

1 SYSTEM

The following document provides setup procedures using SuperMicro. Redhat and Brocade installation procedures used for this project.

Equipment manufactures webs sites:

SuperMicro

<https://www.supermicro.com/index.cfm>

<https://www.supermicro.com/products/system/2u/6028/sys-6028tr-htr.cfm>

Redhat

<https://access.redhat.com/>

Brocade

<http://www.brocade.com/en/products-services.html>

Product descriptions:

<https://www.supermicro.com/products/system/2u/6028/sys-6028tr-htr.cfm>

<https://www.supermicro.com/products/nfo/IPMI.cfm>

https://www.supermicro.com/products/nfo/files/IPMI/Best_Practices_BMC_Security.pdf

User manual for setup

<https://www.supermicro.com/manuals/superserver/2U/MNL-1644.pdf>

2 Hardware Setup

2.1 Recommended System Requirements

Based upon Red Hat Open Stack Platform 10 *Director Installation and Usage* guide:

https://access.redhat.com/documentation/en-us/red_hat_openstack_platform/10/html/director_installation_and_usage/

The recommended hosting requirements are:

- 1 host machine for the Red Hat Enterprise Linux OpenStack Platform director
- 3 host machines for Red Hat Enterprise Linux OpenStack Platform Compute nodes
- 3 host machines for Red Hat Enterprise Linux OpenStack Platform Controller nodes in a cluster
- 3 host machines for Red Hat Ceph Storage nodes in a cluster

To support the recommended processor and memory requirements, we will be utilizing the following hardware:

- 1 x Supermicro Model 6028TR-HTR (1 x Director, 3 x Controller)
- 3 x Supermicro Model 1028R-WC1R (3 x Compute)

2.2 Supermicro Model 6028TR-HTR

The manual for Supermicro Model 6028TR-HTR can be found at:

<https://www.supermicro.com/products/system/2u/6028/sys-6028tr-htr.cfm>

The hardware specifications for Supermicro Model 6028TR-HTR are as follows:

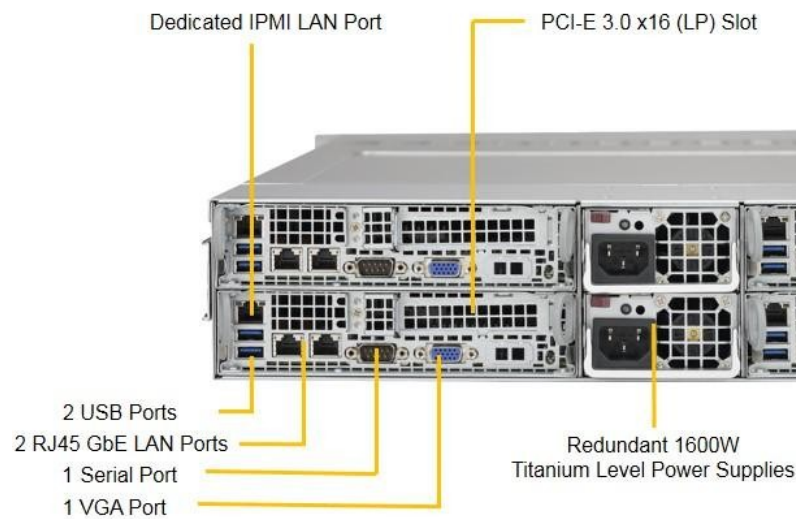
Platform	6028TR-HTR : 2U, Supermicro SuperServer
CPU	8x E5-2620v4 (2 CPU Per Node)
Memory	32x 8GB DDR4-2400 ECC REG DIMM (8 x 8GB Per Node)
Storage	8x Intel DC S3520 240GB, SATA 6Gb with OS Raid 1

	configured (2 x 240GB <u>Per Node</u>)
--	---

The following diagram depicts the rear view of the 6028TR-HTR system and its components. NOTE: The diagram DOES NOT show the 2 x 10GbE LAN Ports which are installed in the PCI-E 3.0 x 16 Slots

2UTwin² SYS-6028TR-HTR

(Rear View – System)



