Designing Resilient and High-Performance Data Centres for the Future

> Prem Rodrigues Vice President, IMEA The Siemon Company



Agenda



Who is Siemon?



Data Centers for the future



Siemon Solutions









Global Headquarters



ABOUT SIEMON



Leadership in...

- Technology
- Innovation
- Quality
- Sustainability

First to the market, Best in the market!



QUALITY LEADERSHIP



SIEMON[®]





OUR ONGOING COMMITMENT TO SUSTAINABILITY





- Reduce our carbon footprint
- Minimize all forms of waste
- Eliminate pollution & support biodiversity
- Produce & deliver safe products
- Share, listen and act





Siemon achieves Gold rating in Annual EcoVadis ESG Review Placing Siemon in the top 5% of the 100,000+ companies EcoVadis rates globally.



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At Siemon, we pride ourselves on our engineering heritage, innovation, and our data center pedigree. We've taken this passion and focused it into our portfolio of Advanced Data Center solutions that have been designed from the ground up to support your data center requirements for now and the future.





Data Center Design Services



High Speed Interconnects



Copper Cabling & Connectivity



Copper & Fiber Plug & Play



LightWays Fiber ducts







The foundation of converged and integrated building systems is a single unified physical infrastructure that transmits information and delivers power to devices using Power over Ethernet (PoE) technology – everything from IP phones, desktop computers and wireless access points, to surveillance cameras, LED lighting, distributed antenna systems and building automation devices.





Category 7A Cabling



Category 6A Cabling



Zone Cabling



Automated Infrastructure Management



Industry Standards & Organizations Siemon is Involved Where it Counts

- Active member of Ethernet Alliance
- ethernet alliance
- We participate in marketing, webinars and interoperability testing
- Active member of InfiniBand Trade Association (IBTA)

 - IBTA is association that develops IB standards TEEE
 We participate in standards working groups TEEEE interoperability testing
- Active member of IEEE
 - We participate in relevant copper & fiber stand



Supported by Industry Leading Partnerships

Over the years we've developed an ecosystem of data center partners who are all specialists in what they do.

We prides ourselves on partnering with global leaders that provide complementary products and services which combine with our own best-inclass IT infrastructure solutions to deliver additional value and support to our customers.

ARISTA **NVIDIA**



Siemon...member of NVIDIA Partner Network (NPN)

Solution Advisor - Consultant

• Partners that provide consultation services and expert advice to customers looking to implement NVIDIAbased solutions or technologies



https://www.nvidia.com/en-us/aboutnvidia/partners/



Evolving Data Center Landscape



The Evolving Data Center Landscape

Increased Demand:

- Data explosion from IoT, AI, and cloud computing
- Rising data storage and processing needs

Growing Challenges:

- Data security and privacy threats
- Natural disasters and climate change
- Energy consumption and sustainability

Therefore, there is a need to design resilient Data Centers .

Core Principles of Resilient Design

Modularity and Scalability:

Redundancy and Fault Tolerance:

Flexible infrastructure for scalability and migration Modular design for easy upgrades and replacements Multiple power and cooling systems

Network redundancy with diverse routing paths

Data replication and backup strategies

Security and Privacy

Robust Security Measures:

- Physical security controls (access control, surveillance)
- Network security (firewalls, intrusion detection)
- Data security (encryption, access controls)

Compliance and Regulations:

- Adhering to industry standards (PCI DSS, HIPAA)
- Data privacy regulations (GDPR, CCPA)

Building a Resilient Data Center: A Roadmap



Needs Assessment and Planning:

Define business requirements and SLAsDevelop a detailed design plan

Infrastructure Deployment:

- Implement physical infrastructure, power, and cooling systems
- Deploy network and security infrastructure



Configuration and Testing:

- •Configure hardware and software components
- •Conduct rigorous testing and validation



Ongoing Management and Optimization:

- •Monitor performance and security
- •Implement proactive maintenance and upgrades

AI... Artificial Intelligence is here!

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We are in an Era of great change.



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Timeline

NOV 2022 -----

- MAR 2023 -

MAR 2023

Open AI introduced the ChatGPT large language model

Google & Microsoft introduce Bard AI & Azure OpenAI Service w/GPT-4

Bill Gates: "Artificial Intelligence is as revolutionary as mobile phones and the Internet"

MAY 2023 —

DEC 2023 —

point of a new computing era"

"We have now reached the tipping

Jensen Huang, NVIDIA CEO,

NVIDIA reports their Q3 data center revenue up 279% to \$14.5B

Mar 2024

NVIDIA Blackwell platform announced that will run a trillion-parameter LLM at 25x less cost and energy consumption than its predecessor "Generative AI is driving exponential growth in compute requirements...You're seeing the beginning of a <u>10-year transition</u> to basically recycle or reclaim the world's data centers and build it out as accelerated computing."





The global AI market is valued at \$142.3 Billion with forecasted CAGR of 17.3% through 2030

Finance, Healthcare and high-tech/telco markets driving adoption

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What's Different About Generative AI Networks?

 Very high bandwidth requirements - 100G, 200G, 400G & 800G at the server

Combination of InfiniBand and Ethernet

• Extremely Low Latency Requirements

Dramatically increased power consumption & cooling



Air-Based Cooling Solutions

- 1.Computer Room Air Conditioner (CRAC)
- Uses refrigerants to cool the air.
- Typical kW Rating: 10-20 kW per CRAC unit
- 2. Computer Room Air Handler
 (CRAH)
- Uses chilled water and works with chiller plants.
- Typical kW Rating: 20-30 kW per rack with water-chilled systems.

3. Hot Aisle/Cold Aisle Containment

• Physical barriers separate hot and cold airflows. Improves CRAC/CRAH efficiency.

Today's Data Centers

Solutions

1. Liquid Cooling Systems

- Circulates liquid coolant directly to servers or components.
- Typical kW Rating: 50-100 kW per rack, depending on the density of the workload.

