CHINA
OpenStack Days

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# Compose Hardware Resources On The Fly with OpenStack Valence

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# Agenda

Data Center Challenges

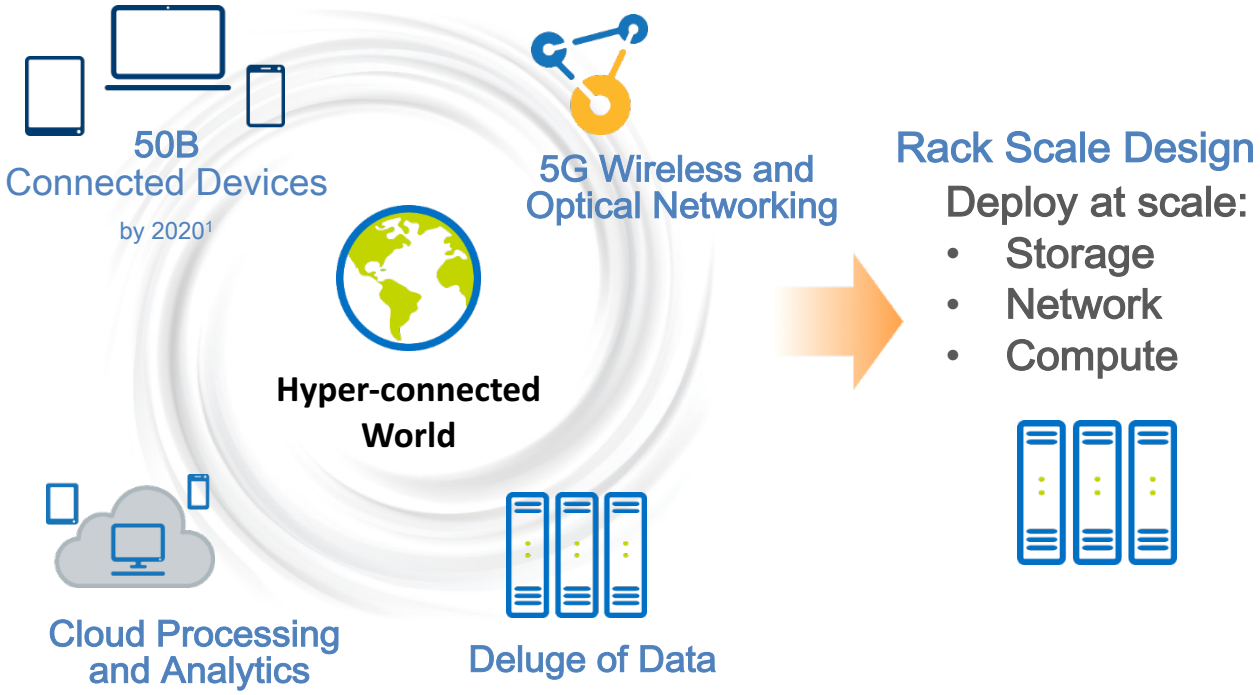
Intel ® Rack Scale Design Technology Overview

