

Configuration 1: Hadoop/Spark Cluster with 256K-cores, 2PB memory, 400PB HDD, and 25Gb/s Ethernet Fat-Tree network (each VM should be equivalent to the d2.8xlarge instance); in addition to the compute resources, a 800PB distributed storage shared across the entire cloud should be procured, with enough capacity for 800GB/sec throughput (for pricing comparison, see S3)

Private Cloud:

	Description	Price Per Item (\$)	Quantity	Total Price (\$)
Computer Servers	RAX-VM XS12-22S1	12,669	7,112	90,101,928
Network Switches	Mellanox MSN2410-BB2FO	17,493	134	3,097,437
	Mellanox MSN3800-CS2R	56,660	4	226,640
	N9500-32D (32*400Gb) Data Center Switch	9,000	5	45,000
	N8500-48B6C (48*25Gb+6*100Gb) 25Gb L2/L3 SDN Switch	6,200	157	973,400
Network Cables	1m Arista Networks CAB-D-D-400G-1M Compatible 400G QSFP-DD Passive Direct Attach Copper Twinax Cable	165	5	825
	1m (3ft) Generic Compatible 100G QSFP28 Passive Direct Attach Copper Twinax Cable	29	14,200	41,600
Racks	Netshelter SX 48U Rack	1,735	571	990,685
Storage servers	STX-NS XE12-12S1-10G	9,590	6,400	61,376,000
Electric Power		\$0.15 KWH	5656KW	37,159,920 (5 years)
Cooling		\$0.15 KWH	5656KW	37,159,920 (5 years)
Administration		100,000 (per year)	15	7,500,000 (5 Years)
Total				235,574,976



READY TO BUY?
800-371-1212

RAX-VM XS12-22S1

My System April 13th, 4:00 pm EDT
Thinkmate Config ID 422096

Configured Price: \$12,669.00

Selection Summary	
Barebone	Supermicro SuperServer 6029P-TRT - 2U - 8x SATA - Dual 10-Gigabit Ethernet - 16x DDR4 - 1000W Redundant
Processor	2 x Intel® Xeon® Gold 6140 Processor 18-core 2.30GHz 24.75MB Cache (140W)
Memory	12 x 32GB PC4-23400 2933MHz DDR4 ECC RDIMM
Hard Drive	2 x 1.0TB SATA 6.0Gb/s 7200RPM - 3.5" - Ultrastar™ DC HA210 (512n) 4 x 4.0TB SATA 6.0Gb/s 7200RPM - 3.5" - Ultrastar™ DC HC310 (512n) 4 x 10TB SATA 6.0Gb/s 7200RPM - 3.5" - Ultrastar™ DC HC510 (512e)
Controller Card	LSI SAS 9300-8i SAS 12Gb/s PCIe 3.0 8-Port Host Bus Adapter
Network Card	Mellanox 25-Gigabit Ethernet Adapter ConnectX®-4 Lx EN MCX4111A (1x SFP28)
Mounting Rails	Quick-Release Rackmount Mounting Rails - 26.5" to 36.4" (Included) (MCP-290-00053-0N)
Hypervisor	2 x No vSphere Licensing
Support and Subscription	2 x No VMware vSphere Support
Server Management	Thinkmate® Update Manager (OOB Management Package)
Warranty	3 Year Advanced Parts Replacement Warranty
Tech Specs	
Barebone	
Memory Technology	DDR4 ECC Reg
Chipset	Intel C622
Form Factor	2U
Color	Black
Memory Slots	16x 288-pin DIMM Sockets
Graphics	ASPEED AST2500 BMC
Ethernet	Intel® X722 10GBase-T Ethernet Controller
Power	1000W Redundant Power Supplies with PMBus
External Bays	8 Hot-swap 3.5" SATA drive bays
M.2	1x M.2 NGFF connectors Interface: PCIe 3.0 x4 Form Factor: M-Key 2260, 2280, 22110
Expansion Slots	4 PCI-E 3.0 x16 (Low-profile) 2 PCI-E 3.0 x8 (Low-profile)
Front Panel	Power On/Off button System Reset button UID button Power status LED Hard drive activity LED Network activity LEDs System information (overheat/UID) LED
Dimensions (WxHxD)	17.2" (437mm) x 3.5" (89mm) x 25.5" (647mm)
Processor	
Product Line	Xeon Scalable
Socket	LGA3647
Clock Speed	2.30 GHz
Cores/Threads	18C / 36T
Intel Virtualization Technology	Yes
Intel Hyper-Threading	Yes
Wattage	140W
Memory	
Technology	DDR4
Type	288-pin DIMM

4/13/2020

Capacity	12 x 32 GB
Speed	2933 MHz
Error Checking	ECC
Signal Processing	Registered
Hard Drive	
Storage Capacity	2 x 1.0TB 4 x 4.0TB 4 x 10.0TB
Interface	6.0Gb/s Serial ATA 6.0Gb/s Serial ATA 6.0Gb/s Serial ATA
Rotational Speed	7,200RPM 7,200RPM 7200RPM
Cache	128MB 256MB 256MB
Format	512n 512n 512e
Controller Card	
Product Type	SAS Host Bus Adapter
Data Transfer Rate	12Gb/s SAS
Internal Ports	8 Ports
External Ports	0 Ports
I/O Processor	LSI SAS3008
RAID Levels	JBOD
Max Devices	1024
Network Card	
Speed	25Gb Ethernet
Connector	SFP28
Interface	PCI Express 3.0 x8

Quotation Date: April 13th, 2020, 04:17 PM EDT. All prices subject to change.

Configured Price: **\$12,669.00**

READY TO BUY?
800-371-1212

CONFIGURATION ID
422096

THINKMATE

Thinkmate is a world-class provider of custom computer and server equipment since 1986. Our business was formed around assisting our customers in planning, budgeting, and implementing complete solutions. We provide a broad range of customized server, storage and cluster solutions to governments, universities, corporations and high performance computing markets. Our commitment to superior customer service and cutting edge technology has kept us the number one white box server solutions provider for nearly twenty years.

