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OpenStack: A popular destination for Legacy IT

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Solution Architect – Infrastructure

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Presenters

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Hewlett Packard Enterprise
Solution Architect – Infrastructure

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Agenda

- Openstack Origins - eMail
- Legacy IT and Openstack
- Openstack Projects
- Migration/Transformation to Openstack
- OpenStack installations
    - Redhat Openstack 10
- Q & A

Openstack Origins - email

The email from where it started

From: **Jim Curry**
Date: Fri, Jun 4, 2010 at 11:02 AM
Subject: Rackspace
To: "Chris.C.Kemp@nasa.gov"

Chris,

I run corporate development at Rackspace, and am very interested in talking with your team about Nebula. Confidentially, we are in the process of open sourcing our cloud stack and I am interested in seeing if there might be some synergies / opportunities for the two projects to work together. Would it be possible to setup some time to discuss with your team?

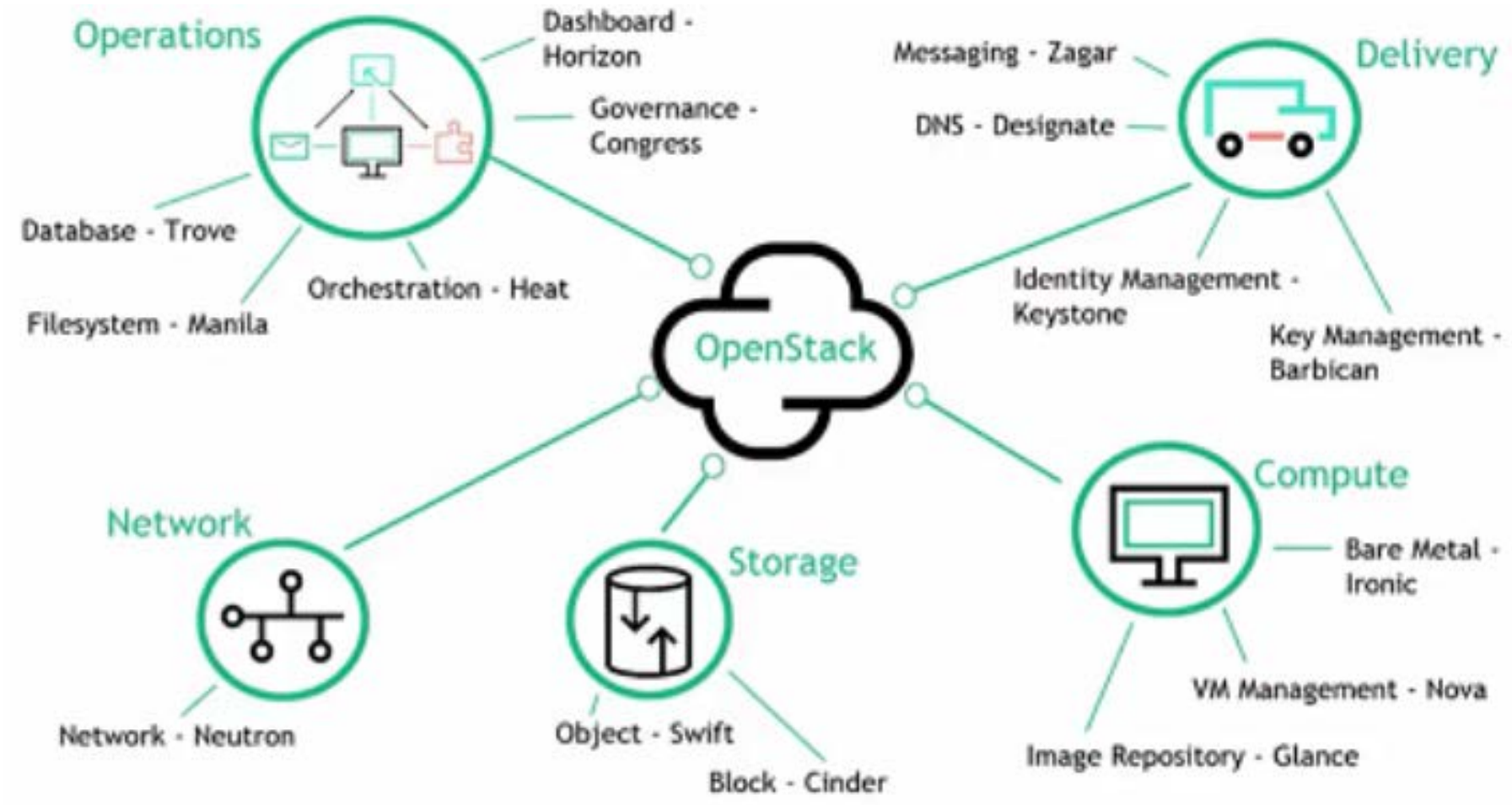
Thanks in advance!
Jim

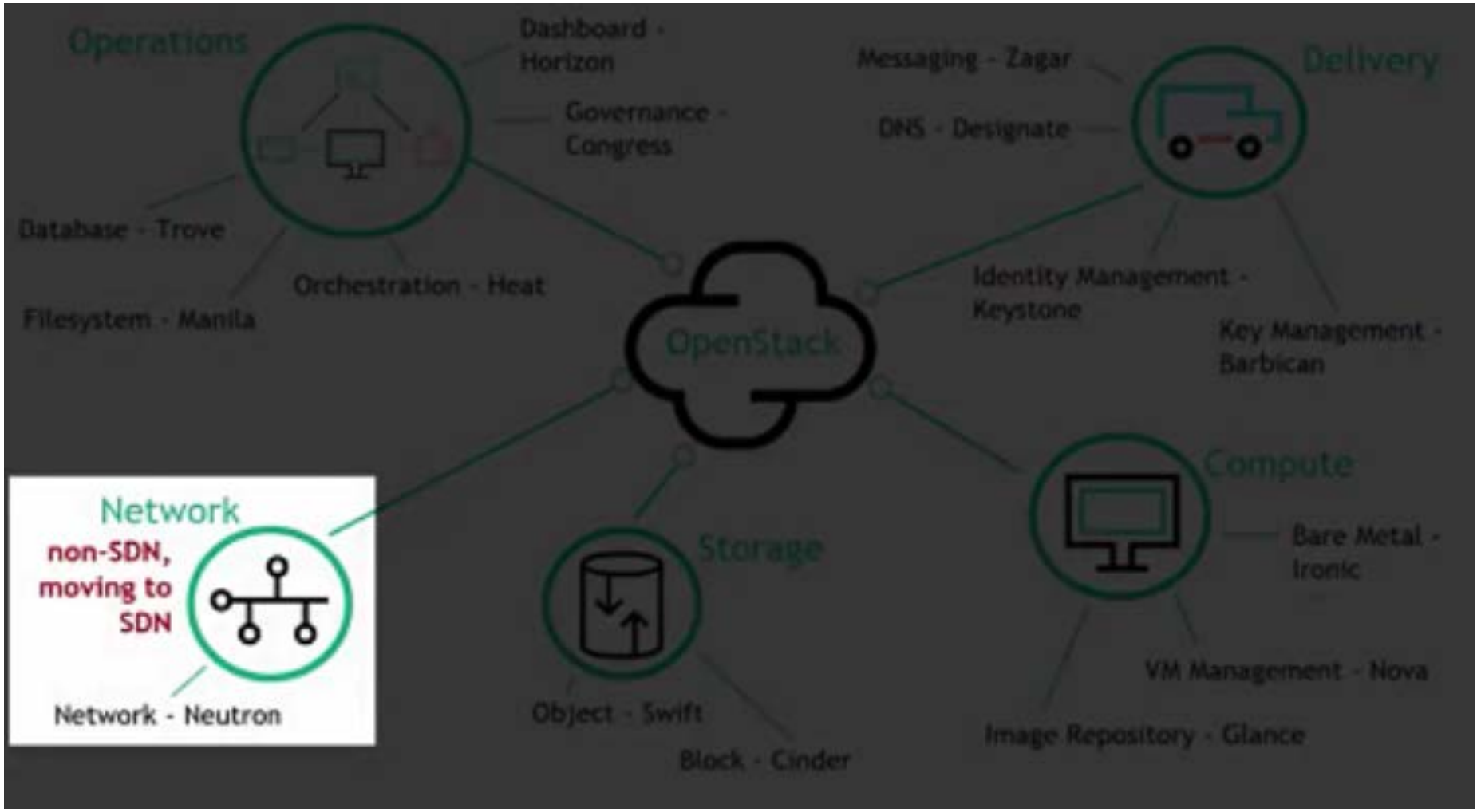
Jointly founded in July 2010 by Rackspace and NASA with merger of two projects:

- Swift object based storage
- Nova based on Nebula compute platform

Legacy IT and Openstack

Legacy IT


Operations
Dashboard - Horizon
Governance - Congress
Database - Trove
Filesystem - Manila
Orchestration - Heat
Messaging - Zagar
DNS - Designate
Delivery
Identity Management - Keystone
Key Management - Barbican
OpenStack
Network
Network - Neutron
Storage
Object - Swift
Block - Cinder
Compute
Bare Metal - Ironic
VM Management - Nova
Image Repository - Glance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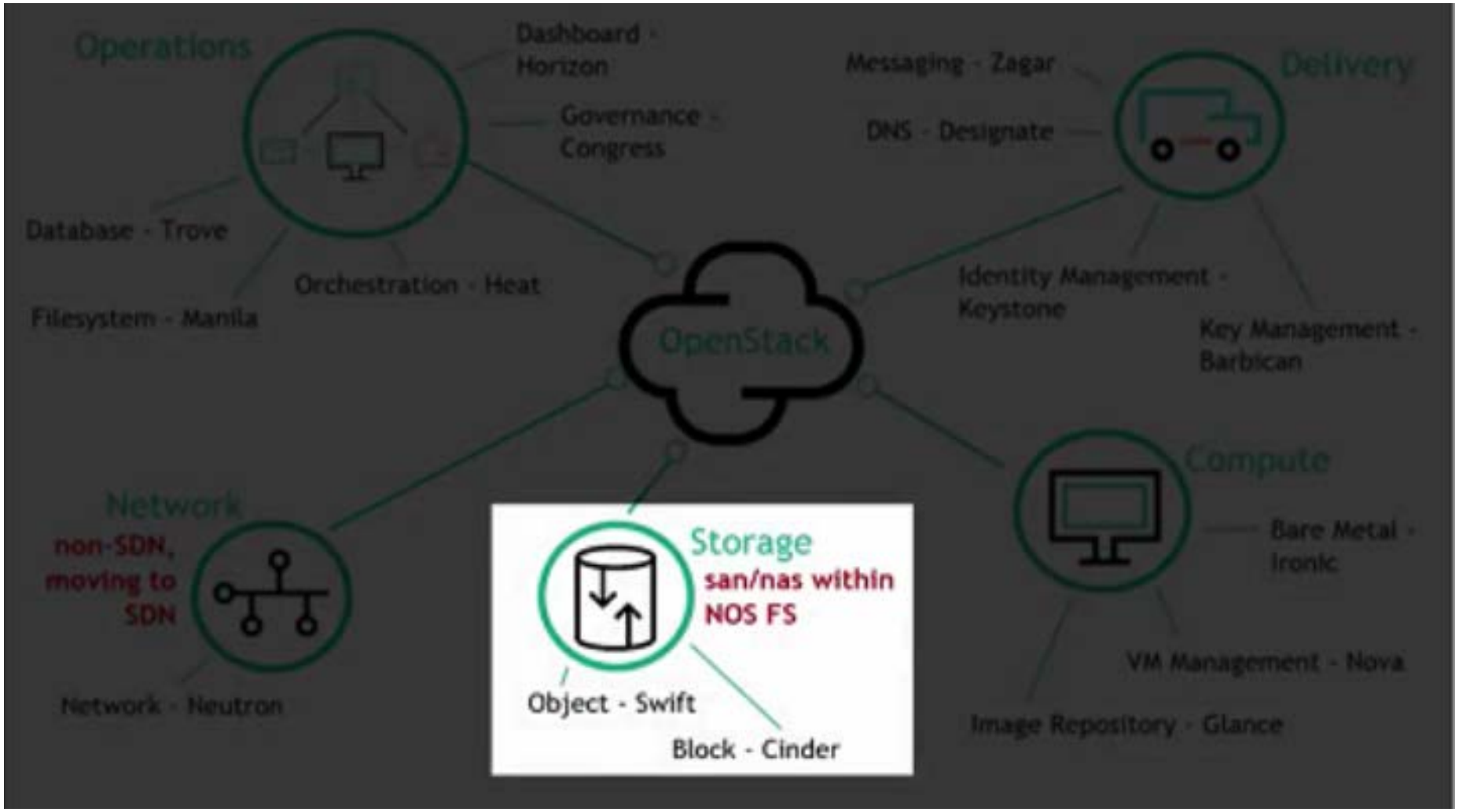
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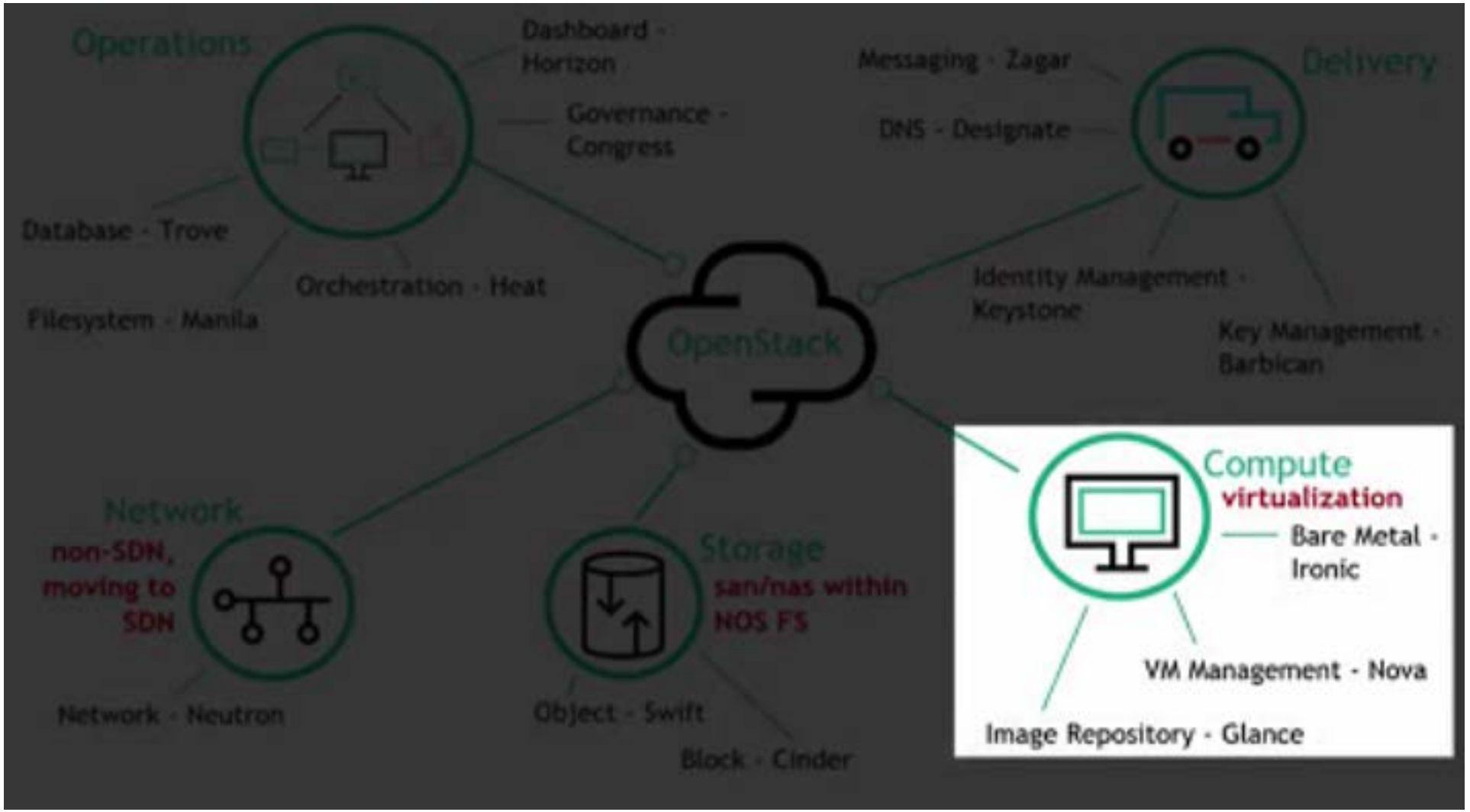

