Lenovo EveryScale Design Architecture for WEKA Storage

Solution Brief

The technological advances of today have created a unique set of challenges for data-intensive applications, such as those used for artificial intelligence (AI), machine learning (ML), deep learning (DL) and high-performance computing (HPC) within, for example, financial analytics, genomics and life sciences. These complex applications require maximum IO performance, but legacy storage solutions were not built to handle the scale of these workloads.

The WEKA® Data Platform is uniquely built to solve the storage challenges of leading-edge applications. WEKA eliminates the complexity and compromises associated with legacy storage (DAS, NAS, SAN) while still providing the enterprise features and benefits of traditional storage solutions, all at a fraction of the cost. WEKA is designed to meet the stringent storage demands of data-intensive workloads and accelerates the process of obtaining insight from mountains of data.

To meet the requirements of these workloads, Lenovo and WEKA have engineered a joint solution that provides maximum acceleration and reduced AI training times. This solution consists of the Lenovo ThinkSystem SR630 V2 server platform, WEKA software, and NVIDIA networking. This combined solution is ideal for data-intensive applications, delivering over 10x more performance than all-flash scale-out NAS and 3x more than locally attached NVMe SSDs. It delivers faster performance than a local file system and can push multiple high-performance network links to their limits with up to 40GB/s. With the Lenovo EveryScale Design Architecture for WEKA performance scales linearly as the infrastructure grows, allowing for the most efficient utilization of expensive compute resources.

Furthermore, the Lenovo and WEKA solution supports organizations to leverage the benefits of a hybrid cloud model, allowing them to take advantage of on-demand public compute resources for cloud-bursting, remote backup, and disaster recovery.

The benefits of this high-performance storage solution extend beyond specific performance and capacity requirements. This modern infrastructure offers IT optimization, data center agility, and data transformation for AI and analytics, resulting in faster time to value and insight. Furthermore, the solution can help organizations gain a competitive advantage, deliver customer value, and grow their businesses.

Use cases

WEKA solves the common storage challenges by eliminating the chokepoints that impact application performance. It is well-suited for demanding environments that need shareable storage with low latency, high-performance, and cloud scalability.

Example use cases include:

- **Artificial Intelligence** (AI) and Machine Learning (ML), including AIOps and MLOps
- **Life sciences** including genomics, Cryo-EM, pharmacometrics (NONMEM, PsN)
- **Financial trading**, including backtesting, time-series analysis, and risk management
- **Engineering DevOps**
- **Electronic Design** and Automation (EDA) Manufacturing EDA simulation and verification, software builds, CFD, and thermal imaging
- **Media and Entertainment** Nonlinear editing, VFX rendering, transcoding, and content delivery
- **High-Performance Computing** (HPC) GPU pipeline acceleration
- **Academic/Government** Climate change simulation, computational physics, earthquake studies, space research, and intelligence

Software platform

WEKA is an advanced software solution that combines existing technologies with cutting-edge engineering innovations to deliver a powerful, simplified solution that would have traditionally required multiple storage systems. By leveraging NVMe flash, the approach offers unparalleled performance for a range of workloads, from large files to random and metadata-heavy operations. Furthermore, it is designed to run on commodity server infrastructure, eliminating the need for specialized hardware.

WEKA Software

The distributed parallel file system also includes integrated tiering that expands the namespace to and from hard disk drive (HDD) based object storage, making data access and management easy. The intuitive graphical user interface allows administrators to quickly and easily manage exabytes of data without specialized storage training. With WEKA, businesses can enjoy high performance and optimized storage capabilities with ease.

WEKA provides a rich enterprise feature set, including local snapshots and remote snapshots to the cloud, clones, automated tiering, cloud-bursting, dynamic cluster rebalancing, private cloud multi-tenancy, backup, encryption, authentication, key management, user groups, quotas with advisory, soft and hard parameters and much more.

WEKA's unique snap-to-object feature allows users to easily create a replica of the production data and instantly push it to any S3 object store — on-premises or in the cloud — enabling snapshot-based replication. The cloud copy can be used for workload migration to another application cluster or to provide a fast recovery point objective (RPO) service guarantee.

