Overview

HPE Solutions for Qumulo

Are you concerned about storing and managing file data at scale? HPE Solutions for Qumulo hybrid cloud file storage is an enterprise-proven, modern, highly scalable file storage solution that runs in the data center and/or the public cloud. More economical than legacy storage with leading performance, the solution provides real-time analytics to help save time and money while increasing performance. Continuous replication allows data to move where it's needed, when it's needed. For example, between on-prem clusters and clusters running in the public cloud.

HPE, together with Qumulo, effectively addresses your growing unstructured data needs – scale and manage billions of files with instant control at lower cost and high performance, on-prem, off-prem, or spanning both – now and into the future.

What's new:

- New Qumulo for Google Cloud Platform SKUs

With high availability HPE Apollo 4200 servers running Qumulo, customers get a density-optimized 2U rack mount file storage solution offering either 90TB, 180TB, 192TB, 288TB and 336TB raw capacity per node.

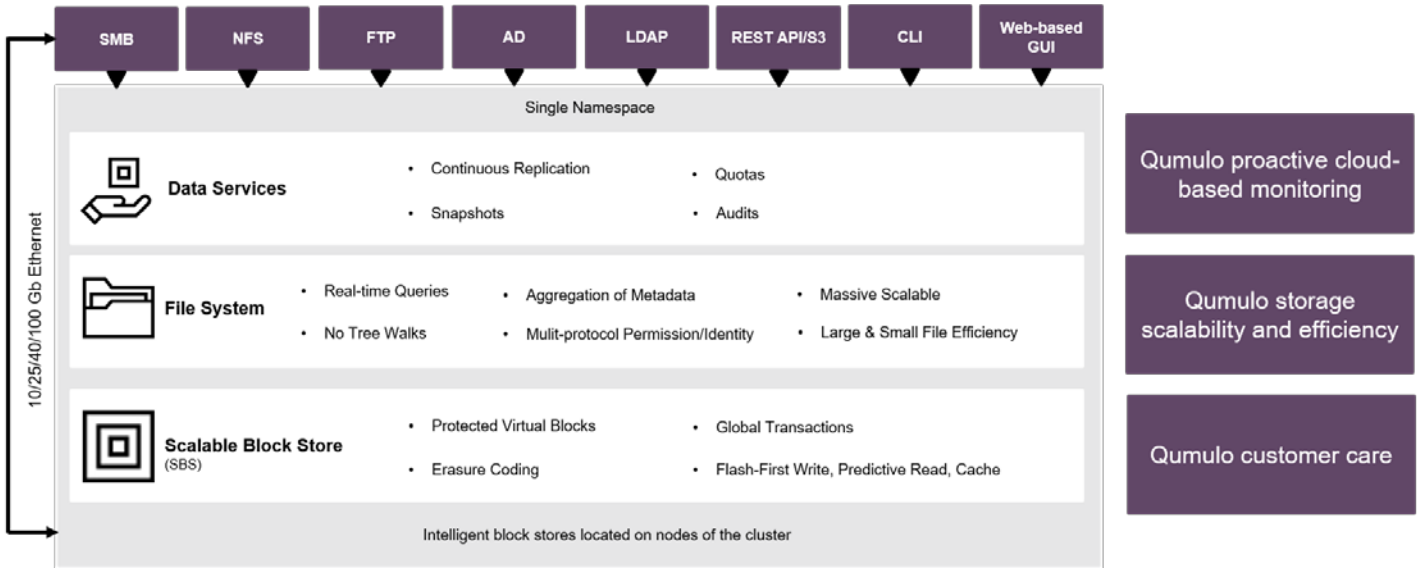

Figure 1. What's Included in the Qumulo Software Subscription

Overview

Models Decsriptions	SKU
HPE Apollo 4200 Gen10 Nodes for Qumulo	
HPE Apollo 4200 Gen10 90TB Hybrid Node for Qumulo	R3W48A
HPE Apollo 4200 Gen10 192TB Hybrid Node for Qumulo	R3W49A
HPE Apollo 4200 Gen10 336TB Archive Node for Qumulo	R3W51A
HPE Apollo 4200 Gen9 Nodes for Qumulo	
HPE Apollo 4200 90TB Qumulo Node	Q2S17A
HPE Apollo 4200 180TB Qumulo Node	Q2S16A
HPE Apollo 4200 288TB Qumulo Archive Node	R0P01A
Qumulo 1TB Tier H1 Subscription and Support Electronic License to Use (E-LTU)	
Qumulo File Fabric 1TB Tier H1 12-month Subscription and Support E-LTU	R0G81AAE
Qumulo File Fabric 1TB Tier H1 36-month Subscription and Support E-LTU	R0G83AAE
Qumulo File Fabric 1TB Tier H1 60-month Subscription and Support E-LTU	R0G85AAE
Qumulo 1TB Tier H3 Subscription and Support Electronic License to Use (E-LTU)	
Qumulo File Fabric 1TB Tier H3 1yr Subscription and Support E-LTU	R0W31AAE
Qumulo File Fabric 1TB Tier H3 3yr Subscription and Support E-LTU	R0W33AAE
Qumulo File Fabric 1TB Tier H3 5yr Subscription and Support E-LTU	R0W35AAE
Qumulo Professional Services	
Qumulo Installation and Advanced Training Service per Day	R0G89AAE
Qumulo Systems Health Check Service	R0G90AAE
Qumulo for Amazon Web Services	
Qumulo Software for Amazon Web Services 1TB 1yr Subscription and Support E-LTU	R3K09AAE
Qumulo Software for Amazon Web Services 1TB 2yr Subscription and Support E-LTU	R3K10AAE
Qumulo Software for Amazon Web Services 1TB 3yr Subscription and Support E-LTU	R3K11AAE
Qumulo for Google Cloud Platform	
Qumulo Software for Google Cloud Platform 1TB 1yr Subscription and Support E-LTU	R4D69AAE
Qumulo for Google Cloud Platform 1TB 2yr Subscription and Support E-LTU	R4D70AAE
Qumulo Software for Google Cloud Platform 1TB 3yr Subscription and Support E-LTU	R4D71AAE

