

*'Bringing the economics and newfound user benefits of
Hyperscale infrastructure to the masses'*

HyperScalers JetStor appliance with Raidix storage software

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HyperScalers is an Australian registered company.

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1. Executive Summary

The objective of this proof of concept is to create a JetStor appliance using Quanta converged storage server running Raidix software. The appliance should create a high performance storage solution; which should conform to all supported features of Raidix software and IOPs higher than a disaggregated hardware setup. The appliance should be executing in HyperScalers demonstration laboratory. The administrator of appliance should enable the end customer an access to the solution; so that they can launch their appliances on top of it and verify them before going commercial.

2. Introduction

Raidix storage software provides a cost effective; cluster-in-a-box solution. It has single management web interface enabling creation and maintenance of RAID partitions with extreme flexibility, data security and integrity features. The appliance executes this storage software on Quanta's converged box QuantaPlex T21P-4U; which supports E5 CPU with upto 78 SAS 3.5" HDD with 12Gb/s access.

The objective of this appliance is to create a large NAS partition; and execute a video streaming application on various lab environments. The performance numbers of appliance are captured and compared with existing solutions.

3. Test Environment

The test environment consists of following hardware and software components:

Hardware	Quanta QuantaPlex T21P-4U converged server <ul style="list-style-type: none">• E5-2603 CPU• 128 (32x4) GB DDR4 RAM• 2x120GB SATA SSD• 20x8TB 3.5" HDD• LSI SAS 3008 HBA
Software	Raidix Software 4.4.0

The diagram below describes the block involved in executing the appliance.

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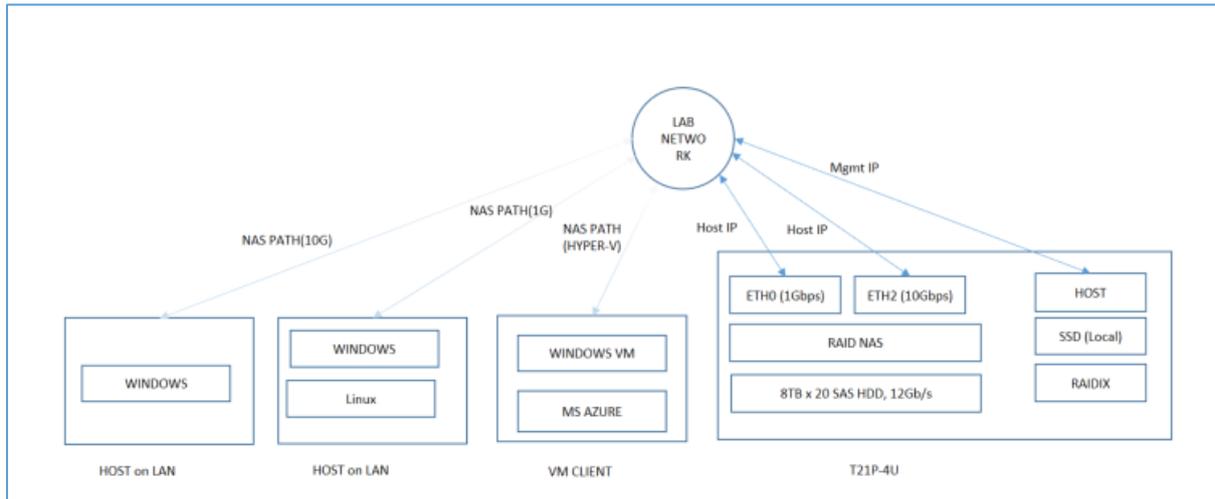


Figure 1: Appliance block diagram

The T21P-4u server is installed with Raidix software on SSD drives. Once the installation is done; the Raidix image boots and enables the user to configure Management and Host IPs for accessing the system. One of the 1G Ethernet LOM ports is used as the data port and another one as the management port. Once the IPs are configured the management portal can be accessed on through the data port IP. The Raidix management webpage provides support to create a RAID partition and expose it in various formats like NAS or SMB to for eternal accesses.