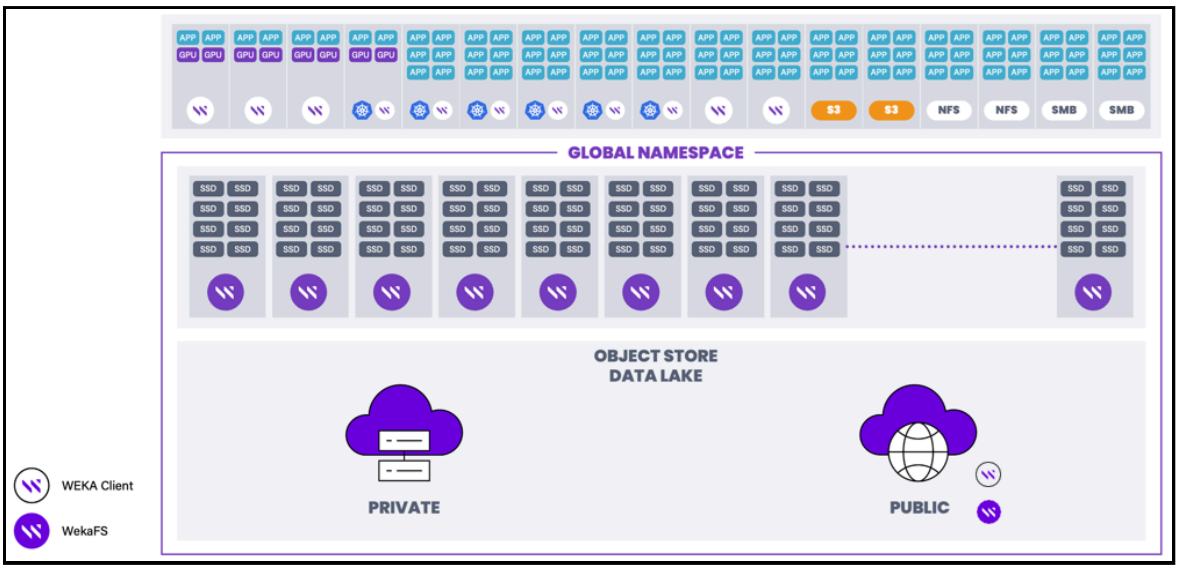

Figure 3: WEKA combines NVMe flash with cloud object storage in a single global namespace

The WEKA Data Platform's unique architecture, as shown in Figure 1, is radically different from legacy storage systems, appliances, and hypervisor-based software-defined storage solutions because it overcomes not only traditional storage scaling and file sharing limitations but also allows parallel file access via multiple protocols.

Multi-Protocol access

Clients with the appropriate credentials and privileges can create, modify, and read data using any of the following protocols:

- POSIX

- NVIDIA® GPUDirect® Storage (GDS)4
- NFS (Network File System) v3 and v4.1
- SMB (Server Message Block) v2 and v3
- S3 (Simple Storage Service)

NOTE: Many non-traditional applications and data systems can take advantage of the POSIX capabilities that WEKA provides as it appears as a local mount. One example of this is HDFS (Hadoop Distributed File System); WEKA's POSIX connector can directly mount to Hadoop nodes to provide very high performance.

Data written to the file system from one protocol can be read via another one, so the data is fully shareable among applications.

Server platform

The building block of Lenovo's WEKA storage node, the Lenovo ThinkSystem SR630 V2, has been designed to take advantage of the features of the 3rd generation Intel Xeon Scalable processors, support for 3200 MHz memory and PCIe Gen 4.0 support. The server also offers onboard NVMe PCIe ports that allow direct connections to 10x NVMe SSDs, which results in faster access to store and access data.

The Lenovo EveryScale WEKA Storage server

The following minimum entry-level building block for an initial storage deployment gives you the ability to scale out to much larger capacities and performance levels by adding more servers:

- 6x Lenovo ThinkSystem SR630 V2 servers
- 128 TB to 614 TB of usable storage capacity

The 128 TB usable capacity option provides a great entry point with the ability to scale for small environments. The 614 TB option is perfect for those who need a capacity-optimized storage solution with the best cost per GB. This assumes 4+2P RAID code.

Where a larger cluster is expected, the following minimum entry-level building block is recommended and allows use of 8+2P RAID code which has reduced overhead when scaling to larger-scale clusters:

- 8x Lenovo ThinkSystem SR630 V2 servers
- 204 TB to 982 TB of usable storage capacity

See the table below for more details on the Lenovo EveryScale WEKA Storage Node configuration options.

To provide high-performance capability, WEKA uses DPDK, the high-performance network adapters options are based on WEKA support for the device and compatibility in Lenovo ThinkSystem servers. To provide the highest performance of WEKA, the HDR or 200GbE adapter should be selected in combination with an appropriate high-performance network infrastructure. WEKA currently uses at most 2 RDMA enabled adapters for WEKA traffic, however when an object backend is used, a third adapter can be used that is dedicated to traffic to the object storage system, similarly the third adapter may be used for multi-protocol clients accessing the WEKA storage. In addition to the high-performance networking options, a choice of LOM adapters is available for the operating system network, the selection of this adapter should be made based on the customer preference – both copper and SFP+ based LOM adapters are available.

The performance of WEKA is dependent on the performance of the NVMe drives installed within the system. When configuring a Lenovo EveryScale WEKA storage node, only high-performance NVMe drives are offered. Options for different levels of drive endurance based on customer workload and requirements – both 1DWPD and 3DWPD options are available.

The CPU configuration is based on the best balance of cores to drives in the systems along with high single thread performance to provide optimal metadata performance, with additional cores dedicated to multi-protocol access in the systems. When configuring the solution, it is essential that WEKA containers are distributed over the CPUs to take most advantage of the cores and architecture of the system.

Two memory configurations are qualified. For many clusters the default of 256GB should be sufficient. Where large numbers of small files or where a large capacity object tier is expected and highest metadata performance is also important the larger memory option can support that.

WEKA delivers a differentiated solution that goes beyond the current market and performance standards for storage. The partnership with Lenovo delivers the best solutions for your IT and business challenges.

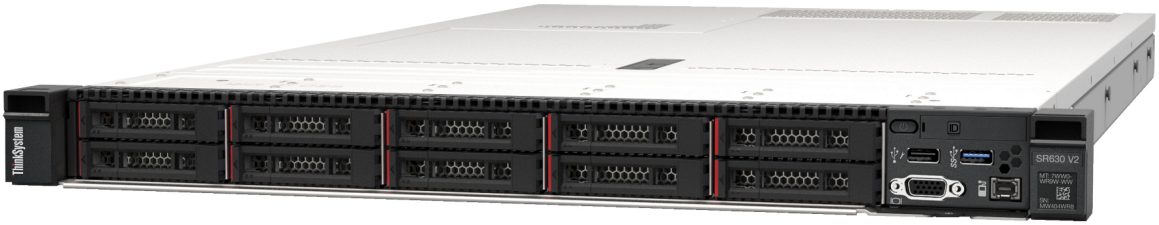

Figure 4. WEKA node - ThinkSystem SR630 V2

For more information regarding the Lenovo ThinkSystem SR630 V2 in general, see the SR630 V2 product guide.

