
# 雲端技術豐富您的資料中心

雲達科技技術處協理
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# 大綱

- 雲達科技(QCT)介紹
- QCT X Red Hat OpenStack 解決方案
- QCT X Red Hat 軟體定義儲存解決方案
  - QxStor Red Hat Ceph Storage
  - QxStor Red Hat Gluster Storage

# 雲達科技(QCT)
# 介紹

# QCT – Quanta Cloud Technology

- QCT (Quanta Cloud Technology) was announced as a subsidiary of Quanta Computer in 2012
- Quanta Computer is a fortune global 500 company with over $32B revenue
- QCT offers a full spectrum of own-brand datacenter products and services directly to
  - Hyperscale datacenter
  - CSPs and Telcos
  - Large enterprises
- Product lines include
  - Servers, storage, network switches, integrated rack systems and cloud solutions
  - Suite of configuration, integration, and optimization services to help configure best product combination

# QCT Powers Most of Cloud Services

## Including Global Tier 1 Hyperscale Datacenters, Telcos and Large Enterprises

# QCT Provides Complete Product Line

## with Hyperscale Performance, Flexible Configuration and Ensured Compatibility

QCT

### Racks

- Standard Rack
- OCP-Open Rack
- OCP-OCS
- Scorpio

### Network Switch

- 1G Switch
- 10G Switch
- 25G Switch
- 40G Switch
- 100G Switch

### Server

- Cloud server
- GPU server
- Xeon Phi

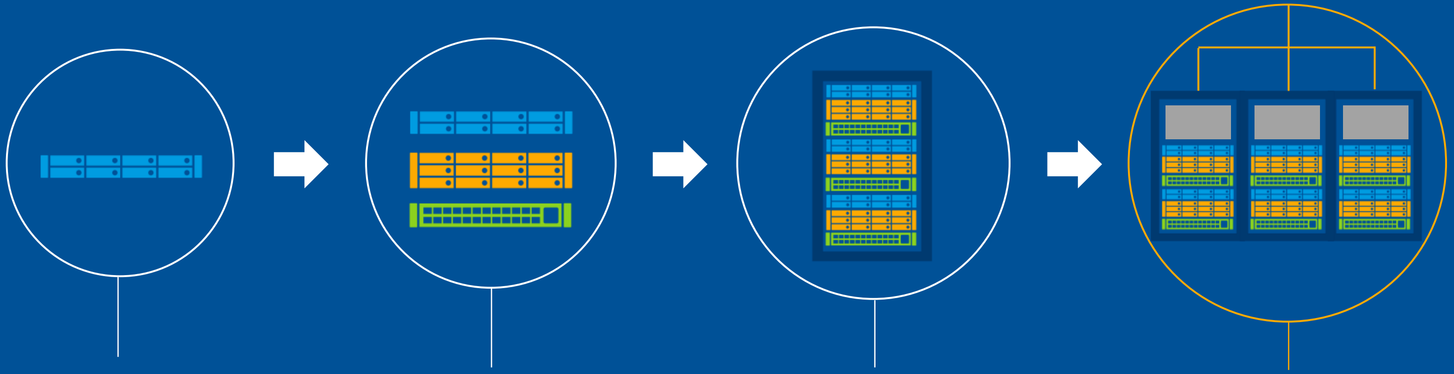
### Storage

- Storage server
- JBOD/JBOF
- Cluster Server

Extending Hyperscale Experiences to All

# With Hyper Converged Infrastructure

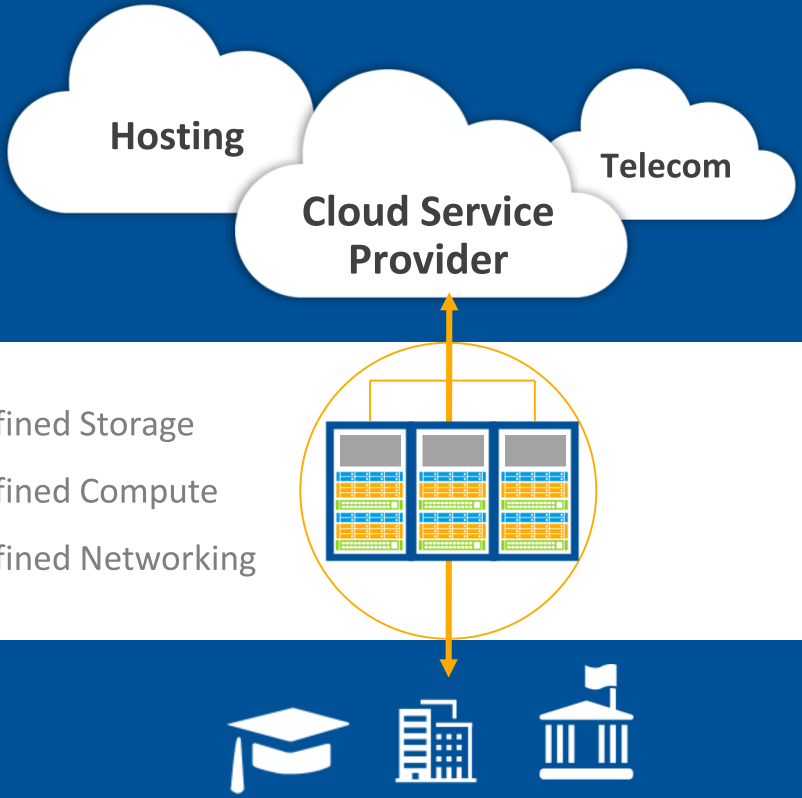
| OCP Server | Data Center Hardware | Hyperscale Rack Solutions | Hyper Converged Infrastructure |
|---|---|---|---|



| ***1.0*** | ***2.0*** | ***3.0*** | ***4.0*** |
|---|---|---|---|
| Original Design Manufacturer | Own Brand Hardware Provider | **Cloud Enabler** with Global Fulfillment | **Cloud Enabler** with Solution Centers |