2.Direct-to-Chip Liquid Cooling

- Coolant is delivered directly to CPUs/GPUs.
- Typical kW Rating: Supports 30-80 kW per rack, suitable for AI and HPC tasks.

3.Immersion Cooling

- Entire servers are submerged in non-conductive liquid for maximum heat dissipation.
- Typical kW Rating: Up to 200 kW per rack or higher for high-performance

Will Data Centers look like tanks in the future...?

Siemon Solutions for Physical Layer 1



Connectivity Solutions for AI Applications



Artificial

AI Ready - DAC & AOC Solutions - 10 to 800G (1.6T)





QSFP Quad-Small Form Factor Pluggable 4 Lanes*



SFP-DD Small Form Factor Pluggable Double Density



2 Lanes

OSFP-RHS Octal-Small Form Factor Pluggable



50G per Lane Connector

QSFP-DD

Quad-Small Form Factor Pluggable Double Density 8 Lanes*



OSFP-FT Octal-Small Form Factor Pluggable



#FT = Switch Side Only ; RHS = NIC/HCA Side Only

Singlemode Ultra Low Loss Solution

- Complete Single-mode MTP cabling solution with best performance in industry
 - MTP Trunks & Jumpers: 0.3 de
 - MTP-LC modules: <u>0.5 dB</u> max IL
 - LC Bladepatch cords: <u>0.2 dB max I</u>
- First manufacturer to have 3rd party testing to 400G performance





400GBASE-FR4 channel with (5) x MTP-LC modules + 1 MTP pair over max allowed channel of 2km

3rd Party 400G SM ULL Testing

400GBASE-FR4 Insertion Loss Margin



FR4 II Limit Standard Loss IL Limit Max dB ULL IL Limit Max dB

High Speed Low Loss







Data Center Design Services

Our team of DC Design specialists are ready to provide expert advice and assistance to help your teams design, deploy or upgrade your data center spaces.



