SNIA NSF | NETWORKING STORAGE

Great Storage Debate: Hyperconverged vs. Disaggregated vs. Centralized

Live Webcast

May 4, 2021

10:00 am PT / 1:00 pm ET

Today's Presenters

Moderator
David McIntyre
Samsung

Panelist
Walt O'Brien
Dell Technologies

Panelist
John Kim
SNIA NSF Chair
NVIDIA

Panelist
Christine McMonigal
Intel

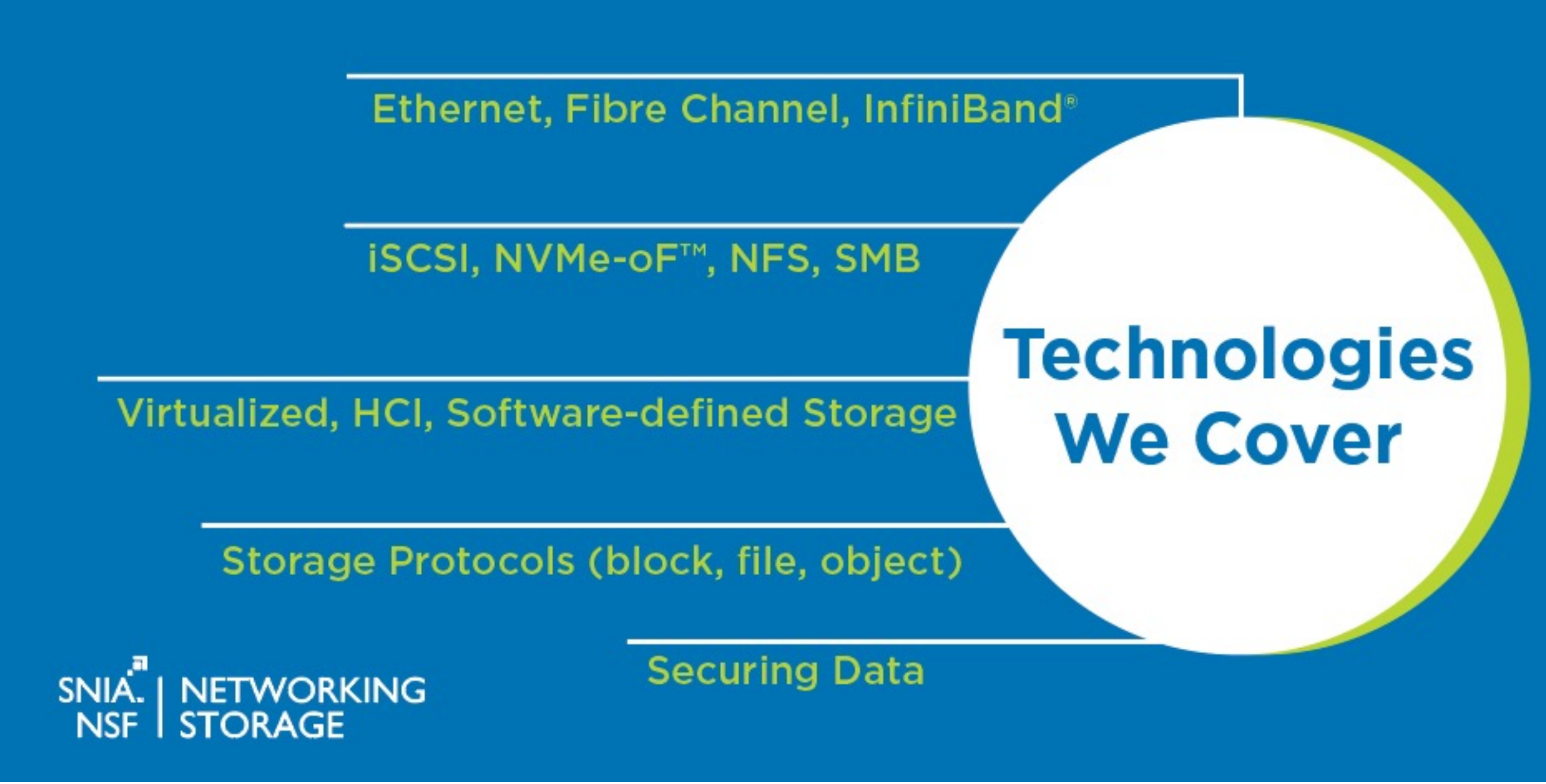
SNIA-at-a-Glance

180
industry leading organizations

2,500
active contributing members

50,000
IT end users & storage pros worldwide

Learn more: **snia.org/technical** **@SNIA**



SNIA Legal Notice

- The material contained in this presentation is copyrighted by the SNIA unless otherwise noted.
- Member companies and individual members may use this material in presentations and literature under the following conditions:
  - Any slide or slides used must be reproduced in their entirety without modification
  - The SNIA must be acknowledged as the source of any material used in the body of any document containing material from these presentations.
- This presentation is a project of the SNIA.
- Neither the author nor the presenter is an attorney and nothing in this presentation is intended to be, or should be construed as legal advice or an opinion of counsel. If you need legal advice or a legal opinion please contact your attorney.
