جامعة نيويورك أبوظبي

NYU | ABU DHABI

Getting Started with *Dalma*

High Performance Computing NYUAD

November 2017 v6.1

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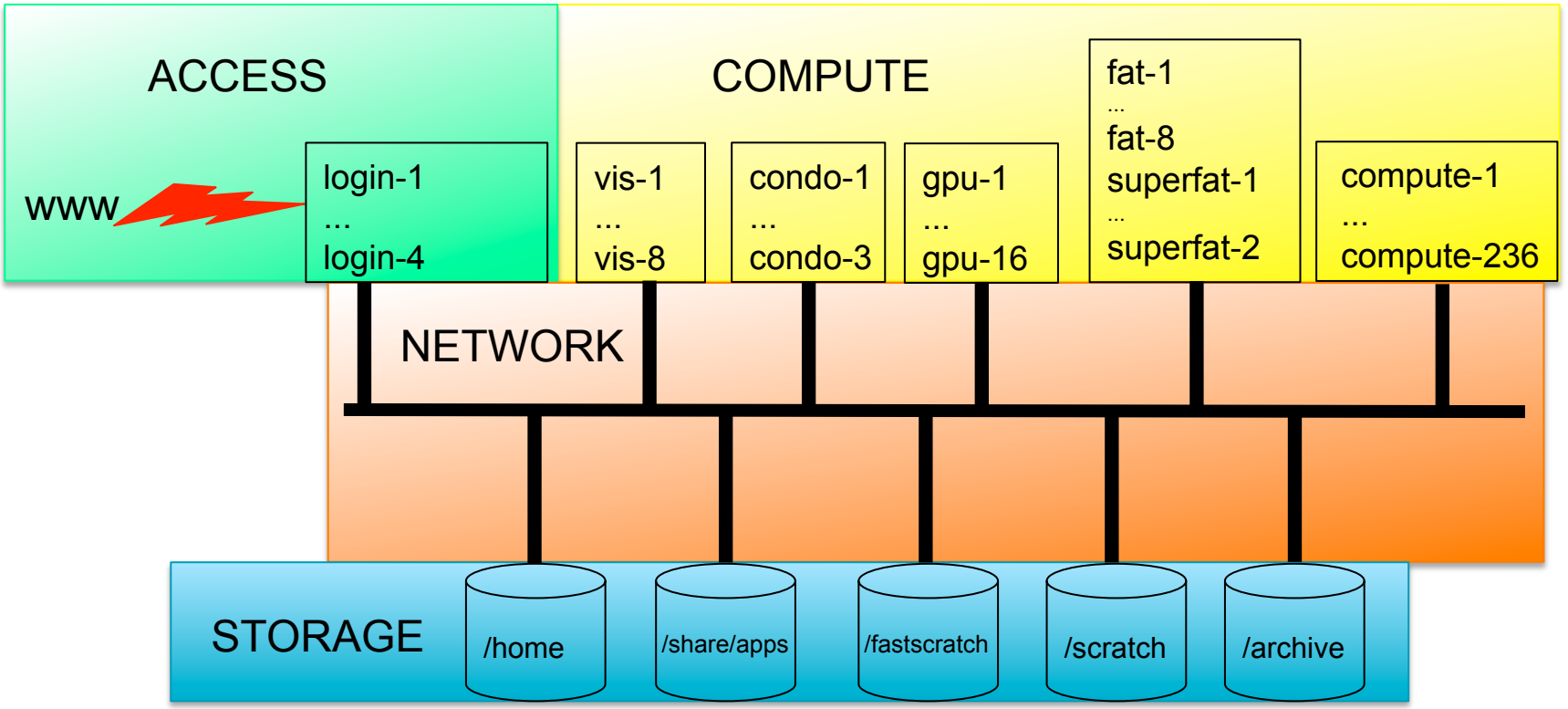
Dalma Block Diagram

These are Dalma's hardware components. We are using a classic cluster architecture which is ideal for varied workloads. Each node is a Symmetric Multi Processor (SMP) system connected to the other nodes, and the storage system, through a 100Gbps Infiniband network.