Valence Overview

Use Cases

Demo

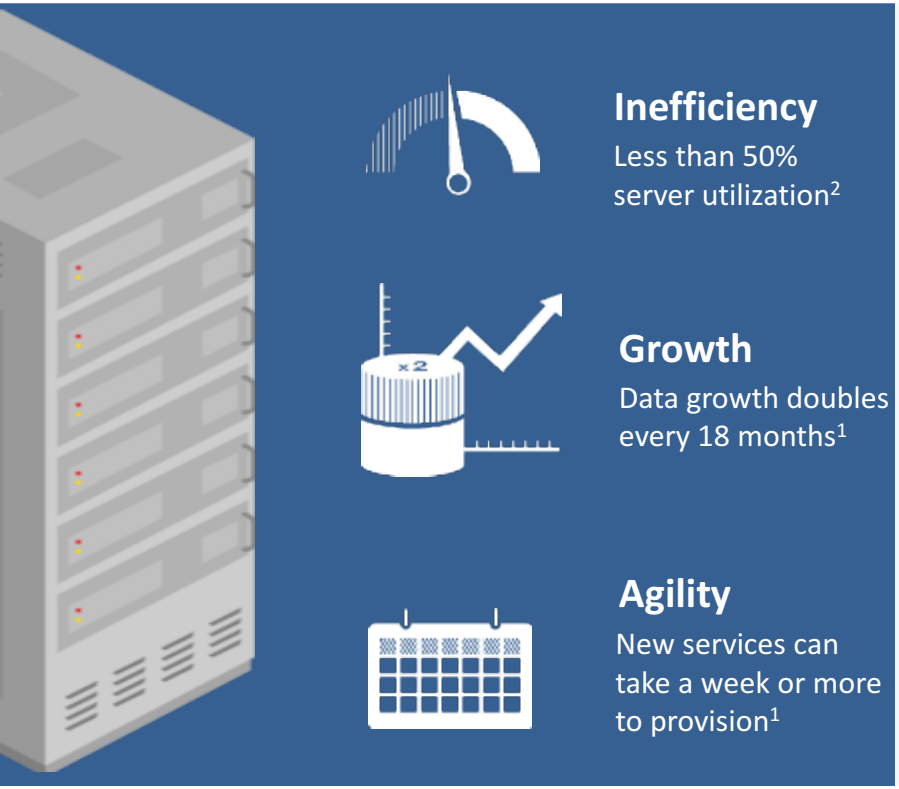
# Digital Transformation Driving Datacenter Scale




Open Solutions accelerating the pace of innovation

# Data Center Challenges

## Infrastructure has not kept up with increasing business demands



### Inefficiency
Less than 50% server utilization[2]

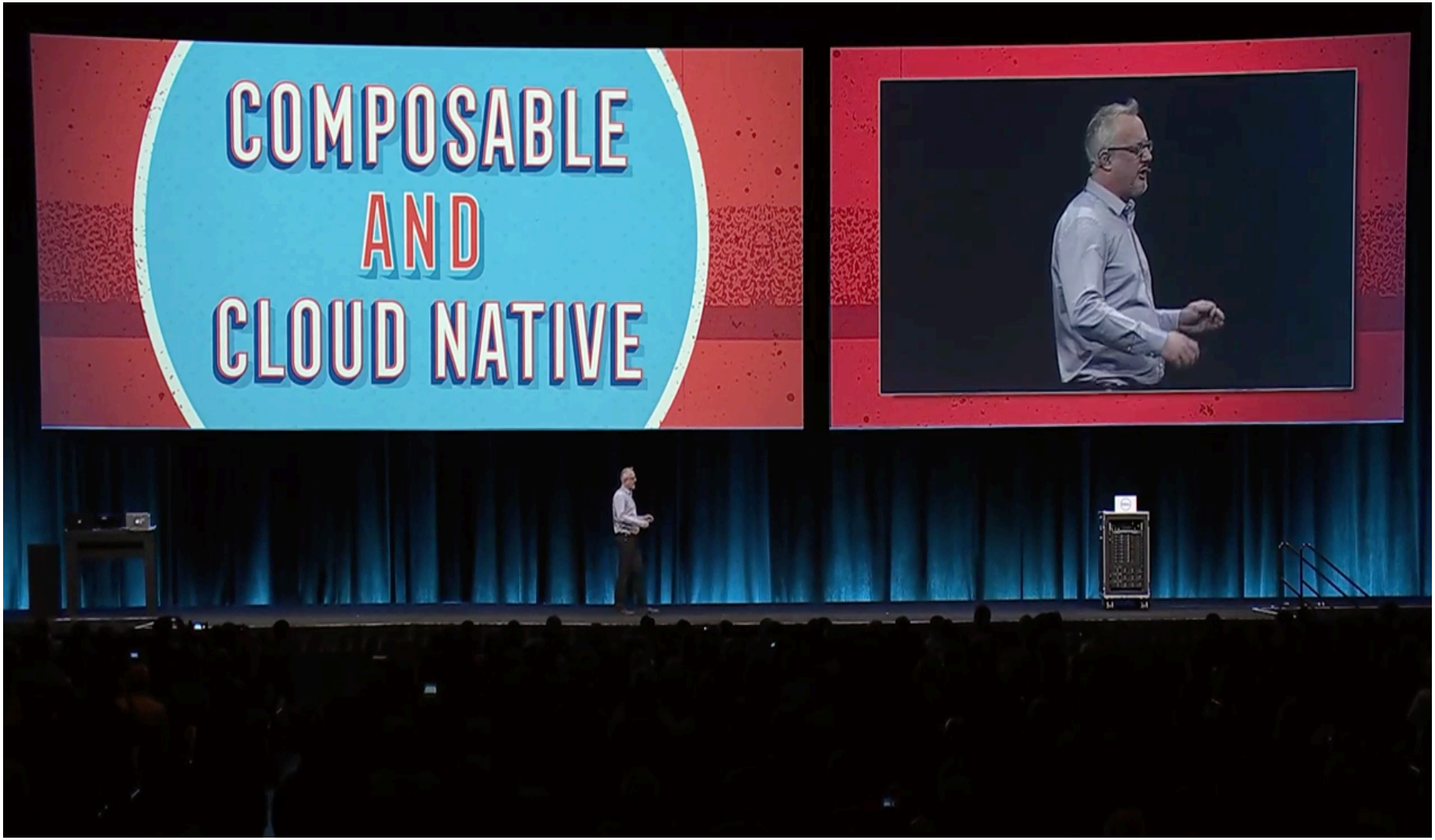
### Growth
Data growth doubles every 18 months[1]