[Print](#)



STX-NS XE12-12S1-10G

My System April 13th, 4:32 pm EDT

Thinkmate Config ID 422109

Configured Price: \$9,590.00

Selection Summary

Motherboard	Intel® C622 Chipset - 10x SATA3 - 1x M.2 - Dual Intel® 10-Gigabit Ethernet (RJ45)
Processor	Intel® Xeon® Silver 4112 Processor 4-core 2.60GHz 8.25MB Cache (85W)
Memory	4 x 8GB PC4-23400 2933MHz DDR4 ECC RDIMM
Chassis	Thinkmate® STX-2312 2U Chassis - 12x Hot-Swap 3.5" SATA/SAS - 12Gb/s SAS Single Expander - 1200W Redundant Power
3.5"/2.5" Boot Drive	2 x 240GB Intel® SSD D3-S4610 Series 2.5" SATA 6.0Gb/s Solid State Drive
Storage Drive	8 x 16TB SATA 6.0Gb/s 7200RPM - 3.5"
Controller Card	Broadcom MegaRAID 9480-8i8e SATA/SAS/NVMe 12Gb/s PCIe 3.1 8-Port RAID Controller with 4GB Cache
Battery Backup	CacheVault Flash Cache Protection Module for 9460/9480 Series (CVPM05)
Network Card	Mellanox 25-Gigabit Ethernet Adapter ConnectX®-4 Lx EN MCX4111A (1x SFP28)
Server Management	Thinkmate® Update Manager (OOB Management Package)
Operating System	ThinkNAS™ DirectorProPlus v2.5 - 16-Drive License
Warranty	3 Year Advanced Parts Replacement Warranty

Tech Specs

Motherboard

North Bridge	Intel C622
Memory Technology	DDR4 ECC Registered
Memory Slots	8x 288-pin DIMM sockets
Expansion Slots	1x PCI-E 3.0 x16 1x PCI-E 3.0 x16 (x16 or x8) 1x PCI-E 3.0 x8 (x0 or x8) 1x PCI-E 3.0 x8 1x PCI-E 3.0 x4 (in x8 slot)
Graphics Controller	Aspeed AST2500 BMC
Network Controller(s)	Dual LAN with 10GBase-T with Intel® X557
On-Board Interfaces	Intel® C622 controller for 10 SATA3 (6 Gbps) ports; RAID 0,1,5,10
USB 3.0 Ports	5x USB 3.0 Ports (2 Rear, 1 Type-A, and 2 via header)
USB 2.0 Ports	6x USB 2.0 Ports (2 Rear, 4 via headers)
VGA Ports	1x VGA port

Processor

Product Line	Xeon Scalable
Socket	LGA3647
Clock Speed	2.60 GHz
Cores/Threads	4C / 8T
Intel Virtualization Technology	Yes
Intel Hyper-Threading	Yes
Wattage	85W

Memory

Technology	DDR4
Type	288-pin DIMM
Capacity	4 x 8 GB
Speed	2933 MHz
Error Checking	ECC
Signal Processing	Registered

Chassis

4/13/2020

Product Type	2U Rackmount
Color	Black
Watts	1200W
External Drive Bays	12x 3.5" SAS / SATA / 4x NVMe Hot-swap drive trays
Cooling Fans	3x 8cm high-performance PWM fans
Dimensions (WxHxD)	17.2" (437mm) x 3.5" (89mm) x 25.5" (678mm)
3.5"/2.5" Boot Drive	
Storage Capacity	2 x 240GB
Interface	6.0Gb/s Serial ATA
Read IOPS	92,000 IOPS
Write IOPS	28,000 IOPS
Read Speed	560 MB/s
Write Speed	320 MB/s
NAND	3D NAND TLC
Storage Drive	
Storage Capacity	8 x 16.0TB
Interface	6.0Gb/s Serial ATA
Rotational Speed	7200RPM
Cache	256MB
Controller Card	
Product Type	SAS RAID Controller
Data Transfer Rate	12Gb/s SAS
Internal Ports	8 Ports
External Ports	8 Ports
I/O Processor	LSI SAS3516
Cache Memory	4 GB 2133MHz DDR4 SDRAM
RAID Levels	0, 1, 5, 6, 10, 50, 60
Max Devices	SAS/SATA: 240 NVMe: 24
Network Card	
Speed	25Gb Ethernet
Connector	SFP28
Interface	PCI Express 3.0 x8

Quotation Date: April 13th, 2020, 04:37 PM EDT. All prices subject to change.

Configured Price: **\$9,590.00**

READY TO BUY?
800-371-1212

CONFIGURATION ID
422109

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Mellanox MSN2410-BB2FO

Mellanox MSN2410-BB2FO Spectrum Based 10GbE/100GbE 1U Open Ethernet Switch with ONIE 48 SFP28 Ports 8 QSFP28 Ports 2 Power Supplies AC

MPN: MSN2410-BB2FO

Condition: New



Availability:	Limited ⓘ
MSRP:	\$17,493.00
Switch Family:	SN2000
Condition:	New
Max Ports:	48x10GbE and 8x100GbE
Connector Type:	QSFP28 and SFP28
Max Speed:	100GbE
ECCN:	5A991
Operating System:	ONIE/Bare Metal
Technology:	Ethernet
Product Brief:	Download MSN2410-BB2FO

Recommended Support: ⓘ

None

Quantity: 1

Add to Cart

Get a Quote

Mellanox MSN3800-CS2R

Mellanox MSN3800-CS2R Spectrum-2 Based 100GbE 2U Open Ethernet Switch with Onyx 64 QSFP28 Ports 2 Power Supplies (AC) x86 CPU Standard Depth C2P Airflow Rail Kit

MPN: MSN3800-CS2R

Condition: New



Availability:	Limited ⓘ
MSRP:	\$56,660.00
Condition:	New
Technology:	Ethernet
Connector Type:	QSFP28
Max Speed:	100GbE
Max Ports:	64x100GbE
Operating System:	Mellanox Onyx
Product Brief:	Download MSN3800-CS2R