Standard Features

Key benefits of HPE Apollo 4200 with Qumulo :

- **High-performance, enterprise-proven features you expect**
  - Scale to billions of files with Qumulo's advanced file system technology that handles small files as efficiently as large ones, with no double or triple mirroring of small files. There is no practical limit to scale. User files can occupy 100% of provisioned capacity, not just 70% or 80%.
  - Sophisticated data protection techniques including custom erasure coding, replication, snapshots, and quota. These data protection techniques enable the fastest re-protect times in the industry. Snapshots can be taken instantly, or scheduled, with no limit to the number.
  - Automatically manages NTFS and POSIX permissions, preserving ACL inheritance, allowing true collaboration without compromise. Qumulo SMB, NFS, FTP, & REST are custom, so they are optimized & highly efficient.
  - Qumulo's auditing capability is easy to set-up and integrates with standard monitoring systems for enhanced security. Audit will track all events and actions with your data, and can scale from thousands to millions of IOPS with minimal performance impact.
  - A NVMe-first hybrid architecture optimizes cost and performance. You can simultaneously get the speed benefits of SSD and the economic advantages of HDD.

- **Your data where you want it, scaling across on-prem and/or public cloud environments**
  - Use the exact same software on-prem and in the cloud. Qumulo runs directly on Amazon Web Services or Google Cloud Platform infrastructure. Licensing is transferable across platforms on-prem and in the cloud.
  - Qumulo's software-defined storage puts technology advancements and price reductions into the hands of users fast.
  - Store your data anywhere and get multiple GB/s of performance for your workloads both on and off prem. You get scalable performance regardless of number of files or file sizes.
  - Continuous replication moves the data where it's needed, when it's needed and operates across storage clusters, whether on-prem or in the cloud. Once a replication relationship between a source cluster and a target cluster is established, Qumulo automatically keeps data consistent.
  - Use the cloud when you need it. Access compute capability not available in your data center. Leverage applications, AI and ML capabilities, hosted in the cloud. Easily collaborate with users around the world.

- **Real-time visibility of storage usage and performance - No Data Blindness!**
  - At-a-glance visibility to storage capacity usage patterns by IP address or by directory path. Up-to-the-minute analytics pinpoint problems and effectively control how storage is used.
  - Instantly see usage, activity and throughput at any level of the unified directory structure, no matter how many files in the file system. Identify problem areas and hot spots, optimize workload distribution across the file system to ensure file system resources are fully utilized.
  - Directory-based capacity quotas give administrators instant control over storage allocation. Capacity quotas can be applied to any directory, even nested ones. Moving a directory with a quota is easy.
  - All storage capacity usage, activity & throughput levels of the unified directory structure and analytics is available from a central web GUI.
  - Use the Qumulo REST API to integrate, build and manage a modern application stack. Manage your hardware platform programmatically.

- **Ultra-dense and secure storage server**
  - The HPE Apollo 4200 Gen10 Server builds on years of proven leadership with an architecture even more optimized for Software-Defined Storage Its unique design allows customers to save valuable data center space through a 2U standard rack depth chassis.
  - The focus on security extends from FIPS 140-2 Level 1 validated storage controllers all the way down to the system silicon level, taking full advantage of HPE innovations in firmware protection, malware detection, and firmware recovery through HPE Silicon Root of Trust technology.
  - HPE Secure Encryption is a controller-based data-at-rest encryption technology included standard with the Apollo 4200 Gen10 for Qumulo based nodes that can help comply with data privacy requirements and meet compliance regulations.
  - HPE Active Health System is an industry-first technology providing continuous, proactive health monitoring of over 1,600 system parameters and 100% of configuration changes. Cloud-based monitoring proactively detects potential problems including historical trends data about system usage.

Standard Features

HPE Apollo 4200 Gen10 based nodes			
Specifications (per node)	**336TB Archive Node (R3W51A)**	**192TB Hybrid Node (R3W49A)**	**90TB Hybrid Node (R3W48A)**
Hard Disk Drive Storage Capacity (raw)	336TB	192TB	90TB
Logical Flash Cache Capacity[1]	7.68TB	5.76TB	2.88TB
HDDs	24 x 14TB 6G SATA 7.2K LFF 512e HDD	24 x 8TB 6G SATA 7.2K LFF 512e HDD	9 x 10TB 6G SATA 7.2K LFF 512e HDD
CPU	1 x Intel Xeon Xeon-Silver 4210 (2.2GHz/10-core/85W)	2 x Intel Xeon Xeon-Silver 4210 (2.2GHz/10-core/85W)	1 x Intel Xeon Xeon-Silver 4210 (2.2GHz/10-core/85W)
Memory	128GB (DDR4-2933 CAS-21-21-21 Registered Memory)	128GB (DDR4-2933 CAS-21-21-21 Registered Memory)	64GB (DDR4-2933 CAS-21-21-21 Registered Memory)
Networking Ports	HPE Ethernet 10/25Gb 2-port 640SFP28 Adapter(default)	HPE InfiniBand EDR/Ethernet 100Gb 2-port 841QSFP28 Adapter(default)	HPE Ethernet 10/25Gb 2-port 640SFP28 Adapter(default)
Management Ports	Dedicated iLO5 1Gb base T(RJ-45) Management Port (Includes iLO Advanced Electronic License with 3yr Support on iLO Lincesed Features)		
Power and Cooling	10 system fans shipped as standard		
Form Factor	2U rack mount		