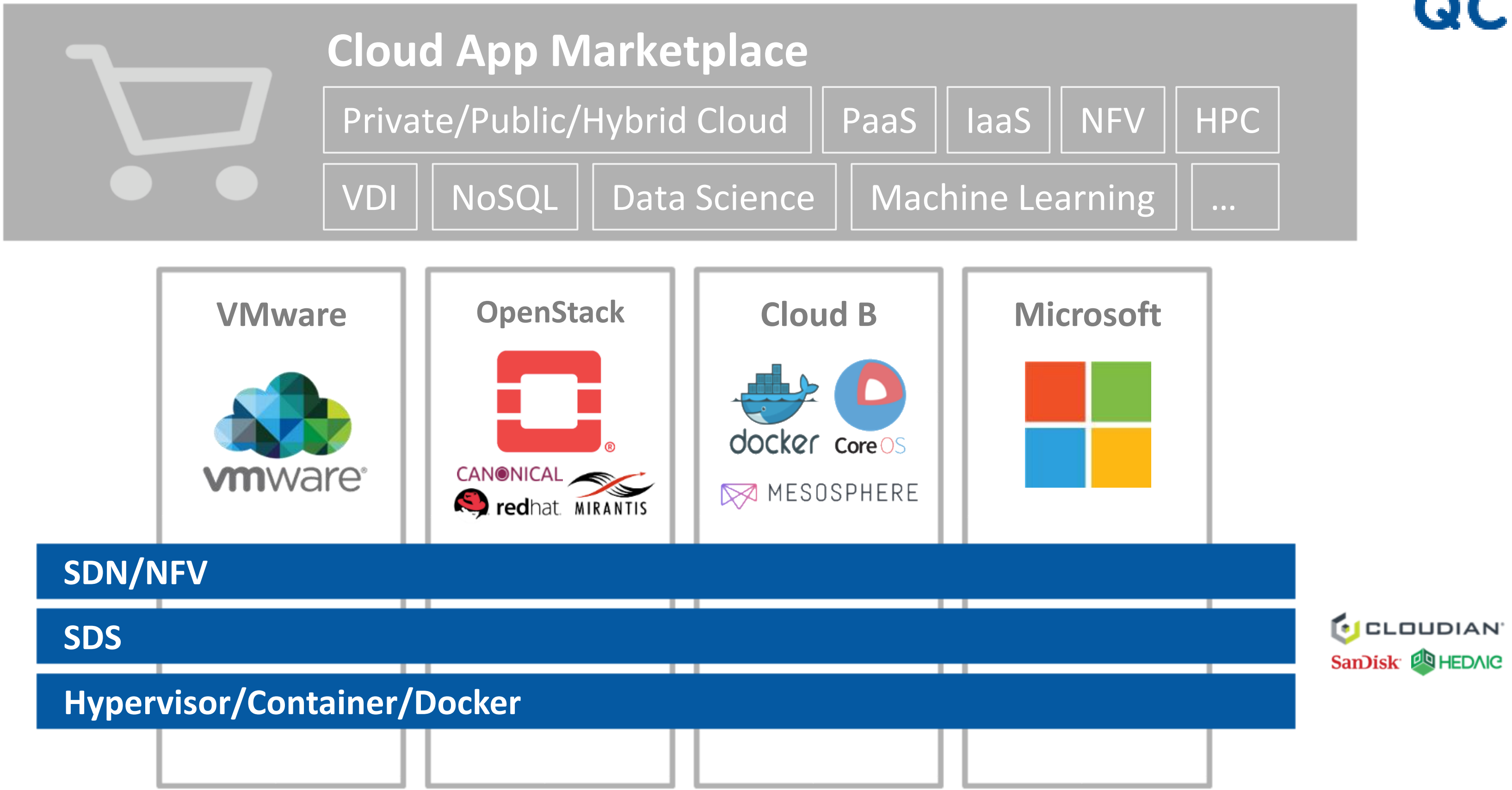
# Seamless Platforms
# Across Public,

Hyper Converged Infrastructure
- Software-Defined Storage
- Software-Defined Compute
- Software-Defined Networking




# Hybrid and Private Cloud

# QCT Solution Architecture



# QCT X Red Hat OpenStack 解决方案

# QCT QxStack with Red Hat OpenStack Edition

## Disaggregated Infrastructure

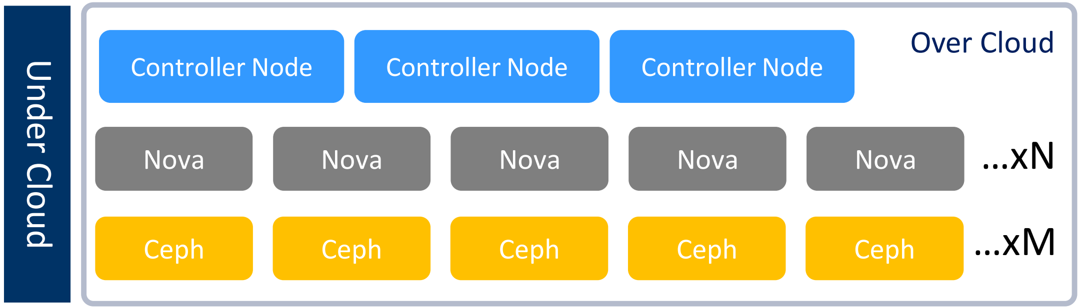
### Configuration

- 1x Director
- 3x Controller
- Nx Nova
- Mx Ceph

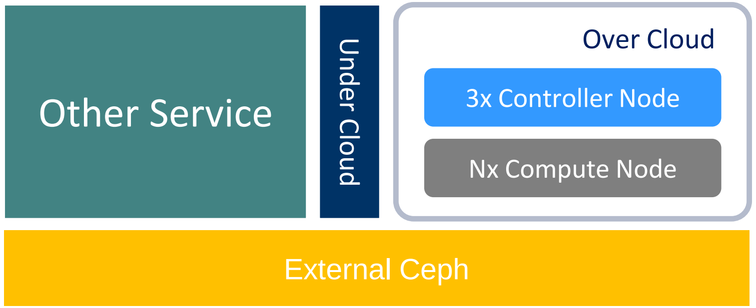
### Design Consideration

- Leverage existing Ceph storage
- Optimize for workload
- Single Ceph storage for multiple cloud