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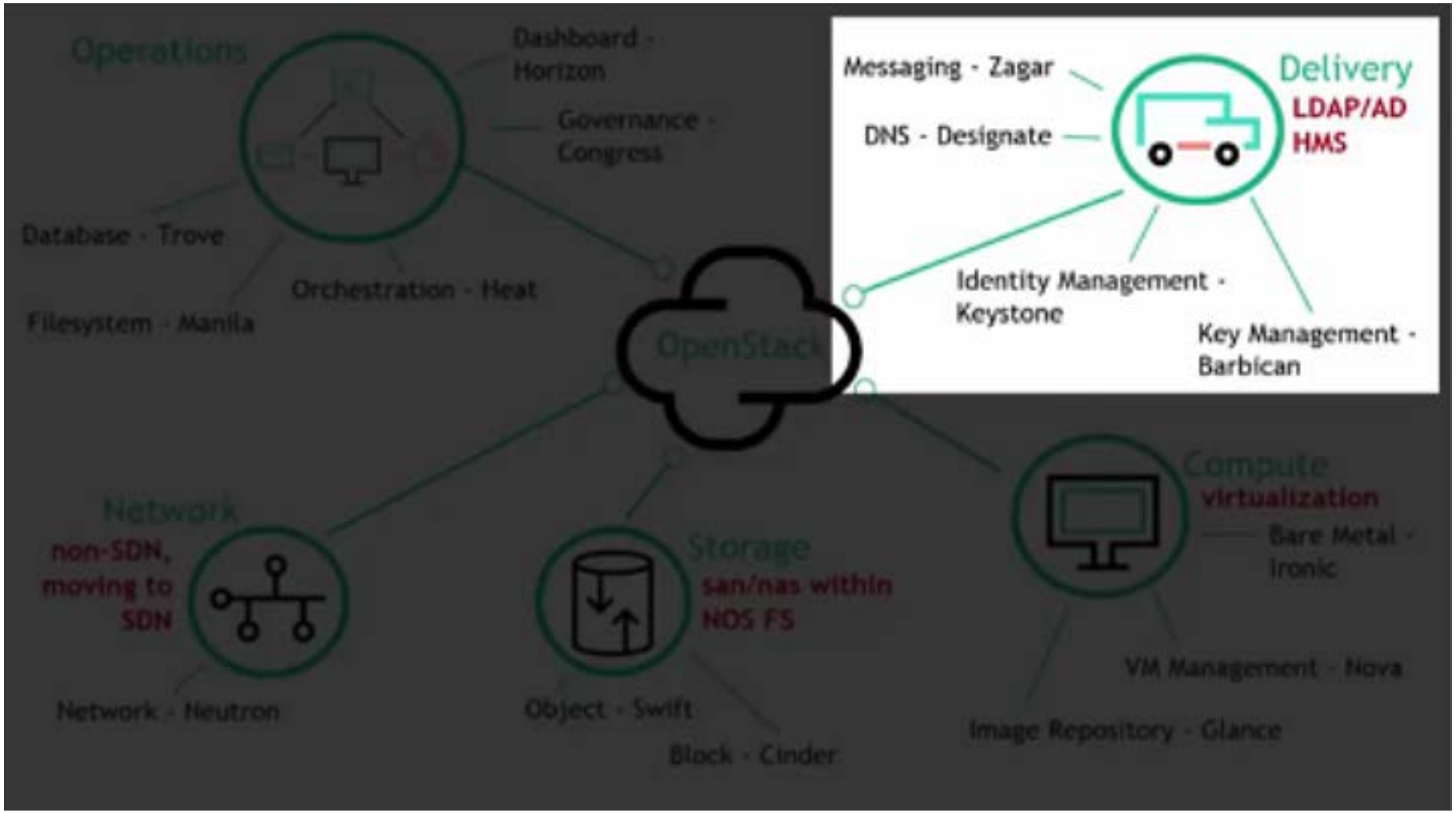