### Agility
New services can take a week or more to provision[1]

## Business Needs

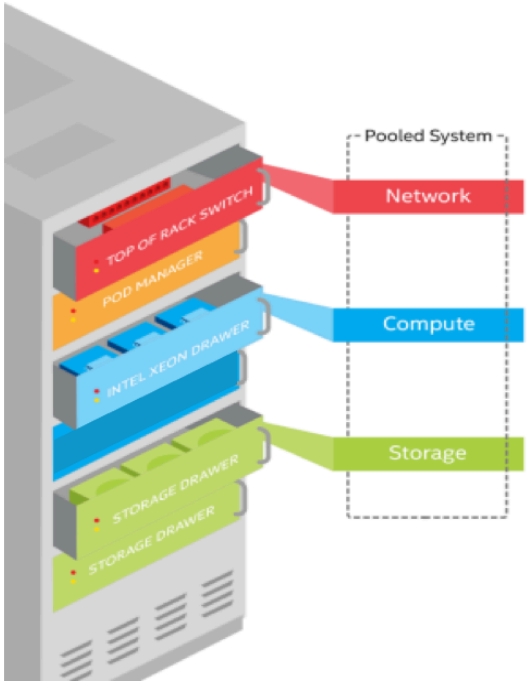
- **Reduce** operational and capital expenses.
- **Deliver** new services in minutes, not months.
- **Optimize** data center based on real-time analytics.
- **Address** application workload needs with agility.
- **Scale** capacity without interruption.

1 *Worldwide and Regional Public IT Cloud Services 2013–2017 Forecast.* IDC (August 2013) idc.com/getdoc.jsp?containerId=242464
2 IDC's Digital Universe Study, sponsored by EMC, December 2012