- The information presented herein represents the author's personal opinion and current understanding of the relevant issues involved. The author, the presenter, and the SNIA do not assume any responsibility or liability for damages arising out of any reliance on or use of this information.

  NO WARRANTIES, EXPRESS OR IMPLIED. USE AT YOUR OWN RISK.

Today's Great Storage Debate Format

- Ground Rules
- Definitions and Contender Introductions
- The Overviews
  - Centralized Storage
  - Disaggregated Storage
  - Hyperconverged Storage

- **Main Event: The Great Debate**
- Cool Down

Great Storage Debate: The Contenders

- **Centralized storage** is the storage of files, data and databases shared between computing servers over a network. Indeed, it is also known as networked storage. SAN/NAS are examples and are different from storing data locally or DAS.

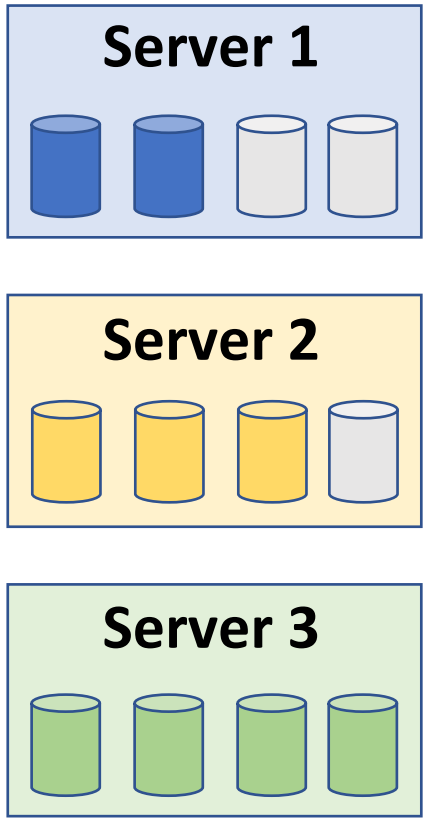
- **Disaggregated storage** is a type of data storage within data centers. It allows compute resources within a computer server to be separated from **storage** resources without modifying any physical connections.

- **Hyperconverged Infrastructure (HCI)**, in which storage is bundled with compute and networking in a single virtualized cluster. Defined SW managed policies for flexible storage pools replace dedicated HW.

