Designing Resilient and High-Performance Data Centres for the Future

Prem Rodrigues
Vice President, IMEA
The Siemon Company

SIEMON™

Agenda

Who is Siemon?

Data Centers for the future

Siemon Solutions

SIEMON™


FOUNDED IN
1903
USA
PRESENCE IN
OVER
100
COUNTRIES
OVER
400
ACTIVE PATENTS
OVER
50%
OF THE FORTUNE
500 LIST
ISO
9001:2015
ENVIRONMENTAL MANAGEMENT SYSTEM
ISO 14001
OUR PEDIGREE

ABOUT SIEMON

Global Headquarters

1903

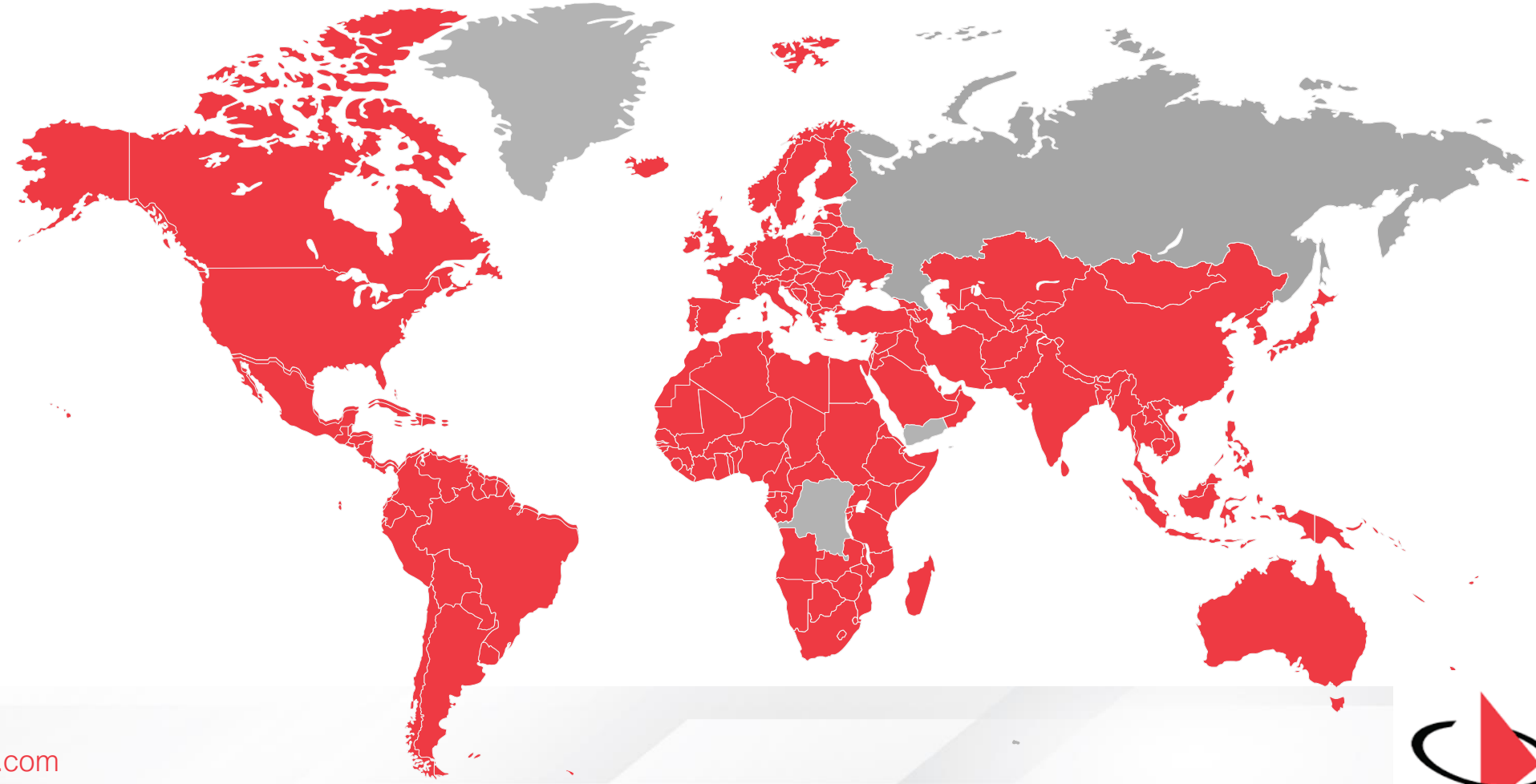
2024

ABOUT SIEMON

Presence in 100+ Countries

40+ Regional & Support Offices

Multiple Manufacturing & Warehousing Sites



SIEMON™

Leadership in…

- Technology
- Innovation
- Quality
- Sustainability

First to the market, Best in the market!