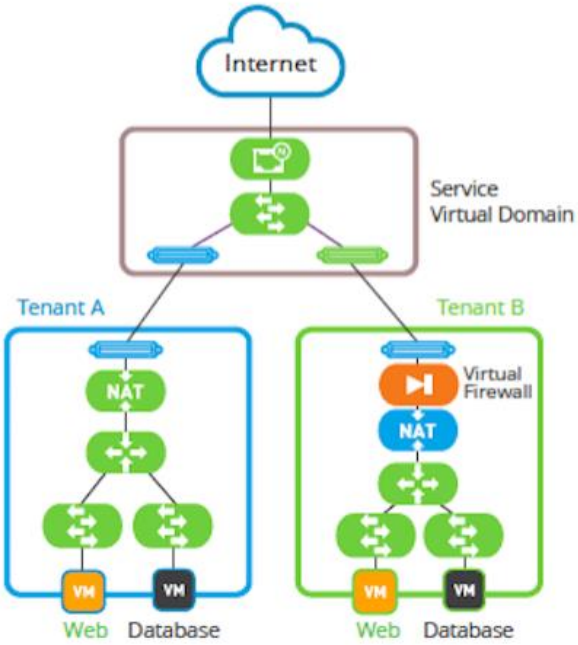
Self-contained Design




External Ceph Design



# QCT QxStack with PLUMgrid ONS for OpenStack




**Micro-Segmentation & Security Service Insertion**

- Micro-segmentation
- Virtual Security Insertion
- Security Function Chaining

**Virtual Tap**

- Policy-based virtual Tap
- Distributed Software Tap
- No custom hardware

# QCT QxStack with PLUMgrid ONS for OpenStack

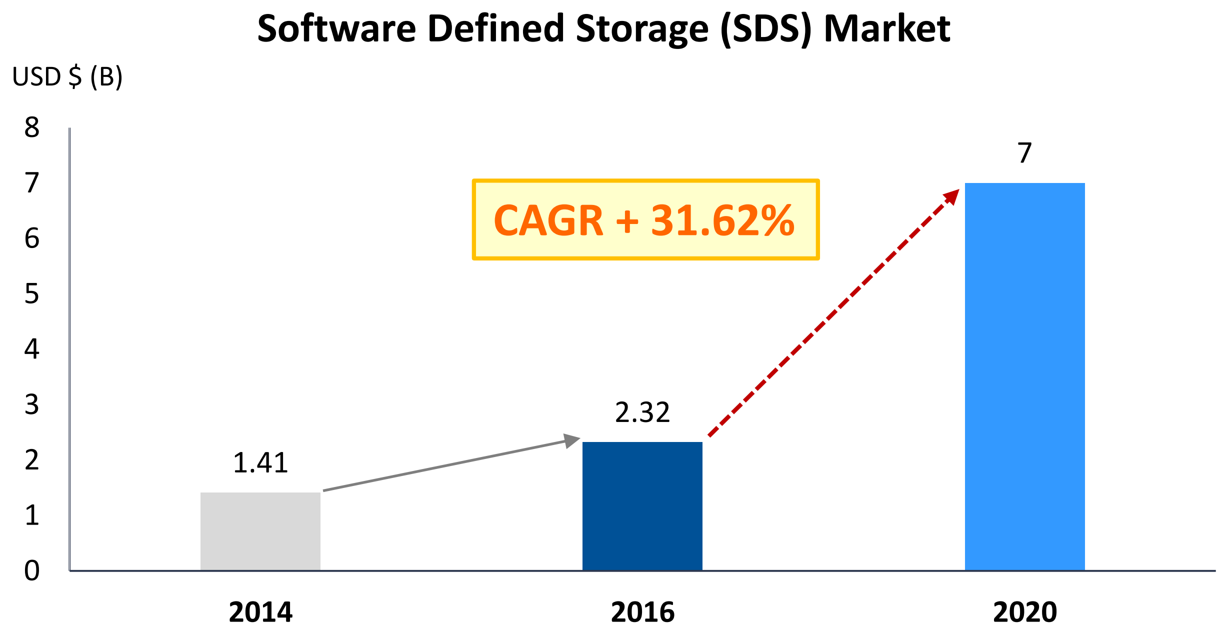

**Support by QCT Multi-node Server <u>T41S-2U</u>**

- Ideal for regional office and branch office, and small enterprise
- 2U-4 node server featuring highest compuing density
- Various OCP network option