Recommended Support: ⓘ

None

Quantity: 1

Add to Cart

Get a Quote

Activate Windows

Call 800-322-0770

N9500-32D (32*400Gb) Data Center Switch, Bare-Metal Hardware



N9500-32D (32*400Gb) Data Center Switch, Bare-Metal Hardware #96982

★★★★★ 1 Review | 3 Questions | Share

US\$ 9,000.00

Import Fees included ⓘ

FS P/N: N9500-32D

Available, Asia Warehouse ⓘ

Deliver to New York, 10010

Free Shipping via FedEx IP, get it by Mon. Jun. 1 ⓘ

1

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Add to Cart

N8500-48B6C (48*25Gb+6*100Gb) 25Gb L2/L3 SDN Switch



N8500-48B6C (48*25Gb+6*100Gb) 25Gb L2/L3 SDN Switch, Bare-Metal Hardware #65

★★★★★ 13 Reviews | 11 Questions | Share

US\$ 6,200.00

FS P/N: N8500-48B6C

Chip:

Tomahawk+ Trident 3

Software:

Cumulus OS 1 Year Cumulus OS 3 Years Cumulus OS 5 Years
 Bare-Metal

Netshelter SX 48U Rack

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Item	Quantity	Price
APC NetShelter SX Deep Enclosure with Sides... more Save for later	1 <input type="button" value="▼"/>	\$1,734.99

Dell Netshelter SX 42U Rack - 600mm Wide x 1070mm Deep was removed from your cart. [Undo](#)

Coupons

Coupon code Chat with an agent for additional help.

Additional savings

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1m (3ft) Arista Networks CAB-D-D-400G-1M Compatible 400G QSFP-DD Passive Direct Attach Copper Twinax Cable #82452

★★★★★ 4 Reviews | 3 Questions | Share

US\$ 165.00

Import Fees included ⓘ

FS P/N: QSFP-DD-PC01

Compatible:

Arista Generic Customized

Length:

1m (3ft) 2m (7ft) 3m (10ft)

Available: [Asia Warehouse](#) ⓘ

FS United States Free Shipping on Orders of Eligible Items over US\$ 79

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Cart

Item	Quantity	Price
1m (3ft) Generic Compatible 100G QSFP28 Passive Direct Attach Copper Twinax Cable #74660 - 1 In Stock, U.S. Warehouse Get it by Wed, Apr. 15	1	US\$ 29.00

Subtotal (1 Item): US\$ 29.00

Summary (1 Item)

Subtotal: US\$ 29.00
Shipping: Calculated at checkout
Total: US\$ 29.00

Secure Checkout

Save Cart | View Saved Carts

VISA PayPal American Express Discover
Bank Transfer eCheck Check

Norton McAfee SECURE based on 600+ reviews

Public Cloud (AWS):

Compute: <https://calculator.aws/#/estimate?id=5be7c70cf5270427be584b01e5d94426ad834dc2>

Monthly - \$ 33,030,631.56

5 Year Cost - \$ 1,981,837,893

Distributed - <https://calculator.aws/#/estimate?id=5417282036ea9b78768ae3fc0af9ebcbc2c91156>

Monthly - 17,203,782.55

5 Year cost - \$1,032,226,953

My Estimate [Info](#)

[Add service](#) [Add group](#) [Action ▾](#) [Save and share](#)

Contact Sales
You might be able to further optimize your architecture and spend. To discuss your options, [contact sales](#).

First 12 months total 396,367,578.72 USD	Total upfront 0.00 USD	Total monthly 33,030,631.56 USD
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Services (1)

Amazon EC2 Region: US East (Ohio)	Edit	Action ▾
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Quick estimate

Operating system (Linux), Quantity (8197), Storage for each EC2 instance (Throughput Optimized HDD (st1)), Storage amount (1 MB)

Upfront: 0.00 USD	Monthly: 33,030,631.56 USD
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My Estimate [Info](#)

[Add service](#) [Add group](#) [Action ▾](#) [Save and share](#)

Contact Sales
You might be able to further optimize your architecture and spend. To discuss your options, [contact sales](#).

First 12 months total 206,445,390.60 USD	Total upfront 0.00 USD	Total monthly 17,203,782.55 USD
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Services (1)

Amazon Simple Storage Service (S3)	Edit	Action ▾
---	----------------------	--------------------------

S3 Standard storage (800000 TB per month)

Monthly: 17,203,782.55 USD

Inbound (from: Internet) 0 TB per month

Outbound (to: Internet) 0 TB per month

Monthly: 0.00 USD

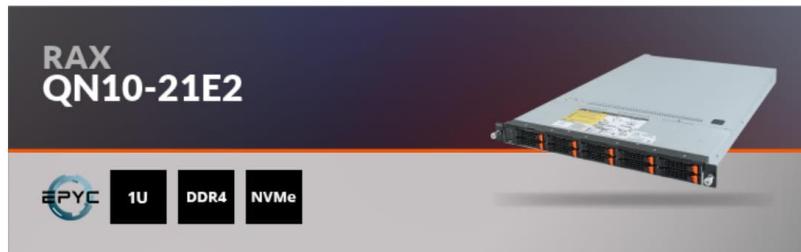
Configuration 2: Support 1M virtual machines (VM) where each VM requires 2-core, 16GB RAM, 75GBNVMe storage, and 10Gb/s Fat-Tree network (each VM should be equivalent to the r5d.large instances);in addition to the compute resources, a 10PB distributed storage shared across the entire cloud should be procured, with enough capacity for 100GB/sec throughput (for pricing comparison, see S3)

Private Cloud:

	Description	Price Per Item (\$)	Quantity	Total Price (\$)
Computer Servers	RAX QN10-21E2	28,771	15,625	449,546,875
Network Switches	Cisco 550X Series SG550X-48P	3,137	378	1,118,578
	Mellanox MSN3800-CS2R	25,387	1	25,387
Network Cables	Tripp Lite Cat6 Ethernet Cable Left Angled UTP Slim Molded M/M Blue 2ft	3.99	16,001	63,843.99
	1m (3ft) Generic Compatible 100G QSFP28 Passive Direct Attach Copper Twinax Cable	29	1,811	52,519
Racks	Netshelter SX 48U Rack	1,735	330	572,550
Storage servers	STX-NS XS4-11S1-10G	5,575	1,776	9,901,020
Electric Power		\$0.15 KWH	10,555 KW	69,346,350 (5 years)
Cooling		\$0.15 KWH	10,555 KW	69,346,350 (5 years)
Administration		100,000 (per year)	16	8,000,000 (5 Years)
Total				606,855,686