SIEMON™

QUALITY LEADERSHIP

Vertically Integrated Manufacturing & Automation

Long-standing Commitment to World Class Quality

ISO 9001 and 14001

Statistical Process Control and Six Sigma Methodology

Adhering to the strictest quality standards is not a task, but an unbending commitment.

From raw materials, through highly automated production to in-depth inspection, every product is held to the highest standards.

SIEMON™

OUR ONGOING COMMITMENT TO SUSTAINABILITY

SIEMON SUSTAINABILITY PLEDGE

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

GOLD 2023 ecovadis Sustainability Rating

SEAL AWARD WINNER 2024

Siemon achieves Gold rating in Annual EcoVadis ESG Review

Placing Siemon in the top 5% of the 100,000+ companies EcoVadis rates globally.

ESG


DATA CENTERS
SMART BUILDINGS
ENTERPRISE LAN

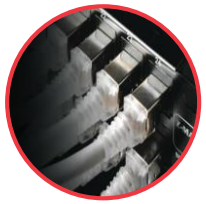
Data Centers

Data Centers

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.

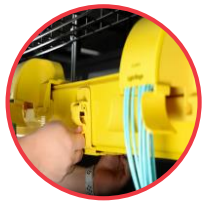
Data Center
Design Services

High Speed
Interconnects



Copper Cabling
& Connectivity

Copper & Fiber
Plug & Play



LightWays
Fiber ducts

Smart Buildings

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
  - We participate in marketing, webinars and interoperability testing

- Active member of InfiniBand Trade Association (IBTA)
  - IBTA is association that develops IB standards
  - We participate in standards working groups 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 eco-system 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-in-class IT infrastructure solutions to deliver additional value and support to our customers.

ARISTA

CISCO™

NVIDIA

SIEMON™

Siemon…member of NVIDIA Partner Network (NPN)

Solution Advisor - Consultant

- Partners that provide consultation services and expert advice to customers looking to implement NVIDIA-based solutions or technologies

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

Evolving Data Center Landscape

SIEMON™

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:

- Flexible infrastructure for scalability and migration
- Modular design for easy upgrades and replacements

Redundancy and Fault Tolerance:

- 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

1

Needs Assessment and Planning:

- Define business requirements and SLAs
- Develop a detailed design plan

2

Infrastructure Deployment:

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

3

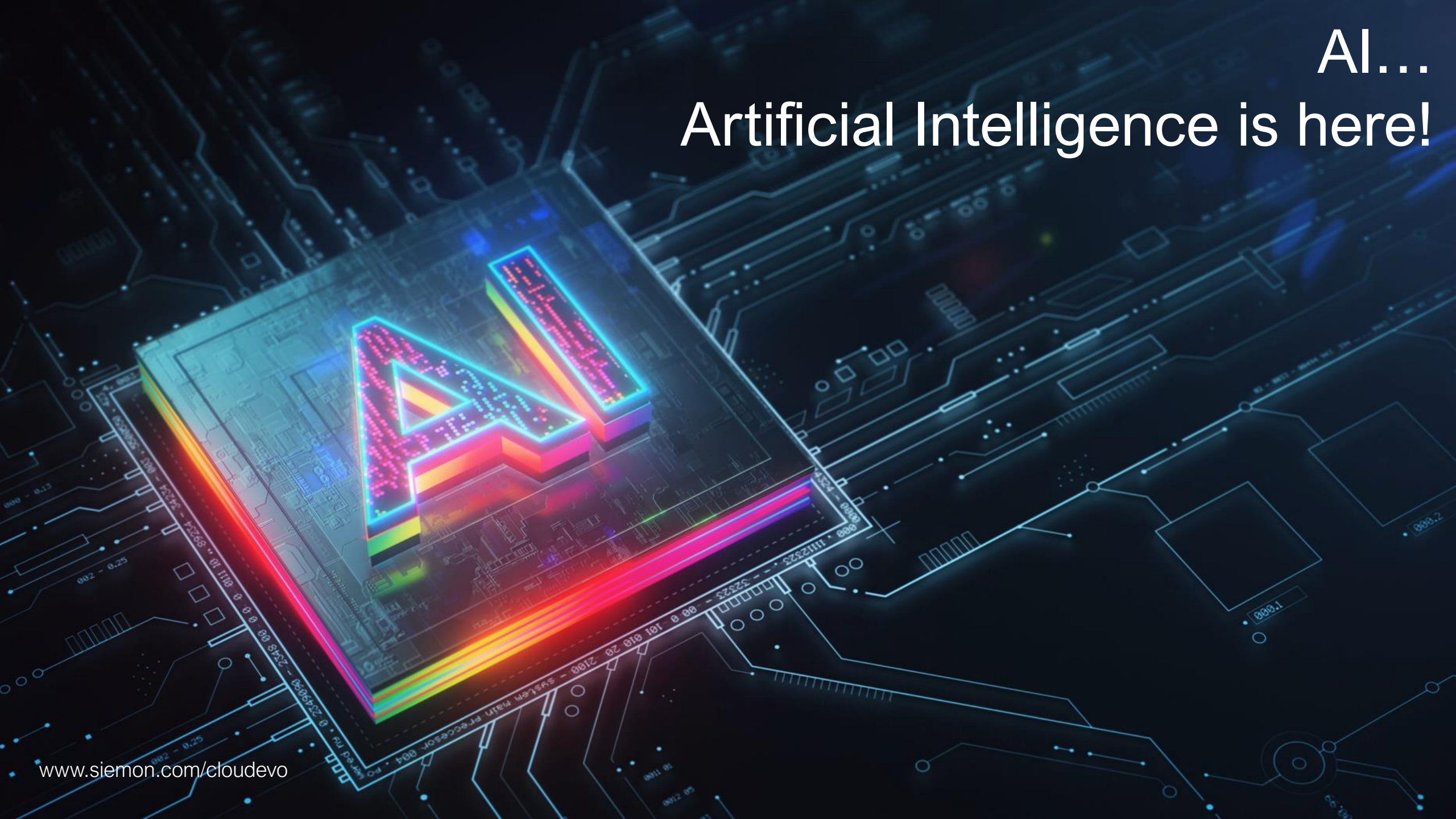
Configuration and Testing:

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

4

Ongoing Management and Optimization:

- Monitor performance and security
- Implement proactive maintenance and upgrades


AI...
Artificial Intelligence is here!
www.siemon.com/cloudevo


We are in an
Era of great change.

Timeline

NOV 2022 — Open AI introduced the ChatGPT large language model

MAR 2023 — Google & Microsoft introduce Bard AI & Azure OpenAI Service w/GPT-4

MAR 2023 — Bill Gates: “Artificial Intelligence is as revolutionary as mobile phones and the Internet”

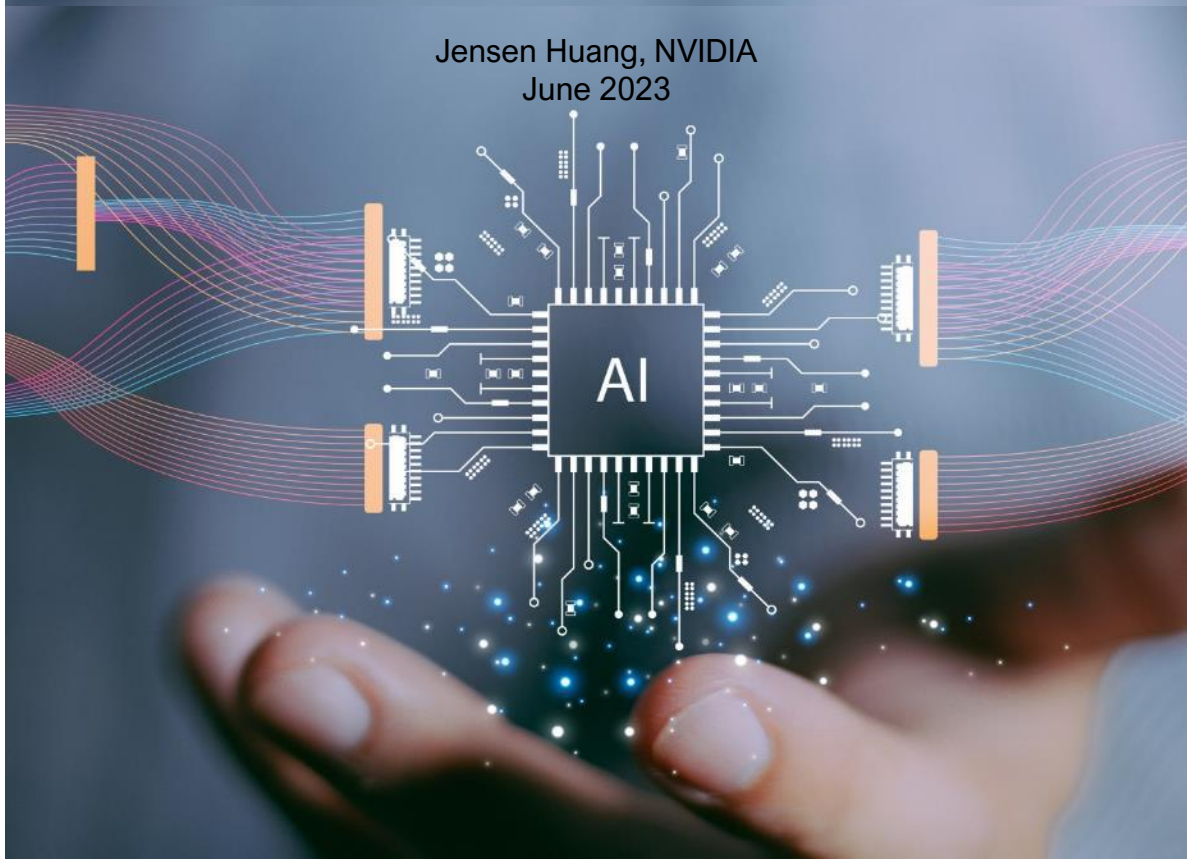
MAY 2023 — Jensen Huang, NVIDIA CEO, “We have now reached the tipping point of a new computing era”