HPE Apollo 4200 Gen9 based nodes			
Specifications (per node)	**288TB Archive Node (R0P01A)**	**180TB Node (Q2S16A)**	**90TB Node (Q2S17A)**
Hard Disk Drive Storage Capacity (raw)	288TB	180TB	90TB
Logical Flash Cache Capacity[1]	7.68TB	4.32TB	2.88TB
HDDs	24 x 12TB 6G SATA 7.2K LFF 512e HDD	18 x 10TB 6G SATA 7.2K LFF 512e HDD	9 x 10TB 6G SATA 7.2K LFF 512e HDD
CPU	1 x Intel Xeon E5-2620v4 (2.1GHz 8-core)	2 x Intel Xeon E5-2620v4 (2.1GHz 8-core)	1 x Intel Xeon E5-2620v4 (2.1GHz 8-core)
Memory	128GB (DDR4-2400 CAS-17-17-17 Registered Memory)	128GB (DDR4-2400 CAS-17-17-17 Registered Memory)	64GB (DDR4-2400 CAS-17-17-17 Registered Memory)
Networking Ports	HPE InfiniBand FDR/Ethernet 10Gb/40Gb 2-port 544+FLR-QSFP Adapter	HPE InfiniBand FDR/Ethernet 10Gb/40Gb 2-port 544+FLR-QSFP Adapter + HPE InfiniBand FDR/Ethernet 10Gb/40Gb 2-port 544+ QSFP Adapter	HPE InfiniBand FDR/Ethernet 10Gb/40Gb 2-port 544+FLR-QSFP Adapter
Management Ports	Dedicated iLO4 1Gb base T(RJ-45) Management Port (Includes iLO Advanced Electronic License with 3yr Support on iLO Lincesed Features)		
Power and Cooling	2 x 800W Power Supplies, 8 redundant fans	2 x 800W Power Supplies, 10 redundant fans	2 x 800W Power Supplies, 8 redundant fans
Form Factor	2U rack mount		

1 - Flash cache physical capacity may exceed logical capacity.

Service and Support

Apollo 4200 Gen10 Hardware Warranty

This product is covered by a global limited warranty and supported by HPE Services and a worldwide network of HPE Authorized Channel Partners resellers. Hardware diagnostic support and repair is available for three years from date of purchase. Support for software and initial setup is available for 90 days from date of purchase. Enhancements to warranty services are available through HPE Pointnext operational services or customized service agreements. Hard drives have either a one year or three year warranty; refer to the specific hard drive QuickSpecs for details.

NOTE: Server Warranty includes 3-Year Parts, 3-Year Labor, 3-Year Onsite support with next business day response. Warranty repairs may be accomplished through the use of Customer Self Repair (CSR) parts. These parts fall into two categories: 1) Mandatory CSR parts are designed for easy replacement. A travel and labor charge will result when customers decline to replace a Mandatory CSR part; 2) Optional CSR parts are also designed for easy replacement but may involve added complexity. Customers may choose to have Hewlett Packard Enterprise replace Optional CSR parts at no charge. Additional information regarding worldwide limited warranty and technical support is available at:
http://h17007.www1.hpe.com/us/en/enterprise/servers/warranty/.

Apollo 4200 Gen9 Hardware Warranty

This product is covered by a global limited warranty and supported by Hewlett Packard Enterprise Services and a worldwide network of Hewlett Packard Enterprise Authorized Channel Partners resellers. Hardware diagnostic support and repair is available for three years from date of purchase. Support for initial hardware setup is available for 90 days from date of purchase. Enhancements to hardware warranty services are available through HPE Pointnext operational services or customized service agreements. Hard drives have either a one year or three year warranty; refer to the specific hard drive QuickSpecs for details.

NOTE: Harware warranty includes 3-Year Parts, 1-Year Labor, 1-Year Onsite support with next business day response. Warranty repairs may be accomplished through the use of Customer Self Repair (CSR) parts. These parts fall into two categories: 1) Mandatory CSR parts are designed for easy replacement. A travel and labor charge will result when customers decline to replace a Mandatory CSR part; 2) Optional CSR parts are also designed for easy replacement but may involve added complexity. Customers may choose to have Hewlett Packard Enterprise replace Optional CSR parts at no charge. Additional information regarding worldwide limited warranty and technical support is available at:
http://h20564.www2.hpe.com/hpsc/wc/public/home

Qumulo Customer Success Program

Service and Support for the Qumulo File Fabric software products are provided directly by Qumulo. Details on Qumulo's Customer Success Program can be found here: **https://qumulo.com/resources/terms-hub/support-offerings/**

Qumulo licensors service delivery organization will be responsible for responding with a call, assigning a severity level to the call, and determining the service Severity Level acceptable to Hewlett Packard Enterprise customer. The support request will be processed by Qumulo in accordance with the Severity Level agreed upon.

Qumulo File Fabric Software Warranty

For a period of ninety (90) days from the Start Date, Qumulo warrants (a) that the media on which the software is delivered will be free of defects in material and workmanship, and (b) the software will operate substantially as set forth in the applicable Qumulo specifications when used in accordance with the terms of the Qumulo software license. End User's exclusive remedy and the entire liability of Qumulo and its suppliers under this limited warranty will be replacement of the software media. Except for the foregoing, the software is provided AS IS. This limited warranty extends only to the End User as the original licensee. See other Warranty Limitations and Restrictions below.