Example Customer Design







Data Center Design Services



Stemon Data Center Design Services South Copper Patch cord activation 10016 Fiber Patch cord activation 10016 Panel ZMax 24 port shielded panel, Empty 25-PNL-24E ZMax 24 port shielded panel, Empty 25-PNL-24E 1 Panel ZMax 24 port shielded panel, Empty 25-PNL-24E 1 Cat6A, Shielded, ZMAX 6A, RJ45-RJ45, ISOH, T568A/B, White, Stranded, 01M ZM6A503M-02 2 Cat6A, Shielded, ZMAX 6A, RJ45-RJ45, ISOH, T568A/B, White, Stranded, 03M ZM6A503M-02 8 Cat6A, Shielded, ZMAX 6A, RJ45-RJ45, ISOH, T568A/B, White, Stranded, 05M ZM6A505M-02 8 Cat6A, Shielded, ZMAX 6A, RJ45-RJ45, ISOH, T568A/B, White, Stranded, 05M ZM6A505M-02 8 Cat6A, Shielded, ZMAX 6A, RJ45-RJ45, ISOH, T568A/B, White, Stranded, 05M ZM6A505M-02 8 Cat6A, Shielded, ZMAX 6A, RJ45-RJ45, ISOH, T568A/B, White, Stranded, 05M ZM6A505M-02 8 PIN ASY, FILLER 96 STR 1U FIBER ENC PPM-84-ICO 8 PIN ASY, WOULE, 12-PRT, IC, OM4, SO-125 10G-MM, BLK PPM-24-ICOSV-031 4 PIG&PLY, MODULE, 12-PRT, IC, OM4, SO-125 10G-MM, BLK PPM-24-ICOSV-024 8 BiadePatch, IC - IC, Duplex,	1 13 104 104 104 104 9 9 6 26 4 26 4 156 156 156 156 24	1 26 4 104 4 104 4 104 4 104 5 16 5 156			
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Cat6A, Shielded, ZMAX 6A, RJ45-RJ45, LSOH, T568A/B, White, Stranded, 02M ZM6A-802M-02 Cat6A, Shielded, ZMAX 6A, RJ45-RJ5, LSOH, T568A/B, White, Stranded, 03M ZM6A-802M-02 Cat6A, Shielded, ZMAX 6A, RJ45-RJ5, LSOH, T568A/B, White, Stranded, 03M ZM6A-803M-02 Cat6A, Shielded, ZMAX 6A, RJ45-RJ5, LSOH, T568A/B, White, Stranded, 03M ZM6A-803M-02 Cat6A, Shielded, ZMAX 6A, RJ45-RJ5, LSOH, T568A/B, White, Stranded, 03M ZM6A-803M-02 Cat6A, Shielded, ZMAX 6A, RJ45-RJ5, LSOH, T568A/B, White, Stranded, 07M ZM6A-807M-02 RACK MOURT BUT PREPAREL FOR 4 ADAPTER PLATES, JRMS PPM-SPIL4-01 PLLASSY, FILLEB 95RT RJJ FIBER ENC PPM-BLNK PLGBPLY, MODULE, 24-PRT, LC, M4, SO-125 10G-MM, BLK PPM-24-LCSV-01 PLGBPLY, MODULE, 24-PRT, LC, M4, SO-125 10G-MM, BLK PPM-24-LCSV-01 PLGBPLY, MODULE, 24-PRT, LC, M4, SO-125 10G-MM, BLK PPM-24-LCSV-01 PLGBPLY, MODULE, 24-PRT, LC, M4, SO-125 10G-MM, BLK PPM-24-LCSV-01 PLGBPLY, MODULE, 24-PRT, LC, M4, SO-13, TO FCP3-DWR-4A BladePatch, LC - LC, Duples, OM4, SOH, 2m F6P-LCLCSV-03AH BladePatch, LC - LC, Duples, OM4, SOH, 2m F6P-LCLCSV-03AH BladePatch, LC - LC, Duples, OM4, SOH, 7m F8P-LCLCSV-03AH BladePatch, LC - LC, Duples, Single Mode OS1/052, LSOH, 2m F8P-LCLCSV-03AH BladePatch, LC - LC, Duples, Single Mode OS1/052, LSOH, 3m F8P-LCLCSV-03AH BladePatch, LC - LC, Dupl	104 104 9 6 25 4 156 156 24	4 104 4 104 4 104 5 106 5 156		8 8 8 1 4	
Cat6A, Shielded, ZMAX 6A, RJ45-RJ45, LSOH, T568A/B, White, Stranded, 03M ZM6A-803M-02 8 Cat6A, Shielded, ZMAX 6A, RJ45-RJ45, LSOH, T568A/B, White, Stranded, 05M ZM6A-803M-02 8 Cat6A, Shielded, ZMAX 6A, RJ45-RJ45, LSOH, T568A/B, White, Stranded, 05M ZM6A-803M-02 8 Cat6A, Shielded, ZMAX 6A, RJ45-RJ45, LSOH, T568A/B, White, Stranded, 05M ZM6A-803M-02 8 RACK MOUNT FIBER PAREL FOR 4 ADAPTER PLATES, IRMS PPM-SPIL4-01 1 PILASSY, FILLER 96 STR 1U FIBER ENC PPM-SPIL4-01 1 PILGBPLY, MODULE, 24-PRT, LC, OM4, 50-125 10G-MM, BLK PPM-24-LSSV-01 4 PILGBPLY, MODULE, 24-PRT, LC, OM4, 50-125 10G-MM, BLK PPM-24-LSSV-01 - PILGBPLY, MODULE, 24-PRT, LC, OM4, 50-125 10G-MM, BLK PPM-24-LSSV-01 - PILGBPLY, MODULE, 24-PRT, LC, OM4, 50-125 10G-MM, BLK PPM-24-LSSV-01 - PILGBPLY, MODULE, 24-PRT, LC, OM4, 50-125 10G-MM, BLK PPM-24-LSSV-01 - PILGBPLY, MODULE, 24-PRT, LC, OM4, 50-125 10G-MM, BLK PPM-24-LSSV-01 - DRAWER ASSY, 95 STRAND, JU FIBER ENCLOSURE FC9-DWR-AA - BiadePatch, LC-L, D, Duplex, OM4, LSOH, 3m FBP-LCLCSV-03AH 8 BiadePatch, LC-L, D, Duplex, OM4, LSOH, 7m FBP-LCLCSV-03AH 8 BiadePatch, LC-L, D, Duplex, Single Mode OS1/052, LSOH, 2m FBP-LCULCU-02H BiadePatch, LC-L, D, Duplex, Sin	104 9 6 26 4 156 156 156 24	4 104 8 5 16 5 156 156		8 8 1 4 4	