Centralized Storage

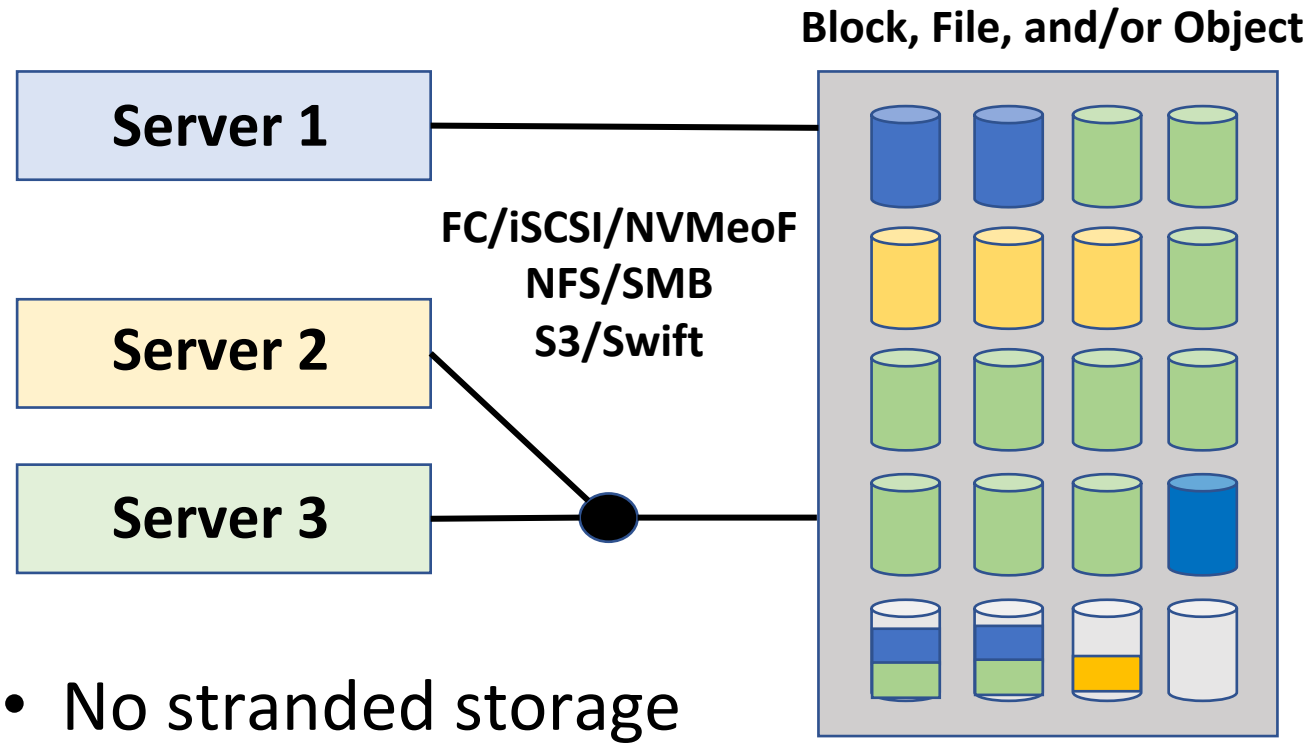
Walt O’Brien

Local Storage vs. Centralized Storage



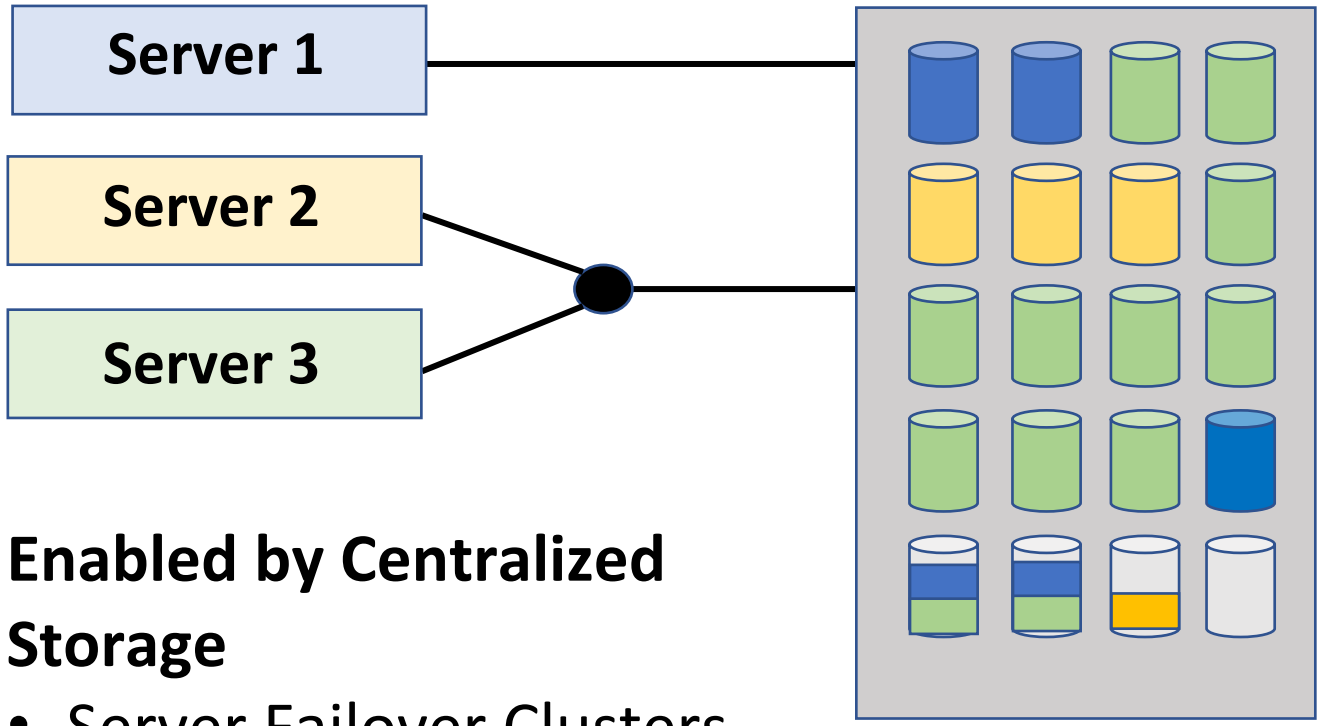
Stranded storage

Network Storage on Dedicated Hardware



- No stranded storage
- Sub-disk storage allocation
- Shared storage

Centralized Storage Advantages



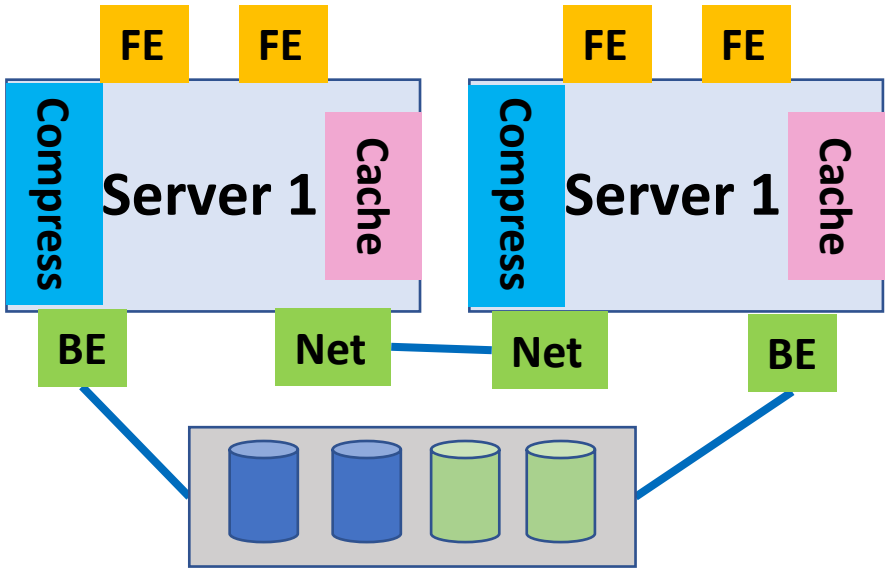
Enabled by Centralized Storage

- Server Failover Clusters
- Golden disk images
- Independent compute and storage scaling

Advanced Storage Capabilities

- Centralized management
- Shared Advanced Data Services