The following table lists the detailed configuration of the Lenovo EveryScale WEKA Storage Node.

Table 1. Lenovo EveryScale WEKA Storage Node configuration - ThinkSystem SR630 V2

Component	Feature code	Quantity	Description
Base CTO Model	7Z71CTO6WW	1	Lenovo EveryScale WEKA Storage Node
Processor	BB4E	2	Intel Xeon Gold 6326 16C 185W 2.9GHz Processor
Memory (Choose 1)	B963	16	256GB: 16x ThinkSystem 16GB TruDDR4 3200 MHz (2Rx8 1.2V) RDIMM
	B964	16	512GB: 16x ThinkSystem 32GB TruDDR4 3200 MHz (2Rx4 1.2V) RDIMM
OS SSD	BKSR	2	ThinkSystem M.2 7450 PRO 960GB Read Intensive NVMe PCIe 4.0 x4 NHS SSD
Data SSD (One type of drive only; with quantities of 4-10)	BNEH	4-10	ThinkSystem 2.5" U.2 P5620 3.2TB Mixed Use NVMe PCIe 4.0 x4 HS SSD
	BNEZ	4-10	ThinkSystem 2.5" U.2 P5620 6.4TB Mixed Use NVMe PCIe 4.0 x4 HS SSD
	BA4V	4-10	ThinkSystem 2.5" U.2 P5620 12.8TB Mixed Use NVMe PCIe 4.0 x4 HS SSD
	BMGE	4-10	ThinkSystem 2.5" U.2 P5520 3.84TB Read Intensive NVMe PCIe 4.0 x4 HS SSD
	BNEF	4-10	ThinkSystem 2.5" U.2 P5520 7.68TB Read Intensive NVMe PCIe 4.0 x4 HS SSD
	BNEQ	4-10	ThinkSystem 2.5" U.2 P5520 15.36TB Read Intensive NVMe PCIe 4.0 x4 HS SSD
	BC4Z	4-10	ThinkSystem U.2 PM1733 3.84TB Entry NVMe PCIe 4.0 x4 Hot Swap SSD
	BE2E	4-10	ThinkSystem U.2 PM1733 7.68TB Entry NVMe PCIe 4.0 x4 Hot Swap SSD
	BE2F	4-10	ThinkSystem U.2 PM1733 15.36TB Entry NVMe PCIe 4.0 x4 Hot Swap SSD

Component	Feature code	Quantity	Description
Network Interface (One type of adapter only with quantities of 2-3)	B4RC	2-3	ThinkSystem Mellanox ConnectX-6 HDR/200GbE QSFP56 1-port PCIe 4 VPI Adapter
	B4RA	2-3	ThinkSystem Mellanox ConnectX-6 HDR100/100GbE QSFP56 2-port PCIe VPI Adapter
	B4RC	2-3	ThinkSystem Mellanox ConnectX-6 HDR/200GbE QSFP56 1-port PCIe 4 VPI Adapter
	BQX9	2-3	ThinkSystem NVIDIA ConnectX-6 DX 200GbE QSFP56 1-Port PCIe Ethernet Adapter
	B8PP	2-3	ThinkSystem Mellanox ConnectX-6 Dx 100GbE QSFP56 2-port PCIe Ethernet Adapter
Power	BSH9	2	ThinkSystem 1100W (230V/115V) v2 Platinum Hot-Swap Power Supply

Network platform

Performance of the WEKA storage system depends on the network infrastructure in place. Highest performance will be seen where HDR or 200GbE networking is used. 100GbE networking is possible, however performance will be limited by the network infrastructure. When designing a network for use with WEKA, it is important to ensure that sufficient bandwidth is provided both between WEKA servers and WEKA client systems. When network congestion is present on the network between clients and servers, performance of the WEKA storage will likely be impacted. Lenovo supplies and supports a number of high-performance network switches and recommends these are used when deploying a WEKA solution based on Lenovo ThinkSystem servers.

When installed into a rack, to reduce hot air reflow, the use of the air duct is strongly recommended. All switches are Port-Side Exhaust (PSE) and should be mounted with the ports at the rear of the rack. The Lenovo ThinkSystem servers are equipped with rear-mounted PCIe devices which means that back-of-rack cabling is possible to reduce the need for front-to-back network cabling.

InfiniBand-based networking

The InfiniBand switches listed are managed switches are ideal for small-scale or new InfiniBand networks with no external subnet management software required. Where the storage is integrated as part of an existing InfiniBand network or an external InfiniBand subnet management software is deployed, the choice of an unmanaged switch is sufficient.

Table 2. InfiniBand switch ordering information

Part number	Feature code	Description
0724HD7	B4RH	NVIDIA QM8700 HDR IB Managed Switch (PSE) (Order AirDuct Separately)
4M27A16331	B5RV	NVIDIA QM87xx Enterprise RMK w/Air Duct (Required for PSE HDR Switches)

Refer to the LeSI Product Guide, Table 14, where unmanaged or oPSE air flow are required. Table 6 provides details of suitable high-speed network cables.