THINKMATE**RAX QN10-21E2**

My System April 11th, 7:13 pm EDT
Thinkmate Config ID 421710



Configured Price: \$28,771.00

Selection Summary

Barebone	AMD EPYC™ 7002 Series - 1U - 10x NVMe - Dual 1-Gigabit Ethernet - 1200W Redundant Power Supply
Processor	2 x AMD EPYC™ 7742 Processor 64-core 2.25GHz 256MB Cache (225W)
Memory	32 x 32GB PC4-23400 2933MHz DDR4 ECC RDIMM
U.2 NVMe Drive	1.0TB Intel® SSD DC P4510 Series U.2 PCIe 3.1 x4 NVMe Solid State Drive 2 x 2.0TB Intel® SSD DC P4510 Series U.2 PCIe 3.1 x4 NVMe Solid State Drive
Network Card	Intel® 10-Gigabit Ethernet Converged Network Adapter X722-D4 (4x SFP+)
Cables	2 x IEC60320 C13 to C14 Power Cable, 16 AWG, 240V/15A, Black - 6'
Operating System	No Operating System
Warranty	3 Year Advanced Parts Replacement Warranty

Tech Specs

Barebone	
Memory Technology	DDR4 ECC Reg
Chipset	System on Chip
Form Factor	1U
Color	Black
Memory Slots	32x 288-pin DIMM Sockets
Graphics	Aspeed AST2500 BMC
Ethernet	Dual-Port Intel i350 Gigabit Ethernet LAN Dedicated Management LAN port
Power	Redundant 1200W AC-DC Power Supply
External Bays	10 x U.2 hot-swap NVMe drives
M.2	1 M.2 PCIe 3.0 x4 Form Factor: 2242/2260/2280/22110 Key: M-Key
Expansion Slots	Riser Card CRS101E: - 1 x PCIe x16 slot (Gen4 x16), FHHL Riser Card CRS101E: - 1 x PCIe x16 slot (Gen4 x16), FHHL 1 x OCP 3.0 mezzanine slot with PCIe Gen4 x16 bandwidth from CPU_0 1 x OCP 2.0 mezzanine slot with PCIe Gen3 x8 bandwidth (Type1, P1, P2)
Front Panel	Power button with LED Reset button ID button with LED HDD LED LAN LEDs NMI button 2 USB 3.0 System status LED
Back Panel	2 RJ45 Gigabit Ethernet LAN ports 1 RJ45 Management LAN port 2 USB 3.0 ports (rear) 1 VGA 1 ID button with LED
Dimensions (WxHxD)	17.2 inches (438 mm) x 1.7 inches (43.5 mm) x 27.9 inches (710 mm)
NVMe 6.4Gbps Ports	10
Processor	
Product Line	EPYC 7002
Socket	SP3

4/11/2020

Clock Speed	2.20 GHz
Cores/Threads	64C / 128T
AMD Boost Technology	yes
Wattage	225W
Memory	
Technology	DDR4
Type	288-pin DIMM
Capacity	32 x 32 GB
Speed	2933 MHz
Error Checking	ECC
Signal Processing	Registered
U.2 NVMe Drive	
Storage Capacity	1.0TB 2 x 2.0TB
Interface	PCIe 3.1 x4 NVMe PCIe 3.1 x4 NVMe
Read IOPS	465,000 IOPS 637,000 IOPS
Write IOPS	70,000 IOPS 81,500 IOPS
Read Speed	2850 MB/s 3200 MB/s
Write Speed	1100 MB/s 2000 MB/s
NAND	64-Layer 3D TLC NAND 64-Layer 3D TLC NAND
Network Card	
Speed	10Gb Ethernet
Connector	SFP+
Interface	PCI Express 3.0 x8
Cable Medium	Copper
VT for Directed I/O (VT-d)	Yes

Quotation Date: April 11th, 2020, 10:45 PM EDT. All prices subject to change.

Configured Price: **\$28,771.00**

READY TO BUY?
800-371-1212

CONFIGURATION ID
421710

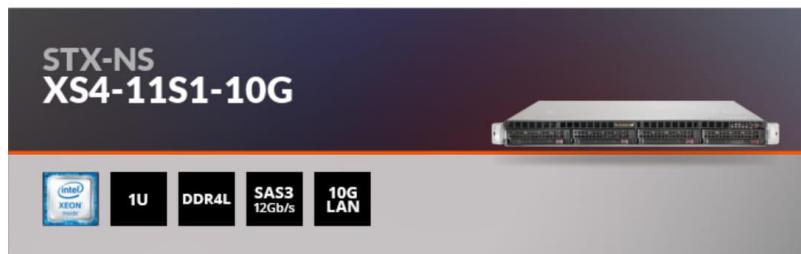
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THINKMATEREADY TO BUY?
800-371-1212**STX-NS XS4-11S1-10G**

My System April 14th, 12:42 am EDT

Thinkmate Config ID 422260



Configured Price: \$5,575.00

Selection Summary

Motherboard	Intel® C622 Chipset - 10x SATA3 - 1x M.2 - Dual Intel® 10-Gigabit Ethernet (RJ45)
Processor	Intel® Xeon® Silver 4112 Processor 4-core 2.60GHz 8.25MB Cache (85W)
Memory	4 x 8GB PC4-23400 2933MHz DDR4 ECC RDIMM
Chassis	Thinkmate® RAX-1304 1U Chassis - 4x Hot-Swap 3.5" SATA/SAS3 - 600W Single Power
3.5"/2.5" Boot Drive	2 x 240GB Intel® SSD D3-S4610 Series 2.5" SATA 6.0Gb/s Solid State Drive
Storage Drive	3 x 1.92TB Samsung PM883 Series 2.5" SATA 6Gb/s Solid State Drive
Controller Card	Broadcom MegaRAID 9480-8i8e SATA/SAS/NVMe 12Gb/s PCIe 3.1 8-Port RAID Controller with 4GB Cache
Battery Backup	CacheVault Flash Cache Protection Module for 9460/9480 Series (CVPM05)
Riser Cards	Thinkmate® 1U Riser Card - Left Side WIO - 2x PCIe 3.0 x16 Thinkmate® 1U Riser Card - Right Side WIO - 1x PCIe 3.0 x8
Server Management	Thinkmate® Update Manager (OOB Management Package)
Operating System	ThinkNAS™ DirectorProPlus v2.5 - 4-Drive License
Warranty	3 Year Advanced Parts Replacement Warranty