Cat6A, Shielded, Z-MAX 6A, RJ4S-RJ4S, LSOH, TS6BA/B, White, Stranded, OSM ZM6A-S05M-02 8 Cat6A, Shielded, Z-MAX 6A, RJ4S-RJ4S, LSOH, TS6BA/B, White, Stranded, OTM ZM6A-S05M-02 8 RACK MOUNT FIBER PAREL FOR 4 ADAPTER PATES, IRMS PPM-BLNK PI PILASSY, FILLER 96 STR 1U FIBER ENC PPM-BLNK PPM-BLNK PLG&PLY, MODULE, 21-PRT, LC, OM, 90:125 106-MM, BLK PPM-24-LCSV-01 4 PLG&PLY, MODULE, 21-PRT, LC, OM, 90:125 106-MM, BLK PPM-24-LCSV-01 4 PLG&PLY, MODULE, 21-PRT, LC, OM, 90:125 106-MM, BLK PPM-24-LCSV-01 4 PLG&PLY, MODULE, 21-PRT, LC, OM, 90:125 106-MM, BLK PPM-24-LCSV-01 4 DRAWER SSY, 95 STRAND, UJ TBER ENCOLOSURE FCP3-DWR-4A 5 BladePatch, LC - LD, Dujes, OM4, LSOH, 2m FBP-LCLCSV-02AH 8 BladePatch, LC - LD, Dujes, OM4, SOH, 5m FEP-CLCSV-03AH 8 BladePatch, LC - LD, Dujes, OM4, SOH, 5m FBP-LCLCSV-03AH 8 BladePatch, LC - LD, Dujes, OM4, SOH, 5m FBP-LCLCSV-03AH 8 BladePatch, LC - LD, Dujes, Single Mode 051/052, LSOH, 2m FBP-LCULCU-02H 8 BladePatch, LC - LD, Dujes, Single Mode 051/052, LSOH, 3m FBP-LCULCU-02H 8 BladePatch, LC - LD, Dujes, Single Mode 051/052, LSOH, 3m FBP-LCULCU-02H 8 BladePatch, LC - LD, Dujes, Single Mode 051/052, LSOH, 3m FBP-LCUL	9 6 26 4 156 156 156 22 4 24	8 52 8 16 5 5 156			
Cat6A, Shielded, ZMAX 6A, RJ4S-RUSS, ISOH, TS68A/B, White, Stranded, 07M ZM6A-S07M-02 8 RACK MOUTEREP PAREL FOR 4 ADAPTER PLATES, ISMS PPM-SPIL4-01 1 PRIL ASSY, FILLER 95R TAUL FOR 4 ADAPTER PLATES, ISMS PPM-SPIL4-01 1 PLGB.PLY, MODULE, 21-PRT, LC, OM4, 50-125 10G-MM, BLK PPM-ELNK 4 PLGB.PLY, MODULE, 24-PRT, LC, OM4, 50-125 10G-MM, BLK PPM-24-LCSV-01 4 PLGB.PLY, MODULE, 24-PRT, LC, MA, SO-125 10G-MM, BLK PPM-24-LCSV-01 4 PLGB.PLY, MODULE, 24-PRT, LC, MA, SO-125 10G-MM, BLK PPM-24-LCSV-01 4 PLGB.PLY, MODULE, 24-PRT, LC, MA, SO-125 10G-MM, BLK PPM-24-LCSV-01 4 PLGB.PLY, MODULE, 24-PRT, LC, MA, SO-125 10G-MM, BLK PPM-24-LCSV-01 4 DRAWER ASSY, 96 STRAND, 1U FIBE RENCOSURE FCP3-DWR-4A 5 BladePatch, LC - LC, Duples, OM4, ISOH, 3m FBP-LCLCSV-02AH 8 BladePatch, LC - LC, Duples, OM4, ISOH, 7m FBP-LCLCSV-03AH 8 BladePatch, LC - LC, Duples, Single Mode OS1/052, ISOH, 2m FBP-LCULCU-02H 8 BladePatch, LC - LCU, Duples, Single Mode OS1/052, ISOH, 2m FBP-LCULCU-03H 5 Cabinet RS-DTE 2 1 Cabinet RSAUminium axtra-deep cable management rack system, 45U RS-OTE 2 RoutelT 10 Sin, Horizontal Cable Manager v/G IN, Fingers, 1U HCM-6-1	9 6 26 4 156 156 156 24 24	8 52 8 52 8 5 16 5 156			
RACK MOUNT FIBER PANEL FOR 4 ADAPTER PLATES, IRMS PPM-SPNL4-01 1 PNL ASSY, FILLER 9 65TR 1U FIBER INC PPM-SPNL4-01 4 PLG&PLY, MODULE, 24-PRT, LC, OM4, 50-125 10G-MM, BLK PPM-24-LCSV-01 4 PLG&PLY, MODULE, 24-PRT, LC, OM4, 50-125 10G-MM, BLK PPM-24-LCSW-01 4 PLG&PLY, MODULE, 24-PRT, LC, OM4, 50-125 10G-MM, BLK PPM-24-LCSW-01 4 PLG&PLY, MODULE, 24-PRT, LC, OM4, 50-125 10G-MM, BLK PPM-24-LCSW-01 4 PLG&PLY, MODULE, 24-PRT, LC, OM4, 50-125 10G-MM, BLK PPM-24-LCSW-01 5 DBAWER ASSY, 95 STRAND, 1U FIBER INCLOSURE FCP3-DWR-4A 5 BladePatch, LC - LC, Duplex, OM4, LSOH, 2m FBP-LCLCSV-02AH 8 BladePatch, LC - LC, Duplex, OM4, LSOH, 3m FBP-LCLCSV-03AH 8 BladePatch, LC - LC, Duplex, OM4, LSOH, 7m FBP-LCLCSV-07AH 8 BladePatch, LC - LCD, Duplex, Single Mode 0S1/0S2, LSOH, 2m FBP-LCULCU-02H BladePatch, LC - LCD, Duplex, Single Mode 0S1/0S2, LSOH, 2m FBP-LCULCU-02H BladePatch, LC - LCD, Duplex, Single Mode 0S1/0S2, LSOH, 3m FBP-LCULCU-02H BladePatch, LC - LCD, Duplex, Single Mode 0S1/0S2, LSOH, 3m FBP-LCULCU-02H BladePatch, LC - LCD, Duplex, Single Mode 0S1/0S2, LSOH, 3m FBP-LCULCU-02H BladePatch, LC - LCD, Duplex, Single Mode 0S1/0S2, LSOH, 3m FBP-LCULCU-02H BladePatch, LC - LO, Duplex, Sin	9 6 26 4 156 156 26 4 4 26 4 26 4 26 4 26 4 22 24	8 52 8 16 5 5 156			