Ethernet-based networking

Table 3. Ethernet switch ordering information

Part number	Feature code	Description
7D5FCTOBWW	BJ5T	NVIDIA SN3700V 200GbE Managed Switch with Cumulus (PSE)
7D5FCTO9WW	BE2S	NVIDIA SN3700C 100GbE Managed Switch with Cumulus (PSE)
4M27A16331	B5RV	NVIDIA QM87xx Enterprise RMK w/Air Duct (Required for PSE HDR Switches)

Refer to the LeSI Product Guide, Table 6 where oPSE air flow is required. Tables 10-12 provide details of suitable high-speed network cables and optics.

WEKA software licenses

Topics in this section:

- License types
- License quantity
- Calculating the XPS Net Capacity
- Part numbers: WEKA Extreme Performance and Scale (XPS) Edition
- Part numbers: WEKA Data Tiering Option-DTO
- Part numbers: WEKA Data Protection Option-DPO
- Part numbers: WEKA Extreme Performance and Scale (XPS) Edition - State, Local, Education (EDU)
- Part numbers: WEKA Data Tiering Option-DTO - State, Local, Education (EDU)
- Part numbers: WEKA Data Protection Option-DPO - State, Local, Education (EDU)

License types

WEKA has tiered subscription-based licensing which is licensed per TB per year. Licenses for WEKA are not perpetual. Discounts are provided based on the tiering level and the number of advance years of purchase.

There are three types of licenses which can be applied to a WEKA cluster:

- **WEKA Extreme Performance and Scale (XPS) Edition**

  XPS is the core foundation license required for a WEKA deployment which covers licensing of the flash tier embedded within the WEKA servers.

- **WEKA Data Tiering Option-DTO**

  WEKA DTO is an additional add-on license on top of XPS. This license is necessary when data is tiered to an object backend behind the XPS layer.

- **WEKA Data Protection Option-DPO**

  WEKA DPO is an additional add-on license on top of XPS, this covers data protection functionality of WEKA including snapshot to object, incremental snapshot sync and secure backup features. DPO also includes the tiering functions of DTO.

Where a system is currently licensed with XPS+DTO and features of DPO are required, contact your local Lenovo sales team to discuss trade-up options.

XPS licenses are calculated using the Net Capacity of the cluster (usable capacity) and varies depending on the number of servers, RAID encoding, hot spares, and capacity of drives, further details and example calculations are provided below. DTO and DPO licenses are calculated based on the usable capacity of the object store presented to be used by WEKA.

License quantity

To calculate the number of XPS licenses required:

1. Determine the Net Capacity of the WEKA cluster in TB (see below)
2. Use the Net Capacity of the cluster to determine the tiering level
3. Determine how long the license is required for to select the correct part number

Discounted part numbers are available for qualified educational (EDU) customers. Check with your Lenovo sales organization to determine if you are eligible.

Monthly license options are provided to support co-terming when expanding the size of a cluster. For example, to add an additional node providing an additional 100TB of capacity, where the cluster has 2 years and 3 months of support remaining.

Calculating the XPS Net Capacity

The capacity required is the Net Capacity of the cluster. To calculate the XPS net capacity of a WEKA Storage cluster, use the following calculation:

$$\text{SSD Net Capacity} = \text{Raw Capacity} * \frac{\#\text{ Failure Domains} - \text{Hot Spares}}{\#\text{ Failure Domains}} * \frac{\text{Stripe Width}}{\text{Stripe Width} + \text{Protection}} * \text{File System Overhead}$$

Where the File System Overhead is a static value of 0.9. The calculation should then be rounded UP to the nearest whole number to give the SSD Net Capacity license requirement.

When deploying a WEKA Storage cluster using Lenovo ThinkSystem servers, the number of failure domains is typically the number of servers.

For example, when using 6 servers, each with 10x 3.2TB NVMe drives with 4+2P RAID code:

Net Capacity	=	Raw Capacity: 6 servers * 10 drives * 3.2TB	*	6 servers (Failure Domains) – 1 (Hot Spares) / 6 servers (Failure Domains)	*	4 (Stripe Width) / 4 (Stripe Width) + 2 (Protection)	*	0.9 (File System Overhead)
96TB	=	192TB	*	5 / 6	*	4 / 6	*	0.9

This is exactly 96TB Net Capacity.

Or when using 10 servers, each with 10x 7.68TB NVMe drives with 8+2P RAID code:

Net Capacity	=	Raw Capacity: 10 servers * 10 drives * 7.68TB	*	10 servers (Failure Domains) – 1 (Hot Spares) / 10 servers (Failure Domains)	*	8 (Stripe Width) / 8 (Stripe Width) + 2 (Protection)	*	0.9 (File System Overhead)
497.6TB	=	768TB	*	9 / 10	*	8 / 10	*	0.9

Round **UP** to the next integer value – 498TB to calculate license Net Capacity requirement.

Part numbers: WEKA Extreme Performance and Scale (XPS) Edition

Table 4. WEKA Extreme Performance and Scale (XPS) Edition

Part number	Description
Up to 1 PB	
7S1G000DWW	WEKA XPS Edition - XPS Per TB per month, up to 1PB 1 Month License w/WEKA support
7S1G0001WW	WEKA XPS Edition - XPS Per TB per year, up to 1PB 1Yr License w/WEKA support
7S1G0004WW	WEKA XPS Edition - XPS Per TB, up to 1PB 2Yr License w/WEKA support
7S1G0007WW	WEKA XPS Edition - XPS Per TB, up to 1PB 3Yr License w/WEKA support
7S1G000AWW	WEKA XPS Edition - XPS Per TB, up to 1PB 5Yr License w/WEKA support
Between 1 PB – 2.5 PB	
7S1G000EWW	WEKA XPS Edition - XPS Per TB per month, b/w 1PB - 2.5PB 1 Month License w/WEKA Support
7S1G0002WW	WEKA XPS Edition - XPS Per TB, b/w 1PB - 2.5PB 1Yr License w/WEKA Support
7S1G0005WW	WEKA XPS Edition - XPS Per TB, b/w 1PB - 2.5PB 2Yr License w/WEKA Support