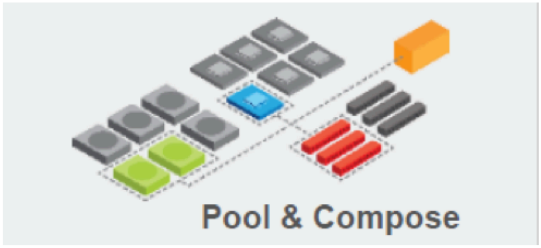

COMPOSABLE
AND
CLOUD NATIVE

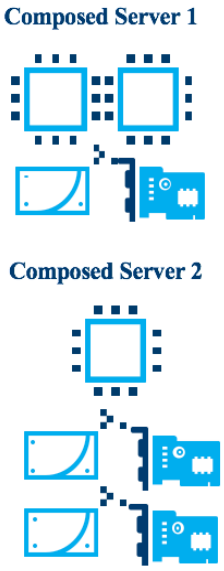
# Intel® RSD - Value Proposition

- Flexible
- Manageable
- Economical
- Open





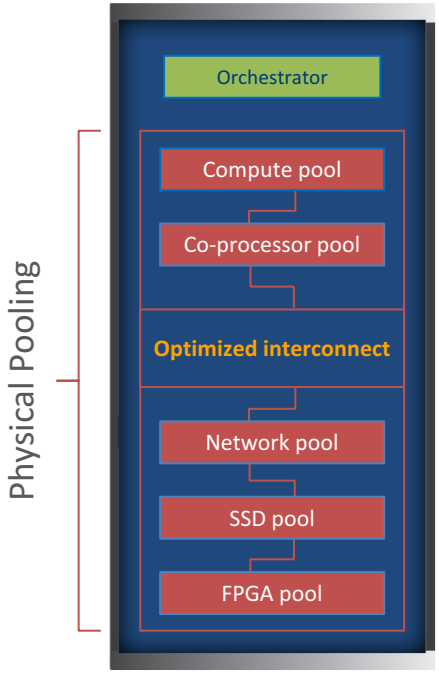


# Intel® RSD - Vision: Revolutionizing the Datacenter

↑ Savings

- Composable
- Standards Based Management
- Buy what you need
- Interoperable
- Eliminate redundant infrastructure*



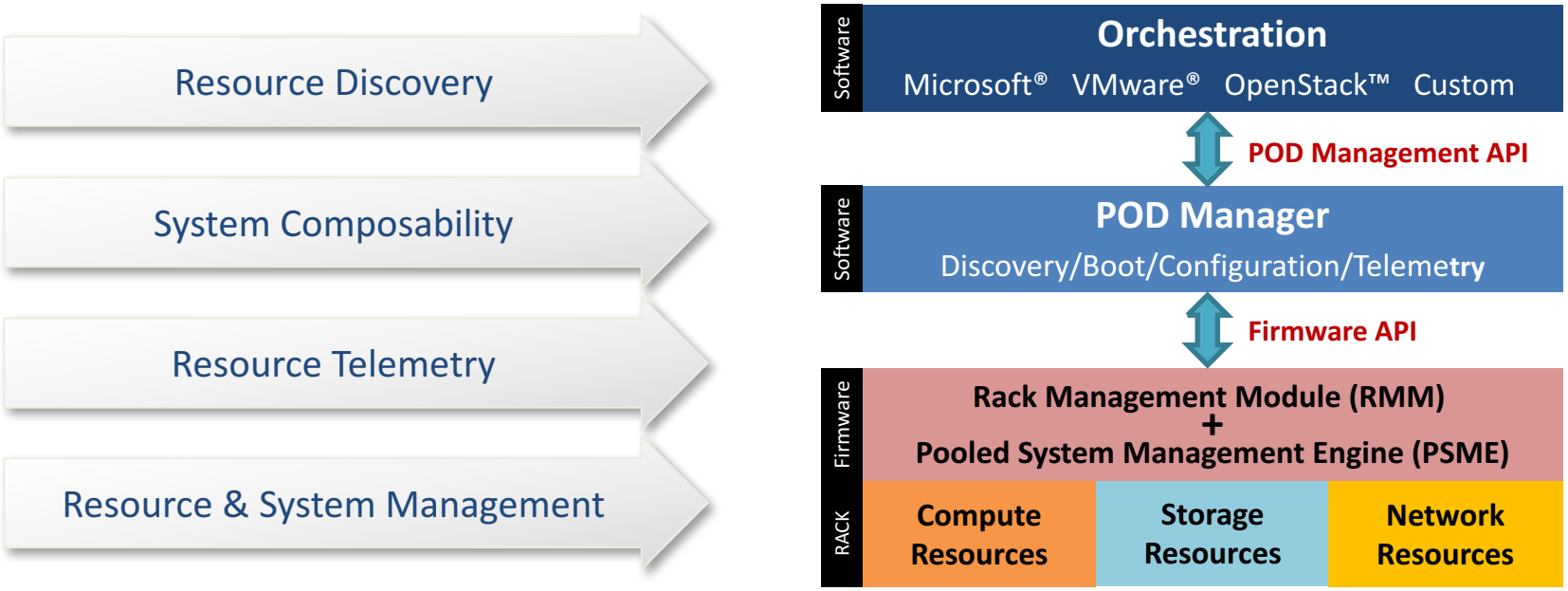

- Intel® Xeon® processor
- FPGA
- Intel® Optane™
- Intel® Silicon Photonics

*Optimized to Intel® Rack Scale Design*

**Bringing Hyperscale Capabilities to All**

* Fan, power supply, chassis, cabling, etc.