  - High availability
  - Caching/Tiering/QOS
  - Thin provisioning
  - Compression/Deduplication
  - Snapshots
  - Remote Mirroring
  - Encryption
  - Ransomware Protection
  - …

BYO vs. Storage Appliance



- Servers
- Frontend, Backend, Network cards
- Compression offload & Cache HW
- Drive Shelfs
- OS, Clustering, Drivers
- Storage Software

Front View

Back View

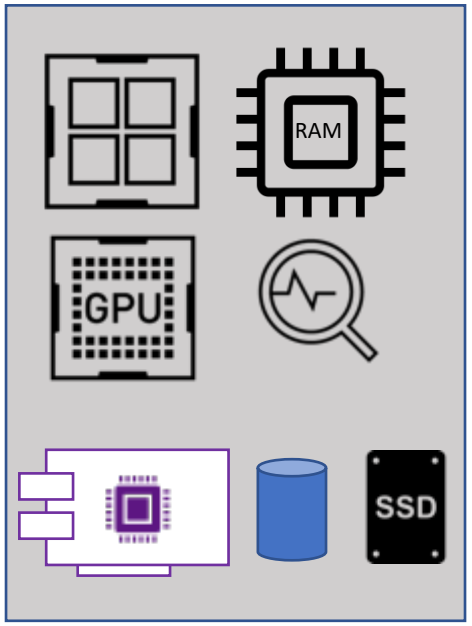
- Storage optimized components
- No single point of failure design
- Fully integrated/tested
- Easy installation
- Easy online software upgrade
- Online repair

