



STORAGE CATALOG

FLR ITN #FLRCLD2016 – Procurement of Long Term
Data Storage

[Configurations / Pricing / Sizing / Contract information](#)
Easy to read and shop!. Storage solutions for research and general computing.

Douglas Beary
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Lenovo Certifies that all configurations and pricing adhere to the FLR ITN #FLRCLD2016 – Procurement of Long Term Data Storage Contract terms and conditions.

In witness hereof, this amended price list to the master agreement is certified as accurate and consistent with the original agreement.

Lenovo Global Technology (United States) Inc.,

 Signature

John Therrell
Regional Sales Director
8-21-17

“Starter Cheap and Deep” Lenovo Z22 840TB \$105,213

The design point of this storage is:

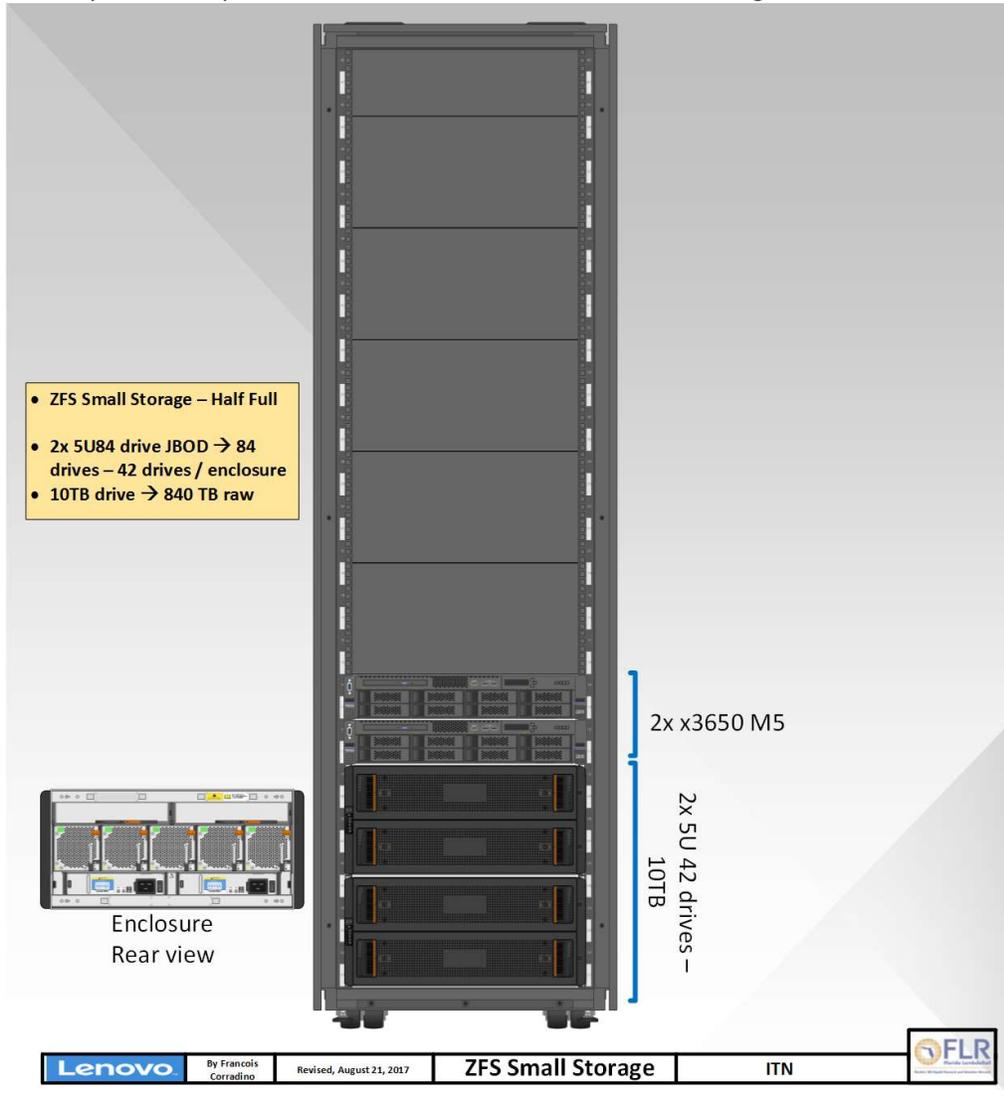
Low total cost – starting point - Expandable

Large capacity – 840 TB (expandable to 1.6PB with the purchase of 84 more 10TB drives)

Inexpensive - ZFS

“Tape like” – not necessarily high performance – but acceptable. 1-2GB/s estimated.