# Intel® RSD – Software Management Foundation




- Flexible management architecture allows a range of implementation options
- Industry-standard interoperability across multiple vendors

# Introduction to Redfish

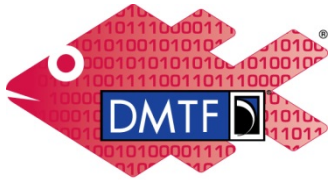
A DMTF standard capable of managing multi node servers via a RESTful interface.

A secure, multi-node capable replacement for IPMI-over-LAN.

Add devices over time to cover customer use cases & technology.

Intended to meet Remote Machine Management requirements.

Schema-backed but human-readable




http://redfish.dmtf.org/

# Valence Overview

**An OpenStack Big tent project**

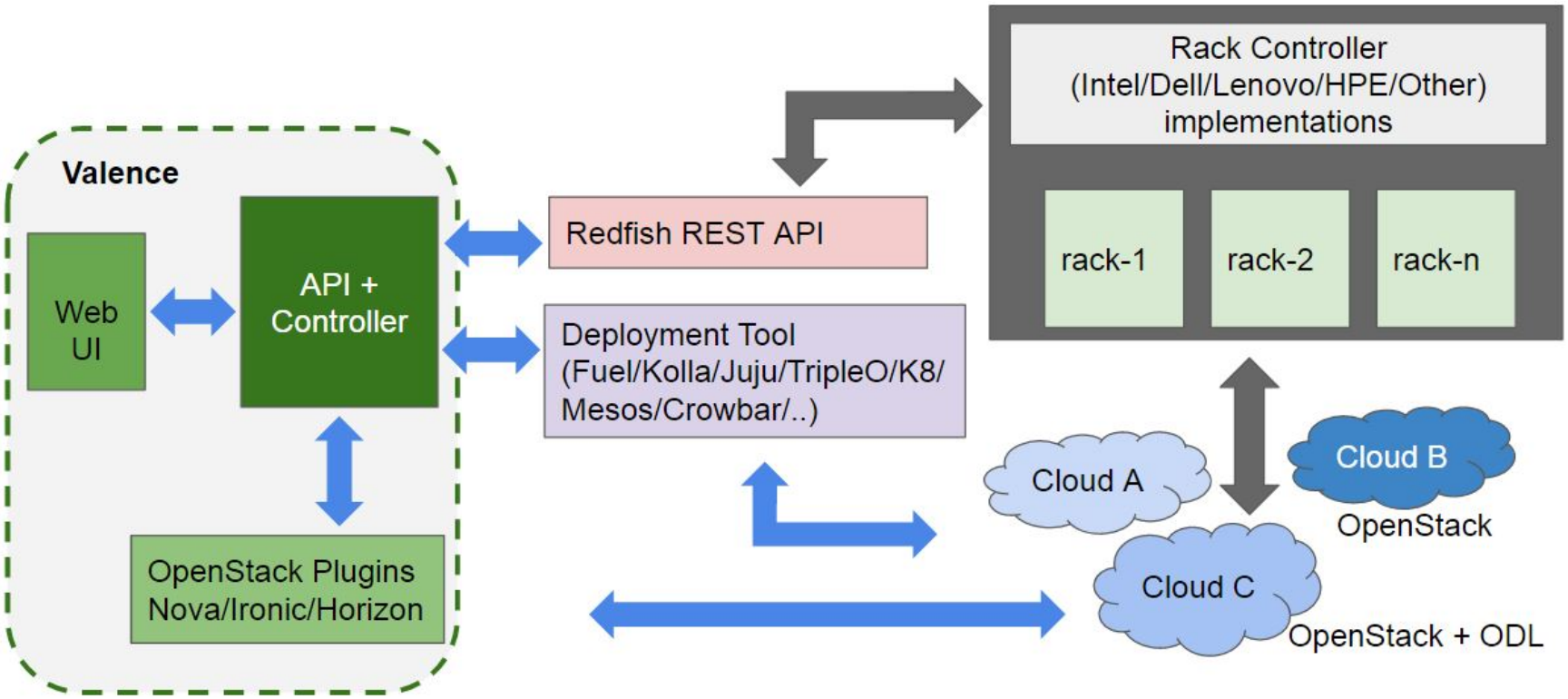
**A collection of software**

- valence API – API service for lifecycle management of Rack Scale Resource
- python-valenceclient – CLI and python binding
- plugins to integrate with OpenStack (ironic/horizon)
- basic reference GUI

