



IBM Spectrum Scale on Google Cloud



IBM **Spectrum Scale**

Google Cloud

Agenda

1. Introduction
2. GCP resources and terminology
3. Scale Deployment on GCP
4. Performance
5. Maintenance
6. Q&A

Presenters

1. Jeff Ceason (IBM Business Dev.)

Disclaimer

- **This presentation does not represent Google or IBM Spectrum Scale**
- **There is no committed date to put Spectrum Scale on the Google Cloud Marketplace. This is an investigation by IBM business development.**
- **All performance and other information regarding Google Cloud Platform is based on testing in us-central region and may not reflect current or other region performance**

Regions and Zones

- A region is a specific geographical location where you can run your resources. Each region has one or more zones; For example, the us-central1 region denotes a region in the Central United States that has zones us-central1-a, us-central1-b, us-central1-c, and us-central1-f.
- Resources that live in a zone, such as instances or persistent disks, are referred to as zonal resources. Other resources, like static external IP addresses, are regional.
- Regional resources can be used by any resources in that region, regardless of zone, while zonal resources can only be used by other resources in the same zone



Machine Types

- Machine types combine vCPUs, RAM, and disk
- Predefined
 - Standard, High memory, High CPU
- Customized

Machine name	Description	vCPUs ¹	Memory (GB)	Max number of persistent disks (PDs) ²	Max total PD size (TB)
n1-standard-1	Standard machine type with 1 vCPU and 3.75 GB of memory.	1	3.75	128	64
n1-standard-2	Standard machine type with 2 vCPUs and 7.5 GB of memory.	2	7.50	128	64
n1-highcpu-32	High-CPU machine type with 32 vCPUs and 28.8 GB of memory.	32	28.8	128	64

Types of Storage

- **Persistent Storage** (Persistent Disk)
 - **Two types:** pd-standard and pd-ssd
 - Moderate latency & throughput - **dependent on capacity and # vCPUs**
 - Multi-mount support (RO PD)
 - Large, persistent through reboots
- **Local Storage** (Local SSD)
 - Lowest latency, high throughput
 - Small, **non-persistent**
- **Object Storage** (Google Cloud Storage)
 - Object Interface (GET, PUT, DELETE)

Images

- **Public**
 - Free – Centos-6,7, Core OS, Debian, Suse ,Ubuntu
 - Premium - RHEL, SLES, Windows Server
- **Custom**
 - Pre-saved images stored in project
 - Scale on GCP uses Centos7-byol
 - Centos-7 + rpms, root ssh-keys, /scaleGCPinstall scripts, .bashrc, .hushlogin, SELINUX=disabled

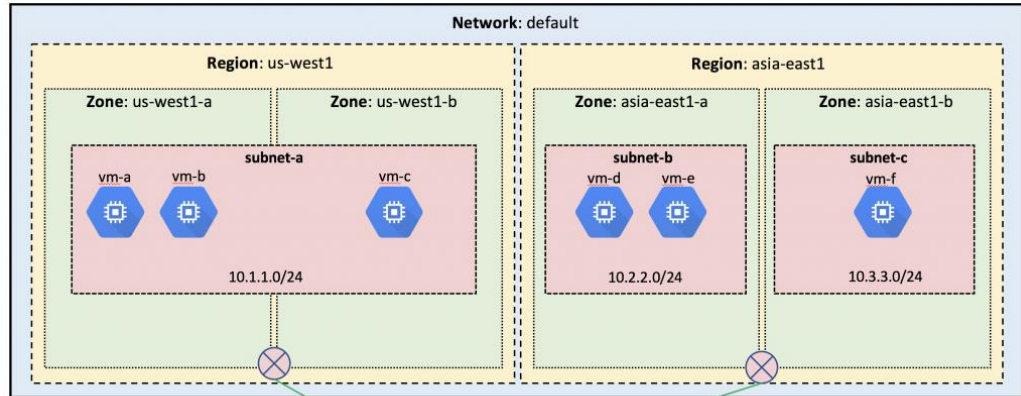
Google Cloud Platform | IBM-Spectrum-Scale-Dev

Compute Engine | Images | CREATE IMAGE | REFRESH | CREATE INSTANCE | DEPRECATE | DELETE | SHOW INFO P