Tech Specs

Motherboard	
North Bridge	Intel C622
Memory Technology	DDR4 ECC Registered
Memory Slots	6x 288-pin DIMM sockets
Expansion Slots	1x PCI-E 3.0 x8 (in x16 slot) 1x PCI-E 3.0 x32 Left Riser Slot
Graphics Controller	Aspeed AST2500 BMC
Network Controller(s)	Dual 10GbE LAN (C622 + x557)
On-Board Interfaces	Intel® C622 controller for 10 SATA3 (6 Gbps) ports; RAID 0,1,5,10
USB 3.0 Ports	5x USB 3.0 Ports (2 Rear, 1 Type-A and 2 via header)
USB 2.0 Ports	8x USB 2.0 Ports (2 Rear, 6 via headers)
VGA Ports	1x VGA port
Processor	
Product Line	Xeon Scalable
Socket	LGA3647
Clock Speed	2.60 GHz
Cores/Threads	4C / 8T
Intel Virtualization Technology	Yes
Intel Hyper-Threading	Yes
Wattage	85W
Memory	
Technology	DDR4
Type	288-pin DIMM
Capacity	4 x 8 GB
Speed	2933 MHz

4/13/2020

Error Checking	ECC
Signal Processing	Registered
Chassis	
Product Type	1U Rackmount
Color	Black
Watts	600W
External Drive Bays	4x 3.5" Hot swap SAS/SATA
Peripheral Drives	Slim DVD-ROM drive (optional)
Front Ports	Power Switch, Reset, UID Button & 5 LED Indicators
Cooling Fans	4x 40x56mm PWM fan
Dimensions (WxHxD)	25.6" (650mm) x 17.2" (437mm) x 1.7" (43mm)
3.5"/2.5" Boot Drive	
Storage Capacity	2 x 240GB
Interface	6.0Gb/s Serial ATA
Read IOPS	92,000 IOPS
Write IOPS	28,000 IOPS
Read Speed	560 MB/s
Write Speed	320 MB/s
NAND	3D NAND TLC
Storage Drive	
Storage Capacity	3 x 1.92TB
Interface	6.0Gb/s Serial ATA
Endurance	1.3 DWPD
Read IOPS	98,000 IOPS
Write IOPS	30,000 IOPS (4KB)
Read Speed	550 MB/s
Write Speed	520 MB/s
NAND	Samsung V-NAND TLC
Controller Card	
Product Type	SAS RAID Controller
Data Transfer Rate	12Gb/s SAS
Internal Ports	8 Ports
External Ports	8 Ports
I/O Processor	LSI SAS3516
Cache Memory	4 GB 2133MHz DDR4 SDRAM
RAID Levels	0, 1, 5, 6, 10, 50, 60
Max Devices	SAS/SATA: 240 NVMe: 24

Quotation Date: April 14th, 2020, 12:43 AM EDT. All prices subject to change.

Configured Price: **\$5,575.00**

READY TO BUY?
800-371-1212

CONFIGURATION ID
422260

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Tripp Lite Cat6 Ethernet Cable Left Angled UTP Slim Molded M/M Blue 2ft

The screenshot shows a shopping cart page for a Tripp Lite Cat6 Gigabit Snagless Molded Patch Cable (RJ45 M/M) Blue, 3'. The item is listed with a quantity of 1, price of \$3.99, and an 'Add to Cart' button. The page includes a sidebar for 'Top Recommendations' showing three similar products at different prices (\$6.99, \$4.99, \$5.99) with their own 'Add to Cart' buttons. On the right, there's an 'Order Summary' section with a subtotal of \$3.99 and a 'Checkout' button. The bottom of the screen shows a Windows taskbar with various icons and a search bar.

1m (3ft) Generic Compatible 100G QSFP28 Passive Direct Attach Copper Twinax Cable

The screenshot shows a shopping cart page for a 1m (3ft) Generic Compatible 100G QSFP28 Passive Direct Attach Copper Twinax Cable. The item is listed with a quantity of 1, price of US\$ 29.00, and an 'Add to Cart' button. The page includes a summary section showing a subtotal of US\$ 29.00 and a total of US\$ 29.00. It also features a 'Secure Checkout' button and payment method icons for VISA, PayPal, and others. A Norton Security seal is visible in the bottom right corner.

Cisco 550X Series SG550X-48P



★★★★★

Cisco 550X Series SG550X-48P - switch - 48 ports - managed - rack-mountable

Mfg.Pt: SG550X-48P-K9-NA | CDW Part: 4875485 | UNSPSC: 43222612

Availability: • In Stock

Orders placed today ship tomorrow by a CDW partner

Warranties

None

Include: [Cisco SMARTnet extended service agreement](#) - \$304.99

[View More](#)

[View All Warranties](#)

[View Services](#)

[Activate Windows](#)

[View Accessories](#)

Mellanox MSN2410-CB2F Spectrum 25GbE/100GbE-24P



Mellanox MSN2410-CB2F Spectrum 25GbE/100GbE 1U Open Ethernet Switch with Mellanox Onyx 48 SFP28 Ports 8 QSFP28 Ports 2 Power Supplies AC x86 Dual Core Short Depth P2C Airflow Rail Kit RoHS6

MPN: MSN2410-CB2F

Condition: New

Availability:

Limited

\$25,387.00

MSRP:

Recommended Support:

None

Switch Family:

SN2000

Condition:

New

Max Ports:

48x25GbE and 8x100GbE

Connector Type:

QSFP28 and SFP28

Max Speed:

100GbE

ECCN:

5A991

Operating System:

Mellanox Onyx

Technology:

Ethernet

Product Brief:

[Download MSN2410-CB2F](#)

Quantity:

1

[Add to Cart](#)

[Get a Quote](#)

Netshelter SX 48U Rack

Cart

Sign In

Shipping

Payment

Verify & Submit

Order Submitted

Want free expedited shipping? Create an account on the next page to ship your items faster, receive Dell Rewards for your purchases and more!