PNL ASSY, FILLER 96 STR 1U FIBER ENC PPM-BLNK PLG&PLY, MODULE, 21-PAT, LC, OM4, SO.125 10G-MM, BLK PPM-BLNK PLG&PLY, MODULE, 21-PAT, LC, OM4, SO.125 10G-MM, BLK PPM-24-LCSV-01 PLG&PLY, MODULE, 21-PAT, LC, OM4, SO.125 10G-MM, BLK PPM-24-LCSM-01 PLG&PLY, MODULE, 21-PAT, LC, OM4, SO.125 10G-MM, BLK PPM-24-LCSM-01 PLG&PLY, MODULE, 21-PAT, LC, OM4, SO.125 10G-MM, BLK PPM-24-LCSM-01 DRAWER ASSY, 95 STRAND, UJ TBER ENCLOSVER FCP3-DWR-4A BladePatch, LC-1, CD, Duplex, OM4, LSOH, 2m FBP-LCLCSV-02AH BladePatch, LC-1, CD, Duplex, OM4, LSOH, 3m FBP-LCLCSV-03AH BladePatch, LC-1, CD, Duplex, OM4, LSOH, 5m FEP-LCLCSV-03AH BladePatch, LC-1, CD, Duplex, OM4, LSOH, 7m FBP-LCLCSV-07AH BladePatch, LC-1, CD, Duplex, Single Mode OS1/0S2, LSOH, 2m FBP-LCULCU-02H BladePatch, LC-1, CD, Duplex, Single Mode OS1/0S2, LSOH, 3m FBP-LCULCU-02H BladePatch, LC-1, CD, Duplex, Single Mode OS1/0S2, LSOH, 3m FBP-LCULCU-02H BladePatch, LC-1, CD, Duplex, Single Mode OS1/0S2, LSOH, 3m FBP-LCULCU-02H BladePatch, LC-1, CD, Duplex, Single Mode OS1/0S2, LSOH, 3m FBP-LCULCU-02H BladePatch, LC-1, CD, Duplex, Single Mode OS1/0S2, LSOH, 3m FBP-LCULCU-02H BladePatch, LC-1, TU, Duplex, Single Mode OS1/0S2, LSOH, 3m FBP-LCULCU-02H BladePatch, LC-1, TU, Duplex, Single Mode OS1/0S2, LSOH, 3m FBP-LCULCU-02H	6 26 4 156 156 26 4 4 156 24 24	8 52 8 16 5 156 156		4	
PLGBPLY,MODULE,12-PRT,LC,OM4, 50-125 10G-MM, BLK PPM-12-LCSV-01 4 PLGBPLY,MODULE,24-PRT,LC,OM4, 50-125 10G-MM, BLK PPM-24-LCSV-01 - PLGBPLY,MODULE,24-PRT,LC,OM4, 50-125 10G-MM, BLK PPM-24-LCSV-01 - PLGBPLY,MODULE,12-PRT,LC,OM4, 50-125 10G-MM, BLK PPM-24-LCSV-01 - DRAWER ASSY, 96 STRAND, 1U FIBER ENCLOSURE FCP3-DWR-4A - BladePatch, LC - LC, Duples, OM4, ISOH, 3m FBP-LCLCSV-02AH - BladePatch, LC - LC, Duples, OM4, ISOH, 3m FBP-LCLCSV-02AH - BladePatch, LC - LC, Duples, OM4, ISOH, 7m FBP-LCLCSV-02AH - BladePatch, LC - LC, Duples, OM4, ISOH, 7m FBP-LCLCSV-07AH 8 BladePatch, LC - LC, Duples, Single Mode OSI/052, ISOH, 2m FBP-LCULCU-02H - BladePatch, LC - LC, Duples, Single Mode OSI/052, ISOH, 3m FBP-LCULCU-02H - BladePatch, LC - LCU, Duples, Single Mode OSI/052, ISOH, 3m FBP-LCULCU-02H - BladePatch, LC - LCU, Duples, Single Mode OSI/052, ISOH, 3m FBP-LCULCU-02H - BladePatch, LC - LCU, Duples, Single Mode OSI/052, ISOH, 3m FBP-LCULCU-02H - RouterT Double-Sided vertical cable managersor 10° Width (set VCM-10D	26 4 156 156 24 24	52 8 16 5 5 156 156		4	
PLGB.PLY,MODULE,24-PRT,LC,OM4,50-125 10G-MM,BLK PPM-24-LCSM-01 PLGB.PLY,MODULE,24-PRT,LC,OM4,50-125 10G-MM,BLK PPM-24-LCSM-01 PLGB.PLY,MODULE,24-PRT,LC,OM4,50-125 10G-MM,BLK PPM-24-LCSM-01 DRAWER ASSY, 96 STRAND,1U FIBER ENCLOSURE FCP3-DWR-4A BladePatch, LC-LC, Duplex, OM4, ISOH, 2m FBP-LCCSV-02AH BladePatch, LC-LC, Duplex, OM4, ISOH, 3m FBP-LCCSV-03AH BladePatch, LC-LC, Duplex, OM4, ISOH, 5m FBP-LCCSV-07AH BladePatch, LC-LC, Duplex, OM4, ISOH, 7m FBP-LCCSV-07AH BladePatch, LC-LC, Duplex, Single Mode 051/052, ISOH, 2m FBP-LCUCV-02H BladePatch, LC-LCU, Duplex, Single Mode 051/052, ISOH, 2m FBP-LCUCU-02H BladePatch, LCU-LCU, Duplex, Single Mode 051/052, ISOH, 3m FBP-LCULCU-02H BladePatch, LCU-LCU, Duplex, Single Mode 051/052, ISOH, 3m FBP-LCULCU-02H BladePatch, LCU-LCU, Duplex, Single Mode 051/052, ISOH, 3m FBP-LCULCU-02H BladePatch, LCU-LCU, Duplex, Single Mode 051/052, ISOH, 3m FBP-LCULCU-02H BladePatch, LCU-LCU, Duplex, Single Mode 051/052, ISOH, 3m FBP-LCULCU-02H BladePatch, LCU-LCU, Duplex, Single Mode 051/052, ISOH, 3m FBP-LCULCU-02H BladePatch, LCU-LCU, Duplex, Single Mode 051/052, ISOH, 3m FBP-LCULCU-02H BladePatch, LCU-LCU, Duplex, Single Mode 051/052, ISOH, 3m FBP-LCULCU-02H BladePatch, LCU-LCU, Duplex, Single Mode 051/052, ISOH, 3m FBP-LCULCU-02H <td>26 4 156 156 156 24 24</td> <td>52 8 16 5 156 5 156</td> <td>4</td> <td></td> <td></td>	26 4 156 156 156 24 24	52 8 16 5 156 5 156	4		