# QCT X Red Hat 軟體定義儲存解決方案

# Software Defined Storage (SDS) Market Share

## 2016-2020 Future Growth Trend




Resource: http://www.marketwatch.com/

# QCT QxStor Red Hat Storage

## QxStor Solutions

### QxStor Red Hat Ceph Storage Edition

- Throughput Optimized
- Cost/Capacity Optimized
- IOPS Optimized

### QxStor Red Hat Gluster Storage Edition

- Throughput Optimized
- Cost/Capacity Optimized

## HW Product lines

- 1U Server
- 2U Server
- 2U4N Server
- 3U9N Micro Server

- 1U/2U Storage
- 1U All Flash Storage
- 4U Storage
- JBOD/JBOF

- 1G Switch
- 10G Switch
- 25G Switch
- 40G Switch
- 100G Switch

- Standard Rack
- OCP-Open Rack
- OCP-OCS
- Scorpio

# Easy to Deployment

**Easy Config**
Optimized Ceph/Gluster Ref Architecture

❯

**Easy Order**
QCT QxStor Ceph/Gluster SKUs

❯

**Easy Install**
Red Hat Storage pre-installed

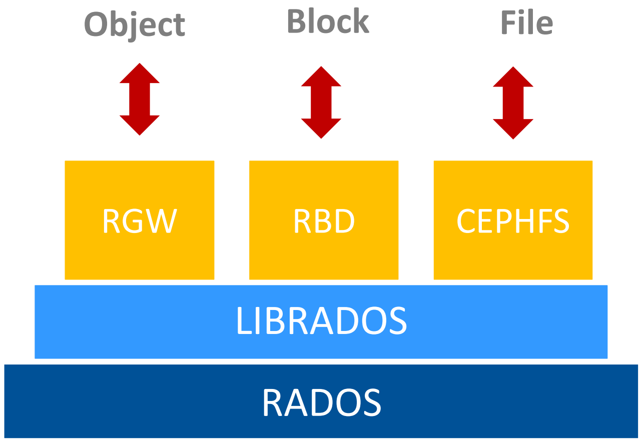
❯

**Easy Rollout**
Red Hat Storage appliance bundles

| Software Defined Object, Block Storage | Software Defined NAS File Storage |
|---|---|
| QxStor Red Hat Ceph Storage | QxStor Red Hat Gluster Storage |

# QxStor Red Hat Ceph Storage

# QxStor Red Hat Ceph Storage Overview




**Scalability**

- Provide linier scale-out performance as additional servers are added.
- Validated with scale-up ability, achieving consistent performance per disk.

**Workload Optimization**

- Optimize for different workload: Throughput, Cost/Capacity and IOPS.
- Suitable for rich media, OpenStack, archive or database.

**Leading Performance**

- Ultra dense storage servers with optimal ratio of HDD and SSD for journaling.
- Use NVMe and SSD to enhance sequential write: 50% higher throughput and 33% lower latency.

# Ceph – Easy to Config and Easy to Order

## QCT QxStor Red Hat Ceph Storage Edition

### Throughput Optimized

**QxStor RCT-200**

D51PH-1ULH

**QxStor RCT-400**

T21P-4U

- Densest 1U Ceph building block
- Smaller failure domain

- Obtain best throughput & density at once
- Scale at high scale 2x 280TB

- Block or Object Storage, Video, Audio, Image, Streaming media, Big Data
- 3x replication

### Cost/Capacity Optimized

**QxStor RCC-400**

T21P-4U

- Maximize storage capacity
- Highest density 560TB* raw capacity per chassis

- Object storage, Archive, Backup, Enterprise Dropbox
- Erasure coding

### IOPS Optimized

**QxStor RCI-300**

*Coming soon*

D51BP-1U

- All Flash Design
- Lowest latency
- Performance & capacity SKUs

- Database, HPC, Mission Critical Applications
- 3x replication

USE CASE

* Optional model, one MB per chassis, can support 620TB raw capacity

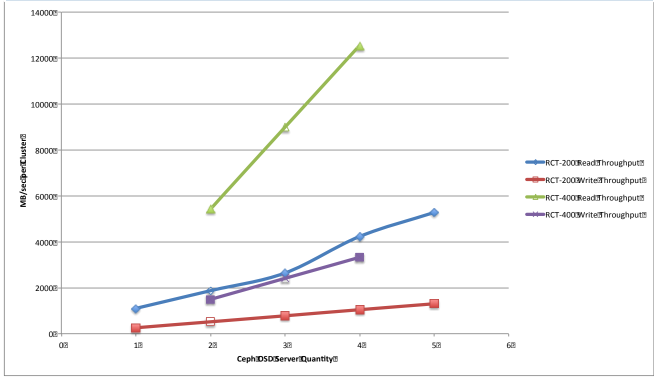
# QxStor Red Hat Ceph Storage Configurations

