CEPH

(Project Proposal for CEPH Cluster)

Abstract ---

As the data needs in every field continue to grow, storage systems have to grow and therefore need to adapt to the increasing demands of performance, reliability and fault tolerance. Improving all these factors while maintaining low costs is thus crucial. The Ceph promises to reliably store data distributed across many nodes. This project proposes to investigate how Ceph performs in different setups and compares this with the theoretical maximum performance of the hardware.

Objective ---

To build a Cloud cluster with 4 nodes (servers) having combination of CMR HDDs and SSDs and to Study performance improvement of the cluster over traditional clusters.

Hardware Requirement ---

Total drives required for 4 servers are 32 CMR HDDs each having 4 Tb capacity and 16 SSDs each having 400Gb capacity in addition to this we will need 4 HPSA Controllers.

Experimental Setup ---

1) Hardware Setup

To evaluate Software Defined Storage properties and performance for a cluster, we propose to set up a cluster with HP ProLiant DL180 G6 having Intel 5520 Chipset.

Each Server will have 8 CMR HDDs + 4 SSDs (OS will be on 1 of the SSD, other 3 SSDs will be used as cache) + HP Smart Array (HPSA) Controller and it will be connected to 1 GB and 10 GB network.

2) Software Setup

All the 4 nodes having CentOS version 7.1 with kernel 3.10.0-229 and latest stable version of CEPH. One of the server (within 4 nodes) will be used as CEPH Monitor and as an Admin for cluster.

3) Performance Testing

There are some benchmarks available on web such as Bonnie ++, DD, Rados bench, OSD Tell, IPerf and Netcat to study the speed of data being copied and also the read/write performance.

In addition to this changing different Smart Array cache setting to check percentage DRAM used for read and write caching.

Comparison Metrics - Average MB/s/OSD, IO/s/OSD and Latency/IO/OSD

Milestones ---

Task	Deadline
Finalize the Project plan	2/10/2016
Hardware Setup	3/11/2016
Software Setup	3/18/2016
Verifying the Setup	3/22/2016
Performance Testing	4/05/2016
Retuning the setup as per performance (if required)	4/12/2016

References ---

1) CEPH on HP ProLiant SL4540 Gen8 Servers
   http://www8.hp.com/h20195/v2/GetPDF.aspx/4AA5-2799ENW.pdf

2) Building CEPH with multiple OSD and Monitors
   http://www.virtualtothecore.com/en/adventures-ceph-storage-part-4-deploy-the-nodes-in-the-lab/