Part number	Description
7S1G0008WW	WEKA XPS Edition - XPS Per TB, b/w 1PB - 2.5PB 3Yr License w/WEKA Support
7S1G000BWW	WEKA XPS Edition - XPS Per TB, b/w 1PB - 2.5PB 5Yr License w/WEKA Support
Above 2.5 PB	
7S1G000FWW	WEKA XPS Edition - XPS Per TB per month, above 2.5 PB 1 Month License w/ WEKA support
7S1G0003WW	WEKA XPS Edition - XPS Per TB, above 2.5 PB 1Yr License w/ WEKA support
7S1G0006WW	WEKA XPS Edition - XPS Per TB, above 2.5 PB 2Yr License w/ WEKA support
7S1G0009WW	WEKA XPS Edition - XPS Per TB, above 2.5 PB 3Yr License w/ WEKA support
7S1G000CWW	WEKA XPS Edition - XPS Per TB, above 2.5 PB 5Yr License w/ WEKA support

Part numbers: WEKA Data Tiering Option-DTO

Table 5. WEKA Data Tiering Option-DTO

Part number	Description
Up to 2.5 PB	
7S1G0019WW	WEKA Data Tiering Option-DTO Per TB per month, up to 2.5PB, 1 Month w/WEKA support
7S1G000XWW	WEKA Data Tiering Option-DTO Per TB, up to 2.5PB, 1Yr w/WEKA support
7S1G0010WW	WEKA Data Tiering Option-DTO Per TB, up to 2.5PB, 2Yr w/WEKA support
7S1G0013WW	WEKA Data Tiering Option-DTO Per TB, up to 2.5PB, 3Yr w/WEKA support
7S1G0016WW	WEKA Data Tiering Option-DTO Per TB, up to 2.5PB, 5Yr w/WEKA support
Between 2.5 PB – 5 PB	
7S1G001AWW	WEKA Data Tiering Option-DTO Per TB per month, between 2.5PB-5PB, 1 Month w/WEKA support
7S1G000YWW	WEKA Data Tiering Option-DTO Per TB, between 2.5PB-5PB, 1Yr w/WEKA support
7S1G0011WW	WEKA Data Tiering Option-DTO Per TB, between 2.5PB-5PB, 2Yr w/WEKA support
7S1G0014WW	WEKA Data Tiering Option-DTO Per TB, between 2.5PB-5PB, 3Yr w/WEKA support
7S1G0017WW	WEKA Data Tiering Option-DTO Per TB, between 2.5PB-5PB, 5Yr w/WEKA support
Above 5 PB	
7S1G001BWW	WEKA Data Tiering Option-DTO Per TB per month, above 5PB, 1 Month w/WEKA support
7S1G000ZWW	WEKA Data Tiering Option-DTO Per TB, above 5PB, 1Yr w/WEKA support
7S1G0012WW	WEKA Data Tiering Option-DTO Per TB, above 5PB, 2Yr w/WEKA support
7S1G0015WW	WEKA Data Tiering Option-DTO Per TB, above 5PB, 3Yr w/WEKA support
7S1G0018WW	WEKA Data Tiering Option-DTO Per TB, above 5PB, 5Yr w/WEKA support

Part numbers: WEKA Data Protection Option-DPO

Table 6. WEKA Data Protection Option-DPO

Part number	Description
Up to 2.5 PB	
7S1G0025WW	WEKA Data Protection Option-DPO Per TB per month, up to 2.5PB 1Month w/WEKA support
7S1G001TWW	WEKA Data Protection Option-DPO Per TB, up to 2.5PB 1Yr w/WEKA support
7S1G001WWW	WEKA Data Protection Option-DPO Per TB, up to 2.5PB 2Yr w/WEKA support
7S1G001ZWW	WEKA Data Protection Option-DPO Per TB, up to 2.5PB 3Yr w/WEKA support
7S1G0022WW	WEKA Data Protection Option-DPO Per TB, up to 2.5PB 5Yr w/WEKA support
Between 2.5 PB – 5 PB	

Part number	Description
7S1G0026WW	WEKA Data Protection Option-DPO Per TB per month, between 2.5PB-5PB 1Month w/WEKA support
7S1G001UWW	WEKA Data Protection Option-DPO Per TB, between 2.5PB-5PB 1Yr w/WEKA support
7S1G001XWW	WEKA Data Protection Option-DPO Per TB, between 2.5PB-5PB 2Yr w/WEKA support
7S1G0020WW	WEKA Data Protection Option-DPO Per TB, between 2.5PB-5PB 3Yr w/WEKA support
7S1G0023WW	WEKA Data Protection Option-DPO Per TB, between 2.5PB-5PB 5Yr w/WEKA support
Above 5 PB	
7S1G0027WW	WEKA Data Protection Option-DPO Per TB per month, above 5PB 1Month w/WEKA support
7S1G001VWW	WEKA Data Protection Option-DPO Per TB, above 5PB 1Yr w/WEKA support
7S1G001YWW	WEKA Data Protection Option-DPO Per TB, above 5PB 2Yr w/WEKA support
7S1G0021WW	WEKA Data Protection Option-DPO Per TB, above 5PB 3Yr w/WEKA support
7S1G0024WW	WEKA Data Protection Option-DPO Per TB, above 5PB 5Yr w/WEKA support

