerEdge C6420, User: root, 5.4 fps
File View Macros Tools Power Next Boot Virtual Media Help

CentOS Linux 7 (Core)
Kernel 3.10.0-514.26.2.el7.x86_64 on an x86_64

bms-centos-raw login:
```

```
[vlongo@bastion01 ~]$ ssh centos@172.16.156.12
[centos@jump ~]$ ssh centos@192.168.1.29 -i mykey.pem
[centos@bms-centos-raw ~]$
```


It works!



Multi-tenancy achieved thanks to VSGs

Easily usable by people as because **integrated with Nova**

Images are **stored in Glance** and managed as **normal images**

But it could be even better!

Connectivity No NAT operation possible at this time

Quotas No quota to limit the number of bare-metal servers per tenant

Metadata Available only through config drive

Images Because of the config drive being used for metadata specific images have to be built for Ironio

The journey continues...

What's next?



Deployment of OSP12 (**Pike**) **solving** most of the problems

Onboarding of new customers and **adding more nodes**

Design a solution **allowing NAT connectivity**

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