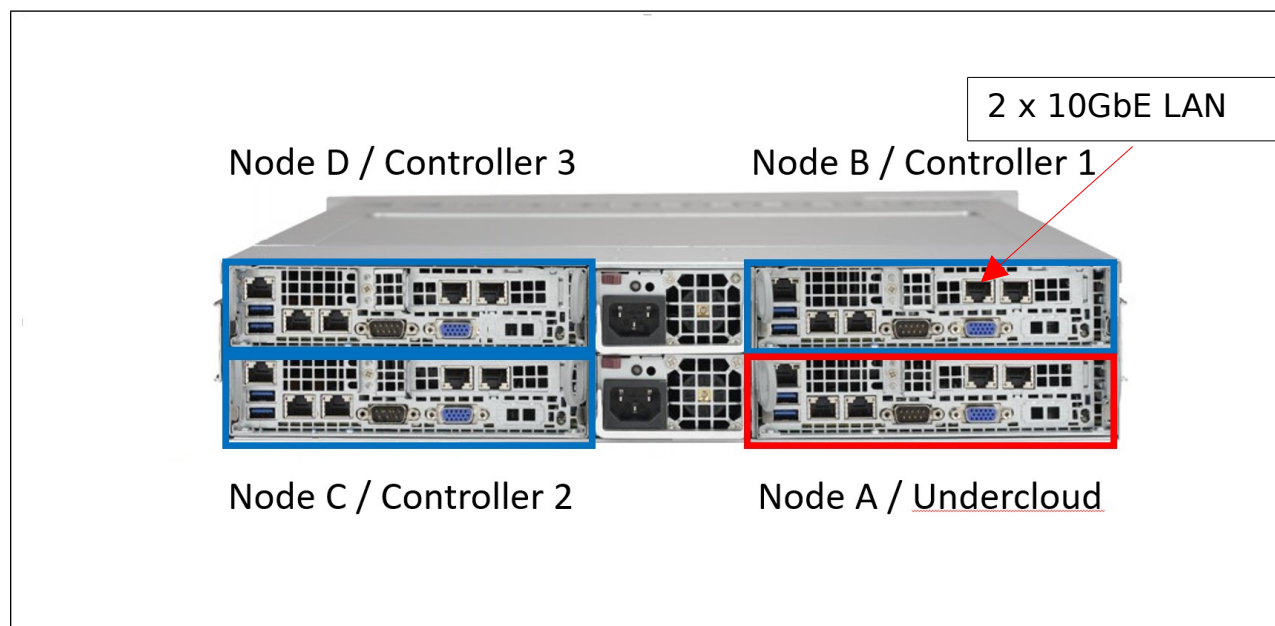
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Each one of the nodes are labeled Node A, B, C, D respectively on the front of the chassis. The following table explains what each one of the nodes have been designated for in the OpenStack architecture.

Hardware Node	OpenStack Designation
6028TR-HTR Node A	Director / Undercloud

6028TR-HTR Node B	Controller 1
6028TR-HTR Node C	Controller 2
6028TR-HTR Node D	Controller 3

The following “rear” diagram shows the locations of these nodes:



2.3 Supermicro Model 1028R-WC1R

The manual for Supermicro Model 1028R-WC1R can be found at:

<https://www.supermicro.com/products/system/1u/1028/sys-1028r-wc1r.cfm>

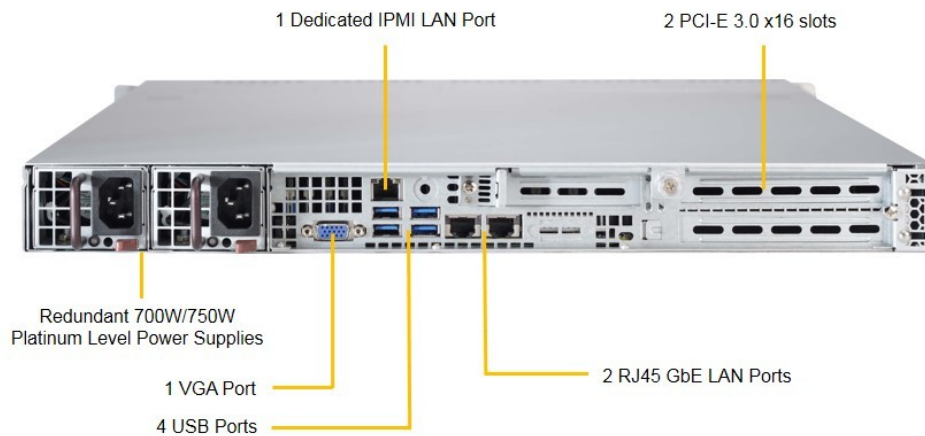
The hardware specifications for Supermicro Model 1028R-WC1R are as follows:

Platform	1028R-WC1R : 1U
CPU	2x E5-2650v4 (Per machine)
Memory	16x 16GB DDR4-2400 ECC REG DIMM (Per machine)
Storage	2x Intel DC S3520 240GB, SATA 6Gb (Per machine)

The following diagram depicts the rear view of the 1028R-WC1R system and its components. NOTE: The diagram DOES NOT show the 2 x 10GbE LAN Ports which are installed in the PCI-E 3.0 x 16 Slots