Service and Support

Restrictions

Qumulo warranties as set forth herein ("Warranty") are contingent on proper use of the Hewlett Packard Enterprise hardware and Qumulo branded software ("Products") and do not apply if (a) the Products have been modified without the written approval of Qumulo, (b) the Products' serial number label is removed, (c) the Product has been damaged or subjected to abnormal physical or electrical stress, abnormal environmental conditions, misuse, negligence, or accident, or (d) the Product is licensed for beta, evaluation, testing or demonstration purposes. The terms of the Warranty are limited to the remedies as set forth in this Warranty. This warranty is provided in lieu of all other rights, conditions and warranties. Qumulo makes no other express or implied warranty with respect to the software, hardware, products, documentation or Qumulo support, including, without limitation, any warranty of merchantability, fitness for a particular purpose and non-infringement of third party rights. Qumulo does not warrant that any products will be error-free, or that any defects that may exist in its products can be corrected. In no event shall Qumulo be liable for cost of procurement of substitute goods, lost profits or any other special, indirect, consequential or incidental damages (including but not limited to lost data), however caused whether or not Qumulo has been advised of the possibility of such damages. Some jurisdictions do not allow limitation or exclusion of liability for consequential or incidental damages, so that limitation or exclusion may not apply.

For any Qumulo support and generic queries please email: **support@qumulo.com**.

Configuration Information

The Apollo 4200 for Qumulo solution is configured as follows:

Step 1: Select HPE Apollo 4200 Hybrid or Archive Qumulo nodes (required)

SKU Description	SKU
HPE Apollo 4200 Gen10 90TB Hybrid Node for Qumulo	R3W48A
HPE Apollo 4200 Gen10 192TB Hybrid Node for Qumulo	R3W49A
HPE Apollo 4200 90TB Qumulo Node	Q2S17A
HPE Apollo 4200 180TB Qumulo Node	Q2S16A

NOTE: Custom-built HPE Apollo 4200 hybrid-capacity, high performance data storage.. A minimum of four HPE Apollo 4200 Qumulo Hybrid nodes are required to build a Qumulo cluster.

HPE Apollo 4200 Gen10 336TB Archive Node for Qumulo	R3W51A
HPE Apollo 4200 288TB Qumulo Archive Node	R0P01A

NOTE: Custom-built HPE Apollo 4200 Qumulo Archive Nodes designed with the economics of large scale archive storage, better performance than other nearline storage, and provides massive scalability in terms of the number of files it can manage. A minimum of four HPE Apollo Qumulo Archive Nodes are required to build a Qumulo cluster.

Step 1a: Select Network Adapter (Apollo 4200 Gen10 Qumulo Nodes only)

HPE Ethernet 10/25Gb 2-port 640SFP28 Adapter	817753-B21

NOTE: Order Quantity 1 of 817753-B21 for the Apollo 4200 Gen10 90TB Hybrid or 336TB Archive Node (SKU R3W48A and R3W51A) as the default network adapter for a Qumulo cluster consisting of Gen10 nodes only.
NOTE: If adding an Apollo 4200 Gen10 90TB Hybrid or 336TB Archive Node to an existing Qumulo cluster using Apollo 4200 Gen9 Qumulo Nodes then you should order SKU 872726-B21 below as the network adapter. This adapter can negotiate down to 40Gb to run at the same speed as the 40Gb Network Adapters used in the Apollo 4200 Gen9 Qumulo Nodes.

HPE InfiniBand EDR/Ethernet 100Gb 2-port 841QSFP28 Adapter	872726-B21

NOTE: Order Quantity 1 of 872726-B21-B21 for the Apollo 4200 Gen10 192TB Hybrid Node (SKU R3W49A) as the default network adapter for a Qumulo cluster consisting of Apollo 4200 Gen10 or Gen9 Qumulo Nodes. A Qumulo cluster with all Apollo 4200 Gen10 Nodes will run at 100Gb and a cluster with both Apollo 4200 Gen10 and Gen9 Nodes will run at 40Gb.
NOTE: A 40Gb Network Adapter is included with all Apollo 4200 Gen9 nodes (SKUs Q2S17A, Q2S16A and R0P01A) and cannot be changed or upgraded.

Step 2: Select Qumulo File Fabric Subscription and Support E-LTU (required)

Qumulo File Fabric 1TB Tier H1 12-month Subscription and Support E-LTU	R0G81AAE
Qumulo File Fabric 1TB Tier H1 36-month Subscription and Support E-LTU	R0G83AAE
Qumulo File Fabric 1TB Tier H1 60-month Subscription and Support E-LTU	R0G85AAE

NOTE: Number of 1TB E-LTUs ordered must match raw capacity of each Qumulo Node that the E-LTU is installed on. As an example one Apollo 4200 192TB Hybrid Node for Qumulo (R3W49A) requires 192 x R0G81AAE or R0G83AAE or R0G85AAE.
NOTE: E-LTUs R0G81AAE or R0G83AAE or R0G85AAE can only be installed on the Apollo 4200 for Qumulo SKUs R3W48A, R3W49A, Q2S16A or Q2S17A.