PLGB.PLY,MODULE,24-PRT,LC,SM,BLK PPM-24-LCSM-01 PLGB.PLY,MODULE,12-PRT,LC,SM,BLK PPM-12-LCSM-01 PLGB.PLY,MODULE,12-PRT,LC,OM,SO-125 10G-MM,BLK PPM-12-LCSM-01 DRAWER ASSY, 95 STRAND, UT RER RENCLOSURE FCP3-DWR-4A BladePatch, LC-L, Duplex, OM4, LSOH, 2m FBP-LCLSV-02AH BladePatch, LC-L, Duplex, OM4, LSOH, 3m FBP-LCLSV-02AH BladePatch, LC-L, Duplex, OM4, LSOH, 5m FEP-LCLSV-07AH BladePatch, LC-L, Duplex, OM4, LSOH, 7m FBP-LCLSV-07AH BladePatch, LC-L, Duplex, OM4, LSOH, 7m FBP-LCLSV-07AH BladePatch, LC-L, Duplex, Single Mode 051/052, LSOH, 2m FBP-LCULCU-02H BladePatch, LC-L, Duplex, Single Mode 051/052, LSOH, 3m FBP-LCULCU-02H BladePatch, LCU-LOU, Duplex, Single Mode 051/052, LSOH, 3m FBP-LCULCU-02H BladePatch, LCU-LOU, Duplex, Single Mode 051/052, LSOH, 3m FBP-LCULCU-02H BladePatch, LCU-LOU, Duplex, Single Mode 051/052, LSOH, 3m FBP-LCULCU-02H BladePatch, LCU-LOU, Duplex, Single Mode 051/052, LSOH, 3m FBP-LCULCU-02H BladePatch, LCU-LOU, Duplex, Single Mode 051/052, LSOH, 3m FBP-LCULCU-02H BladePatch, LCU-LOU, Duplex, Single Mode 051/052, LSOH, 3m FBP-LCULCU-02H Cabiner RoutelT Double-Sided vertical cable managers 10*Width (set CVCM-10D - 10) Vertical Dividers for RoutelT Double-Sided vertical cable managers 10*Width (set CVCM-10D - 11) 1 <	4 156 156 24 24	8 16 5 5 5 5	4		
PLGBPLY_MODULE_12-PRT_LC_OM4_SO-125 10G-MM, BLK PPM-12-LCSM-01 DRAWER ASSY_96 STRAND_1U FIBE RENCLOSURE FCP3-DWR-4A BladePatch, LC - LC, Duplex, OM4, ISOH, 3m FGP4-LCCSV-02AH BladePatch, LC - LC, Duplex, OM4, ISOH, 3m FGP-LCCSV-03AH BladePatch, LC - LC, Duplex, OM4, ISOH, 3m FGP-LCCSV-03AH BladePatch, LC - LC, Duplex, OM4, ISOH, 7m FGP-LCCSV-03AH BladePatch, LC - LC, Duplex, OM4, ISOH, 7m FGP-LCCSV-03AH BladePatch, LC - LC, Duplex, OM4, ISOH, 7m FGP-LCCSV-07AH BladePatch, LC - LCU, Duplex, Single Mode OSI/052, ISOH, 2m FGP-LCULCU-02H BladePatch, LC - LCU, Duplex, Single Mode OSI/052, ISOH, 3m FGP-LCULCU-03H Cabinet RS RouteIT Double-Sided vertical cable manager 10° Width (set VCM-10D Vertical Dividers for KouteIT Double-sided vertical cable managers 10° Width (set VCM-10D-R8 Cabine Tray Rack, Black H2.24 4U CTR-04-01 1 Ledder Rack Mounting Kit for Cable Tray Rack CTR-44-01 1 RouteIT 19 in. Horizontal Cable Manager w/6 in. Fingers, 1U HCM-6-1U 1 RouteIT 19 in. Horizontal Cable Manager w/6 in. Fingers, 4U HCM-6-1U 2	156 156 24 24 24	16 5 156 5 155	4		
DRAWER ASSY, 96 STRAND, 1U FIBER ENCLOSURE FCP3-DWR-4A BiadePatch, LC-LC, Duplex, OM4, LSOH, 2m FBP-LCLCSV-02AH BiadePatch, LC-L, Duplex, OM4, LSOH, 3m FBP-LCLCSV-03AH BiadePatch, LC-L, Duplex, OM4, LSOH, 5m FBP-LCLCSV-03AH BiadePatch, LC-L, Duplex, OM4, LSOH, 7m FBP-LCLCSV-07AH BiadePatch, LC-L, Duplex, Single Mode 0S1/0S2, LSOH, 2m FBP-LCLCV-02H BiadePatch, LCU-LOU, Duplex, Single Mode 0S1/0S2, LSOH, 2m FBP-LCLCU-02H BiadePatch, LCU-LOU, Duplex, Single Mode 0S1/0S2, LSOH, 2m FBP-LCLCU-02H BiadePatch, LCU-LOU, Duplex, Single Mode 0S1/0S2, LSOH, 3m FBP-LCULCU-02H BiadePatch, LCU-LOU, Duplex, Single Mode 0S1/0S2, LSOH, 3m FBP-LCULCU-02H BiadePatch, LCU-LOU, Duplex, Single Mode 0S1/0S2, LSOH, 3m FBP-LCULCU-02H BiadePatch, LCU-LOU, Duplex, Single Mode 0S1/0S2, LSOH, 3m FBP-LCULCU-02H BiadePatch, LCU-LOU, Duplex, Single Mode 0S1/0S2, LSOH, 3m FBP-LCULCU-02H BiadePatch, LCU-LOU, Duplex, Single Mode 0S1/0S2, LSOH, 3m FBP-LCULCU-02H BiadePatch, LCU-LOU, Duplex, Single Mode 0S1/0S2, LSOH, 3m FBP-LCULCU-02H BiadePatch, LCU-LOU, Duplex, Single Mode 0S1/0S2, LSOH, 3m FBP-LCULCU-02H RouteIT Double-Sided vertical cable manager 10" Width VCM-10D-RB	156 156 24 24 24	16 5 156	12		
BladePatch, LC-LC, Duplex, OM4, LSOH, 2m FBP-LCLCSV-02AH BladePatch, LC-LC, Duplex, OM4, LSOH, 3m FBP-LCLCSV-03AH BladePatch, LC-LC, Duplex, OM4, LSOH, 5m FBP-LCLCSV-05AH BladePatch, LC-LC, Duplex, OM4, LSOH, 5m FBP-LCLCSV-05AH BladePatch, LC-LC, Duplex, OM4, LSOH, 7m FBP-LCLCSV-07AH BladePatch, LC-LO, Duplex, Single Mode 051/052, LSOH, 2m FBP-LCULCU-02H BladePatch, LCU-LOU, Duplex, Single Mode 051/052, LSOH, 3m FBP-LCULCU-02H BladePatch, LCU-LOU, Duplex, Single Mode 051/052, LSOH, 3m FBP-LCULCU-02H BladePatch, LCU-LOU, Duplex, Single Mode 051/052, LSOH, 3m FBP-LCULCU-02H BladePatch, LCU-LOU, Duplex, Single Mode 051/052, LSOH, 3m FBP-LCULCU-02H BladePatch, LCU-LOU, Duplex, Single Mode 051/052, LSOH, 3m FBP-LCULCU-02H BladePatch, LCU-LOU, Duplex, Single Mode 051/052, LSOH, 3m FBP-LCULCU-02H BladePatch, LCU-LOU, Duplex, Single Mode 051/052, LSOH, 3m FBP-LCULCU-02H Cabiner RoutelT Double-Sided vertical cable managers 10*Width VCM-10D Vertical Dividers for RoutelT Double-Sided vertical cable managers 10*Width VCM-10D-R8 Cabine Tray Rack, Black #12:24 4U CTR-04-01 1 Ladder Rack Mounting Kit for Cabile Tray Rack CTR-18K 1 RoutelT 19 in. Horizontal Cable Manager w/6 in. Fingers, 4U HCM-5-1U RoutelT 19 in. Horizontal Cable Manager w/6 in. F	156 156 24 24	5 156	12		