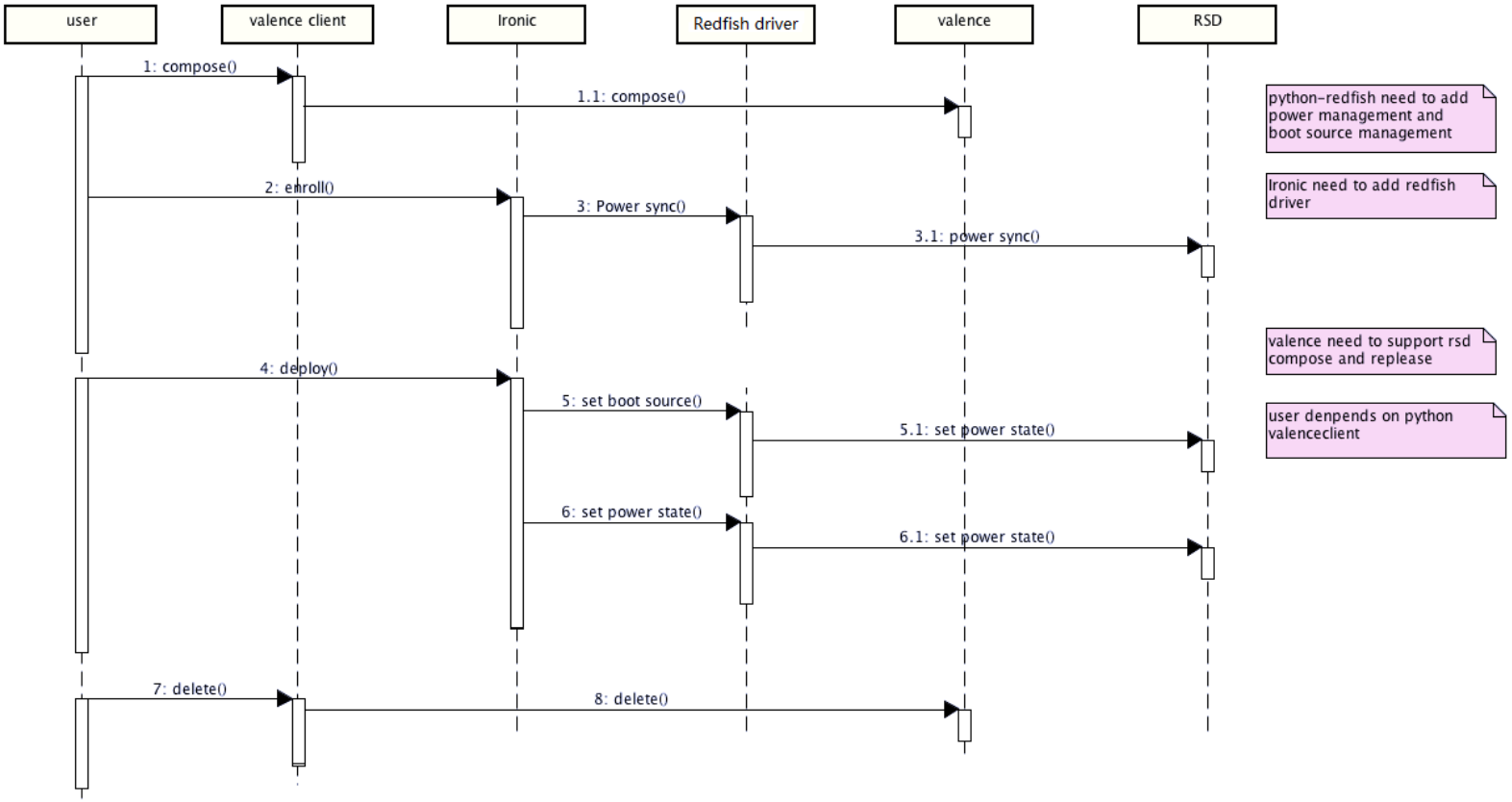
**Horizontal Scalability**

- Support multiple pod managers on backend
  - Pod manager from same or multiple vendors
  - Even different version of pod manager
  - RSD/Non-RSD pod manager