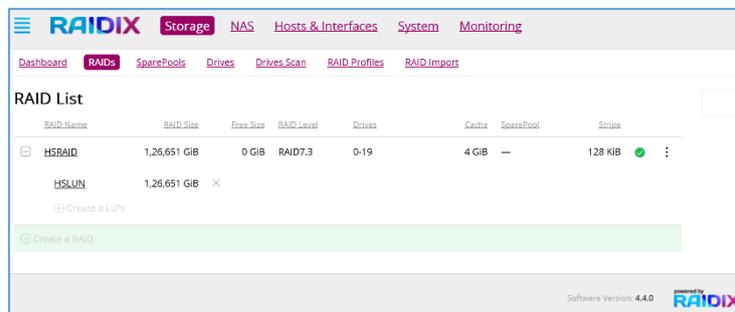


Figure 2: Raidix management web interface

In the appliance the 20 HDD drives are combined to create a large 120TB RAID partition and exposed through NAS and SMB interface. The NAS partition is accessed on multiple setups and its performance numbers are captured as part of this appliance.

4. Performance and Accessibility

4.1 Converged vs disaggregated storage performance

The appliance executes in a converged storage box. The storage HDD drives are connected to the compute node though PCI HBA card. The performance of a converged storage box is better than the disaggregated compute and storage setup. The storage in disaggregated setup is connected through

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10G line and has dependency on network connectivity as well; so appliance performs better with converged architecture.

Converged System

Disaggregated System

Write IO thread	bytes	I/Os	MB/s	I/O per s	file
total:	38930677760	594035	123.75	1980.08	

Write IO thread	bytes	I/Os	MB/s	I/O per s	file
total:	5120388608	78253	16.30	260.83	

Figure 3: IOPs comparison for converged vs disaggregated architecture

The storage performance in converged systems “123.75 MB/s” is better than in disaggregated systems “16.30 MB/s”. The I/O access is also much better in converged system “1980.08” than in disaggregated system “260.83”.

4.2 Cloud vs LAN performance

The video stream is executed on Windows machine connected over same LAN as the appliance and its performance is compared to the stream running over MS Azure cloud setup. The objective of this comparison is to check the factors affecting NAS performance in a cloud enabled setup.

	LAN Connected	Cloud Connected
Frame decode speed (Content bitrate)	29899 kb/s	19263 kb/s
Frame Loss (Same time period)	0	0

The comparison shows that appliance performs better if the NAS is connected on the direct LAN. The factors affecting performance could be software layers running in the cloud infrastructure and inherent network delay of IaaS application.

4.3 Disk speed on NAS

The NAS drive “Z:” was mapped to a Windows machine connected to through the same network. The disk speed performance of the partition was calculated using IOMETER utility and it got following results.

	Total MB/s	Total I/O
Read / Write I/O	970MB/s	925

The diagram below depicts HyperScalers appliance running Raidix and its performance number.



Figure 4: Raidix appliance performance in HyperScalers lab

4.4 1G vs 10G performance

The NAS partition is also connected through the 10G SFP+ port to a Windows client which is also on same network directly connected to the same switch. Following table shows performance numbers comparing 1G and 10G NAS interface.

Features	10G interface	1G interface
Frame Rate (Content bitrate)	29899 kb/s	28452 kb/s
Frame Loss	0	0
Disk Speed	970 MB/s	92 MB/s
Total I/O	925	87

The table shows 10G traffic comparison with respect to 1G and following are some observations:

- The NAS drives performance is better in 10G traffic. The read and write I/O operations show better performance.
- The video streaming performance is better in 10G mounted network interface and there are no frame losses.

4.5 Software rebuild while HDD replacement

The Raidix software has a smooth transition while rebuild process. If any HDD which is a part of raid partition is replaced; the Raidix goes in rebuild mode without disruption the NAS traffic or its performance.

12:30:57	⚠	RAID "HSRAID"	raidix.HYPERSCALERS	Degraded
12:30:57	❌	Drive "ZEKUTSMX"	raidix.HYPERSCALERS	No drive
11:26:46	🟢	Port "eth2"	raidix.HYPERSCALERS	Running

Figure 5: Software rebuild while HDD replacement

The screenshot shows the rebuild in action; post rebuild the partition was unchanged.

4.6 Accessibility

The appliance can be accessible to the customers using WAP DDNS "http://hyperscalers.asuscomm.com/". Depending on the customer requirements; the administrator can open a port accessible via DDNS VPN.

5. Conclusion

The appliance shows that Raidix software performance numbers are better in case of converged platforms and it can execute within the secured lab infrastructure. The experiment also demonstrates the methods to create; configure and expose the storage partitions for external usage.

The JetStor appliance can be a demonstrated as an efficient storage solution running on Quanta converged box with Raidix software.