Distributed Desktop Hyperconvergence and Implications for Distributed Architectures

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At Sphere 3D, our philosophy is to reduce as many layers of abstraction between hardware and software as possible.
Storage Architectures and Implications

• Review

• Current Model: HCI VDI Centralized Architecture

• Distributed Desktop Hyperconverged Architecture

• Building a Distributed Desktop Hyperconverged Architecture

• Conclusion
Review
Storage Choices Inform VDI Feature Set

**Implications for Feature Set**
- **VDI performance subject to network latency**
- **Distance of more than 1-10 miles creates multiple, isolated storage networks**
- **Performance degrades as nodes increase**
- **All Data needs to be replicated, leading to very slow recover times**
- **Expensive & special networking equipment required**
- **Skilled storage AND VDI professionals required**

**Implications for Feature Set**
- **VDI performance with nominal network latency**
- **Local storage for each node is segregated; therefore no performance degradation as you add nodes**
- **No need to replicate OS and Temp Data on Recovery, leading to faster recover times**
- **No special storage equipment or personnel needed**

**Implications for Feature Set**
- **No limit on distance between nodes**
- **Only need to replicate User and App Data on Recovery, leading to faster recover times**
- **No special storage equipment or personnel needed**

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* HyperConverged Infrastructure vendors including Nutanix, SimpliVity, EVO, etc. We are referring to the VDI side of their business, not their server virtualization side.

V3 Uses Local Storage & NAS or SAN

V3, Local Storage and NAS or SAN

Temp & OS Data
Fast: shorter path, no network so nominal latency

Storage

Temp & OS Data

Desktop Down
App Data
User Data
No limit on distance
Near instantaneous

New Desktop
App Data
User Data
V3

HCI VDI Vendors & SAN

Temp & OS Data
Slower: longer path, additional storage network so addition of network latency

SAN

Desktop Down
App & User Data
Temp & OS Data
10 mile limit on distance
4+ hour Recover time (more data to be moved & restored)

New Desktop
App & User Data
Temp & OS Data
SAN

Temp & OS data (heartbeat & breathing of compute) runs on local storage for V3.

For HCI VDI vendors, Temp & OS Data must hit 3+ nodes of the SAN.

NAS provides more flexibility than SAN in moving users (Fail Over).

Replication of unnecessary OS & Temp Data in SAN leads to longer Recover times.

Current Model: HCI VDI
Centralized Architecture
HCI VDI Centralized Architecture, The Ideal

3 Single Points of Failure:
- Data center goes down,
- Server deployment goes down,
- Bandwidth goes down.

All Remote Office locations do not have local access to VDI server. They must access the VDI server through the internet.

Bandwidth pipe at Corp HQ better be huge and redundant.

Any office like a Regional Office with many users also better have a large pipe.

Initial VDI deployment must aggregate at least 500 users to make it economical.
In actuality, an all HCI VDI Centralized Architecture is unworkable for a company with multiple locations, so companies just put physical desktops in most Remote Locations.

Yes that does mean keeping 2 different IT staffs: Virtual Desktop Admins to manage VDI servers and Desktop Admins to manage physical desktops.
So in addition to managing the HCI VDI in your data center, you have all the issues and costs related to managing physical desktops:
- Employing local staff or desktop consultants in remote locations,
- Managing loading apps (image), updates, patches,
- Dealing with security with regards to lost or stolen physical desktops,
- Data security overall (viruses, malware, passwords)

Oh and employees can’t access their desktops, nor can they access all of their apps from mobile devices.
Distributed Desktop
Hyperconverged Architecture
DDH Architecture: Overview

**Lights Out Performance**
All done at speeds faster than a physical desktop or any HCI VDI competitors.

**Scale Out**
- No theoretical limit on number of sites (n+)

**Scale Up**
- No theoretical limit on number of servers or users per site

**Scale Down**
- Boxes can be sized to fit users per site, can go as small as 10 users

**Distributed**
- No earthly limit on distance between sites

**Management**
- DCO enables a Physical Desktop Admin to manage all boxes at all sites on a single pane of glass with a granular view and control down to the virtual desktop level.

**Fail Over**
- A site can Fail Over to any other site, n-1 redundancy.
  
For example, 7 sites would have 600% redundancy (n-1 or 7-1).

**Flexibility**
- A site or box can be added, removed or replaced real time without affecting the broader DDH Architecture or user performance.
DDH Architecture: Step 1 Initial Deployment

- **DDH can start with a smaller deployment (50 users vs. 500+ for HCI VDI)**
- **DDH can reduce server sprawl because we only require 1 V3 server per location**
- **DDH doesn’t require an expensive data center environment; a V3 server can be maintained in a locked supply closet**
- **DDH requires the same bandwidth as the same number of physical desktops; HCI VDI if it is servicing remote locations requires enough bandwidth for those other locations and often requires a redundant bandwidth connection**
DDH Architecture: Step 2 Distribute the Compute

DDH means we put the appropriately sized V3 appliance in each remote location. Our V3 appliances can scale down to as small as 10 users.

Users have all the advantages of local access to the V3 servers:
- Fast performance
- Able to use even if internet connection goes down
DDH means each location or node can act as a backup for every other location. This feature is built in to V3 and is very easily deployed.

Here are V3’s DDH advantages against HCI VDI:
- Recovery is near instantaneous (vs. 4+ hours).
- Recovery is automated (vs. a manual process).
- Redundancy can be greater than 100% because each node can act as a backup for another; in other words the VDI network gets more resilient the more distributed it gets.
DDH Architecture: Step 4 Distributed Desktops, Centrally Managed

It would all come for naught if it were hard to manage. We created Desktop Cloud Orchestrator so you can manage all your virtual desktops in all your locations from a single pane of glass.

Here are V3’s DDH advantages against HCI VDI:
- Existing physical desktops admins can manage (no expensive VDAs required)
- Can go to granular desktop level (HCI VDI can only go to server level)
- Granularity creates a workflow process for support that is the same as that of a desktop admin; no special VDI or server knowledge required to get a user back up!
Building a Distributed Desktop Hyperconverged Architecture
Planning a DDH Architecture

Unlike HCI VDI architectures which can take months to devise and months to pilot and test, you can create a DDH Architecture very quickly.

Just match the appropriate size appliance to the number of users at that location.
What Happens if My Needs Change

Just add a box at an existing location or new location or replace a box and move it to another location.

Unlike with HCI VDI installations, you can make changes very easily after the fact AND keep the same speed and performance for all your users.
Summary

The ABC’s of simple and inexpensive DDH Architecture

• Achieve the fastest speeds possible for your users
• Build your VDI network as you would put lego blocks together
• Change your VDI network as needed as your business grows
• Distribute your VDI compute so it is close to your users and remove the need for corporate data center real estate space to house VDI