<input type="checkbox"/>	Name	Size	Created by	Family	Creatio
<input type="checkbox"/>	✓ centos7-523	40 GB	IBM-Spectrum-Scale-Dev		Mar 22
<input type="checkbox"/>	✓ centos7-byol	40 GB	IBM-Spectrum-Scale-Dev		Apr 1, :

Networking

- **GCP has Virtual Private Cloud (VPC)**
 - Virtual version of a physical network with WW scope
 - Contains regional subnets , each instance belongs to a subnet
 - IPv4 only
 - Can be shared between project/deployments within an account

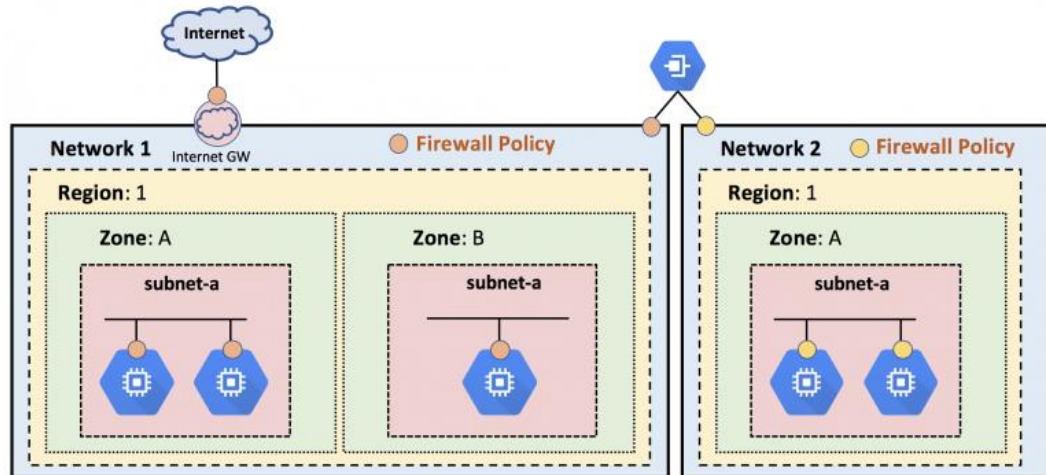


We can all route to each other across the globe in the same VPC network by default.

Firewalls

- **Firewalls**

- Virtual version of a physical network with WW scope
- Contains regional subnets , each instance belongs to a subnet
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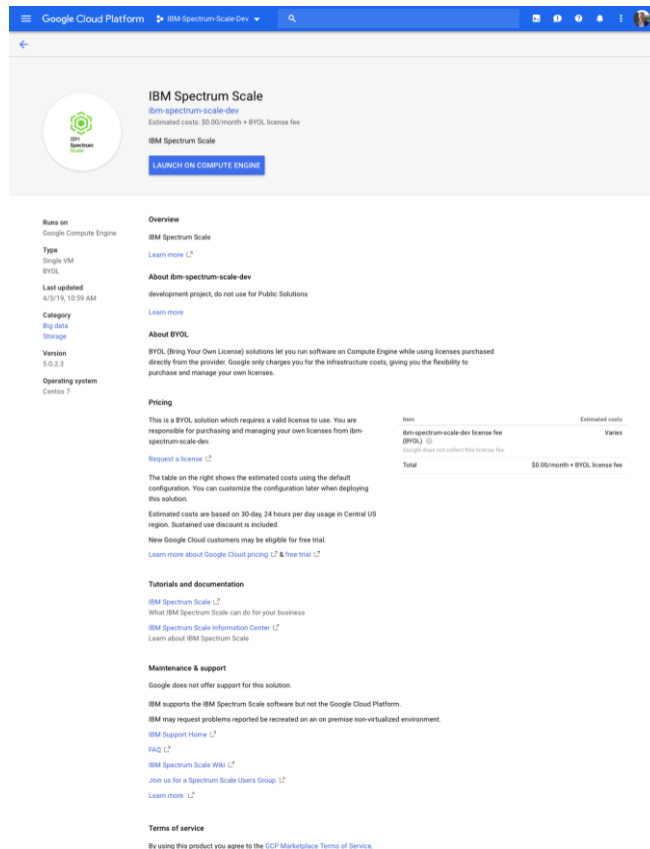
Instances