Disaggregated Storage

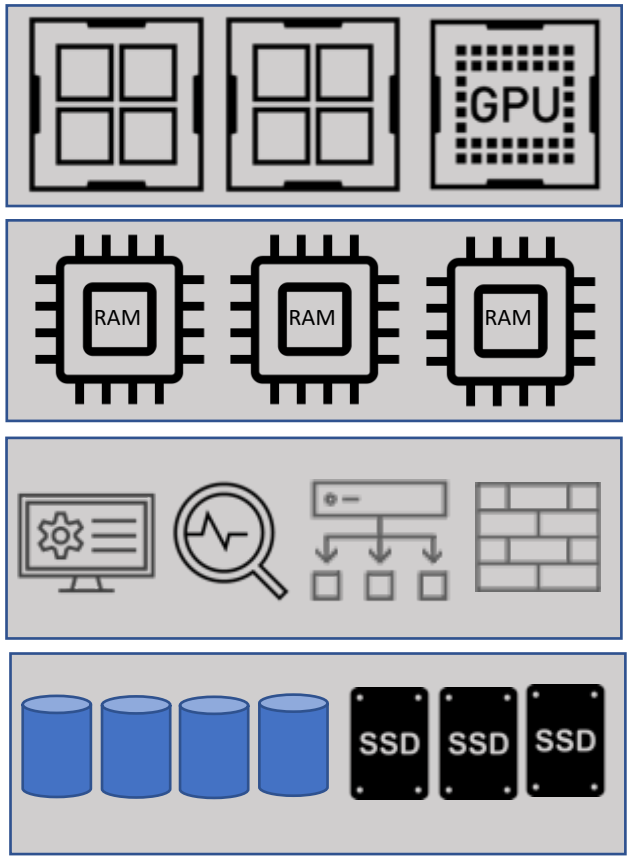
John Kim

Define “Disaggregate”

- **Disaggregate**: To separate a collection or mass into component parts
- Can separate compute, memory, storage, security, etc.
- Storage is the most commonly disaggregated part of servers
- Faster networking enables more disaggregation



Aggregated Server Resources



Disaggregated Resource Tiers

Local vs. Disaggregated Storage

Local Storage/DAS

- Fast (low latency)
- Easy to manage individually
- Low cost to acquire
- Inefficient, Inflexible
- Difficult to share
- Hard to manage in total