Part numbers: WEKA Extreme Performance and Scale (XPS) Edition - State, Local, Education (EDU)

Table 7. WEKA Extreme Performance and Scale (XPS) Edition - State, Local, Education (EDU)

Part number	Description
Up to 1 PB	
7S1G000UWW	WEKA XPS Edition - XPS Per TB per month, up to 1PB 1 Month License w/WEKA support EDU
7S1G000GWW	WEKA XPS Edition - XPS Per TB, up to 1PB 1Yr License w/WEKA support EDU
7S1G000KWW	WEKA XPS Edition - XPS Per TB, up to 1PB 2Yr License w/WEKA support EDU
7S1G000NWW	WEKA XPS Edition - XPS Per TB, up to 1PB 3Yr License w/WEKA support EDU
7S1G000RWW	WEKA XPS Edition - XPS Per TB, up to 1PB 5Yr License w/WEKA support EDU
Between 1 PB – 2.5 PB	
7S1G000VWW	WEKA XPS Edition - XPS Per TB per month, b/w 1PB - 2.5PB 1 Month License w/WEKA Support EDU
7S1G000HWW	WEKA XPS Edition - XPS Per TB, b/w 1PB - 2.5PB 1Yr License w/WEKA Support EDU
7S1G000LWW	WEKA XPS Edition - XPS Per TB, b/w 1PB - 2.5PB 2Yr License w/WEKA Support EDU
7S1G000PWW	WEKA XPS Edition - XPS Per TB, b/w 1PB - 2.5PB 3Yr License w/WEKA Support EDU
7S1G000SWW	WEKA XPS Edition - XPS Per TB, b/w 1PB - 2.5PB 5Yr License w/WEKA Support EDU
Above 2.5 PB	
7S1G000WWW	WEKA XPS Edition - XPS Per TB per month, above 2.5 PB 1 Month License w/ WEKA support EDU
7S1G000JWW	WEKA XPS Edition - XPS Per TB, above 2.5PB 1Yr License w/ WEKA support EDU
7S1G000MWW	WEKA XPS Edition - XPS Per TB, above 2.5PB 2Yr License w/ WEKA support EDU
7S1G000QWW	WEKA XPS Edition - XPS Per TB, above 2.5 PB 3Yr License w/ WEKA support EDU
7S1G000TWW	WEKA XPS Edition - XPS Per TB, above 2.5 PB 5Yr License w/ WEKA support EDU

Part numbers: WEKA Data Tiering Option-DTO - State, Local, Education (EDU)

Table 8. WEKA Data Tiering Option-DTO - State, Local, Education (EDU)

Part number	Description
Up to 2.5 PB	
7S1G001QWW	WEKA Data Tiering Option-DTO Per TB per month, up to 2.5PB, 1 Month w/WEKA support EDU

Part number	Description
7S1G001CWW	WEKA Data Tiering Option-DTO Per TB, up to 2.5PB, 1Yr w/WEKA support EDU
7S1G001FWW	WEKA Data Tiering Option-DTO Per TB, up to 2.5PB, 2Yr w/WEKA support EDU
7S1G001JWW	WEKA Data Tiering Option-DTO Per TB, up to 2.5PB, 3Yr w/WEKA support EDU
7S1G001MWW	WEKA Data Tiering Option-DTO Per TB, up to 2.5PB, 5Yr w/WEKA support EDU
Between 2.5 PB – 5 PB	
7S1G001RWW	WEKA Data Tiering Option-DTO Per TB per month, b/w 2.5PB-5PB, 1 Month w/WEKA support EDU
7S1G001DWW	WEKA Data Tiering Option-DTO Per TB, between 2.5PB-5PB, 1Yr w/WEKA support EDU
7S1G001GWW	WEKA Data Tiering Option-DTO Per TB, between 2.5PB-5PB, 2Yr w/WEKA support EDU
7S1G001KWW	WEKA Data Tiering Option-DTO Per TB, between 2.5PB-5PB, 3Yr w/WEKA support EDU
7S1G001NWW	WEKA Data Tiering Option-DTO Per TB, between 2.5PB-5PB, 5Yr w/WEKA support EDU
Above 5 PB	
7S1G001SWW	WEKA Data Tiering Option-DTO Per TB per month, above 5PB, 1 Month w/WEKA support EDU
7S1G001EWW	WEKA Data Tiering Option-DTO Per TB, above 5PB, 1Yr w/WEKA support EDU
7S1G001HWW	WEKA Data Tiering Option-DTO Per TB, above 5PB, 2Yr w/WEKA support EDU
7S1G001LWW	WEKA Data Tiering Option-DTO Per TB, above 5PB, 3Yr w/WEKA support EDU
7S1G001PWW	WEKA Data Tiering Option-DTO Per TB, above 5PB, 5Yr w/WEKA support EDU

Part numbers: WEKA Data Protection Option-DPO - State, Local, Education (EDU)

Table 9. WEKA Data Protection Option-DPO - State, Local, Education (EDU)