Turnkey – “set it up and use it” minimal intervention and management



Bill of Materials for this solution:

42U Dynamic V2 Rack with appropriate PDUs

2x x3650 M5 Lenovo Server (2 socket 2U server)

2x Lenovo 3284 (5U 42 drives in each drawer – half full) with 10TB 7.2K SAS drives.

84x 10TB SAS drives – 840 TB RAW capacity. 638 TB usable

Cost \$105,213.

Over 5 years – Cost per TB (RAW)/yr = \$25.09

Over 5 years – Cost per TB (Usable)/yr = \$33.40

“8TB Starter” Lenovo Z22 1344TB \$120,500

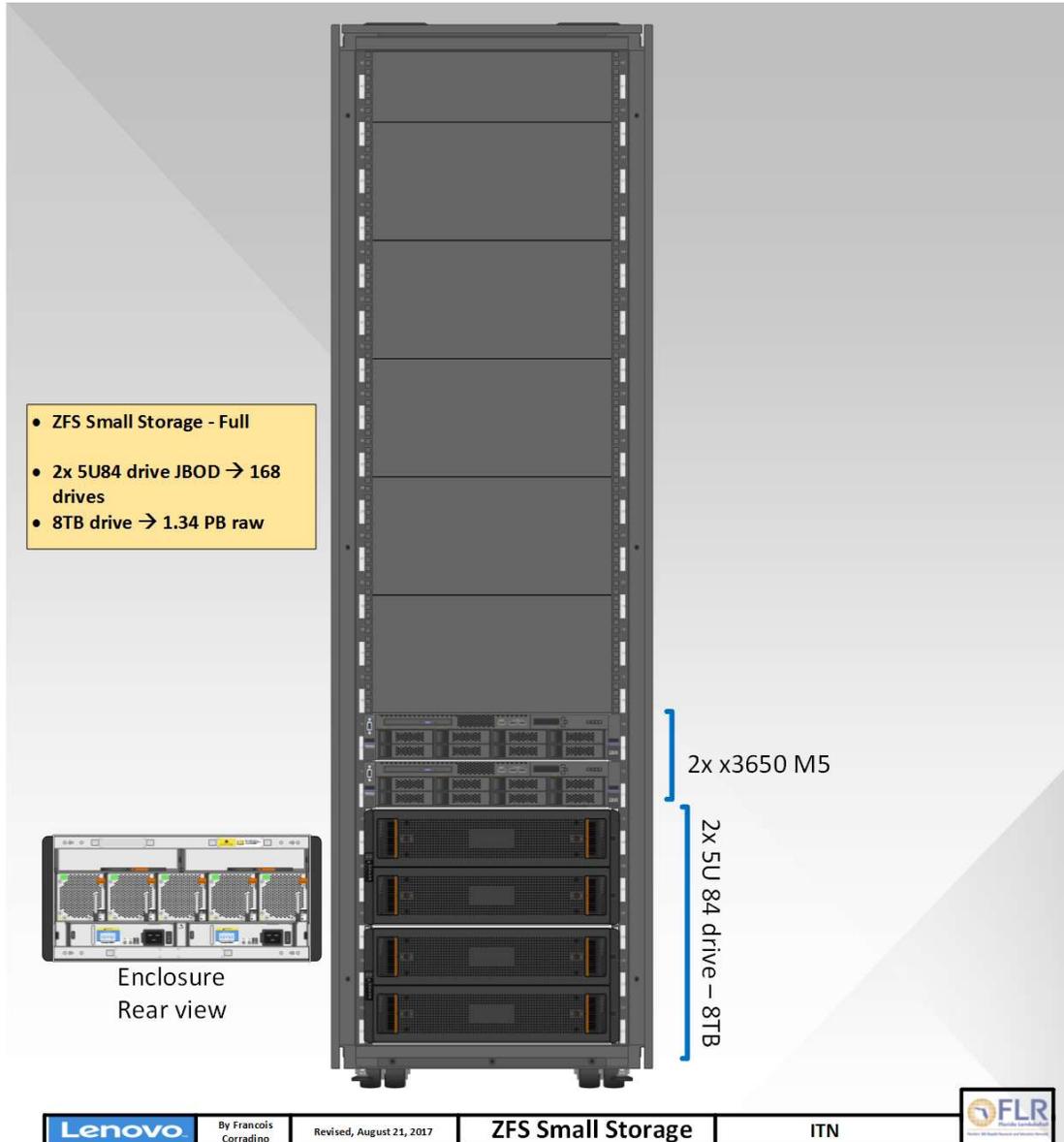
The design point of this storage is:

Low total cost – starting point - Expandable

Large capacity – 1.344PB

Inexpensive - ZFS

“Tape like” – not necessarily high performance – but acceptable. 1-2GB/s estimated **“Cheap and Deep**



Bill of

Materials for this solution:

42U Dynamic V2 Rack with appropriate PDUs

2x x3650 M5 Lenovo Server (2 socket 2U server)

2x Lenovo 3284 (5U 84x 8TB 7.2K SAS drives) 1344TB Raw

168x 8TB SAS drives – 1344 TB RAW capacity. 1008 TB usable

Cost \$120,500.

Over 5 years – Cost per TB (RAW)/yr = \$17.93

Over 5 years – Cost per TB (Usable)/yr = \$23.91

“10TB Starter” Lenovo Z22 1680TB \$132,264

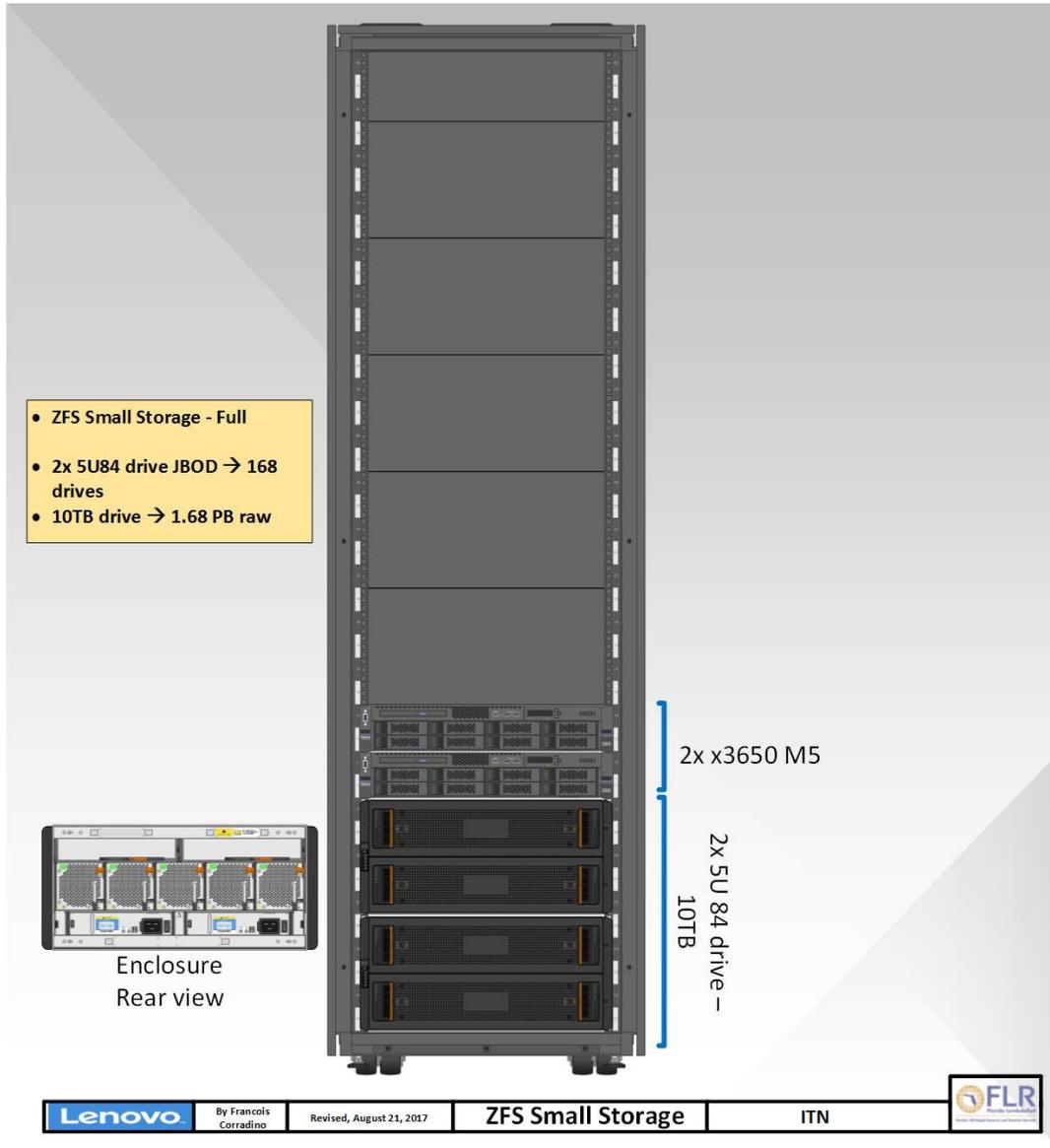
The design point of this storage is:

Low total cost – starting point - Expandable

Large capacity – 1.680PB

Inexpensive - ZFS

“Tape like” – not necessarily high performance – but acceptable. 1-2GB/s estimated



Materials for this solution:

42U Dynamic V2 Rack with appropriate PDUs

2x x3650 M5 Lenovo Server (2 socket 2U server)

2x Lenovo 3284 (5U 84x 10TB 7.2K SAS drives) 1680TB Raw

168x 10TB SAS drives – 1680 TB RAW capacity. 1260TB usable

Cost \$132,264.

Over 5 years – Cost per TB (RAW)/yr = \$15.75

Over 5 years – Cost per TB (Usable)/yr = \$20.99

Lenovo z27 5.8PB \$408,185

The design point of this storage is: **Large capacity – 5.8PB**

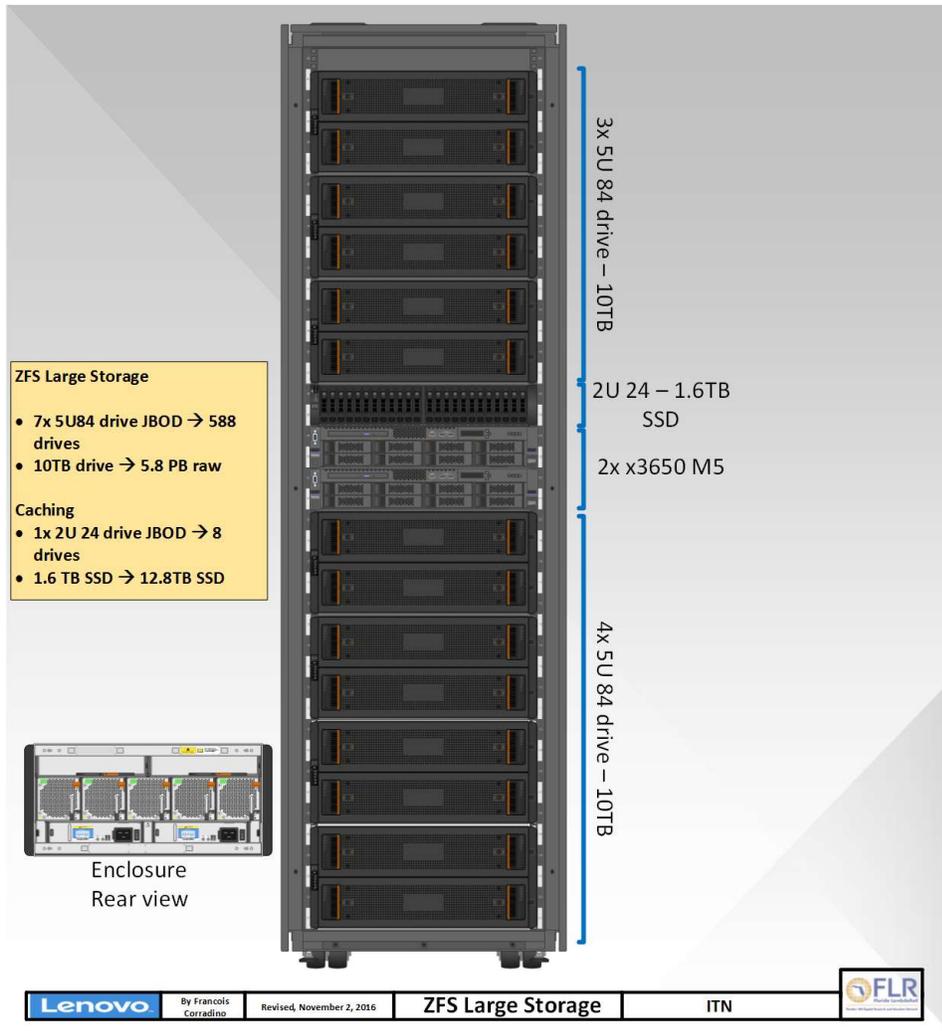
Inexpensive - ZFS

Fill out the Rack – Fill the SAS ports – Fill the Drive bays

“Tape like” – not necessarily high performance – but acceptable. 1-2GB/s estimated.