<table>
<tr><th>SHARED FILE WORKLOADS</th><th>ENTRY (>100TB*)</th><th>SMALL (500TB*)</th><th>MEDIUM (>1PB*)</th><th>LARGE (>2PB*)</th></tr>
<tr><td>THROUGHPUT OPTIMIZED</td><td rowspan="2">QxStor RCT-200<br>4x D51PH-1ULH (4U)<br>• 12x 8TB HDDs<br>• 3x SSDs for journal<br>• 1x dual port 10GbE<br>• 3x replica<br></td><td>QxStor RCT-200<br>16x D51PH-1ULH (16U)<br>• 12x 8TB HDDs<br>• 3x SSDs for journal<br>• 1x dual port 10GbE<br>• 3x replica</td><td>QxStor RCT-400<br>6x T21P-4U/Dual (24U)<br>• 2x 35x 8TB HDDs<br>• 2x 2x PCIe SSDs for journal<br>• 2x single port 40GbE<br>• 3x replica</td><td>QxStor RCT-400<br>11x T21P-4U/Dual (44U)<br>• 2x 35x 8TB HDDs<br>• 2x 2x PCIe SSDs for journal<br>• 2x single port 40GbE<br>• 3x replica</td></tr>
<tr><td>COST/CAPACITY OPTIMIZED</td><td colspan="3">QxStor RCC-400<br>Nx T21P-4U/Dual<br>• 2x 35x 8TB HDDs<br>• 0x SSDs for journal<br>• 2x dual port 10GbE<br>• Erasure Coding 4:2<br></td></tr>
<tr><td>IOPS OPTIMIZED</td><td colspan="2">QxStor RCI-300<br>Nx D51BP-1U<br>• 2x E5-2695/2699 v4 or<br>• 4x NVMe for OSDs<br>• 2x dual port 10GbE<br>Coming soon</td><td>NA</td><td>NA</td></tr>
</table>