Qumulo File Fabric 1TB Tier H3 1yr Subscription and Support E-LTU	R0W31AAE
Qumulo File Fabric 1TB Tier H3 3yr Subscription and Support E-LTU	R0W33AAE
Qumulo File Fabric 1TB Tier H3 5yr Subscription and Support E-LTU	R0W35AAE

NOTE: Number of 1TB E-LTUs ordered must match raw capacity of each Qumulo Node that the E-LTU is installed on. As an example one Apollo 4200 336TB Qumulo Archive node (R3W51A) requires 336 x R0W31AAE or R0W33AAE or R0W35AAE.
NOTE: E-LTUs R0W31AAE or R0W33AAE or R0W35AAE can only be installed on the Apollo 4200 for Qumulo SKUs R3W51A or R0P01A).

Configuration Information

The Qumulo Customer Success Program is available as part of the Qumulo Subscription. You can contact Qumulo by telephone, Slack, email, or the web site 24x7 to report software or hardware issues. The Qumulo Customer Success team will help you to diagnose and resolve technical problems with your Qumulo cluster.

For more information: **https://qumulo.com/terms-hub/support-offerings/#**

Step 3: Select HPE Data Encryption (optional for 180TB or 90TB node only)

SKU Description	SKU
HPE Smart Array SR Secure Encryption (Data at Rest Encryption/per Server Entitlement) E-LTU	Q2F26AAE

NOTE: Enable data at rest encryption via the Smart Array P840 ar and P440 controllers included in the Apollo 4200 Qumulo nodes. One HPE Smart Array SR Secure Encryption E-LTU is required for every Apollo 4200 node in a QF2 cluster when encryption is enabled. For more information on HPE Smart Array Encryption see the QuickSpecs:
https://h20195.www2.hpe.com/v2/GetDocument.aspx?docname=c04318075
NOTE: HPE Special Reminder: Before enabling encryption on the Smart Array controller module on the Apollo 4200 Qumulo node, you must ensure that your intended use of the encryption complies with relevant local laws, regulations and policies, and approvals or licenses must be obtained if applicable. For any compliance issues arising from your operation/usage of encryption within the Smart Array controller module which violates the above mentioned requirement, you shall bear all the liabilities wholly and solely. HPE will not be responsible for any related liabilities.
NOTE: The Smart Array SR Secure Encryption E-LTU is included standard with the HPE Apollo 4200 288TB Archive Node (SKU# R0P01A), HPE Apollo 4200 G10 90TB and 192TB Hybrid Nodes for Qumulo (SKUs R3W48A/R3W49A) and the HPE Apollo 4200 G10 336TB Archive Node for Qumulo (SKU R3W51A).

Step 4: Select On-Site SSD and HDD Spares (recommended)

NOTE: To minimize time to repair for defective SSDs or HDDs it is highly receommended to keep spares of these parts on site. The following formula should be used to determine the number of spares to have on site dependent on the number of nodes installed.

- 4 to 10 nodes of installed – 1 SSD of each type in node and 2 HDDs
- 11 to 20 nodes installed– 1 SSDs of each type in node and 3 HDDs
- 21 to 50 nodes installed – 1 SSDs of each type in node and 4 HDDs

R3W51A – Apollo 4200 G10 336TB Archive Node for Qumulo SSD/HDD spares	
HPE 240GB SATA 6G Read Intensive SFF (2.5in) SC 3yr Wty Digitally Signed Firmware SSD	P04556-K21
HPE 1.92TB SATA 6G Mixed Use SFF (2.5in) SC 3yr Wty Digitally Signed Firmware SSD	P07930-K21
HPE 14TB SATA 6G Midline 7.2K LFF (3.5in) LP 1yr Wty Helium 512e Digitally Signed Firmware HDD	P09165-K21
R3W49A – Apollo 4200 G10 192TB Hybrid Node for Qumulo SSD/HDD spares	
HPE 240GB SATA 6G Mixed Use M.2 2280 3yr Wty Digitally Signed Firmware SSD	875488-K21
HPE 1.92TB SATA 6G Mixed Use SFF (2.5in) SC 3yr Wty Digitally Signed Firmware SSD	P07930-K21
HPE 8TB SATA 6G Midline 7.2K LFF (3.5in) LP 1yr Wty 512e Digitally Signed Firmware HDD	834028-K21
R3W48A – Apollo 4200 G10 90TB Hybrid Node for Qumulo SSD/HDD spares	
HPE 480GB SATA 6G Read Intensive LFF (3.5in) LPC 3yr Wty Digitally Signed Firmware SSD	P04499-K21
HPE 1.92TB SATA 6G Read Intensive LFF (3.5in) LPC 3yr Wty Digitally Signed Firmware SSD	P04501-K21
HPE 10TB SATA 6G Midline 7.2K LFF (3.5in) LP 1yr Wty Helium 512e Digitally Signed Firmware HDD	P09161-K21
R0P01A – Apollo 4200 G9 288TB Qumulo Archive Node SSD/HDD spares	
HPE 240GB SATA 6G Read Intensive SFF (2.5in) SC 3yr Wty Digitally Signed Firmware SSD	P04556-K21
HPE 1.92TB SATA 6G Mixed Use SFF (2.5in) SC 3yr Wty Digitally Signed Firmware SSD	P07930-K21
HPE 12TB SATA 6G Midline 7.2K LFF (3.5in) LP 1yr Wty Helium 512e Digitally Signed Firmware HDD	881787-K21

Configuration Information

Q2S16A – Apollo 4200 G9 180TB Qumulo Node SSD/HDD spares

SKU Description	SKU
HPE 240GB SATA 6G Read Intensive SFF (2.5in) SC 3yr Wty Digitally Signed Firmware SSD	P04556-K21
HPE 480GB SATA 6G Read Intensive SFF (2.5in) SC 3yr Wty Digitally Signed Firmware SSD	P04474-K21
HPE 480GB SATA 6G Read Intensive LFF (3.5in) LPC 3yr Wty Digitally Signed Firmware SSD	P04499-K21
HPE 10TB SATA 6G Midline 7.2K LFF (3.5in) LP 1yr Wty Helium 512e Digitally Signed Firmware HDD	P09161-K21