Turnkey – “set it up and use it” minimal intervention and management.

Picture representation z27



Bill of Materials for this solution:

42U Dynamic V2 Rack with appropriate PDUs

2x x3650 M5 Lenovo Server (2 socket 2U server)

1 2U 24x 2.5 inch 1224 Lenovo JBOD with 8x 1.6 TB SSD (4x RAID 10 caching for R/W performance)

7x Lenovo 3284 (5U 84 drives) with 10TB 7.2K SAS drives.

588x 10TB SAS drives – 5.88PB RAW capacity. 12.8TB of SSD capacity – **Total 6PB RAW 4.5PB Usable**

Cost \$408,185

Over 5 years – Cost per TB (RAW) / yr = \$13.60

Over 5 years – Cost per TB (Usable)/yr = \$18.14

“HPC GPFS Storage Starter” Lenovo DSS G220 – 1.68PB GPFS - \$230,264

The design point of this storage is:

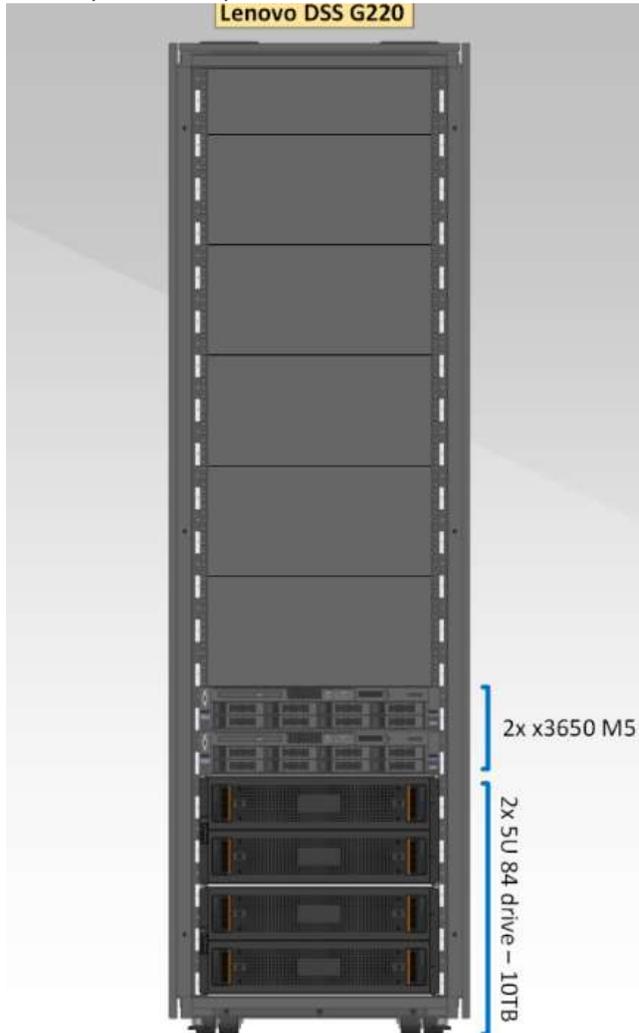
High performance (> 15GB/s R/W)