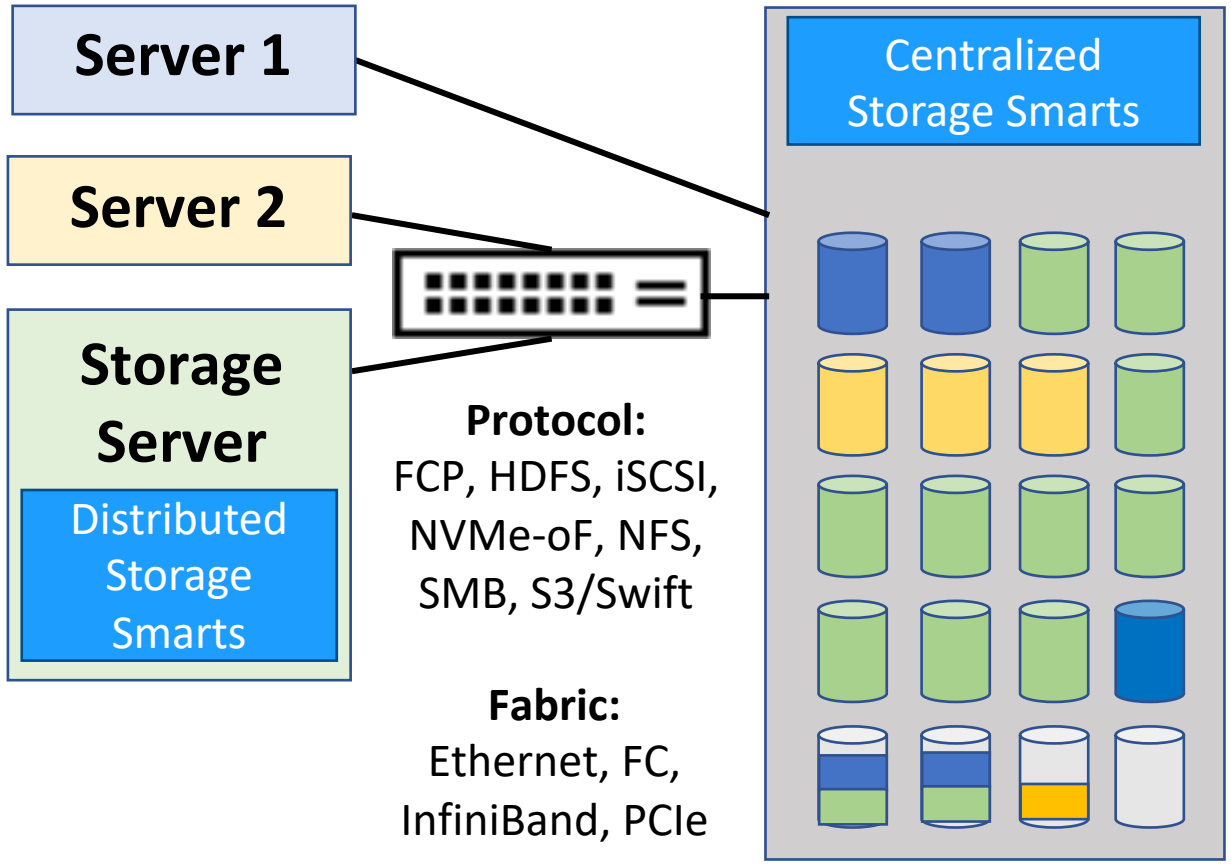
Disaggregated Storage

- Flexible, Efficient
- Easier to share
- Easier to manage in total
- Higher bandwidth (maybe)
- More complex to set up
- Higher latency (maybe)
- Higher cost to acquire?

Differentiating Disaggregated Storage

- How is it connected to servers?
- Where does the file system live?
- Where does the storage control software run?

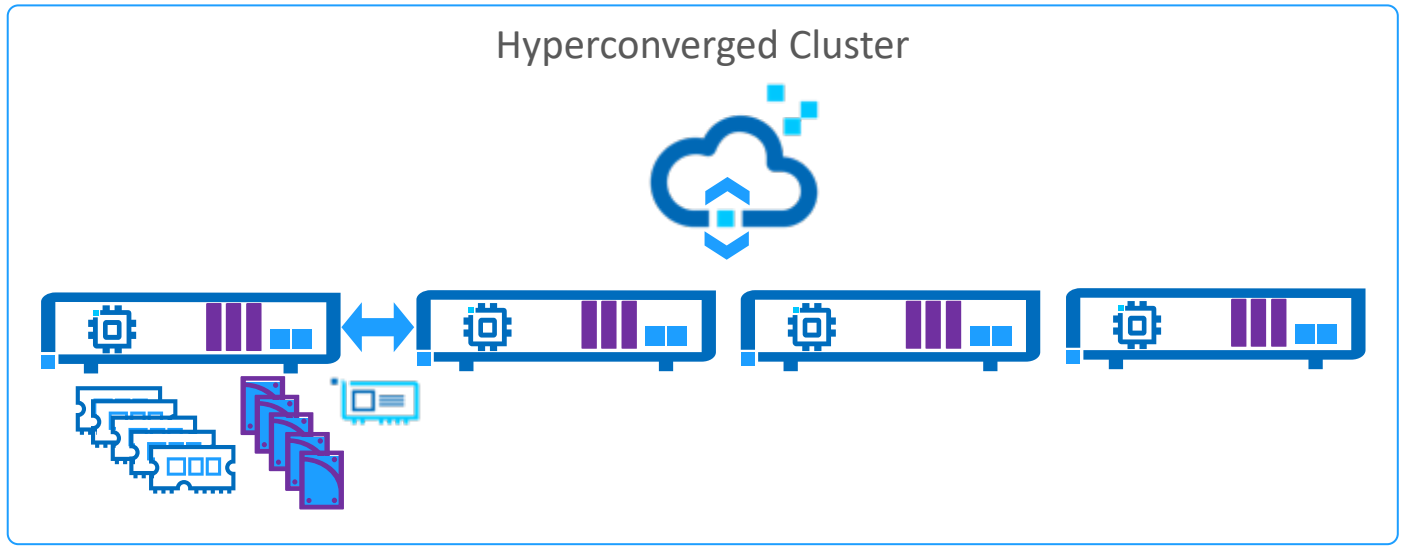
- Is it more efficient?
- Is it more complex?
- Does it add latency?