SuperServer SYS-1028R-WC1R

(Rear View – System)



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There are 3 separate machines that are labeled Compute 1, 2 and 3 respectively on the boxes they came in. The following “rear” diagram shows the location of the 2 x 10GbE LAN Ports

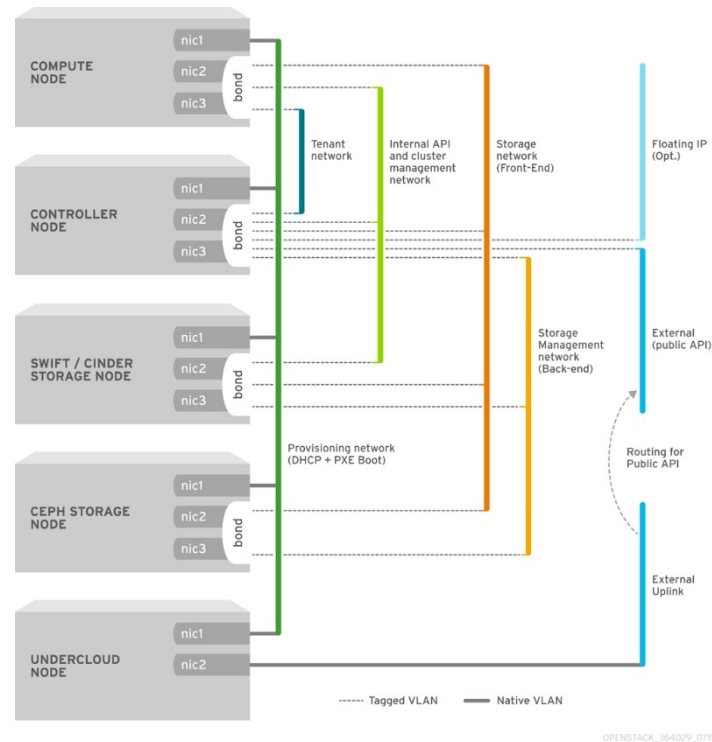


2.4 **Brocade VDX 6740**

The manual for [Brocade VDX 6740](http://www.brocade.com/content/html/en/hardware-installation-guide/vdx6740-installguide/GUID-4F5700C2-A117-462B-AD0D-0E5AB6258D15.html) can be found at:

<http://www.brocade.com/content/html/en/hardware-installation-guide/vdx6740-installguide/GUID-4F5700C2-A117-462B-AD0D-0E5AB6258D15.html>

Red Hat recommends the following network topology with isolated VLANs.



Documentation can be found here:

https://access.redhat.com/documentation/en-us/red_hat_openstack_platform/10/html/director_installation_and_usage/chap-planning_your_overcloud#sect-Planning_Networks

Only one of the switches was configured. Seven VLANs were configured.

The first 15 ports were configured as switchports on VLAN 1. Six port channel groups were configured for the bonded interfaces. Beginning on port port 20 through 25 with the second port for each LACP group starting on port 30 through 35. All the port channel groups were also configured as trunks with access to VLANs 10,20,30,40,50. The switch's management interface was configured for DHCP addressing.

- VLAN 1 was designated as the Mgmt/Provisioning network.
- VLAN 10 was designated as the External network.
- VLAN 20 was designated as the Tenant network.
- VLAN 30 was designated as the Internal API network.
- VLAN 40 was designated as the Storage front-end network.
- VLAN 50 was designated as the Storage back-end network.
- VLAN 199 was designated as the Undercloud network (not used).

3 Hardware Configuration

3.1 Boot Order

All machines with the exception of the Director/Undercloud machine were setup to boot in the following order:

1. Network (via PXE)
2. Hard Disk

3.2 Intelligent Platform Management Interface (IPMI) Setup

Each of the following machines were configured to use static IP addresses for use during the Undercloud introspection process.

Hardware Node	OpenStack Designation	IPMI BMC IP Address
6028TR-HTR Node B	Controller 1	172.031.002.205
6028TR-HTR Node C	Controller 2	172.031.002.206
6028TR-HTR Node D	Controller 3	172.031.002.207
1028R-WC1R #1	Compute 1	172.031.002.208
1028R-WC1R #2	Compute 2	172.031.002.209
1028R-WC1R #3	Compute 3	172.031.002.210

4 OpenStack Installation

4.1 Undercloud Configuration

This is not the actual undercloud.conf file but the properties below were manually updated with the assigned values:

[DEFAULT]

```
local_ip = 172.31.2.1/24
network_gateway = 172.31.2.1
undercloud_public_vip = 172.31.2.2
undercloud_admin_vip = 172.31.2.3
local_interface = ens1f0
network_cidr = 172.31.2.0/24
masquerade_network = 172.31.2.0/24
dhcp_start = 172.31.2.5
dhcp_end = 172.31.2.24
inspection_iprange = 172.31.2.100,172.31.2.120
```

[auth]

4.2 Overcloud Node Registration

To register the overcloud nodes, the file instackenv.json is created and updated with the IPMI IP addresses of each of the controller and compute nodes described in the previous sections.

```
{
  "nodes":[
    {
      "pm_user":"ADMIN",
      "pm_password":"ADMIN",
      "pm_addr":"172.31.2.205"
    },
    {
      "pm_user":"ADMIN",
      "pm_password":"ADMIN",
```

```

    "pm_addr":"172.31.2.206"
  },
  {
    "pm_user":"ADMIN",
    "pm_password":"ADMIN",
    "pm_addr":"172.31.2.207"
  },
  {
    "pm_user":"ADMIN",
    "pm_password":"ADMIN",
    "pm_addr":"172.31.2.208"
  },
  {
    "pm_user":"ADMIN",
    "pm_password":"ADMIN",
    "pm_addr":"172.31.2.209"
  },
  {
    "pm_user":"ADMIN",
    "pm_password":"ADMIN",
    "pm_addr":"172.31.2.210"
  }
]
}

```

Once the nodes are registered, perform the command “openstack baremetal node list” to verify the nodes exist. (NOTE: UUID’s may vary)

Here is our current setup on our last overcloud deployment run:

```

$ openstack baremetal node list
+-----+-----+-----+-----+-----+-----+-----+
| UUID                               | Name | Instance UUID | Power State | Provisioning State | Maintenance |
+-----+-----+-----+-----+-----+-----+-----+
| d2b0690c-bdc8-4f4d-8328-b060d19717f0 | None | None          | power off   | available          | False       |
| 79c99f4e-aecc-4702-9d7a-379676e95e6e | None | None          | power off   | available          | False       |
| 0fc99cbd-286c-4276-9d14-6e912e672680 | None | None          | power off   | available          | False       |
| 03e84eaf-6fdb-4f34-b1c7-49052cd4647b | None | None          | power off   | available          | False       |
| 5dd6be7d-94e6-45b5-a3cd-64ee2c603737 | None | None          | power off   | available          | False       |
| 08e03368-5b83-4756-8169-89a0a5f25e0d | None | None          | power off   | available          | False       |
+-----+-----+-----+-----+-----+-----+-----+

```

After introspection, each of the nodes were tagged into profiles. Perform the command “openstack overcloud profiles list” to view the assignments (NOTE: UUID’s may vary)

```
$ openstack overcloud profiles list
```

Node UUID	Node Name	Provision State	Current Profile	Possible Profiles
d2b0690c-bdc8-4f4d-8328-b060d19717f0		available	control	
79c99f4e-aecc-4702-9d7a-379676e95e6e		available	control	
0fc99cbd-286c-4276-9d14-6e912e672680		available	control	
03e84eaf-6fdb-4f34-b1c7-49052cd4647b		available	compute	
5dd6be7d-94e6-45b5-a3cd-64ee2c603737		available	compute	
08e03368-5b83-4756-8169-89a0a5f25e0d		available	compute	

Each of the nodes contain two disks. Provisioning requires the director to identify which to use as the root disk. Each node was set to the first serial device identified in the hardware introspection recovered from OpenStack Object Storage server (swift) (NOTE: UUID's may vary)

```
$ openstack baremetal node set --property root_device='{ "serial": "PHDV713501H3240AGN"}' d2b0690c-bdc8-4f4d-8328-b060d19717f0
$ openstack baremetal node set --property root_device='{ "serial": "PHDV71340140240AGN"}' 79c99f4e-aecc-4702-9d7a-379676e95e6e
$ openstack baremetal node set --property root_device='{ "serial": "PHDV713501C5240AGN"}' 0fc99cbd-286c-4276-9d14-6e912e672680
$ openstack baremetal node set --property root_device='{ "serial": "PHDV713501J8240AGN"}' 03e84eaf-6fdb-4f34-b1c7-49052cd4647b
$ openstack baremetal node set --property root_device='{ "serial": "PHDV7135017V240AGN"}' 5dd6be7d-94e6-45b5-a3cd-64ee2c603737
$ openstack baremetal node set --property root_device='{ "serial": "PHDV7135016S240AGN"}' 08e03368-5b83-4756-8169-89a0a5f25e0d
```