- Instances - deployed combination of resources and properties into a VM or as containers
 - Combines resources
 - Machine Type
 - Image (Centos7-BYOL)
 - Disks
 - NICS
 - Belongs to a subnet
 - Properties
 - Deletion Protection
 - Metadata

Gcloud CLI

- **gcloud** is a tool that provides the primary CLI to Google Cloud Platform
 - Available windows, Linux, OSX
 - Query
 - Start, stop, delete
 - Update / edit
 - SSH,SCP
- Examples:
 - `gcloud config list`
 - `gcloud compute --project "ibm-spectrum-scale-dev" ssh --zone "us-central1-b" mn`
 - `gcloud compute scp scalesetup.py mn:/scaleGCPinstall`
 - `gcloud compute instances stop nsdsn2`

Scale on GCP Marketplace - Demo



The screenshot shows the Google Cloud Marketplace page for IBM Spectrum Scale. The page is titled "IBM Spectrum Scale" and includes a "LAUNCH ON COMPUTE ENGINE" button. The left sidebar contains metadata such as "Runs on Google Compute Engine", "Type: Single VM BYOL", "Last updated: 4/3/18, 10:59 AM", "Category: Big data Storage", "Version: 5.0.2.3", and "Operating system: CentOS 7". The main content area is divided into sections: "Overview" (with a "Learn more" link), "About ibm-spectrum-scale-dev" (describing it as a development project), "About BYOL" (explaining Bring Your Own License), "Pricing" (with a table of costs), "Tutorials and documentation" (with links to information centers and wikis), "Maintenance & support" (with links to support home and FAQ), and "Terms of service".

Runs on
Google Compute Engine

Type
Single VM
BYOL

Last updated
4/3/18, 10:59 AM

Category
Big data
Storage

Version
5.0.2.3

Operating system
CentOS 7

Overview

IBM Spectrum Scale
[Learn more](#)

About ibm-spectrum-scale-dev

development project, do not use for Public Solutions
[Learn more](#)

About BYOL

BYOL (Bring Your Own License) solutions let you run software on Compute Engine while using licenses purchased directly from the provider. Google only charges you for the infrastructure costs, giving you the flexibility to purchase and manage your own licenses.

Pricing

This is a BYOL solution which requires a valid license to use. You are responsible for purchasing and managing your own licenses from `ibm-spectrum-scale-dev`.
[Request a license](#)

The table on the right shows the estimated costs using the default configuration. You can customize the configuration later when deploying this solution.

Estimated costs are based on 30-day, 24 hours per day usage in Central US region. Sustained use discount is included.
New Google Cloud customers may be eligible for free trial.
[Learn more about Google Cloud pricing](#) & [free trial](#)

Item	Estimated costs
ibm-spectrum-scale-dev license fee (BYOL)	Varies
Google does not collect this license fee.	
Total	\$0.00/month + BYOL license fee

Tutorials and documentation

[IBM Spectrum Scale](#)
What IBM Spectrum Scale can do for your business
[IBM Spectrum Scale Information Center](#)
[Learn about IBM Spectrum Scale](#)

Maintenance & support

Google does not offer support for this solution.

IBM supports the IBM Spectrum Scale software but not the Google Cloud Platform.