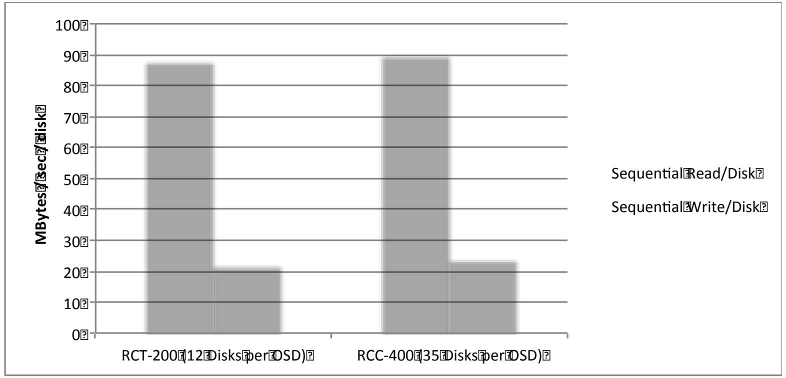
* Usable storage capacity

# Optimized and Validated QCT QxStor Ceph

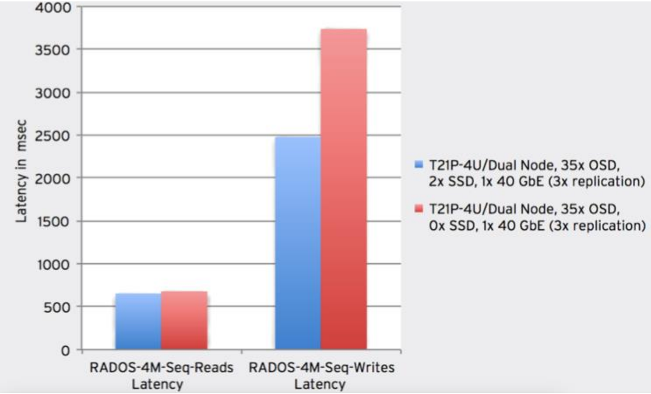
## Linear **scale-out** performance



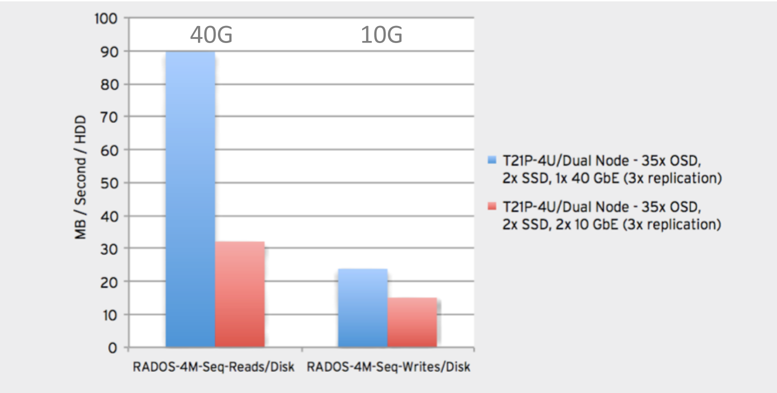

## Outstanding Scale-up Performance




## 50% better write and 33% lower latency by using SSD for Ceph Journal on RGT-400




## Over 2x better performance (40G vs 10G on RGT-400)



# QCT Center of Excellence

## Red Hat Ceph Storage – Object Storage Center of Excellence

### Collaboration

Among QCT, Red Hat, Intel and valued customers

### Showcase

Leading edge solutions and innovative technology

### POC / Forum

For stimulating discussion between QCT, solution providers, customers

### Platform

For testing and benchmark new product and solution development

# Center of Excellence (COE)

redhat

QxStor RCT-400

## Ceph 5.6PB* Object Cluster – RCT-400 Throughput Optimized

**20x Ceph OSD Nodes, each node with 280TB**

- CPU: E5-2650 v4 x2
- RAM: 128GB 2400MHz
- HDD: 8TB SATA Seagate x35
- NVMe SSD: Intel P3700 Series 800G x2
- NIC: QCT OCP CX3 Pro 40G single port
- SAS Controller: S2P MEZZ/B 3008
- Boot OS: Intel S3510 Series 120G

T41S-2U

## Client Cluster (QCT Multi-node Server)

**40x Nodes, each node with**

- CPU: E5-2620v3 x2 or higher CPU spec x2
- RAM: 64GB+
- NIC: QCT OCP 82599ES 10G SFP+ dual port

*raw capacity

# QxStor Red Hat Gluster Storage

# QxStor Red Hat Gluster Storage Overview

| | Open Source | | | Distributed File System | |
|---|---|---|---|---|---|
| **Feature** | No Metadata | Stackable User Space | Unified Namespace | Commodity Resources | Scale-Out |
| **Advantages** | Better Performance | Diverse Workloads | Simple Management | Cost Effective | Scalability |

- Suitable for public, private, and hybrid cloud
- Simple to install and configure
- Offers mature NFS, SMB and HDFS interfaces for enterprise use

# Gluster – Easy to Config and Easy to Order

## QCT QxStor Red Hat Gluster Storage Edition

### Throughput Optimized Small Files

**QxStor RGT-200(SF)**

D51PH-1ULH

- Suitable for small files (e.g. 50KB images or MB audios)
- Distributed replicated volume
- Raid 6 storage
- SSDs for hot tier

### Throughput Optimized Large Files

**QxStor RGT-200(LF)**

D51PH-1ULH

**QxStor RGT-400(LF)**

T21P-4U

- Suitable for large files (e.g. GB files)
- Distributed replicated volume
- Raid 6 storage

### Cost/Capacity Optimized

**QxStor RGC-200**

D51PH-1ULH

**QxStor RGC-400**

T21P-4U

- Maximized capacity for cold data
- Erasure-coded volumes
- JBOD storage

**USE CASE**

- CCTV & Surveillance
- Media & Entertainment
- File Based Workloads
- File Archive & Backup