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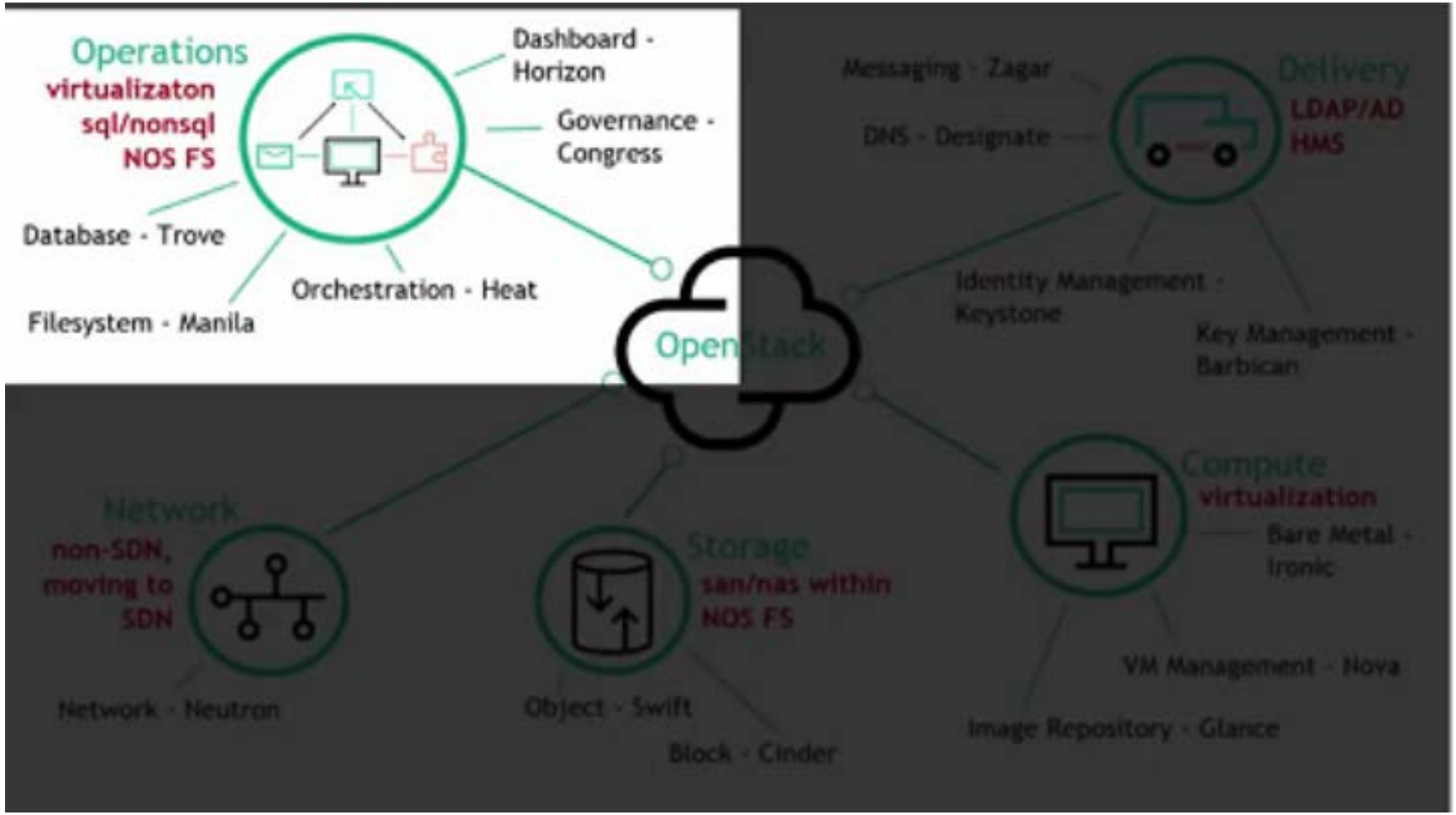
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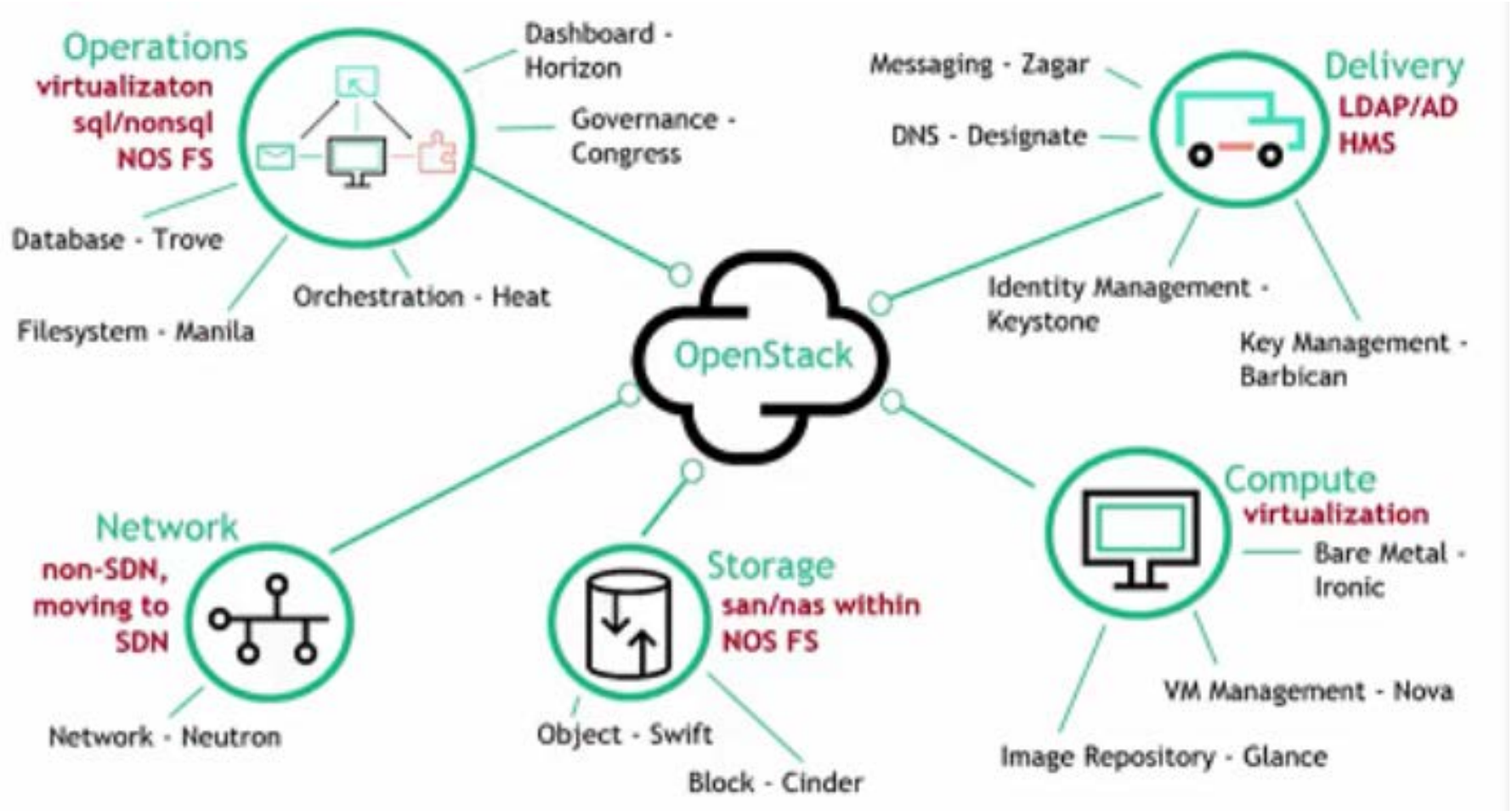
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Replacing Legacy Environment

Enterprises are building clouds to...

- ☑ Meet Application resource needs & timelines
- ☑ Control & monitor the entire environment

Where is your enterprise on the path to cloud?

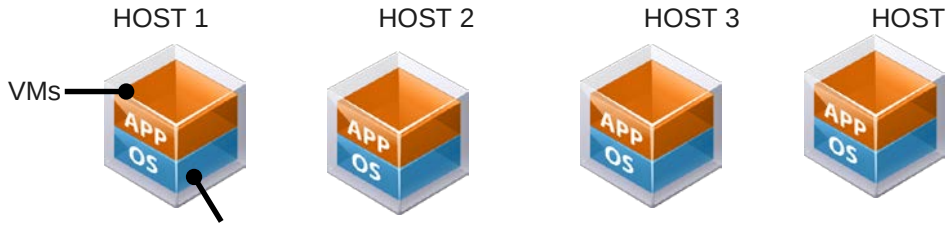
1. Virtualization

2. Cloud Data Center

3. Cloud Federation

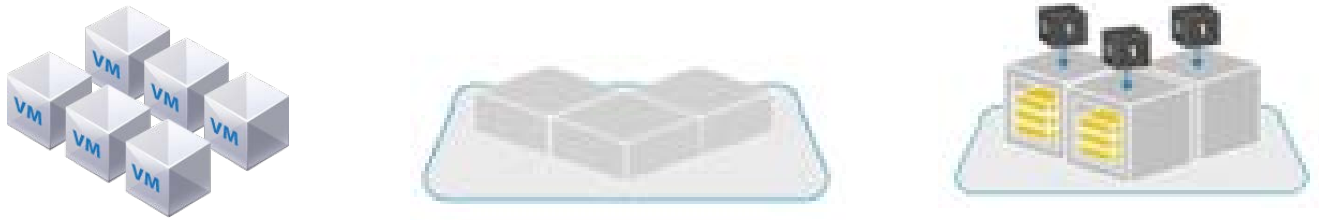
Datacenters are being virtualized, Servers are first

Hypervisors provide abstraction between SW and HW (Servers)



- Hardware abstraction for each server
- Better resource utilization for each server

Next: Storage, Network…the building blocks



Compute Pool	Network Pool	Storage Pool
Virtualized Servers	**Virtualized Networks**	**Virtualized Storage**

- Flexibility, Efficiency are key drivers
- Resource pools for apps starting to form...