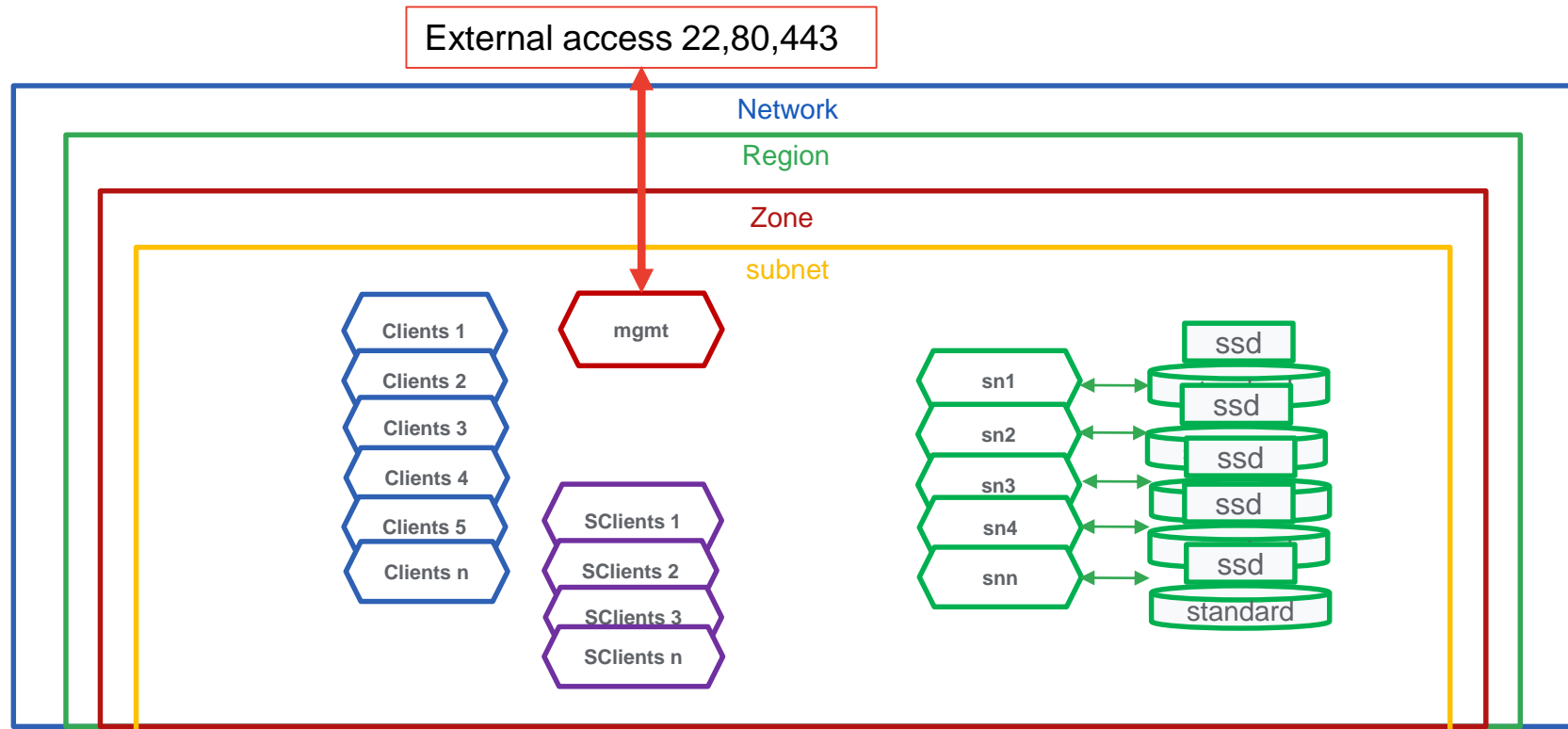
IBM may request problems reported be recreated on an on premise non-virtualized environment.

[IBM Support Home](#)
[FAQ](#)
[IBM Spectrum Scale Wiki](#)
[Join us for a Spectrum Scale Users Group](#)
[Learn more](#)


Terms of service

By using this product you agree to the [GCP Marketplace Terms of Service](#).