Attach to Cluster via multiple methods (available – 10GbE, 40GbE, FDR, EDR, OPA)

Large capacity 1.6PB (RAW) 1.2PB (usable)

Inexpensive - \$230,264

Turnkey – “set it up and use it” - Services included to get GPFS up and running.



Bill of Materials for this solution:

42U Dynamic V2 Rack with appropriate PDUs

2x x3650 M5 Lenovo Server (2 socket 2U server)

2x Lenovo – 3284 JBOD 5U 84 Drives.

166x 10TB SAS drives – 1.6 PB RAW capacity. 1.2PB Usable

Cost \$230,264

Over 5 years – Cost per TB (RAW)/yr = \$28.78

Over 5 years – Cost per TB (usable)/yr = \$38.37

HPC Storage – large capacity and performance Lenovo DSS G240 3200TB GPFS

The design point of this storage is:

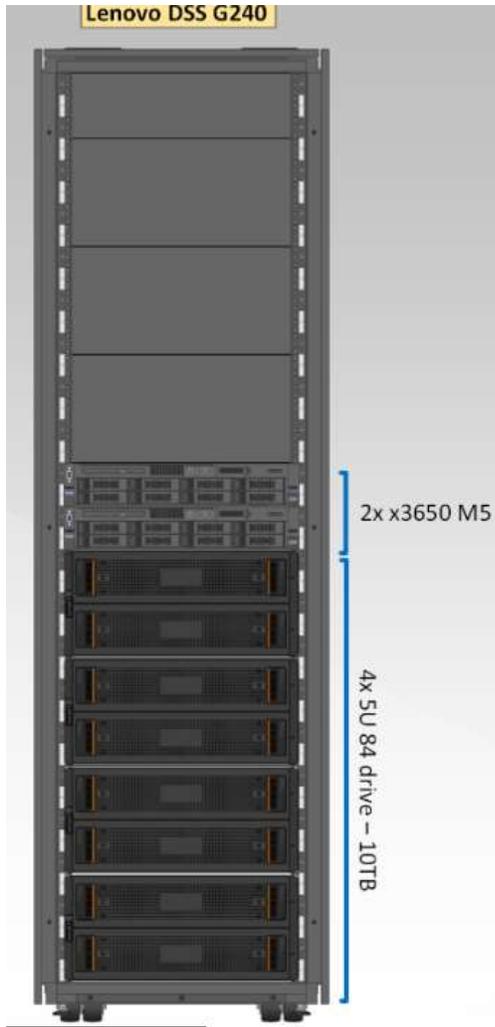
GPFS (Spectrum Scale).

High performance (> 30GB/s R/W)

Attach to Cluster via multiple methods (available – 10GbE, 40GbE, FDR, EDR, OPA)

Large capacity **3.2 PB (RAW) 2.4PB (Usable)**

Turnkey – “set it up and use it” - Services included to get GPFS up and running.



Bill of Materials for this solution:

42U Dynamic V2 Rack with appropriate PDUs

2x x3650 M5 Lenovo Server (2 socket 2U server)

4x Lenovo – 3284 JBOD (5U 84 drives each) with 10TB 7.2K SAS drives.

332x 10TB SAS drives – 3.36 PB RAW capacity. (2.42 PB usable)

Cost \$388,168

Over 5 years – Cost per TB(RAW)/yr = \$23.70

Over 5 years – Cost per TB (Usable)/yr = \$32.08