Hyperconverged Infrastructure

Christine McMonigal

Hyperconverged Infrastructure (HCI) Scales Capacity and Performance Cost Effectively



Hyperconverged Advantages:

Virtualizes compute and storage

Clusters off-the-shelf servers together across a standard Ethernet network

Data distributed across cluster for durability

Scales performance with capacity

Allows incremental investment as needed

Flexible design supports multiple workloads

Manage using familiar virtualization tools and people resources

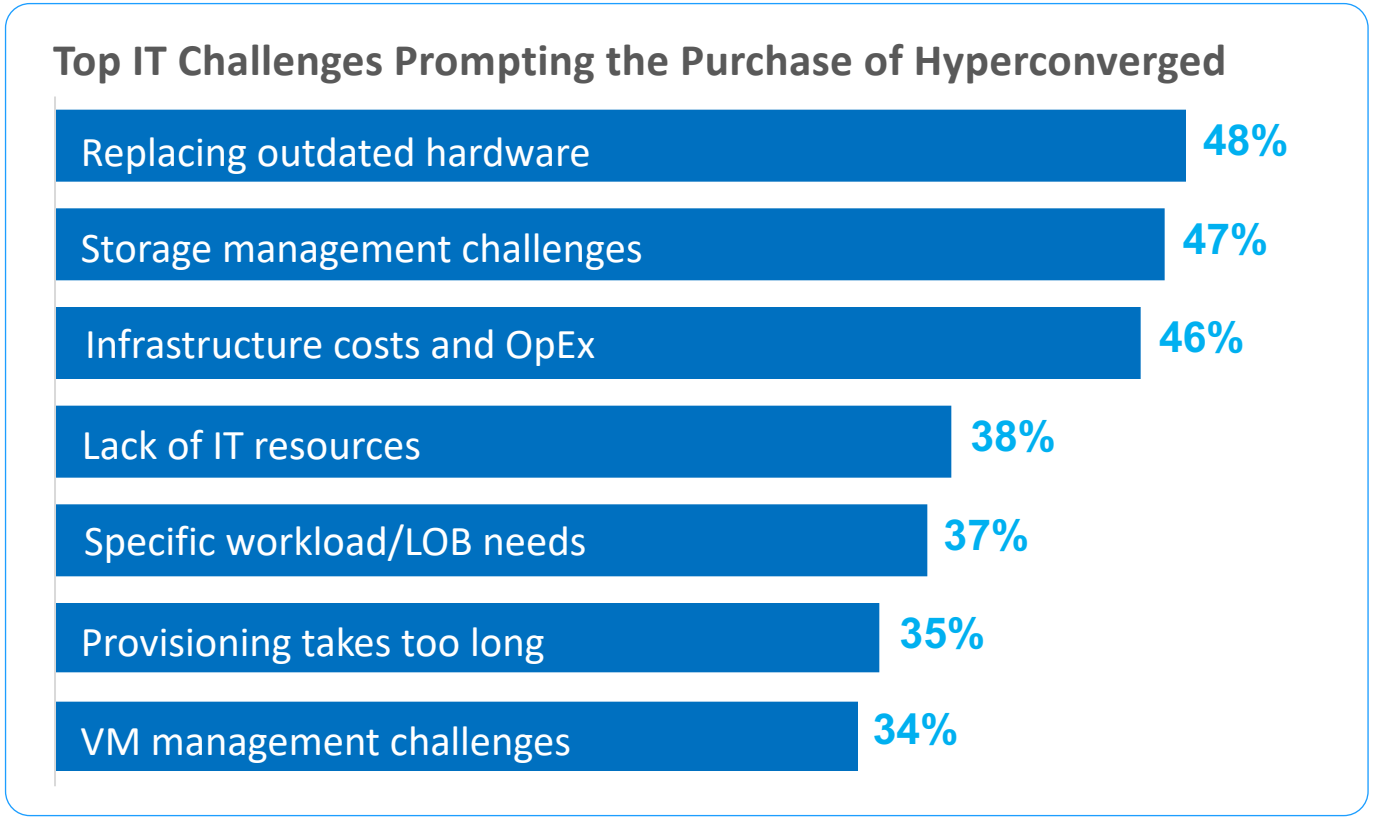
HCI offers the most straightforward path to a private/hybrid cloud by bringing cloud efficiency to on-premises infrastructure