A deployed cluster



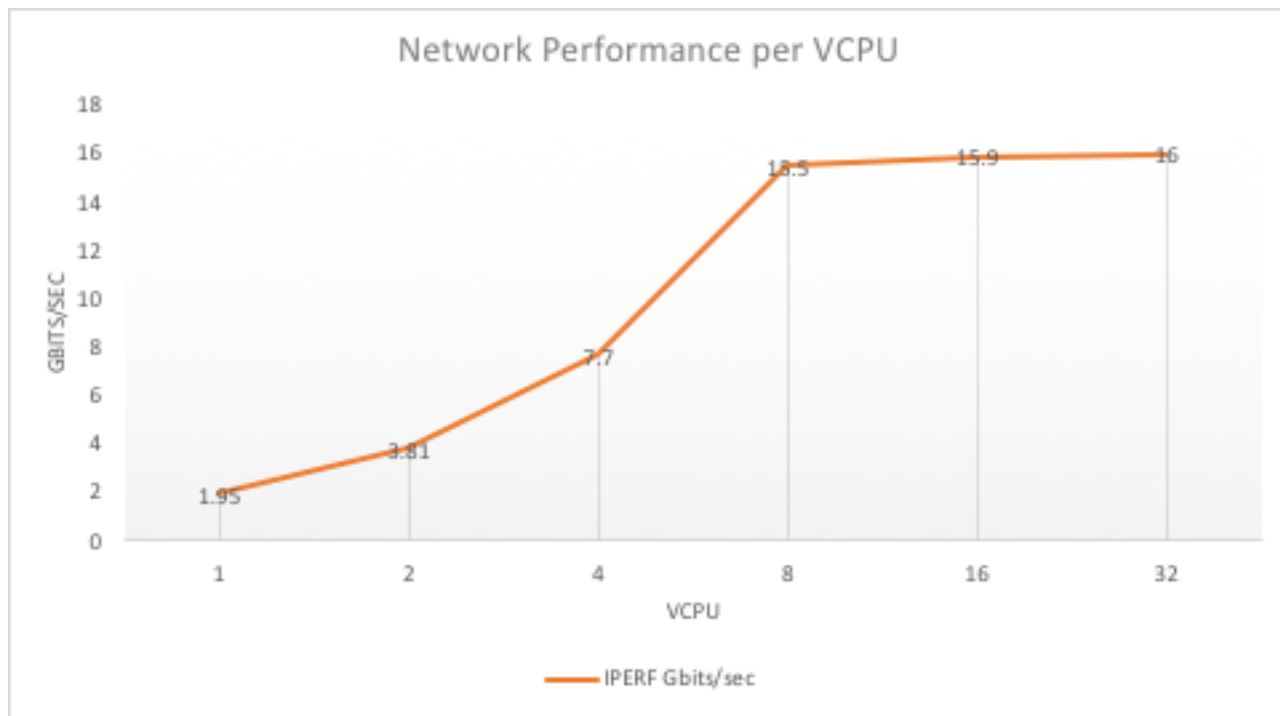
Disk Devices

```
[root@sn1 ~]# cd /dev/disk/by-id/
[root@sn1 by-id]# ls -alt
drwxr-xr-x 2 root root 200 Apr 16 17:13 .
lrwxrwxrwx 1 root root 10 Apr 16 17:13 google-boot-part1 -> ../../sda1
lrwxrwxrwx 1 root root 10 Apr 16 17:13 scsi-0Google_PersistentDisk_boot-part1 ->
../../sda1
lrwxrwxrwx 1 root root 9 Apr 16 17:13 google-pd-ssdnsd1-1 -> ../../sdb
lrwxrwxrwx 1 root root 9 Apr 16 17:13 scsi-0Google_PersistentDisk_pd-ssdnsd1-1 ->
../../sdb
lrwxrwxrwx 1 root root 9 Apr 16 17:13 google-pd-standardnsd1-1 -> ../../sdc
lrwxrwxrwx 1 root root 9 Apr 16 17:13 scsi-0Google_PersistentDisk_pd-standardnsd1-1 -
> ../../sdc
lrwxrwxrwx 1 root root 9 Apr 16 17:13 google-boot -> ../../sda
lrwxrwxrwx 1 root root 9 Apr 16 17:13 scsi-0Google_PersistentDisk_boot -> ../../sda
Google Cloud  root root 120 Apr 16 17:13 ..
```