Item

APC NetShelter SX Deep Enclosure with Sides...
[more](#)

Quantity

1

[Remove](#)

Price

\$1,734.99

Summary (1 Item)

Subtotal \$1,734.99

Free shipping. Taxes not included. [Estimate Tax](#)

[Checkout](#)

[PayPal](#)

[Express Checkout](#)

[Continue Shopping](#)

[Save Cart](#) | [Email your cart](#)

We're here for you

Dell Netshelter SX 42U Rack - 600mm Wide x 1070mm Deep was removed from your cart. [Undo](#)

Coupons

Coupon code

[Apply Coupon](#)

Chat with an agent for additional help.

Additional savings



[Learn more](#)

[Learn more](#)

[Learn more](#)

[FREE 2-3 Day Shipping on Electronics, Computers & Accessories](#)

Public Cloud (AWS):

Compute: <https://calculator.aws/#/estimate?id=b13708b9826e9af76764c71c47006c0a8d4690cf>

Monthly - \$ 105,120,024.41

5 Year cost - \$ 6,307,201,464

Dist. Storage: <https://calculator.aws/#/estimate?id=3ef5a7e045fe03211f9585302e0af64a7f9e2162>

Monthly - \$ 2,150,963.20

5 Year cost - \$ 129,057,792

The screenshot displays two separate cost estimates from the AWS Cost Calculator.

EC2 Estimate:

First 12 months total	Total upfront	Total monthly
1,261,440,292.92 USD	0.00 USD	105,120,024.41 USD

Services (1)

Amazon EC2	Edit	Action ▾
Region: US East (Ohio)		

Quick estimate

Operating system (Linux), Quantity (1000000), Storage for each EC2 instance (Cold HDD (sc1)), Storage amount (1 MB)	Upfront:	0.00 USD
	Monthly:	105,120,024.41 USD

S3 Estimate:

First 12 months total	Total upfront	Total monthly
25,811,558.40 USD	0.00 USD	2,150,963.20 USD

Services (1)

Amazon Simple Storage Service (S3)	Edit	Action ▾
S3 Standard storage (100000 TB per month)	Monthly:	2,150,963.20 USD
Inbound (from: Not selected) 0 TB per month	Monthly:	0.00 USD
Outbound (to: Not selected) 0 TB per month		

Activate Windows

Configuration 3: Support deep learning with 1 exaflop of double precision performance (hint: each VM should be equivalent to p3.16xlarge instances; you will want to use the NVIDIA V100 GPUs (8 GPUs per node), and allocate 8-cores per GPU (64-cores per node) with 8GB of memory per core (512GB per node); the network to use is at least 3Gb/s per GPU (25Gb/s should work), and should be organized in a Fat-Tree network; in addition to the compute resources, a 1PB distributed storage shared across the entire cloud should be procured, with enough capacity for 10GB/sec throughput (for pricing comparison, see S3)

Private Cloud:

	Description	Price Per Item (\$)	Quantity	Total Price (\$)
Computer Servers	GPX QT10-24E2-8GPU	86,606	17,858	1,546,609,948
Network Switches	Cisco Nexus 93180YC-EX - switch - 48 ports - rack-mountable	13,318	394	5,247,682
Network Cables	Cisco SFP28 Passive Copper Cable - direct attach cable - 6.6 ft - orange	102.99	18,248	1,874,793
	1m (3ft) Generic Compatible 100G QSFP28 Passive Direct Attach Copper Twinax Cable	29	180	13,680
Racks	Netshelter SX 48U Rack	1,735	2,245	3,924,270
Storage servers	STX-NS XE36-24S1-10G	8,342	174	1,451,508
Electric Power		\$0.15 KWH	51,747 KW	339,977,790 (5 years)
Cooling		\$0.15 KWH	51,747 KW	339,977,790 (5 years)
Administration		100,000 (per year)	19	9,450,000 (5 Years)
Total				2,248,527,461

THINKMATEREADY TO BUY?
800-371-1212**GPX QT8-22E2-8GPU**My System April 13th, 1:44 am EDT
Thinkmate Config ID 421937

Configured Price: \$86,606.00

Selection Summary

Barebone	AMD EPYC™ 7002 Series - 2U GPU Server - 4x Hot-Swap 2.5" SAS3 - 4x Hot-Swap NVMe - Dual 10-Gigabit RJ45 - 2200W Redundant Power
Processor	2 x AMD EPYC™ 7532 Processor 32-core 2.40GHz 256MB Cache (200W)
Memory	16 x 32GB PC4-23400 2933MHz DDR4 ECC RDIMM
Hard Drive	480GB Intel® SSD D3-S4510 Series 2.5" SATA 6.0Gb/s Solid State Drive
GPU Accelerator	8 x NVIDIA® Tesla™ V100 GPU Computing Accelerator - 32GB HBM2 - PCIe 3.0 x16 - Passive Cooling
Network Card	Mellanox 25-Gigabit Ethernet Adapter ConnectX®-4 Lx EN MCX4121A (2x SFP28)
Cables	2 x IEC320 C19 to NEMA 5-15P Power Cable, 14AWG, 125V/15A, Black - 3ft (TAA Compliant)
Operating System	No Operating System
Warranty	3 Year Advanced Parts Replacement Warranty