Part number	Description
Up to 2.5 PB	
7S1G002LWW	WEKA Data Protection Option-DPO Per TB per month, up to 2.5PB 1Month w/WEKA support EDU
7S1G0028WW	WEKA Data Protection Option-DPO Per TB, up to 2.5PB 1Yr w/WEKA support EDU
7S1G002BWW	WEKA Data Protection Option-DPO Per TB, up to 2.5PB 2Yr w/WEKA support EDU
7S1G002EWW	WEKA Data Protection Option-DPO Per TB, up to 2.5PB 3Yr w/WEKA support EDU
7S1G002HWW	WEKA Data Protection Option-DPO Per TB, up to 2.5PB 5Yr w/WEKA support EDU
Between 2.5 PB – 5 PB	
7S1G002MWW	WEKA Data Protection Option-DPO Per TB per month, b/w 2.5PB-5PB 1Month w/WEKA support EDU
7S1G0029WW	WEKA Data Protection Option-DPO Per TB, between 2.5PB-5PB 1Yr w/WEKA support EDU
7S1G002CWW	WEKA Data Protection Option-DPO Per TB, between 2.5PB-5PB 2Yr w/WEKA support EDU
7S1G002FWW	WEKA Data Protection Option-DPO Per TB, between 2.5PB-5PB 3Yr w/WEKA support EDU
7S1G002JWW	WEKA Data Protection Option-DPO Per TB, between 2.5PB-5PB 5Yr w/WEKA support EDU
Above 5 PB	
7S1G002NWW	WEKA Data Protection Option-DPO Per TB per month, above 5PB 1Month w/WEKA support EDU
7S1G002AWW	WEKA Data Protection Option-DPO Per TB, above 5PB 1Yr w/WEKA support EDU
7S1G002DWW	WEKA Data Protection Option-DPO Per TB, above 5PB 2Yr w/WEKA support EDU
7S1G002GWW	WEKA Data Protection Option-DPO Per TB, above 5PB 3Yr w/WEKA support EDU
7S1G002KWW	WEKA Data Protection Option-DPO Per TB, above 5PB 5Yr w/WEKA support EDU

WEKA Installation & Deployment

The Lenovo EveryScale WEKA Storage Solution can be purchased as part of a Lenovo EveryScale cluster which includes options for factory integrated into racks. Systems can also be purchased and delivered for integration into a customer rack. The system can also be purchased as a standalone Lenovo EveryScale WEKA Storage Solution to complement an existing HPC cluster.

When deploying a WEKA storage system for the first time, planning of the hardware and software configuration is needed to ensure maximum performance can be obtained from the system. It is strongly recommended to take installation services to ensure successful integration of the system.

Lenovo professional services can provide full onsite installation services for hardware and software of the Lenovo EveryScale WEKA storage nodes, this includes installation of racks or equipment into customer racks, cabling, operating system deployment and installation of Weka software, this can also extend to a fully managed service. In addition to this, WEKA also provide remote installation services for the Weka software which is available as an option.

To determine the level of deployment services required, contact your local Lenovo sales team to discuss the scope of work required.

Installation Service

Table 10. Installation Service

Part number	Description
5MS7A85671	HPC Technical Consultant Hourly Unit (Remote)
5MS7A85672	HPC Technical Consultant Labor Unit (Remote)
5MS7A85673	HPC Technical Consultant Hourly Unit (Onsite)
5MS7A85674	HPC Technical Consultant Labor Unit (Onsite)
5MS7A85675	HPC Principal Consultant Hourly Unit (Remote)
5MS7A85676	HPC Principal Consultant Labor Unit (Remote)
5MS7A85677	HPC Principal Consultant Hourly Unit (Onsite)
5MS7A85678	HPC Principal Consultant Labor Unit (Onsite)
5MS7A85679	HPC Technical Consultant Services Bundle (Small)
5MS7A85680	HPC Technical Consultant Services Bundle (Medium)
5MS7A85681	HPC Technical Consultant Services Bundle (Large)
5MS7A85682	HPC Technical Consultant Services Bundle (Extra Large)
7S1G002PWW	WEKA Installation (up to 30 nodes, remote)

Operating System Software

Lenovo recommends the use of Red Hat Enterprise Linux (RHEL) as the operating system to use on WEKA storage servers. When coupled with a premium subscription, the software includes Long Term Support (LTS) updates to the operating system helping to ensure security updates are available for the operating system without the need for regular minor version upgrades. The following table outlines the options for Lenovo ThinkSystem servers. One subscription is needed per storage server.

Table 11. Operating System Software

Part number	Feature code	Description
7S0F0004WW	S0N8	RHEL Server Physical or Virtual Node, 2 Skt Premium Subscription w/Lenovo Support 1Yr
7S0F0005WW	S0N9	RHEL Server Physical or Virtual Node, 2 Skt Premium Subscription w/Lenovo Support 3Yr
7S0F0006WW	S0NA	RHEL Server Physical or Virtual Node, 2 Skt Premium Subscription w/Lenovo Support 5Yr

Why Lenovo

Lenovo is a leading provider of data center infrastructure solutions and a premier WEKA partner. The Lenovo EveryScale WEKA solution is co-designed with WEKA and Lenovo will work with you and WEKA to identify, design, install and support the solution that best ensures your organization's needs.

Lenovo complements a portfolio of leading x86 infrastructure with a full range of storage, software, and comprehensive services that provides excellent performance, reliability, and security for your IT environment from the edge to the cloud.

Integrated Software & Hardware

Lenovo has worked with WEKA to provide a performance engineered solution aimed at extracting maximum performance out of Lenovo ThinkSystem servers which extends to integrating WEKA into an HPC scheduled system.

Lenovo EveryScale systems provide component level validation of the hardware and when shipped as part of a Lenovo EveryScale cluster simplify deployment and help drive reduction in time to results.