# Valence Overview - Architecture



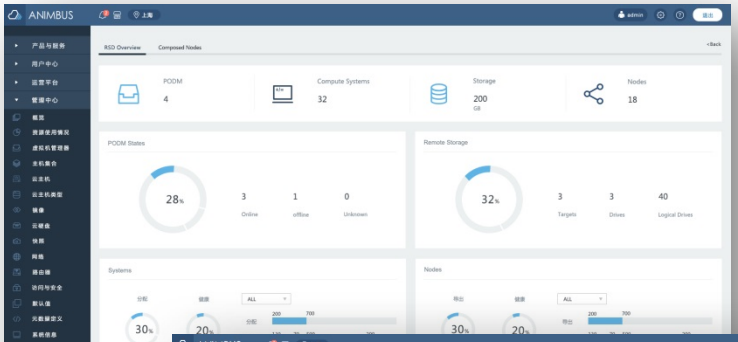
# Valence Overview - Workflow

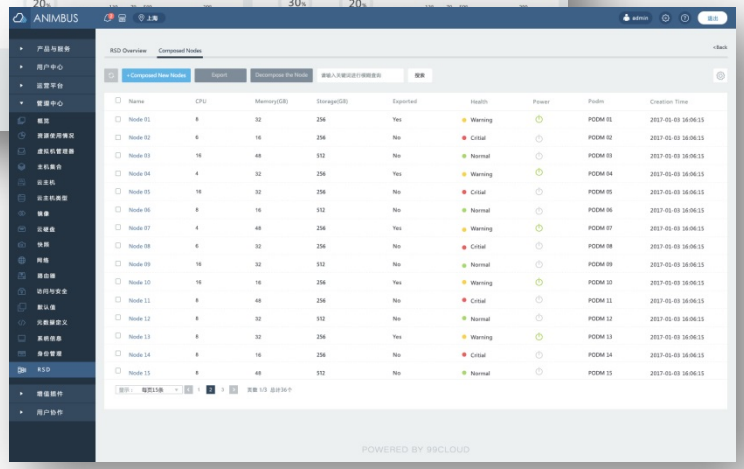


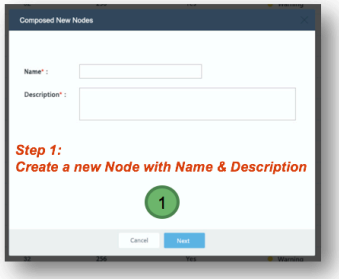
# Use Cases

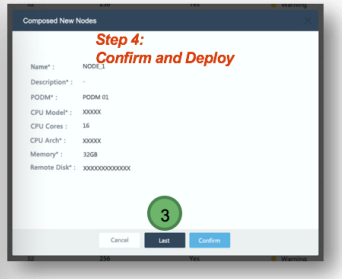
- Scenario 1: Advanced auto deployment with containerized OpenStack and scaling out function
- Scenario 2: Elastic baremetal provisioning function
- Scenario 3: Dynamical pooled NVMe Storage provisioning

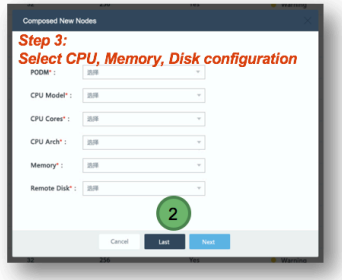
# Demo


ANIMBUS
RSD Overview
Composed Nodes
PODM
4
Compute Systems
32
Storage
200
Nodes
18
PODM States
28%
Remote Storage
32%


ANIMBUS
RSD Overview
Composed Nodes
+Composed New Nodes
Export
Decompose the Node