IT Challenges Prompting Modernization with HCI

HCI Solution Adoption Rate among Surveyed Enterprises

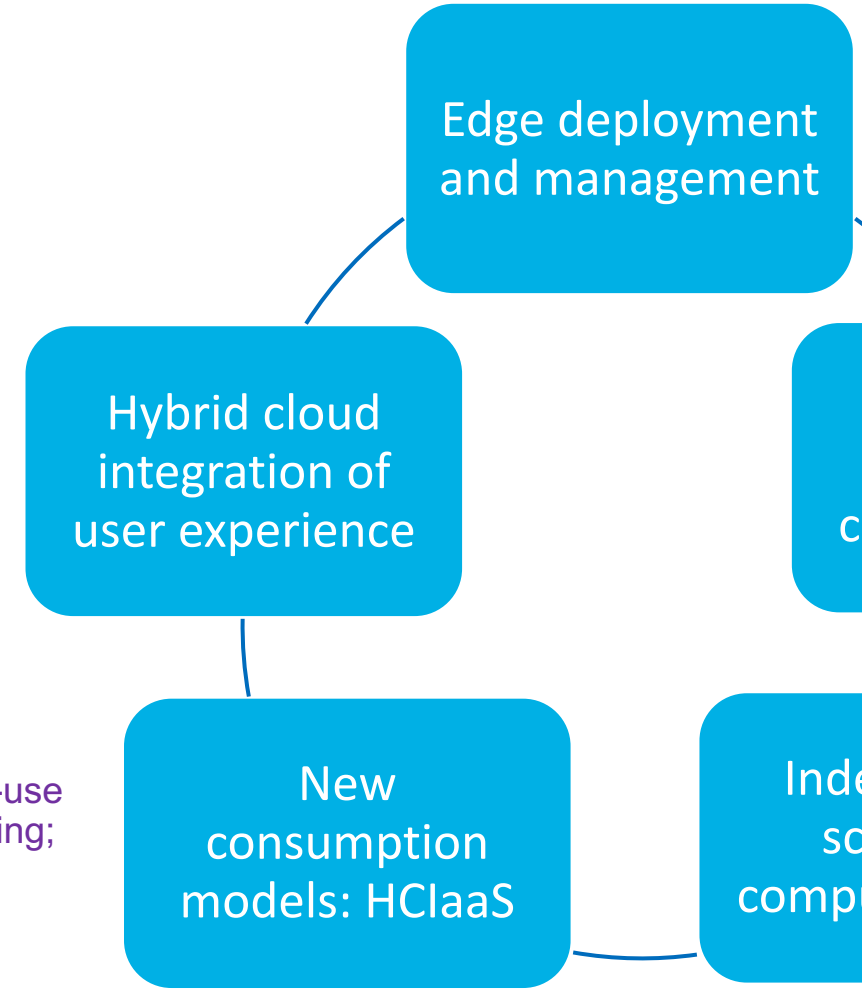
50% already adopted

29% plan to adopt in next year



2H'20: Hyperconverged Platforms Customer Research, Technology Business Research Inc.,

5 Key Trends in HCI



- Minimize initial node requirement, sometimes through use of remote witness node
- Ease of automating deployment across multiple remote sites
- Single management plane across locations, including predictive analytics
- Edge solutions capable of analytics

- Container support via CSI plug-ins
- Most within VMs, but native container support emerging

- **Disaggregated nodes** (compute-only/storage-only) balance excess compute or capacity in a cluster

- **Subscription** or pay-per-use options enable rapid scaling;
- Enables channel to offer **managed cloud model**

- **Public Cloud providers** offer on premises HCI solutions
- **HCI providers** tighten relationships and extend capabilities to public cloud instances

Let’s Debate!

More Great Storage Debates

- File vs. Block vs. Object Storage
- Fibre Channel vs. iSCSI
- FCoE vs. iSCSI vs. iSER
- RoCE vs. iWARP
- Centralized vs, Distributed Storage
- All on our SNIAVideo YouTube Channel at:

  http://bit.ly/GreatStorageDebates

After this Webcast

- Please rate this webcast and provide us with your feedback
- This webcast and a copy of the slides will be available at the SNIA Educational Library https://www.snia.org/educational-library
- A Q&A from this webcast, including answers to questions we couldn't get to today, will be posted on our blog at https://sniansfblog.org/
- Follow us on Twitter @SNIANSF

Thank You