1. Virtualization — 2. Cloud Data Center — 3. Cloud Federation

Automation & Efficiency →

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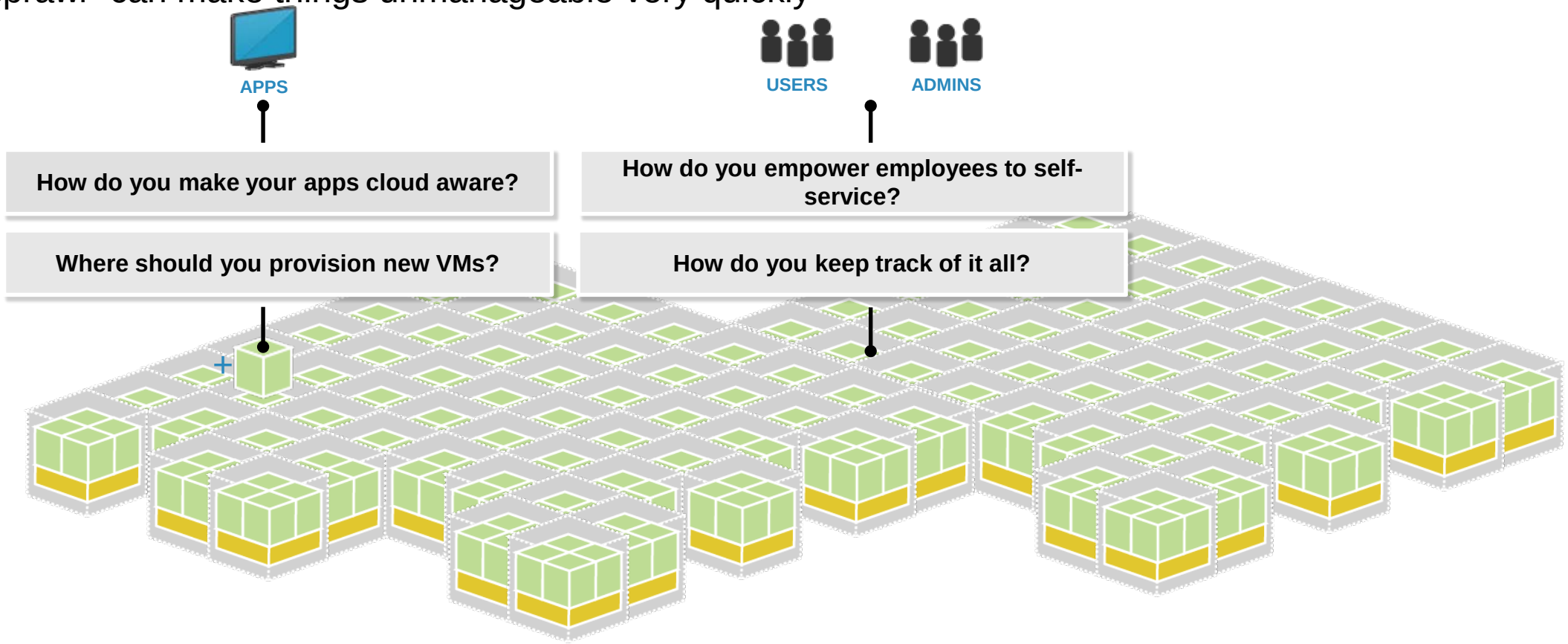
But questions arise as the environment grows...

