Brooklyn Research Cluster (OpenStack)

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Brooklyn Research Cluster is currently in its Pilot phase.

Features

Brooklyn Research Cluster provides Infrastructure as a Service.

- Can be viewed as a Private Cloud
- Users request the resources they need for their project
- The system configures requested resources and gives low-level control to the user.

Users are free to utilize the system in whatever manner their research requires

- They can install packages, customize the system, run/modify system services.
- This allows experienced researchers to work independently of support staff, improving productivity and freeing support staff to work on larger issues.

Brooklyn Research Cluster allows operations that are not normally available on traditional clusters

- Users can create snapshots of their systems allowing them to go back to past states if an experiment goes awry or to reproduce an experiment at a latter date.
- Users can create virtual networks allowing control of communication between different nodes. This is particularly useful for developing networking applications.

Rich library of supported environments

- These environments can be provisioned with a push of a button making the set up seamless.
- These environments do not necessary need to provide root access, ensuring that the system would work as expected.
- This could allow administrators to provide the same level of support to users who don’t need full control of the system or don’t have the technical skills necessary.

Hardware Specifications

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Network
- 100Gbit Ethernet network allows for fast communication between compute servers and between the compute and storage servers
- 10Gbit network provides uplinks to the NYU network
- 1Gbit networks provides management of the cluster

Servers
The cluster consists of 25 compute servers
- Each server has two 14 core Intel E5-2690v4 with a total of 28 cores running at 2.6 GHz
- The servers each have 256Gb of DDR4 RAM
- The cluster is equipped with 80 P100 GPUs with 12Gb RAM each
- The cluster is equipped with 20 P40 GPUs with 24Gb RAM each to be provisioned as baremetal nodes only
- New compute servers can be added, regardless of specs or vendor

Storage
The compute nodes are backed by a Ceph storage system.
- The storage has 300TBs of capacity (100TBs usable)
- Ceph provides storage for images, volumes and data
- The system provides researchers with high bandwidth consistent storage
- The storage is scalable, new storage servers can be added as needed, without vendor lock in

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