BladePatch, LC-LC, Duplex, OM4, ISOH, 3m FBP-LCCSV-03AH 8 BladePatch, LC-LC, Duplex, OM4, ISOH, 5m FBP-LCLCSV-05AH 8 BladePatch, LC-LC, Duplex, OM4, ISOH, 7m FBP-LCLCSV-07AH 8 BladePatch, LC-LC, Duplex, Single Mode OSI/052, ISOH, 2m FBP-LCULCV-02H 8 BladePatch, LC-LC, Duplex, Single Mode OSI/052, ISOH, 2m FBP-LCULCU-02H 8 BladePatch, LCU-LCU, Duplex, Single Mode OSI/052, ISOH, 2m FBP-LCULCU-02H 8 BladePatch, LCU-LCU, Duplex, Single Mode OSI/052, ISOH, 3m FBP-LCULCU-03H 8 Cabinet RSAluminium extra-deep cable management rack system, 45U RS-07E 8 RouteIT Double-Sided vertical cable managers 10° Width (set VCM-10D 1 Ledder Rack Mounting Kit for Cable Tray Rack CTR-04-01 1 Ledder Rack Mounting Kit for Cable Tray Rack CTR-04-01 1 RouteIT 19 in. Horizontal Cable Manager w/6 in. Fingers, 1U HCM-6-1U 1 RouteIT 19 in. Horizontal Cable Manager w/6 in. Fingers, 4U HCM-6-1U 1 RouteIT 19 in. Horizontal Cable Manager 10(h) to 1010 PNL/RIN (ND10-15) 2	24 24	5 156			
BiadePatch, LC-LC, Duplex, OM4, LSOH, Sm FBP-LCLCSV-05AH 8 BiadePatch, LC-LC, Duplex, OM4, LSOH, 7m FBP-LCLCSV-05AH 8 BiadePatch, LC-LC, Duplex, Single Mode OS1/OS2, LSOH, 2m FBP-LCLCSV-05AH 8 BiadePatch, LCU-LC, Duplex, Single Mode OS1/OS2, LSOH, 2m FBP-LCLCLV-02H 8 BiadePatch, LCU-LCU, Duplex, Single Mode OS1/OS2, LSOH, 3m FBP-LCULCU-02H 8 BiadePatch, LCU-LCU, Duplex, Single Mode OS1/OS2, LSOH, 3m FBP-LCULCU-02H 8 Cabinet R 8 8 Cabinet RouteIT Double-Sided vertical cable manager 10° Width VCM-10D-N8 1 Vertical Dividers for RouteIT Double-Sided vertical cable managers 10° Width (set VCM-10D-N8 1 Cable Tray Rack, Black #12-24 4U CTR-04-01 1 1 Ladder Rack Mounting Kitor Cable Tray Rack CTR-1RK 1 1 RouteIT 19 in. Horizontal Cable Manager w/6 in. Fingers, 1U HCM-6-1U 2 2	24 24 24		12	8	
BiadePatch, LC-LC, Duplex, OM4, SOH, 7m FBP-LCLCS-V07AH 8 BiadePatch, LCU-LCU, Duplex, Single Mode OS1/OS2, LSOH, 2m FBP-LCULCU-02H 8 BiadePatch, LCU-LCU, Duplex, Single Mode OS1/OS2, LSOH, 3m FBP-LCULCU-02H 8 BiadePatch, LCU-LCU, Duplex, Single Mode OS1/OS2, LSOH, 3m FBP-LCULCU-02H 8 Cabiner R 8 8 RouteIT Double-Sided vertical cable manager 10*Width VCM-10D 9 Vartical Dividers for RouteIT Double-sided vertical cable managers 10*Width (set VCM-10D-R8 1 1 Ladder Rack Mounting Kitfor Cable Tray Rack CTR-1RK 1 1 RouteIT 19 in, Horizontal Cable Manager w/6 in. Fingers, 1U HCM-5-1U 1 RouteIT 19 in, Horizontal Cable Manager w/6 in. Fingers, 4U HCM-5-1U 2	24 24 24			8	
BladePatch, LCU - LCU, Duples, Single Mode 051/052, LSOH, 2m FBP-LCULCU-02H BladePatch, LCU - LCU, Duples, Single Mode 051/052, LSOH, 3m FBP-LCULCU-03H Cabinet RS Aluminium extra-deep cable management rack system, 45U RS-07E RouteIT Double-Sided vertical cable manager 10° Width VCM-10D Vertical Dividers for RouteIT Double-sided vertical cable managers 10° Width (set VCM-10D-R8 Cable Tray Rack, Black #12.24 4U CTR-04-01 1 Ladder Rack Mounting Kit for Cable Tray Rack CTR-04-01 1 RouteIT 19 in. Horizontal Cable Manager w/6 in. Fingers, 1U HCM-6-1U 1 RouteIT 19 in. Horizontal Cable Manager w/6 in. Fingers, 4U HCM-6-1U 2	24 24			8	
BladePatch, LCU - LCU, Duplex, Single Mode OSI/OS2, LSOH, 3m FBP-LCULCU-O3H Cabinet RS Aluminium extra-deep cable management rack system, 45U RS-07E RouteIT Double-Sided vertical cable manager 10° Width VCM-10D Vertical Dividers for RouteIT Double-Sided vertical cable managers 10° Width (st VCM-10D-R8 Cable Tray Rack, Black #12-24 4U Ladder Rack Mounting Kitfor Cable Tray Rack CTR-04-01 1 Ladder Rack Mounting Kitfor Cable Tray Rack CTR-10 RouteIT 19 in. Horizontal Cable Manager w/6 in. Fingers, 4U HCM-6-1U RouteIT 19 in. Horizontal Cable Manager w/6 in. Fingers, 4U HCM-6-1U SanaEiTM TroujesST hemal Blanking Panel 11/(Rox 010) PNI-RB INS00-015 2	24	24	12		