"VM sprawl" can make things unmanageable very quickly



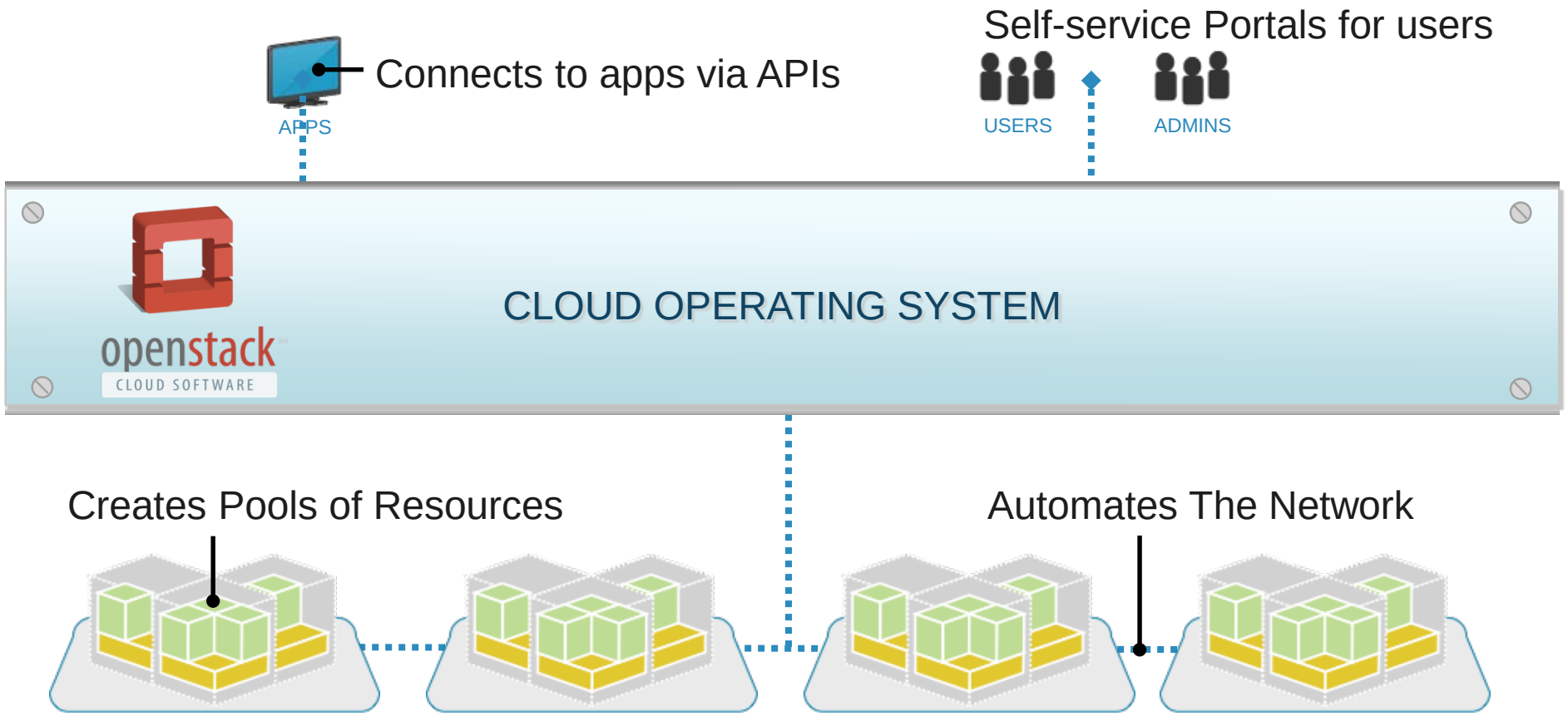
A Cloud Management Layer Is Missing

1. Virtualization — 2. Cloud Data Center — 3. Cloud Federation

Automation & Efficiency →

Solution: OpenStack, The Cloud Operating System

A new management layer that adds automation and control



1. Server Virtualization
2. Cloud Data Center
3. Cloud Federation

Automation & Efficiency →

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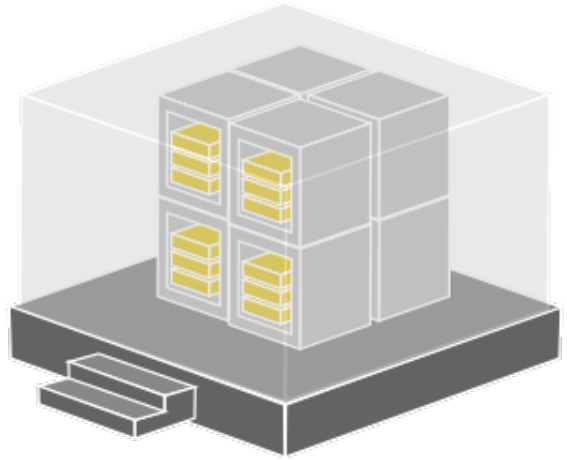
What's next?

Enterprise Private Clouds run cloud operations systems…



Public Clouds run cloud operating systems…

But you can't interoperate if public clouds are built on proprietary software

1. Server Virtualization
2. Cloud Data Center
3. Cloud Federation

Automation & Efficiency →

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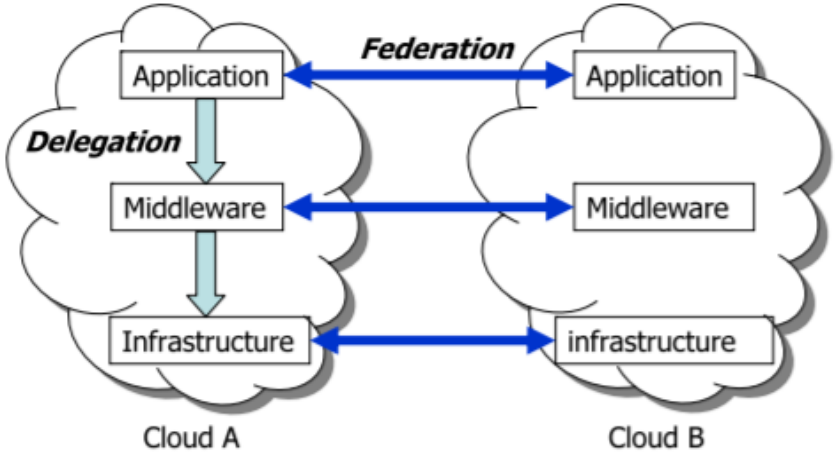
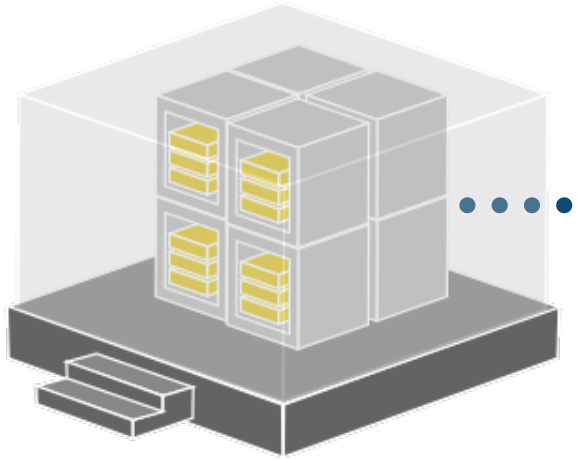


Imagine having a **Common Platform** across clouds



Seamlessly transporting workloads

1. Virtualization
2. Cloud Data Center
3. Cloud Federation

Automation & Efficiency →

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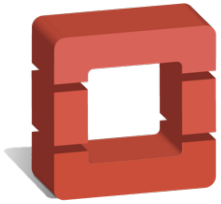
A common platform is here.

OpenStack is open source software powering public and private clouds.



openstack™
CLOUD SOFTWARE

Private Cloud:
Run OpenStack software in your own corporate data centers

Public Cloud:
OpenStack powers some of the worlds largest public cloud deployments.

OpenStack enables cloud federation

Connecting clouds to create global resource pools

1. Virtualization
2. Cloud Data Center
3. Cloud Federation

Automation & Efficiency →

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Entreprises That use Openstack

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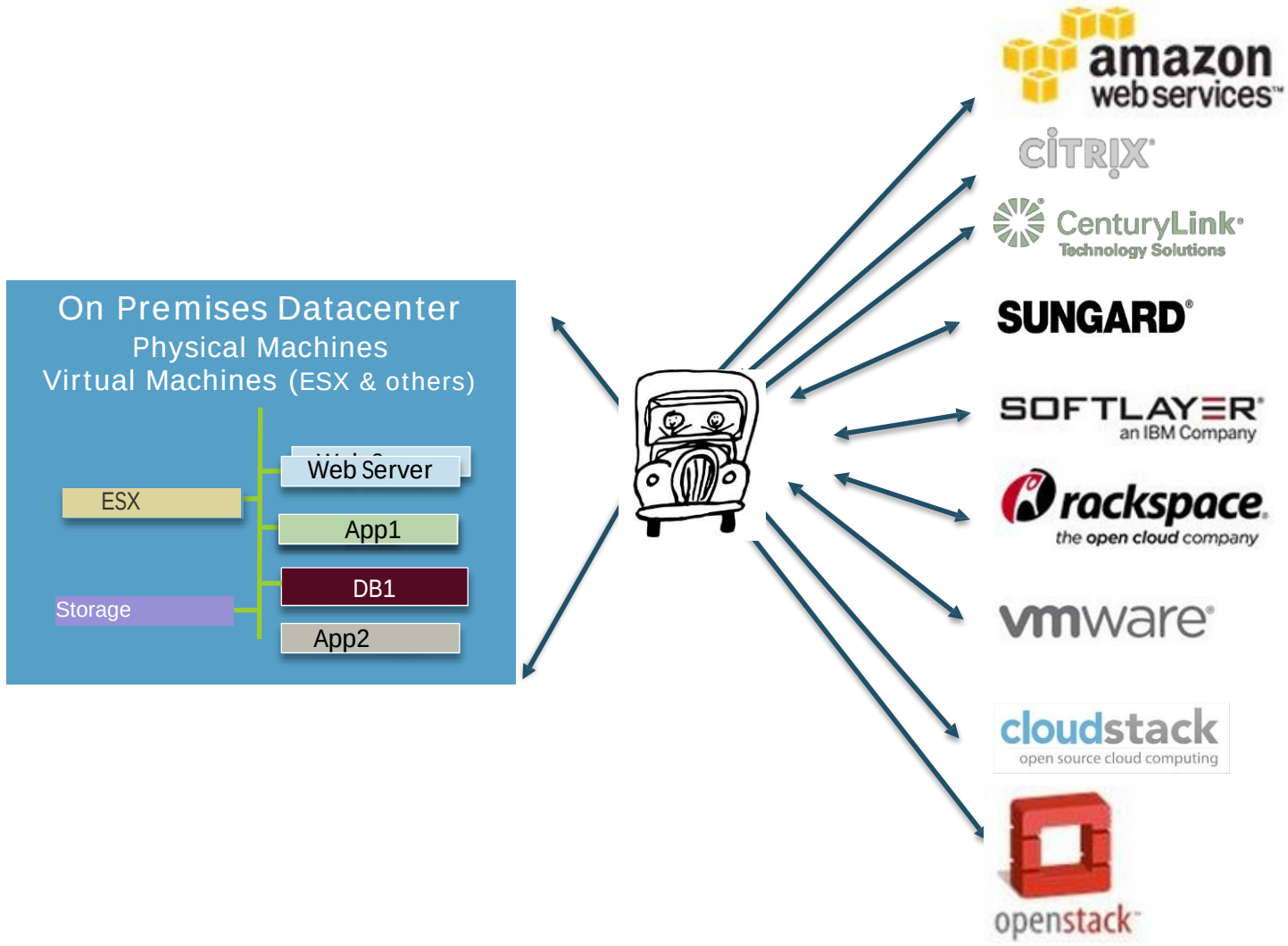
Migration to Openstack