Tech Specs

Barebone	
Memory Technology	DDR4 ECC Reg
Form Factor	2U
Color	Black
Memory Slots	16x 288-pin DIMM Sockets
Graphics	Aspeed AST2500 BMC
Ethernet	2 Ports 10GbE BASE-T RJ45 (Intel X550) 1 Port Ethernet (management) RJ45
Power	2200W 80 Plus Platinum (1+1) Redundant Power Supply C19 power cord required
External Bays	8x 2.5-inch hot-swap drives
Expansion Slots	8 FH PCIe 3.0 x16 for GPGPUs 2 LPHL PCIe 4.0 x16
Front Panel	Power button with LED ID button with LED Reset button System Status LED HDD LED LAN LEDs
Back Panel	2 10GbE RJ45 ports 1 RJ45 Management LAN port ID button with LED Power button with LED Reset button NMI button 2 USB 3.0 ports 1 VGA System status LED
Dimensions (WxHxD)	17.6 x 3.4 x 34.5 inches 448 x 87.5 x 800 mm
NVMe 6.4Gbps Ports	4
SATA 6Gbps AHCI Controller	SOC
SATA 6Gbps AHCI Ports	8
Processor	
Product Line	EPYC 7002
Socket	SP3
Clock Speed	2.40 GHz

4/13/2020

Cores/Threads	32C / 64T
AMD Boost Technology	yes
Wattage	200W
Memory	
Technology	DDR4
Type	288-pin DIMM
Capacity	16 x 32 GB
Speed	2933 MHz
Error Checking	ECC
Signal Processing	Registered
Hard Drive	
Storage Capacity	480GB
Interface	6.0Gb/s Serial ATA
Read IOPS	95,000 IOPS
Write IOPS	18,000 IOPS
Read Speed	560 MB/s
Write Speed	490 MB/s
NAND	3D2 NAND TLC
GPU Accelerator	
Streaming Processor Cores	5120 CUDA Cores
Max Memory Bandwidth	900 GB/s
Peak Double Precision floating point performance (GFLOP)	7.0 TeraFLOPS
Network Card	
Speed	25Gb Ethernet
Connector	SFP28
Interface	PCI Express 3.0 x8

Quotation Date: April 13th, 2020, 01:48 AM EDT. All prices subject to change.

Configured Price: **\$86,606.00**

READY TO BUY?
800-371-1212

CONFIGURATION ID
421937

THINKMATE

Thinkmate is a world-class provider of custom computer and server equipment since 1986. Our business was formed around assisting our customers in planning, budgeting, and implementing complete solutions. We provide a broad range of customized server, storage and cluster solutions to governments, universities, corporations and high performance computing markets. Our commitment to superior customer service and cutting edge technology has kept us the number one white box server solutions provider for nearly twenty years.

4/12/2020

THINKMATE

READY TO BUY?
800-371-1212

STX-NS XE16-23S1-10G

My System April 12th, 12:01 am EDT

Thinkmate Config ID 421743



Configured Price: \$8,342.00

Selection Summary

Motherboard	Intel® C622 Chipset - 10x SATA3 - 2x M.2 - Dual Intel® 10-Gigabit Ethernet (RJ45) - IPMI 2.0 with LAN
Processor	2 x Intel® Xeon® Silver 4112 Processor 4-core 2.60GHz 8.25MB Cache (85W)
Memory	4 x 8GB PC4-23400 2933MHz DDR4 ECC RDIMM
Chassis	Thinkmate® STX-3316 3U Chassis - 16x Hot-Swap 3.5" SATA/SAS3 - 12Gb/s SAS Single Expander - 1200W Redundant Power
3.5"/2.5" Boot Drive	2 x 240GB Intel® SSD D3-S4610 Series 2.5" SATA 6.0Gb/s Solid State Drive
Storage Drive	3 x 1.92TB Micron 5300 PRO Series 2.5" SATA 6.0Gb/s Solid State Drive
Controller Card	Broadcom MegaRAID 9480-8i8e SATA/SAS/NVMe 12Gb/s PCIe 3.1 8-Port RAID Controller with 4GB Cache
Battery Backup	CacheVault Flash Cache Protection Module for 9460/9480 Series (CVPM05)
Network Card	Intel® 10-Gigabit Ethernet Converged Network Adapter X550-T2 (2x RJ-45)
Cables	IEC60320 C13 to C14 Power Cable, 16 AWG, 240V/15A, Black - 3'
Server Management	Thinkmate® Update Manager (OOB Management Package)
Operating System	ThinkNAS™ DirectorProPlus v2.5 - 16-Drive License
Warranty	3 Year Advanced Parts Replacement Warranty

Tech Specs

Motherboard

North Bridge	Intel C622
Memory Technology	DDR4 ECC Registered
Memory Slots	16x 288-pin DIMM sockets
Expansion Slots	3x PCI-E 3.0 x16 4x PCI-E 3.0 x8
Graphics Controller	Aspeed AST2500 BMC
Network Controller(s)	Dual 10GBase-T LAN ports via Intel® X557
On-Board Interfaces	SATA3 (6Gbps); RAID 0, 1, 5, 10
USB 3.0 Ports	7x USB 3.0 (4 rear + 2 front header+ 1 type A)
VGA Ports	1x VGA port

Processor

Product Line	Xeon Scalable
Socket	LGA3647
Clock Speed	2.60 GHz
Cores/Threads	4C / 8T
Intel Virtualization Technology	Yes
Intel Hyper-Threading	Yes
Wattage	85W

Memory

Technology	DDR4
Type	288-pin DIMM
Capacity	4 x 8 GB
Speed	2933 MHz
Error Checking	ECC

4/12/2020

	Signal Processing	Registered
Chassis		
Product Type	3U Rackmount	
Color	Black	
Watts	1000W	
External Drive Bays	16 x 3.5" hot-swap SAS/SATA drive bay with SES2 Optional 2 x 2.5" hot-swap drive bay	
Cooling Fans	3 x 8cm hot-swap redundant PWM cooling fans 2 x 8cm hot-swap exhaust fans & air shroud	
Dimensions (WxHxD)	17.2" (437mm) x 5.2" (132mm) x 25.5" (647mm)	
3.5"/2.5" Boot Drive		
Storage Capacity	2 x 240GB	
Interface	6.0Gb/s Serial ATA	
Read IOPS	92,000 IOPS	
Write IOPS	28,000 IOPS	
Read Speed	560 MB/s	
Write Speed	320 MB/s	
NAND	3D NAND TLC	
Storage Drive		
Storage Capacity	3 x 1.92TB	
Interface	6.0Gb/s Serial ATA	
Endurance	1.5 DWPD	
Read IOPS	95,000 IOPS	
Write IOPS	30,000 IOPS	
Read Speed	540 MB/s	
Write Speed	520 MB/s	
NAND	Micron 96-layer 3D TLC NAND	
Controller Card		
Product Type	SAS RAID Controller	
Data Transfer Rate	12Gb/s SAS	
Internal Ports	8 Ports	
External Ports	8 Ports	
I/O Processor	LSI SAS3516	
Cache Memory	4 GB 2133MHz DDR4 SDRAM	
RAID Levels	0, 1, 5, 6, 10, 50, 60	
Max Devices	SAS/SATA: 240 NVMe: 24	
Network Card		
Speed	10Gb Ethernet	
Connector	RJ45	
Interface	PCI Express 3.0 x4	
Cable Medium	Copper	
VT for Connectivity (VT-c)	Yes	