Cabinet Resource RoutelT Double-Sided vertical cable management rack system, 45U RoutelT Double-Sided vertical cable manager 10° Width VCM-10D Vertical Dividers for RoutelT Double-sided vertical cable managers 10° Width (set VCM-10D-R8 Cable Tray Rack, Black #12.24 4U CTR-04-01 1 Ladder Rack Mounting Kitfor Cable Tray Rack CTR-1R RoutelT 19 in, Horizontal Cable Manager w/6 in, Fingers, 4U RoutelT 19 in, Horizontal Cable Manager w/6 in, Fingers, 4U RoutelT 19 in, Horizontal Cable Manager w/6 in, Fingers, 4U RoutelT 19 in, Horizontal Cable Manager w/6 in, Fingers, 4U RoutelT 19 in, Horizontal Ranking Penel 11/(hox of 10) PNLTRINK010-15 2		24	12		
R5 Aluminium extra-deep cable management rack system, 450 R5-07E RouteIT Double-Sided vertical cable managers 10° Width VCM-10D Vertical Dividers for RouteIT Double-Sided vertical cable managers 10° Width (set VCM-10D-R8 Cable Tray Rack, Black #12-24 4U CTR-04-01 1 Ladder Rack Mounting Kit for Cable Tray Rack CTR-04-01 1 RouteIT 19 in. Horizontal Cable Manager w/6 in. Fingers, 1U HCM-6-1U 1 RouteIT 19 in. Horizontal Cable Manager w/6 in. Fingers, 4U HCM-6-1U 2					
RoutelT Double-Sided vertical cable manager 10° Width VCM-10D Vertical Dividers for RoutelT Double-sided vertical cable managers 10° Width (set VCM-10D-R8 Cable Tray Rack, Black #12-24.4U CTR-04-01 1 Ladder Rack Mounting Kit for Cable Tray Rack CTR-1RK 1 RoutelT 19 in. Horizontal Cable Manager w/6 in. Fingers, 1U HCM-6-1U 1 RoutelT 19 in. Horizontal Cable Manager w/6 in. Fingers, 4U HCM-6-1U 2 StandFith Torolless Themal Blanking Papel 11/(hox of 10) PNI-RIN N010-15 2		2			
Vertical Dividers for Routell Topuble-sided vertical cable managers 10° Width (set VCM-10D-R8 Cable Tray Rack, Black #12-24 4U CTR-04-01 1 Ladder Rack Mounting Kithor Cable Tray Rack CTR-04-01 1 Ladder Rack Mounting Kithor Cable Tray Rack CTR-1R 1 Routell T19 in. Horizontal Cable Manager w/6 in. Fingers, 1U HCM-6-1U 1 Routell T19 in. Horizontal Cable Manager w/6 in. Fingers, 4U HCM-6-1U 2 SnapeTHT Tray Rack Repeat 1U (hox of 10) PNI. TRA INX010-15 2		3			
Cable Tray Rack, Black #12-24 4U CTR-04-01 1 Ladder Rack Mounting Kit for Cable Tray Rack CTR-04-01 1 Routell'1 Sin. Horizontal Cable Manager w/S in. Fingers, 1U HCM-5-1U 1 Routell'1 Sin. Horizontal Cable Manager w/S in. Fingers, 4U HCM-5-1U 2 Sanoif TM Toolless: Thermal Blanking Panel, 1U(flox of 10) PNI. HR IN010-15 2		1			
Ladder Rack Mounting Kit for Cable Tray Rack CTR-LRK 1 RoutelT 19 in. Horizontal Cable Manager w/6 in. Fingers, 1U HCM-F-1U HCM-F-4U RoutelT 19 in. Horizontal Cable Manager w/6 in. Fingers, 4U HCM-F-4U HCM-F-4U Spacific Th Topless, Therma Blanking Papel 1U (hox of 10) PNI-TRI NO10-15 2				1	
RoutelT19 in. Horizontal Cable Manager w/6 in. Fingers, 1U HCM-6-1U RoutelT19 in. Horizontal Cable Manager w/6 in. Fingers, 4U HCM-6-4U SnapeTHT Toples Thermal Blanking Papel 11/(hox of 10) PNI.TBI.NK010-15 2				1	
RouteIT 19 in. Horizontal Cable Manager w/6 in. Fingers, 4U HCM-6-4U SnanFitTM Toplless Thermal Blanking Panel 1U (box of 10) PNI-TBLNK010-1S 2		2			
SpapEitTM Toolless Thermal Blanking Panel, 1U (box of 10) PNI-TBL NK010-1S 2		4			
				2	
Contain					
Roof Panels, 1200mm wide top frame panels, V600 VC-RPA-V6N-A12B					
Door, 45U, window, no lock, Double self closing VC-DRA-DSN-AB					4
End panel, 45U VC-EPA-A12B					4



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- Our **global footprint...**allows us to seamlessly deliver to our multinational clients
- Our Flexibility & Ability to be "nimble" for customers...being a very flat organization
- We understand Data Centers...a **trusted advisor** to our clients
- Local Support & Global Supply ... Siemon direct reporting staff in India
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Please visit/meet us at our booth for further discussions.