What Does Hyperconverged Mean to Storage?

Live SNIA ESF Webcast
March 15, 2017
10:00 am PT
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Today’s Presenters

Greg Schulz  
Founder Sr. Analyst  
Server StorageIO®  
@StorageIO

John Kim  
SNIA-ESF Chair  
Mellanox
Today’s Agenda

- This is
- Our
- Discussion
- Agenda
- You will
- See today

- HCI storage and I/O considerations
- Fast applications need fast server storage I/O
- How to avoid bottlenecks
- Aggregated vs. disaggregated vs. hybrid
- Planning and decision-making topics
- Your questions and related interest items
What Does Hyper-Converged Infrastructure (HCI) Mean To Storage?

Presented by Greg Schulz @StorageIO

www.storageio.com and www.storageioblog.com
Why do you want HCI (or CI)?

Technology
Leverage new technology
Use a new tool or trend
Architecture or packaging
What's being talked about

Outcome Result
Address issues
Enable opportunities
Benefits your business
A tool for transformation

CI, HCI, Cloud, CiB
What Is Your Focus and Objective?

Balanced Focus
Why HCI/CI/CiB?

• Converged Infrastructure (CI) combines resources
  ○ Servers (compute), I/O network, storage, hardware, software

• Converged may be more expensive than ala carte
  ○ Value can be in saving time (acquisition, deploy, manage)

• Different size, type and focused solutions
  ○ One size or approach does fit all scenarios
  ○ Some CI/HCl are for smaller environments
  ○ Some CI/HCl are for larger environments
  ○ Watch out for hyper-compromised or hyper-complex
Why HCI/CI/CiB?

- What is your convergence focus?
  - Step back, look at your environment and applications
  - What is your workload today and tomorrow?
  - What type of performance and availability do you need?
  - Different applications have various resource demands
  - Are you focused on:
    - Hardware (server, storage, I/O network)
    - Software (hypervisors, containers, operating system, file systems, cloud)
    - Data protection (backup, BC/DR/BR/HA, security)
    - Management tools (what aspect or focus area)
    - Vendor give away and free swag

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Focus On Applications

Applications include VDI, IoT, General Purpose, Database, Big Data, Little Data, Analytics, Email among others.

What Are Your Application Resource Needs?

Hardware and Software

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Converged Decision Making

• What are your application workload PACE requirements?
  AI, IoT, File serve, VDI / workspace, Financial, Email/messaging, Database (SQL/NoSQL/Key value), Collaboration (SharePoint), Web, ERP, OLTP, Analytics, Hadoop, SAS, SAP, M1, Splunk, Media, Video Digital Evidence Management (DEM), DevOps and others.

• How do you need (or want) to use CI/HCI/CIB?

• What resources do you currently have?
  o Hardware: Servers, storage, network
  o Software: Hypervisor, OS, applications, tools

• What are current server storage issues?

• What are growth resource usage needs?

PACE = Performance Availability Capacity Economics

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Converged Decision Making

• How will you protect your applications?
  o Security, RAS, Local, Remote, durability
  o Granularity (VM, Guest, File, database)?
  o Resiliency and faults to tolerate (FTT)?
  o Fault isolation, redundancy, self-heal?

• How will you scale-up and scale-out to support growth?
• Can you bring your own hardware or software licenses?
• Do you have (or need) to scale resources independent of each other?
• Will you violate warranties if you reconfigure CI/HCI systems?

PACE = Performance Availability Capacity Economics
Converged Decision Making

• What additional hardware, software, services or tools needed?
• Will you deploy, operate and manage as converged, or as legacy?
• What new tradecraft skills and education are needed?
• Do you need to handle mixed hypervisors?
• What tools do you use for testing, benchmark, simulations?
  o Best is your own application, second are those close to it
  o Be realistic with tools and their configuration to be applicable
  o Run multiple workloads at same time, it’s a converged environment!
  o Since converged, look at converged impact, end to end vs. just device.
HCI Scaling Considerations

Watch out for hyper-compromise or introducing hyper-complexity when scaling

Disaggregated SAN

CI/HCI Cluster

Large Cluster of CI/HCI

Most Initially Simplify

Some May Introduce Complexity
HCI Supporting Applications

Various Applications

Source: Software-Defined Data Infrastructure Essentials (CRC)
HCI vs. CI which is best?

Watch out for hyper-compromise or introducing hyper-complexity (e.g. avoid the hype ;)

CI = Disaggregated

HCI = Aggregated

Source: Software-Defined Data Infrastructure Essentials (CRC)
Converged Infrastructure (CI)

CI = Disaggregated

- Converge compute, I/O and storage
- Scale compute independent of storage
- Tightly or loosely packaged (DAS or SAN)
- Can be packaged with or without hardware
- Similar to traditional bundled solutions
- Align resources to application needs
- From small SMB to large rack-scale
- Can you bring your own hardware?
- Can you bring your own licenses?
- How does solution scale with stability?
- Can make changes without warranty issues?

Source: Software-Defined Data Infrastructure Essentials (CRC)
Hyper-Converged (HCI)

HCI = Aggregated

- Converge compute, I/O and storage
- Various packaging options
- Scale compute with storage
- Scale storage with compute
- Reduces resource integration complexity
- Ease of use and ease of acquisition
- Usually homogenous across resources
- Can you bring your own hardware?
- Can you bring your own licenses?
- How does solution scale with stability?

Source: Software-Defined Data Infrastructure Essentials (CRC)
Addressing I/O Bottlenecks

Watch out for creating new islands of complexity

I/O Aggregation Causing Aggravation (bottlenecks)

More hardware? More software? Efficiency (utilization) vs. Effectiveness (productivity)

Source: Software-Defined Data Infrastructure Essentials (CRC)
### HCI Storage (SSD, HDD)

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Source: Software-Defined Data Infrastructure Essentials (CRC)
Which HDD (if you need them)
Cache, Micro-tier and Tiering

Source: Software-Defined Data Infrastructure Essentials (CRC)
Cache, Micro-tier and Tiering
How will your servers and storage be converged
• What are you converging, hardware, software or management
• Look beyond software defined storage wrapping and hypervisors
• Start focusing on server, storage management and automation
• Keep your applications workload and resource needs in mind
• Many variations of CI, HCI as well as apples to oranges
• One approach, protocol, solution or service does not fit all needs
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Thank You!