Optimized to deliver storage performance for the most demanding IO workloads, Lenovo EveryScale WEKA Storage provides an end-to-end collaboration that transforms access to data providing cost-effective scalability and performance.

Enterprise Level Support

Lenovo EveryScale WEKA Storage Solutions are based on Lenovo Certified Systems, tested, and validated to provide the necessary performance, manageability, security, and scalability. Comprehensive enterprise-grade support for Lenovo EveryScale WEKA solutions will be provided by Lenovo and WEKA software support will be provided directly by WekaIO.

For details about Lenovo support, see the Lenovo ISG Support Plan.

Seller training courses

The following sales training courses are offered for employees and partners (login required). Courses are listed in date order.

1. **VTT Data Storage solutions - HPC AI High-End storage products and offerings and New extension switch Update-September 2026**
   2026-09-25 | 60 minutes | Employees Only

   By the end of this call, participants will be able to:

   Understand the latest updates across the Lenovo DB Series and HPC/AI storage portfolio.
   Identify key customer challenges related to performance, scalability, cyber resilience, and AI workloads.
   Position the right Lenovo storage solution based on customer requirements and use cases.
   Articulate the business value and differentiators of Lenovo storage solutions in customer conversations.
   Recognize new opportunities around Fibre Channel, AI storage, data protection, and high-performance computing.

   Tags: Storage, HPC/AI, DB series, Brocade, Weka, Cloudian, ddn, Vast, IBM

   Published: 2026-09-25
   Length: 60 minutes

   Start the training:
   Employee link: Grow@Lenovo

   Course code: DVDS227

2. **ThinkSystem High Performance File Offering with WEKA**
   2023-10-25 | 25 minutes | Employees and Partners

   This course introduces you the file system solution with WEKA. By the end of this course, you will be able to: describe what is WEKA, identify the high-performance workloads where WEKA can improve the performance, review the file storage, identify the customer's concerns, and describe the process to sell & win.

   Tags: Cloud, Software Defined Infrastruture (SDI), ThinkSystem

   Published: 2023-10-25
   Length: 25 minutes

   Start the training:
   Employee link: Grow@Lenovo
   Partner link: Lenovo 360 Learning Center

   Course code: DSOLO203

3. **Benefits and the positioning of Lenovo ThinkSystem file offerings with WEKA, DSS, and DM+ONTAP**
   2023-05-08 | 10 minutes | Employees and Partners

   Course objectives:
   1.Learn about file storage
   2.Understand the different types of storage
   3.Recognize the Lenovo data management portfolio

   Tags: Artificial Intelligence (AI), Storage, Technical Sales

   Published: 2023-05-08
   Length: 10 minutes

   Start the training:
   Employee link: Grow@Lenovo
   Partner link: Lenovo 360 Learning Center

   Course code: DSOLS207

4. **ThinkSystem High Performance File offering with WEKA Preview**
   2023-02-07 | 3 minutes | Employees and Partners

   This preview introduces the ThinkSystem High Performance File offering with WEKA. Lenovo and WEKA are announcing a strategic partnership to deliver enterprise class solutions to accelerate HPC and AI workloads. Lenovo ThinkSystem Software Defined Storage (SDS) Ready Nodes with WEKA Data Platform software deliver a high performance solution that supports every step of the organizations' data lifecycle – from ingest and pre-processing, to analyzing, storing, and archiving. Note: This course is presented as audio only. There are no slides or video.

   Tags: Advanced DataCenter, High-Performance Computing (HPC), Server, Software Defined Infrastruture (SDI), ThinkSystem

   Published: 2023-02-07
   Length: 3 minutes

   Start the training:
   Employee link: Grow@Lenovo
   Partner link: Lenovo 360 Learning Center

   Course code: SXXW2515a

5. **Technical Champions Webinar: WEKA - Delivering the Data Platform for the Modern Workload**
   2023-01-26 | 93 minutes | Employees Only

   Have you heard about WEKA lately and are wondering what exactly “WEKA” is? Maybe your customer’s data needs (both performance and capacity) are spiraling out of control, as is the complexity of managing multiple data platforms?

   Join Ed Stickney and Chak Singamsetti as they clear up the confusion and provide the training and tools you’ll need to become a WEKA-selling powerhouse. Ed will cover an overview of WEKA, sales positioning, licensing, and more. Chak will take over in the second half for a deeper dive into WEKA’s technological differentiation and how to build Lenovo-WEKA solutions.
   In addition to being a value differentiator and a new market space for Lenovo, this is an EXCITING offering that will provide you with a new and different conversation with your customers. Please join us for what will certainly be an informative and profitable enablement investment in your future.

   Tags: Business solutions, Data Management, Industry solutions

   Published: 2023-01-26
   Length: 93 minutes

   Start the training:
   Employee link: Grow@Lenovo

   Course code: DSOLS206

For More Information

To learn more about the Lenovo EveryScale WEKA Storage Solution, contact your Lenovo Sales Representative or Business Partner.

Products related to this document are the following:

- Lenovo Scalable Infrastructure (LeSI) Product Guide
- Lenovo ThinkSystem SR630 V2 Product Guide
- Lenovo Distributed Storage Solution for IBM Spectrum Scale (DSS-G) Product Guide
- Lenovo High Performance Computing home page
- Lenovo TruScale Infrastructure Services home page

More information on WEKA and related product families

- WEKA home page

Related product families

Product families related to this document are the following:

- Artificial Intelligence
- High Performance Computing
- Software-Defined Storage
- ThinkSystem SR630 V2 Server

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This document, LP1698, was created or updated on March 10, 2023.

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