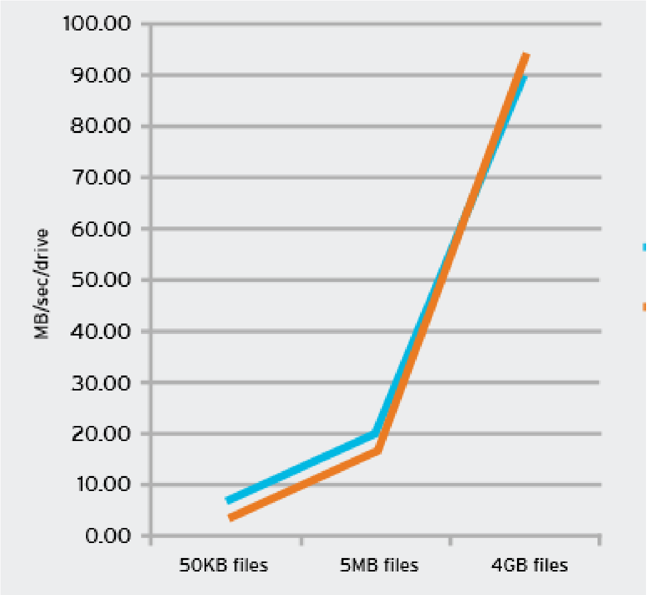
RED HAT® GLUSTER STORAGE

# QxStor Red Hat Gluster Storage Configurations

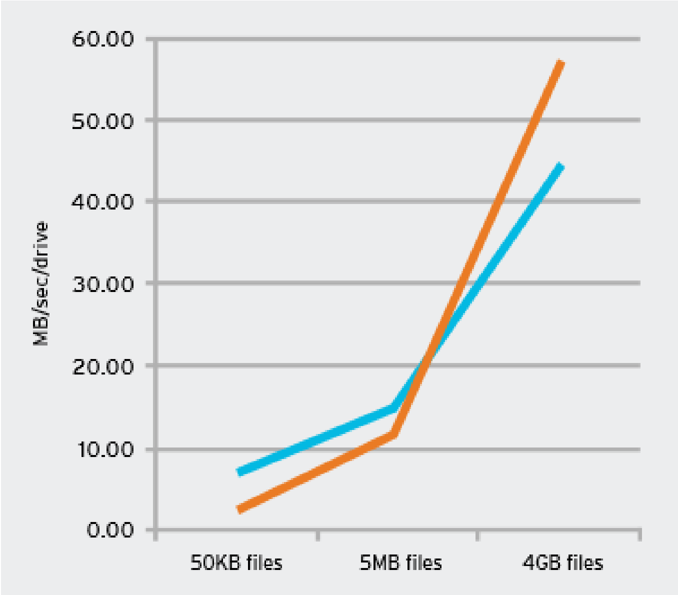
| SHARED FILE WORKLOADS | ENTRY (GREATER THAN 100TB USABLE) | SMALL (UP TO 500 TB USABLE) | MEDIUM ( GREATER THAN 1 PB USABLE) | LARGE (GREATER THAN 2 PB USABLE) |
|---|---|---|---|---|
| THROUGHPUT OPTIMIZED (SMALL FILE PERFORMANCE) | 4x QxStor RGT-200(SF)<br>• 2x Replicated Volume<br>• 12x 8TB HDDs (with RAID6)<br>• 4x SSD Hot Tier<br>• 1x dual port 10 GbE<br>• **Server Node Qty: 4 (160 TB Usable)** | 14x QxStor RGT-200(SF)<br>• 2x Replicated Volume<br>• 12x 8TB HDDs (with RAID6)<br>• 4x SSD Hot Tier<br>• 1x dual port 10 GbE<br>• **Server Node Qty: 14 (560 TB Usable)** | | N/A |
| THROUGHPUT OPTIMIZED (LARGE-FILE PERFORMANCE) | 4x QxStor RGT-200(LF)<br>• 2x Replicated Volume<br>• 12x 8TB HDDs (with RAID6)<br>• 1x dual port 10 GbE<br>• **Server Node Qty: 4 (160 TB Usable)** | 14x QxStor RGT-200(LF)<br>• 2x Replicated Volume<br>• 12x 8TB HDDs (with RAID6)<br>• 1x dual port 10 GbE<br>• **Server Node Qty: 14 (560 TB Usable)** | 5x QxStor RGT-400(LF)<br>• 2x Replicated Volume<br>• 2x 35x 8TB HDDs (with RAID6)<br>• 2x single port 40 GbE<br>• **Server Node Qty: 10 (1.1 PB Usable)** | |