Discover/Analysis	•Allows for complete understanding of migration down to the port and protocol
Anywhere to Anywhere Migration	•P2C, P2P, P2V, V2V, V2P, V2C, C2C, C2P, C2V
Full Cloud API Support	•No console access required •Allows “hands-of” migration
True End to End Automation	•Minimizes or Removes Manual Intervention •Assures cutover readiness and sync
Point to Point Migration	•No compliance broken •Minimizes failure risks
Sync	•Keeping your source and designation current between cutover.
Security	•Requirements between migration and source and designation

Migration Options



Openstack Installations - Redhat

Redhat Openstack Platform 10

- Based on Newton Openstack release
- Monitoring - A sensu client is installed on each of the nodes to allow for monitoring of the individual Openstack nodes and Services.
- Logging - Logging is configured on each node as part of the deployment
- Graphical Installer UI - The deployment of RHOSP overcloud deployment can be performed using a GUI.
- Virtulization - RHSOP 10 director node can be deployed on a VM

References

Booting on HPE servers

https://access.redhat.com/documentation/en-us/reference_architectures/2017/html-single/deploying_red_hat_openstack_platform_10_on_hpe_proliant_dl_servers/

Booting on IBM servers

https://access.redhat.com/documentation/en-US/Red_Hat_Enterprise_Linux/7/html/Installation_Guide/chap-booting-installer-ppc.html

Booting on Dell Hardware

https://www.dell.com/en-uk/work/learn/openstack-cloud

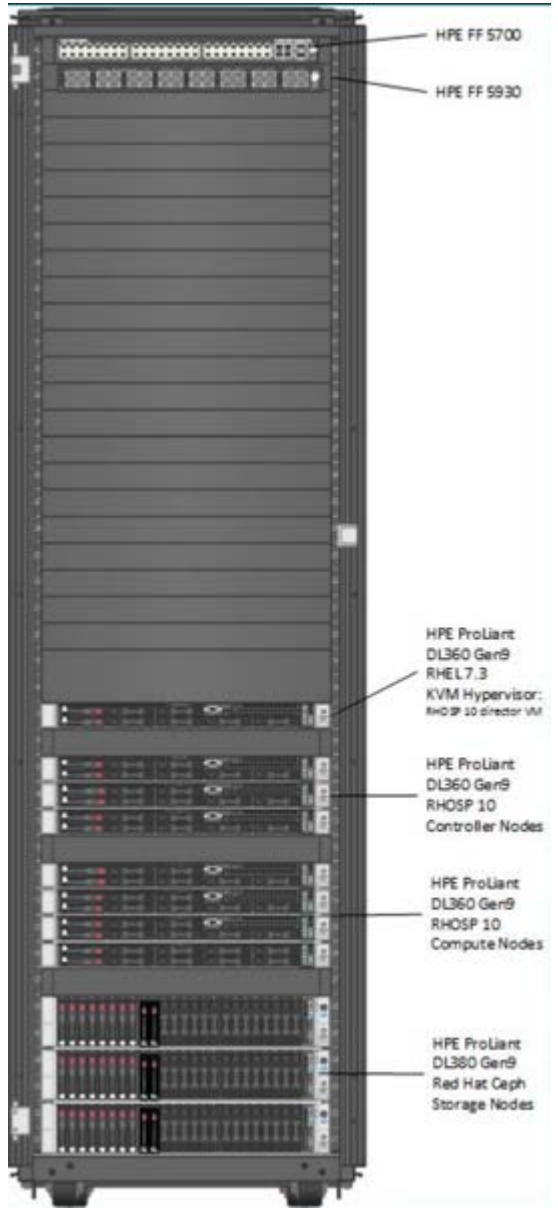
HPE PROLIANT Servers

HPE ProLiant DL360 Gen9

- 1 RHEL 7.3 KVM Hypervisor (director)
- 3 RHOSP 10 Controller Nodes
- 4 RHOSP 10 Compute Nodes

HPE ProLiant DL380 Gen9

- 3 Red Hat Ceph Storage Nodes



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Server Specifications

KVM Hypervisor ProLiant DL360 Gen9 Configuration

- Server Platform – HPE ProLiant DL360 Gen9
- CPU – 2 x Intel® Xeon® E5-2699v3 (2.6GHz/18-core/45MB/145W)
- Memory – 64 GB 4 x 16GB (1x16GB) Dual Rank x4 DDR4-2133
- Storage – 2 x HPE 1.2TB 6G SAS 10K rpm SFF (2.5-inch) Drives
- Network - HPE Ethernet 10Gb 2-port 560FLR-SFP+ FIO Adapter and ALOM 2 port 10Gb NIC

Control Plane HPE ProLiant DL360 Gen9 Configuration

- CPU - 2 x Intel® Xeon® E5-2699v3 (2.6GHz/18-core/45MB/145W)
- Memory - 64 GB 4 x 16GB (1x16GB) Dual Rank x4 DDR4-2133
- Storage - 2 x HPE 1.2TB 6G SAS 10K rpm SFF (2.5-inch) Drives
- Network - HPE Ethernet 10Gb 2-port 560FLR-SFP+ FIO Adapter and ALOM 2 port 10Gb NIC

Compute Plane HPE ProLiant DL360 Gen9 Configuration

- CPU – 2 x Intel® Xeon® E5-2690v3 (2.6GHz/12-core/30MB/135W) Processor
- Memory – 256 GB 8 x 16GB (1x16GB) Dual Rank x4 DDR4-2133
- Storage - 2 x HPE 1.2TB 6G SAS 10K rpm SFF (2.5-inch) Drives
- Network - HPE Ethernet 10Gb 2-port 560FLR-SFP+ FIO Adapter and ALOM 2 port 10Gb NIC

Red Hat Ceph Storage Nodes HPE ProLiant DL380 Gen9 Configuration

- CPU – 1 x Intel® Xeon® E5-2643v3 (3.4GHz/6-core/20MB/135W)
- Memory – 64 GB 8 x 8GB (1x8GB) Single Rank x4 DDR4-2133
- Storage - 12 HP 1.2TB 6G SAS 10K rpm SFF Drives and 2 HP 400GB 12G SAS Write Intensive SFF Solid State Drives
- Network - HP Ethernet 10Gb 2-port 560FLR-SFP Adapter and ALOM 2 port 10Gb NIC