Q2S17A – Apollo 4200 G9 90TB Qumulo Node SSD/HDD spares

HPE 240GB SATA 6G Read Intensive SFF (2.5in) SC 3yr Wty Digitally Signed Firmware SSD	P04556-K21
HPE 960GB SATA 6G Read Intensive SFF (2.5in) SC 3yr Wty Digitally Signed Firmware SSD	P04476-K21
HPE 10TB SATA 6G Midline 7.2K LFF (3.5in) LP 1yr Wty Helium 512e Digitally Signed Firmware HDD	P09161-K21

Step 5: Select Network Cables and Transceivers

HPE BladeSystem c-Class 40G QSFP+ to QSFP+ 15m Active Optical Cable	720211-B21
HPE BladeSystem c-Class QSFP+ to 4x10G SFP+ 15m Active Optical Cable	721076-B21
HPE X140 40G QSFP+ MPO SR4 Transceiver	JG325B
HPE FlexNetwork X240 40G QSFP+ QSFP+ 1m Direct Attach Copper Cable	JG326A
HPE FlexNetwork X240 40G QSFP+ QSFP+ 3m Direct Attach Copper Cable	JG327A
HPE FlexNetwork X240 40G QSFP+ QSFP+ 5m Direct Attach Copper Cable	JG328A

Step 6: Select Top of Rack HPE M-series switches (optional)

HPE StoreFabric SN2100M 100GbE 16QSFP28 Half Width Switch	Q2F23A
HPE StoreFabric SN2100M 100GbE 8QSFP28 Half Width Switch	Q2F24A
HPE StoreFabric SN2410bM 10GbE 48SFP+ 8QSFP28 Switch	Q6M28A
HPE StoreFabric SN2410bM 10GbE 24SFP+ 4QSFP28 Switch	Q6M29A
HPE StoreFabric SN2410M 25GbE 48SFP28 8QSFP28 Switch	Q2F22A
HPE StoreFabric SN2410M 25GbE 24SFP28 4QSFP28 Switch	Q6M27A
HPE StoreFabric SN2700M 100GbE 32QSFP28 Switch	Q2F21A
HPE StoreFabric SN2700M 100GbE 16QSFP28 Switch	Q6M26A

NOTE: If a StoreFabric M-series switch is ordered information on cables and optics needed can be found in the StoreFabric M-series QuickSpecs:

- **StoreFabric SN2100M QuickSpecs**
- **StoreFabric SN2410M QuickSpecs**
- **StoreFabric SN2700M QuickSpecs**

Configuration Information

Step 7: Select Qumulo Installation and Advanced Training Service (required)

SKU Description	SKU
Qumulo Installation and Advanced Training Service per Day	R0G89AAE

Qumulo will evaluate your site to make sure that it's ready, install the Qumulo software on the HPE Apollo 4200 Gen9 servers, and hold an orientation session to get everyone on board. Also, Qumulo trainers will teach your team all about administering a QF2 cluster. Qumulo teachers are experienced storage professionals with a practical, real-world approach. They'll make sure that everyone leaves the class with the skills they need for long-term success with your QF2 cluster.

NOTE: R0G89AAE is required for each separate QF2 cluster to be installed. Up to 10 nodes per cluster can be installed for each R0G89AAE sku purchased. For every additional 10 nodes installed in a single cluster an additional R0G89AAE is required. This service is purchased on a per Day basis.

Step 8: Select Installation Service for HPE Apollo 4200 Qumulo nodes (required)

HPE Installation ProLiant DL1000/DL2000 Service	UM857E

NOTE: Qty of 1 x UM875E per each HPE Apollo 4200 Gen 9 Server node installed

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Step 9: Select HPE M-series installation service (recommended option if M-series switch is ordered)

HPE StoreFabric M-series Eth Startup SVC	HA114A1#5SE
HPE M-series Ethernet Switch Installation and Startup Service	H6SV4E

Step 10: Select HPE Support for the HPE Apollo Qumulo nodes

3 year Service options

HPE 3 year Foundation Care Call to Repair Apollo 4200 Service	U8MJ2E
HPE 3 year Foundation Care Call to Repair wDMR Apollo 4200 Service	U8MJ3E
HPE 3 year Foundation Care Call to Repair wCDMR Apollo 4200 Service	U8MJ4E
HPE 3 year Foundation Care 24x7 Apollo 4200 Service	U8MH3E
HPE 3 year Foundation Care 24x7 wDMR Apollo 4200 Service	U8MH4E
HPE 3 year Foundation Care 24x7 wCDMR Apollo 4200 Service	U8MH5E

5 year Service options

HPE 5 year Foundation Care Call to Repair Apollo 4200 Service	U8MP6E
HPE 5 year Foundation Care Call to Repair wDMR Apollo 4200 Service	U8MP7E
HPE 5 year Foundation Care Call to Repair wCDMR Apollo 4200 Service	U8MP8E
HPE 5 year Foundation Care 24x7 Apollo 4200 Service	U8MN7E
HPE 5 year Foundation Care 24x7 wDMR Apollo 4200 Service	U8MN8E
HPE 5 year Foundation Care 24x7 wCDMR Apollo 4200 Service	U8MN9E

NOTE: (Foundation Care Call to Repair is the recommended service to purchase for HPE Apollo Qumulo Nodes).