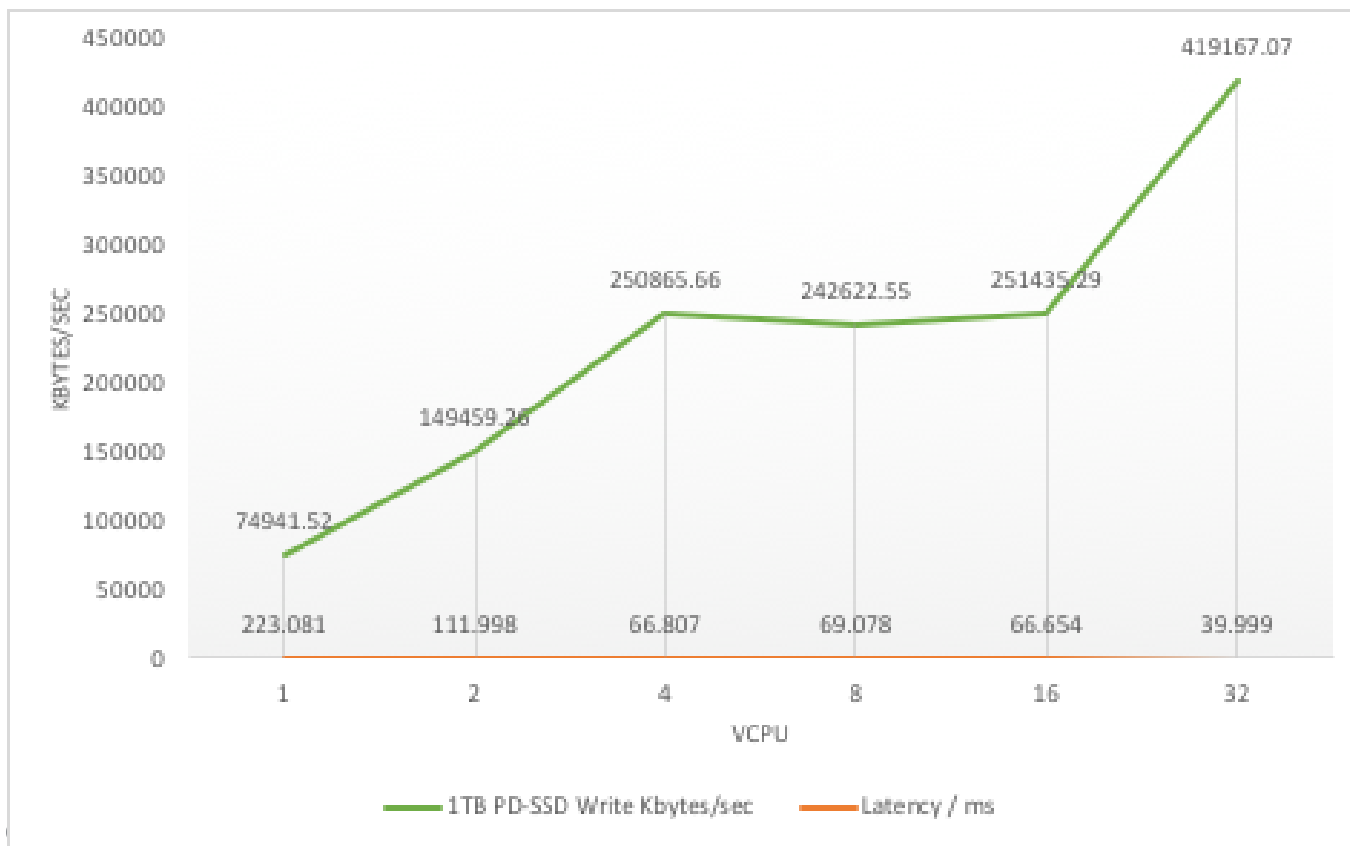
Performance

- **Bottlenecks**
 - **Block limited on**
 - Number of VCPU , need 32 to get max throughput and IOPs
 - Size of block, pd-ssd 900 GB
 - **Type**
 - pd-ssd 400 MB/s
 - pd-standard 280MB/s
 - Per instance , multiple blocks do not add
 - **Network**
 - Number of VCPU
 - 2Gbs per VCPU
 - Max 16 Gbs ~ 1.86 GB/s (Think 20 Gb/s ethernet)