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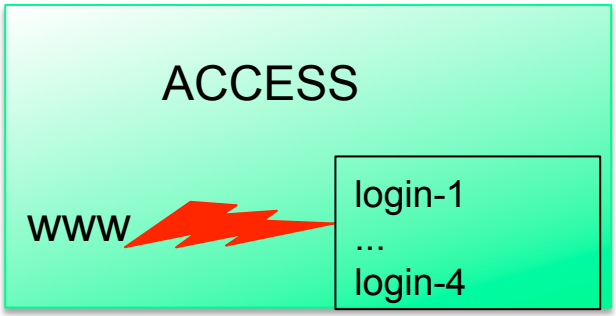
Dalma Block Diagram

If connected to NYU's NYC or AD intranet you access Dalma using:

```
ssh <netid>@dalma.abudhabi.nyu.edu
```



If going through Internet you connect via "hpc":

```
ssh <netid>@hpc.abudhabi.nyu.edu –p 4410
```

then from the "hpc" node:

```
ssh <netid>@dalma.abudhabi.nyu.edu
```

In both cases you will start a shell session on a randomly selected login node. The login nodes arewhere you prepare your jobs to be submitted to the system, and where you manage your data. Login nodes have access to Internet, so you can use "ftp", "git", "gem", "wget", "pip", etc. to access remote data and software repositories.

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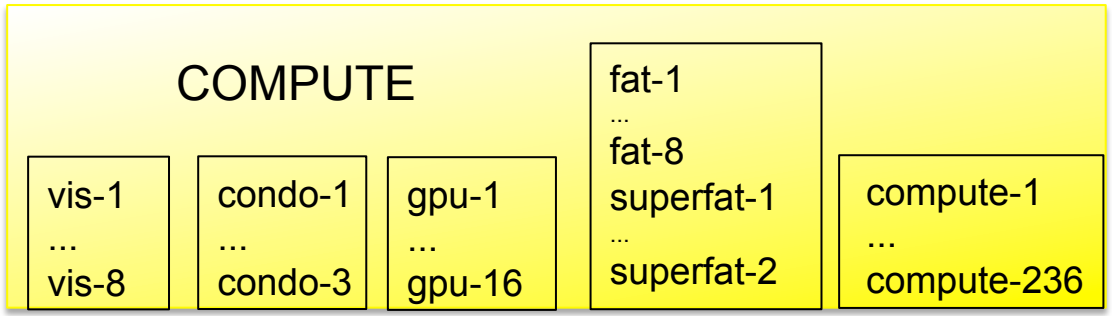
The computing nodes is where you applications run. You can't access them directly. You interact with them through a software tool called a "workload management utility". There are various workload managers out there, NYUAD uses "SLURM". We cover that subject later.

Dalma hosts a few types of compute nodes: visualization, GPU, large memory (fat), privately owned (condo), and general purpose (compute). Together they provide over 213TFlops of compute power using more than 7'000 processor cores.



Node Type	CPU Type	#CPU Cores	Memory
gpu	sse	12@2.7GHz	96GB
fat	sse	12@2.7GHz	192GB
superfat	sse/avx2	32@2.7GHz/ 72@2.4GHz	1TB / 2TB
compute	avx2	28@2.4GHz	128GB

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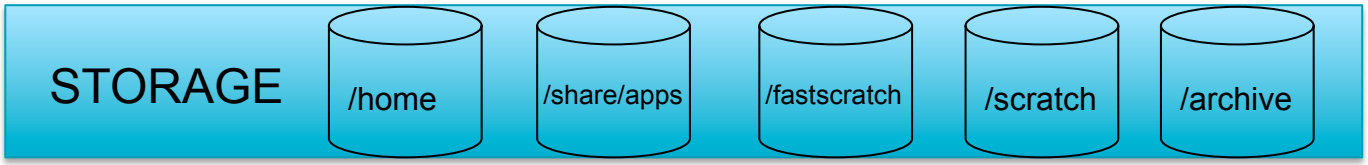
There are 5 types of storage on Dalma, each serves a specific purpose.
(/share/apps not mentioned below is where application software is stored)

Mount Point	/home	/archive	/fastscratch	/scratch
Type	BeeGFS	DMF + Tape	BeeGFS	Lustre
Default Quota	5GB 100K files	2TB 500K files	2TB 500K files	5TB 500K files
Capacity	4.3 TB	750 TB	216 TB	965 TB
Deletion Policy	None	None	Files not accessed for 90 days	Files not accessed for 90 days
Intended Use	bashrc, ssh files, Perl, Python, Java modules	permanently storing data you no longer use (or unlikely to access soon)	data mining applications, segmented I/O, access is granted for specific applications only	storage for your data, location from where you submit jobs



Dalma Block Diagram

The network is 100Gbps EDR Infiniband - non-blocking topology. It transports data to / from disks, as well as MPI traffic (distributed applications). It can sustain data traffic reaching up to 1.4TB/s!