Configuration Information

Qumulo software renewal and co-term options for installed clusters

Qumulo File Fabric Subscription and Support Renewal E-LTU

SKU Description	SKU
Qumulo File Fabric 1TB Tier H1 12-month Subscription and Support Renewal E-LTU	R0G82AAE
Qumulo File Fabric 1TB Tier H1 36-month Subscription and Support Renewal E-LTU	R0G84AAE
Qumulo File Fabric 1TB Tier H1 60-month Subscription and Support Renewal E-LTU	R0G86AAE

NOTE: The skus above are used to renew the QF2 subscription and support license on installed Apollo 4200 192TB, 180TB and 90TB QF2 nodes only (R3W48A, R3W49A, Q2S16A, and Q2S17A). The number of 1TB E-LTUs ordered must match raw capacity of each Qumulo node that the E-LTU is installed on. As an example one Apollo 4200 180TB Qumulo Node (Q2S16A) requires 180 x R0G82AAE or R0G84AAE or R0G86AAE depending on renewal term desired.

Qumulo File Fabric 1TB Tier H3 1yr Subscription and Support Renewal	R0W32AAE
Qumulo File Fabric 1TB Tier H3 3yr Subscription and Support Renewal	R0W34AAE
Qumulo File Fabric 1TB Tier H3 5yr Subscription and Support Renewal	R0W36AAE

NOTE: The skus above are used to renew the QF2 subscription and support license on installed Apollo 4200 336TB and 288TB Qumulo Archive nodes only (R3W51A and R0P01A). The number of 1TB E-LTUs ordered must match raw capacity of each 288TB Qumulo Archive node that the E-LTU is installed on. As an example one Apollo 4200 288TB Qumulo Archive Node (R0P01A) requires 288 x R0W32AAE or R0W34AAE or R0W36AAE depending on renewal term desired.

Qumulo File Fabric 1-month Co-term E-LTU

Qumulo File Fabric 1TB Tier H1 1-month Subscription and Support E-LTU	R0G87AAE

NOTE: This QF2 1-month Co-term sku is used to re-balance QF2 license terms on existing Apollo 4200 192TB, 180TB or 90TB Qumulo nodes (R3W48A, R3W49A, Q2S16A or Q2S17A) when a new 192TB, 180TB or 90TB node(s) is added to cluster. As an example, you purchased 4 x HPE Apollo 4200 180TB Qumulo nodes with a 36 month QF2 subscriptions. Six months later you purchase another HPE Apollo 4200 180TB node with 36 month QF2 subscriptions to add to original 4 node cluster. Now the cluster has 4 nodes with 30 months of QF2 subscriptions and 1 node with 36 months of QF2 subscriptions. You would therefore need to get all QF2 subscriptions up to the same terms across all 5 nodes at 36 months, by purchasing 6 x QF2 1TB Tier H1 1mo subscription (R0G87AAE) for each of the original 4 x 180TB Qumulo Archive nodes.

Qumulo File Fabric 1TB Tier H3 1-month Subscription and Support E-LTU	R0W37AAE

NOTE: This QF2 1-month Co-term sku is used to re-balance QF2 license terms on existing Apollo336TB or 288TB Qumulo Archive nodes (R3W51A or R0P01A) when a new 336TB or 288TB node(s) is added to cluster. As an example, you purchased 4 x HPE Apollo 4200 288TB Qumulo Archive nodes with a 36 month QF2 subscriptions. Six months later you purchase another HPE Apollo 4200 288TB node with 36 month QF2 subscriptions to add to original 4 node cluster. Now the cluster has 4 nodes with 30 months of QF2 subscriptions and 1 node with 36 months of QF2 subscriptions. You would therefore need to get all QF2 subscriptions up to the same terms across all 5 nodes at 36 months, by purchasing 6 x QF2 1TB Tier H3 1mo subscription (R0W37AAE) for each of the original 4 x 288TB Qumulo Archive nodes.

Qumulo Health Check Service

Qumulo Systems Health Check Service	R0G90AAE

NOTE: A periodic evaluation of your QF2 deployment ensures that you're getting the most out of your investment. Qumulo can perform a thorough systems health check that will let you know how well your cluster is performing now and the steps you can take to make that performance even better. Qumulo consultants will come on site, implement those improvements, and demonstrate the results.

Configuration Information

Qumulo for cloud deployments

Moving from on-prem to the cloud allows organizations to focus on their core competencies, accelerate innovation, increase data security, build solutions, and reduce costs. Yet, most of the time it's file storage which remains the last piece of infrastructure on-prem, forcing users to choose between rewriting applications and workflows, and continuing to manage the on-prem infrastructure.

Qumulo is different. How? The enterprise-ready file system runs both on-prem and in the cloud, empowering users to move to the cloud on their terms. Qumulo eliminates the need to re-engineer business-critical workflows and applications while simultaneously reducing TCO, enabling users to take advantage of the hundreds of innovative services which reside in the cloud.