Quotation Date: April 12th, 2020, 07:52 PM EDT. All prices subject to change.

Configured Price: **\$8,342.00**

READY TO BUY?
800-371-1212

CONFIGURATION ID
421743

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Cisco SFP28 Passive Copper Cable - direct attach cable - 6.6 ft - orange



Cisco SFP28 Passive Copper Cable - direct attach cable - 6.6 ft - orange

Mfg.Part: SFP-H25G-CU2M= | CDW Part: 4619238 | UNSPSC: 26121609

Availability: • In Stock
Orders placed today ship tomorrow by a CDW partner

Was \$135.00 SAVE \$32.01
\$102.99 Advertised Price

Claim Your 5% Discount
Create an account to get My CDW Advantage today.

1  

Product Details

Share | Save as Favorites

- Direct attach cable
- SFP28 to SFP28
- 6.6 ft
- twinaxial
- SFF-8402/IEEE 802.3by
- orange
- for Cisco Supervisor1XL

Activate Windows
Go to PC settings to activate Window

1m (3ft) Generic Compatible 100G QSFP28 Passive Direct Attach Copper Twinax Cable

Home / Fiber Optic Transceivers / Direct Attach Twinax Cables (Q / 100G QSFP28 DAC / Generic / 74900)

1m (3ft) Generic Compatible 100G QSFP28 Passive Direct Attach Copper Twinax Cable #50481

★★★★★ 49 Reviews | 5 Questions | Share

US\$ 29.00
FS P/N: Q28-PC01

Compatible:



Cisco Juniper Arista Brocade Dell Mellanox
Extreme HW Generic FS Customized

Length:
    
Click to open expanded view

Netshelter SX 48U Rack

Want free expedited shipping? Create an account on the next page to ship your items faster, receive Dell Rewards for your purchases and more!

Item	Quantity	Price
APC NetShelter SX Deep Enclosure with Sides... more	1	\$1,734.99

[Save for later](#)

Dell Netshelter SX 42U Rack - 600mm Wide x 1070mm Deep was removed from your cart. [Undo](#)

Coupons

Coupon code: [Apply Coupon](#)

Chat with an agent for additional help.

Additional savings

Norton Secured Powered by VeriSign Verified by VISA MasterCard SecureCode SafeKey

FREE 2-3 Day Shipping on Eligible Items. See Details. Read About Shipping

Cisco Nexus 93180YC-EX - switch - 48 ports - rack-mountable

Item	Availability	Price	Quantity	Item Total
Cisco Nexus 93180YC-EX - switch - 48 ports - rack-mountable <small>MFG Part: N9K-C93180YC-EX CDW Part: 499809 UNSPSC: 43222912</small>	1-3 Days Orders placed today will ship within 1-3 days	\$26,937.00 \$13,318.99 Advertised Price	1	\$13,318.99

[Top Recommendations](#)

Order Summary
Subtotal: **\$16,455.98**
Tax and Shipping calculated at checkout

Lease Option Pricing (?)
\$483.15 / Month

[Checkout](#)

Public Cloud (AWS):

Compute: <https://calculator.aws/#/estimate?id=550f7fdad313d8acf107a2232115c492dfb58ee5>

Monthly - 319,558,195.20

5 year cost - \$19,173,491,712

Dist. Storage: <https://calculator.aws/#/estimate?id=1b06e6b496b07fd93ef020d52e5034738ffae20a>

Monthly - 22,067.20

5 Year cost - \$1,324,032

My Estimate [Info](#)

Contact Sales
You might be able to further optimize your architecture and spend. To discuss your options, [contact sales](#).

First 12 months total 3,834,698,342.40 USD	Total upfront 0.00 USD	Total monthly 319,558,195.20 USD
--	----------------------------------	--

Services (1)

Amazon EC2 Region: US East (Ohio)	Edit	Action ▾
---	----------------------	--------------------------

Quick estimate

Operating system (Linux), Quantity (17858), Storage for each EC2 instance (General Purpose SSD (gp2)), Storage amount (240 GB)	Upfront: 0.00 USD	Monthly: 319,558,195.20 USD
--	--------------------------	------------------------------------

My Estimate [Info](#)

Contact Sales
You might be able to further optimize your architecture and spend. To discuss your options, [contact sales](#).

First 12 months total 264,806.40 USD	Total upfront 0.00 USD	Total monthly 22,067.20 USD
--	----------------------------------	---------------------------------------

Services (1)

Amazon Simple Storage Service (S3)	Edit	Action ▾
---	----------------------	--------------------------

S3 Standard storage (1000 TB per month)	Monthly: 22,067.20 USD
---	-------------------------------

Inbound (from: Not selected) 0 TB per month	Monthly: 0.00 USD
---	--------------------------

Outbound (to: Not selected) 0 TB per month	
--	--

	Configuration 1	Configuration 2	Configuration 3
Public Cloud (including EC2 and S3) Cost over 5 years, 24/7 operation, with 100% usage	\$ 3,014,064,846	\$ 6,436,259,256	\$ 19,174,815,744
Private Cloud cost over 5 years, 24/7 operation, with 100% usage	\$ 235,574,976	\$ 606,855,686	\$ 2,248,527,461
What utilization must be achieved with the private/cloud to make option more attractive than the public cloud?	7.82 %	9.43 %	11.73 %