| COST/CAPACITY OPTIMIZED (LARGE-FILE ARCHIVE) | 6x QxStor RGC-200<br>• Erasure Coded Volume<br>• 12x 8TB HDDs (JBOD mode)<br>• 1x dual port 10 GbE<br>• **Server Node Qty: 6 (384 TB Usable)** | 8x QxStor RGC-200<br>• Erasure Coded Volume<br>• 12x 8TB HDDs (JBOD mode)<br>• 1x dual port 10 GbE<br>• **Server Node Qty: 8 (512 TB Usable)** | 4x QxStor RGC-400<br>• Erasure Coded Volume<br>• 2x 24x 8TB HDDs (JBOD mode)<br>• 2x dual port 10 GbE<br>• **Server Node Qty: 8 (1 PB Usable)** | |

# QxStor Red Hat Gluster Storage Test Performance

## Read




## Write




- Erasure coding (4:2) - D51PH-1ULH 12 disks/node JBOD
- 2x replication - D51PH-1ULH 12 disks/node RAID 6

# One More Thing

# First Hyper Converged Red Hat Virtualization Platform

| | | | |
|---|---|---|---|
| MANAGEMENT | RED HAT CLOUDFORMS | | |
| PRIVATE CLOUD<br>vmware vSphere | CONTAINERS | RED HAT OPENSHIFT Container Platform | PUBLIC CLOUD<br>AWS |
| | VIRTUALIZATION<br>RED HAT ENTERPRISE VIRTUALIZATION | PRIVATE CLOUD<br>RED HAT OPENSTACK PLATFORM | |
| | STORAGE<br>RED HAT GLUSTER STORAGE | STORAGE<br>RED HAT CEPH STORAGE | |


# 謝謝

www.QCT.io

Quanta CLOUD TECHNOLOGY