SKU Description	SKU
Qumulo for Amazon Web Services	
Qumulo Software for Amazon Web Services 1TB 1yr Subscription and Support E-LTU	R3K09AAE
Qumulo Software for Amazon Web Services 1TB 2yr Subscription and Support E-LTU	R3K10AAE
Qumulo Software for Amazon Web Services 1TB 3yr Subscription and Support E-LTU	R3K11AAE
Qumulo for Google Cloud Platform	
Qumulo Software for Google Cloud Platform 1TB 1yr Subscription and Support E-LTU	R4D69AAE
Qumulo for Google Cloud Platform 1TB 2yr Subscription and Support E-LTU	R4D70AAE
Qumulo Software for Google Cloud Platform 1TB 3yr Subscription and Support E-LTU	R4D71AAE

Technical Specifications

Technical Specifications

System Unit		
Dimensions (L x W x D)		3.44 x 17.63 x 32.50 in (8.75 x 44.80 x 82.55 cm) Apollo 4200 Gen10 based nodes 3.44 x 17.63 x 32 in (8.75cm x 44.8 x 81.28 cm) Apollo 4200 Gen9 based nodes **NOTE:** Dimensions without Bezel.
Weight (approximate)	Maximum: (Maximum - 24LFF chassis)	89.51 lb (40.6 kg) Apollo 4200 Gen10 based nodes 89.32 lb (40.6 kg) Apollo 4200 Gen9 based nodes
Input Requirements (per power supply)	Range Line Voltage	100 to 120 VAC 200 to 240 VAC
BTU Rating	Maximum	For 800W Power Supply: 3207 BTU/hr (at 100 VAC), 3071 BTU/hr (at 200 VAC), 3112 BTU/hr (at 240 VAC) for China Only
Power Supply Output (per power supply)	Rated Steady-State Power	For 800W Power Supply: 800W (at 100 VAC), 800W (at 240 VAC), 800W (at 240 VAC) input for China only
	Maximum Peak Power	For 800W Power Supply: 800W (at 100 to 127 VAC), 800W (at 200 to 240 1VAC), 800W (at 240 VAC) input for China only
System Inlet Temperature	Standard Operating Support	10° to 35°C (50° to 95°F) at sea level with an altitude derating of 1.0°C per every 305 m (1.8°F per every 1000 ft) above sea level to a maximum of 3050 m (10,000 ft), no direct sustained sunlight. Maximum rate of change is 20°C/hr (36°F/hr). The upper limit and rate of change may be limited by the type and number of options installed. System performance during standard operating support may be reduced if operating with a fan fault or above 30°C (86°F).
	Extended Ambient Operating Support	For approved hardware configurations, the supported system inlet range is extended to be: 5° to 10°C (41° to 50°F) and 35° to 40°C (95° to 104°F) at sea level with an altitude derating of 1.0°C per every 175 m (1.8°F per every 574 ft) above 900 m (2953 ft) to a maximum of 3050 m (10,000 ft). The approved hardware configurations for this system are listed at the URL: **http://www.hpe.com/servers/ashrae** System performance may be reduced if operating in the extended ambient operating range or with a fan fault.
	Non-operating	-30° to 60°C (-22° to 140°F). Maximum rate of change is 20°C/hr (36°F/hr).
Relative Humidity	Operating	Minimum to be the higher (more moisture) of -12°C (10.4°F) dew point or 8% relative humidity. Maximum to be the lower (less moisture) of 24°C (75.2°F) dew point or 90% relative humidity.
(non-condensing)	Non-operating	5 to 95% relative humidity (Rh), 38.7°C (101.7°F) maximum wet bulb temperature, non-condensing.
Altitude	Operating	3048 m (10,000 ft). This value may be limited by the type and number of options installed. Maximum allowable altitude change rate is 457 m/min (1500 ft/min).
	Non-operating	9144 m (30,000 ft). Maximum allowable altitude change rate is 457 m/min (1500 ft/min).
Acoustic Noise	Listed are the declared A-Weighted sound power levels (LWAd) and declared average bystander position A-Weighted sound pressure levels (LpAm) when the product is operating in a 23°C ambient environment. Noise emissions were measured in accordance with ISO 7779 (ECMA 74) and declared in accordance with ISO 9296 (ECMA 109).	

Technical Specifications

Idle	
L WAd	5.2 B Maximum
L pAm	36 dBA Maximum
Operating	
L WAd	5.9 B Maximum
L pAm	45 dBA Maximum

NOTE: Acoustics levels presented here are generated by the test configuration only. Acoustics levels will vary depending on system configuration. Values are subject to change without notification and are for reference only.

Emissions Classification (EMC)
To view the regulatory information for your product, view the Safety and Compliance Information for Server, Storage, Power, Networking, and Rack Products, available at the Hewlett Packard Enterprise Support Center:

http://www.hpe.com/support/Safety-Compliance-EnterpriseProducts

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Environment-friendly Products and Approach - End-of-life Management and Recycling
Hewlett Packard Enterprise offers **end-of-life product return, trade-in, and recycling programs,** in many geographic areas, for our products. Products returned to Hewlett Packard Enterprise will be recycled, recovered or disposed of in a responsible manner.

The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the **Hewlett Packard Enterprise web site.**

These instructions may be used by recyclers and other WEEE treatment facilities as well as Hewlett Packard Enterprise OEM customers who integrate and re-sell Hewlett Packard Enterprise equipment.

Summary of Changes

Date	Version History	Action	Description of Change
06-Jan-2020	Version 9	Changed	Standard Features and Configuration Information sections were updated.
02-Dec-2019	Version 8	Changed	Overview, Standard Features,Configuration Information and Service and Support sections were updated.
04-Nov-2019	Version 7	Changed	Overview, Standard Features, Configuration Information and Service and Support sections were updated.
05-Aug-2019	Version 6	Changed	Overview, Standard Features, Configuration Information and Service and Support sections were updated.
03-Jun-2019	Version 5	Changed	Configuration Information section was updated.
04-Mar-2019	Version 4	Changed	Service and Support Section was updated.
05-Nov-2018	Version 3	Changed	Configuration Information section was updated.
01-Oct-2018	Version 2	Changed	Overview, Configuration Information, Service and Support and Technical Specifications sections were updated. SKUs were added.
04-Jun-2018	Version 1	Created	All content created.

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