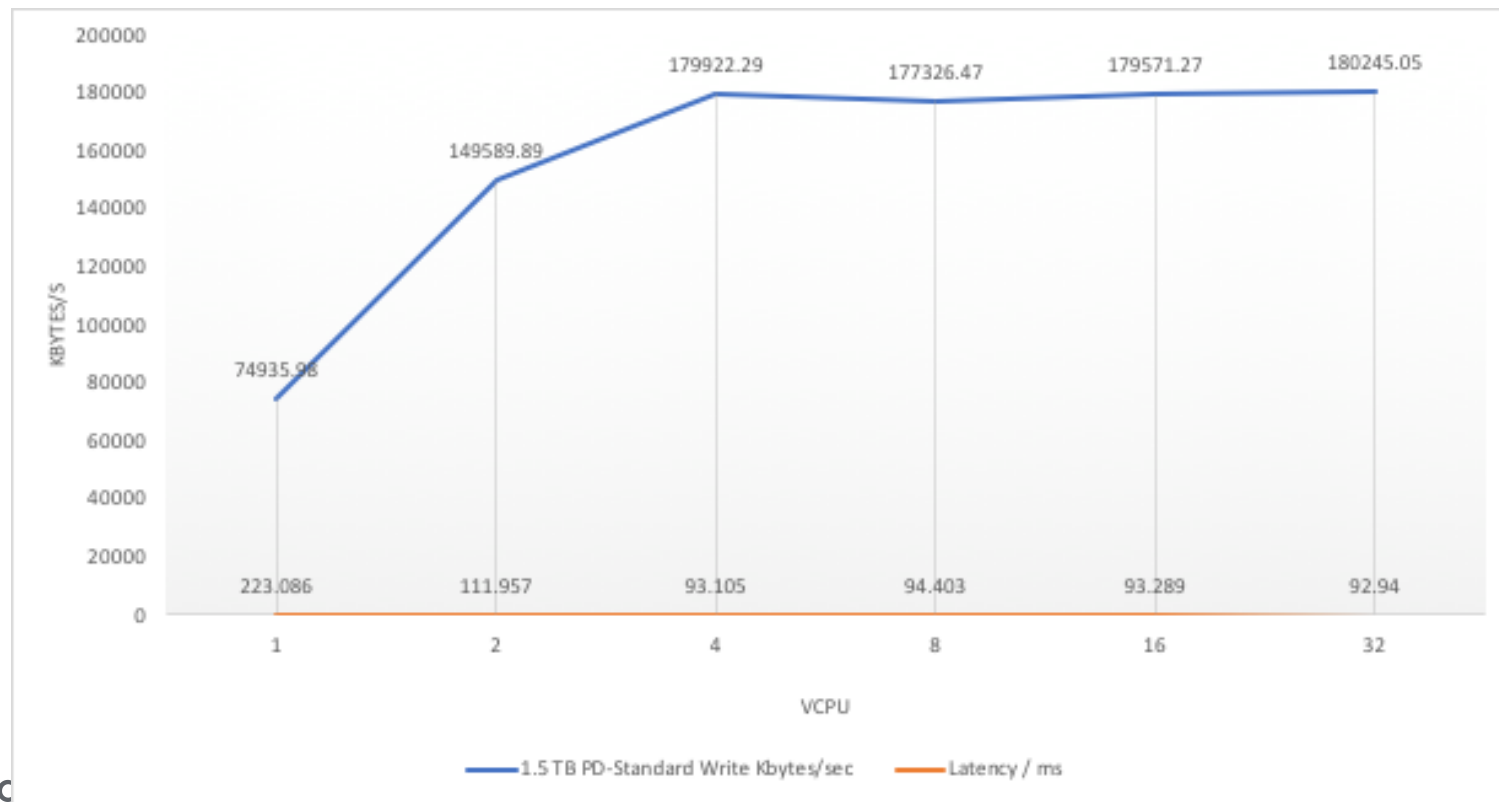
Network Performance



PD-SSD Performance



PD-Standard Performance



Upgrades

Software

- Updated Spectrum Scale
- Update image software
- Replace image

Hardware

- Adding storage.
- Can attached additional disks (depends on VCPU for how many are allowed)
- **Do not resize disks.** Could result in corruption
- Add nodes, be sure to put in same VPC Network and Subnetwork.

Use Cases

Keep in mind

- **Only 20Gbe network**
- **Cloud may not be cheaper**

1. Test new Scale releases
2. Isolate projects from on-premise Scale solution
3. Provide infrastructure to remote sites
4. Start small and grow to on-premise size
5. Evaluate Scale vs other file systems

Next Steps and Needs

What advanced functionality do users want ?

Example: AFM , TCT, CES

What Linux Distros ?

What configuration options?

Who would like to collaborate?

Would you run compute on NSD servers?



Thank You!



IBM **Spectrum Scale**

Google Cloud