Director Installation

System Requirements

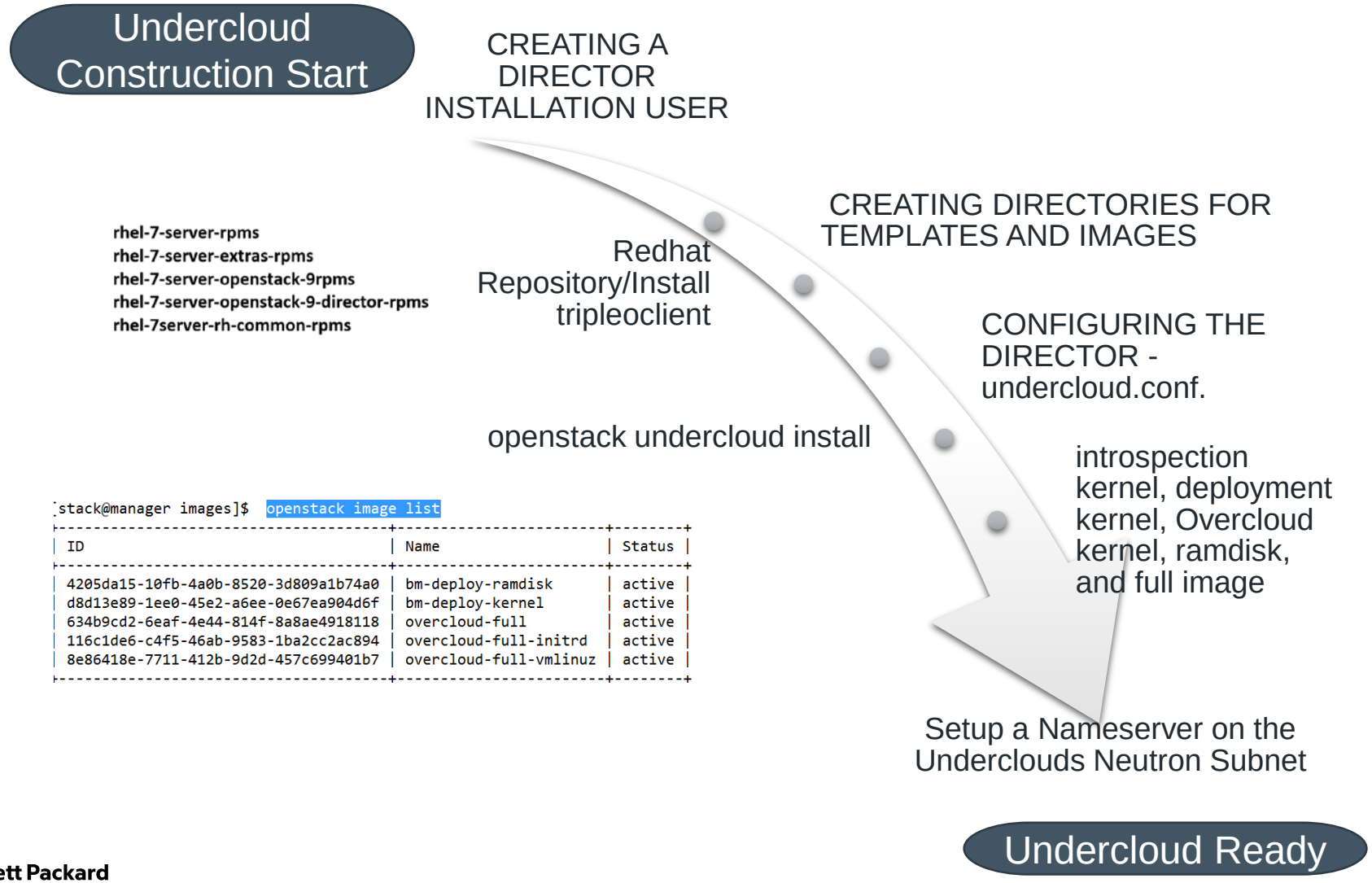
- Physical or Virtual
- Hypervisors - KVM, RHEV, Hyper-V, VMware ESXi
- Red Hat Enterprise Linux 7.3
- 8 CPU cores
- 16 GB RAM
- 40 GB Disk Storage
- Two Network Interfaces with a minimum of 1GB

Repository Requirements

Enable the following repositories on the director

- Red Hat Enterprise Linux 7 Server
- Red Hat Enterprise Linux 7 Server - Extras
- Red Hat Enterprise Linux 7 Server - RH Common
- Red Hat Satellite Tools for RHEL 7 Server RPMs x86_64
- Red Hat Enterprise Linux High Availability (for RHEL 7 Server)
- Red Hat Enterprise Linux OpenStack Platform 10 for RHEL 7
- Red Hat Ceph Storage OSD 2 for Red Hat Enterprise Linux 7 Server
- Red Hat Ceph Storage MON 2 for Red Hat Enterprise Linux 7 Server

Install the Undercloud



Configuration Files - Undercloud

```
[stack@manager ~]$ less undercloud.conf
[DEFAULT]
local_ip = 172.17.110.52/24
network_gateway = 172.17.110.1
undercloud_public_vip = 172.17.110.54
undercloud_admin_vip = 172.17.110.55
local_interface = eth2
network_cidr = 172.17.110.0/24
masquerade_network = 172.17.110.0/24
dhcp_start = 172.17.110.150
dhcp_end = 172.17.110.175
inspection_interface = br-ctlplane
inspection_iprange = 172.17.110.176,172.17.110.200
```

Configuring Basic Overcloud

```
[stack@manager ~]$ cat instackenv.json
{
"nodes":[
        {
            "mac":[
                "5c:b9:01:92:57:3c"
            ],
            "cpu":"4",
            "memory":"6144",
            "disk":"40",
            "arch":"x86_64",
            "pm_type":"pxe_ipmitool",
            "pm_user":"Administrator",
            "pm_password":"33342265",
            "pm_addr":"172.30.1.64"
        },
        {
            "mac":[
                "5c:b9:01:92:bc:b8"
            ],
            "cpu":"4",
            "memory":"6144",
            "disk":"40",
            "arch":"x86_64",
            "pm_type":"pxe_ilo",
            "pm_user":"Administrator",
            "pm_password":"34636606",
            "pm_addr":"172.30.1.68"
        }
    ]
}
```

```
NODE: ddfe8a7a-c6ba-4131-89c9-a512eac00ee9
[
  {
    "size": 1000204886016,
    "rotational": true,
    "vendor": "ATA",
    "name": "/dev/sda",
    "wwn_vendor_extension": null,
    "wwn_with_extension": "0x5000c50086e04c7b",
    "model": "MM1000GBKAL",
    "wwn": "0x5000c50086e04c7b",
    "serial": "9XG97H6V"
  },
  {
    "size": 1000204886016,
    "rotational": true,
    "vendor": "ATA",
    "name": "/dev/sdb",
    "wwn_vendor_extension": null,
    "wwn_with_extension": "0x5000c50086e04134",
    "model": "MM1000GBKAL",
    "wwn": "0x5000c50086e04134",
    "serial": "9XG97HBJ"
  },
  {
    "size": 1000204886016,
    "rotational": true,
    "vendor": "ATA"
```

Create a node definition template and register blank nodes in the director.

Inspect hardware of all nodes.

Tag nodes into Profiles/roles and define root disks.

Define additional node properties

Creating Custom Interface Templates(from Openstack TripleO Heat Templates)

REGISTER and Create THE OVERCLOUD

(openstack overcloud deploy –templates)

```
[stack@manager swift-data]$ nova list
+--------------------------------------+-----------------------+--------+------------+-------------+------------------------+
| ID                                   | Name                  | Status | Task State | Power State | Networks               |
+--------------------------------------+-----------------------+--------+------------+-------------+------------------------+
| eaa133aa-bef2-474d-b9d3-013271547bf1 | overcloud-compute-0   | ACTIVE | -          | Running     | ctlplane=172.17.110.170 |
| b5856c3e-ca58-434b-88e0-7047a67e6f66 | overcloud-controller-0 | ACTIVE | -          | Running     | ctlplane=172.17.110.169 |
+--------------------------------------+-----------------------+--------+------------+-------------+------------------------+
```

Overcloud Ready


Q&A
time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Thank You