Composed New Nodes
Name* :
Description* :
Step 1:
Create a new Node with Name & Description
1
Cancel
Next


Composed New Nodes
Step 4:
Confirm and Deploy
Name* :
Description* :
PODM* :
CPU Model* :
CPU Cores :
CPU Arch* :
Memory* :
Remote Disk* :
3
Cancel
Last
Confirm


Composed New Nodes
Step 3:
Select CPU, Memory, Disk configuration
PODM* :
CPU Model* :
CPU Cores* :
CPU Arch* :
Memory* :
Remote Disk* :
2
Cancel
Last
Next

# THANK YOU

# Scenario 1: Advanced auto deployment with containerized OpenStack and scaling out function

**An OpenStack Cloud can be deployed or scaled out automatically without manual operation on physical machines.**


**Integration Component:**

- 99Cloud Kolla Auto Deployment System
- 99Cloud Ironic Baremetal Management System
- Intel RSD API with OpenStack Valence

**Benefits:**

- The deployment from baremetal and cluster scaling out can be fully automatic.
- Acting as under cloud, RSD can expose node management capabilities to 99cloud Animbus OpenStack for assets & configuration management purpose.
- Improve DevOps efficiency by reducing operation effort with container technology in OpenStack Kolla project combined with Intel RSD technology
- Build once and run everywhere, simplify service packaging and upgrading

# Scenario 3: Dynamical pooled NVMe Storage provisioning

**99cloud Animbus works with RSD can make physical machines as easy to provision asvirtual machines in cloud.**

**Integration Component:**

- 99Cloud Ironic Baremetal management system
- Intel RSD API with OpenStack Valence

**Benefits:**

- OpenStack can get different flavors of baremetal machines directly through Ironic combined with Intel RSD Technology.
- Accelerate cluster scaling out and tenant quotation change process through the combination of 99cloud Animbus OpenStack ticket module and Intel RSD Technology

# Scenario 3: Dynamical pooled NVMe Storage provisioning

**99Cloud Animbus OpenStack manages NVMe Storage through APIs exposed by PSME Storage Controller and will use valence client to handle these API calls. There is a driver in cinder will manage NVMe storage provision and the whole life cycle.**

**Integration Component:**

- 99Cloud Cinder Storage management system
- Intel RSD API with OpenStack Valence

**Benefits:**

- When guest instances require high performance Storage, it can attach a NVMe block storage through the storage node by LVM or simply through a distributed storage system, such as Ceph, GlusterFS, etc.
- The driver will check the quotation of each storage request and make sure the capacity is meet. If there is an insufficient request, RSD controller will be called to dynamically provide additional NVMe storage capacity to those storage nodes.

# For More Information

**Find more information online: http://www.intel.com/intelrsd**
**Open Source reference code available at: http://01.org/intelrsd**

## Our Partners

| | |
|---|---|
| OEMs/ ODMs/TEMs* | inspur 浪潮, QCT, wiwynn, 英業達集團 Inventec, Microsemi, Hewlett Packard Enterprise, DELL EMC, ERICSSON, HUAWEI, Lenovo, Orchestrating a brighter world NEC, SUPERMICRO, radisys |
| ISVs/OSVs* | American Megatrends, CANONICAL, vmware, 九州云 Cloud |

*Other names and brands may be claimed as property of others. ^Contact your local Intel representative for POC information.

# Intel® Rack Scale Design Ecosystem

Common management framework and telemetry supports ecosystem partner requirements to develop a range of platforms and solutions

| | |
|---|---|
| OEMs/ ODMs/TEMs* | DELL EMC, inspur 浪潮, 英業達集團 Inventec, Microsemi, QCT, Supermicro, Hewlett Packard Enterprise, ERICSSON, HUAWEI, Lenovo, Orchestrating a brighter world NEC, radisys, wiwynn |
| ISVs/OSVs* | American Megatrends, CANONICAL, vmware, 九州云 Cloud |
| Industry initiatives/ Standards* | openstack, OPEN Compute Project, DMTF Redfish, 开放数据中心委员会 Open Data Center Committee |
| End Users/POCs*^ | Baidu 百度, SK telecom, SoftBank, Tencent 腾讯, YAHOO! |

*Other names and brands may be claimed as property of others.