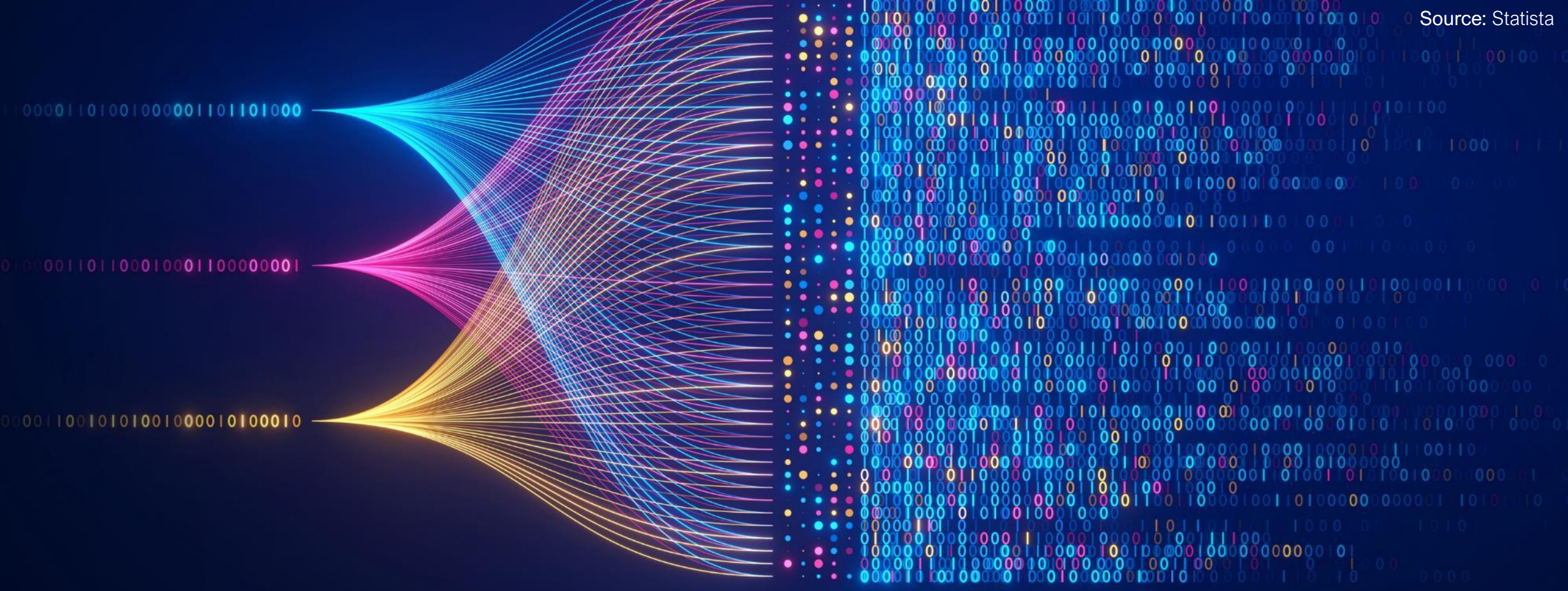
DEC 2023 — NVIDIA reports their Q3 data center revenue up 279% to $14.5B

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 **10-year transition** to basically recycle or reclaim the world's data centers and build it out as accelerated computing.”

Jensen Huang, NVIDIA
June 2023



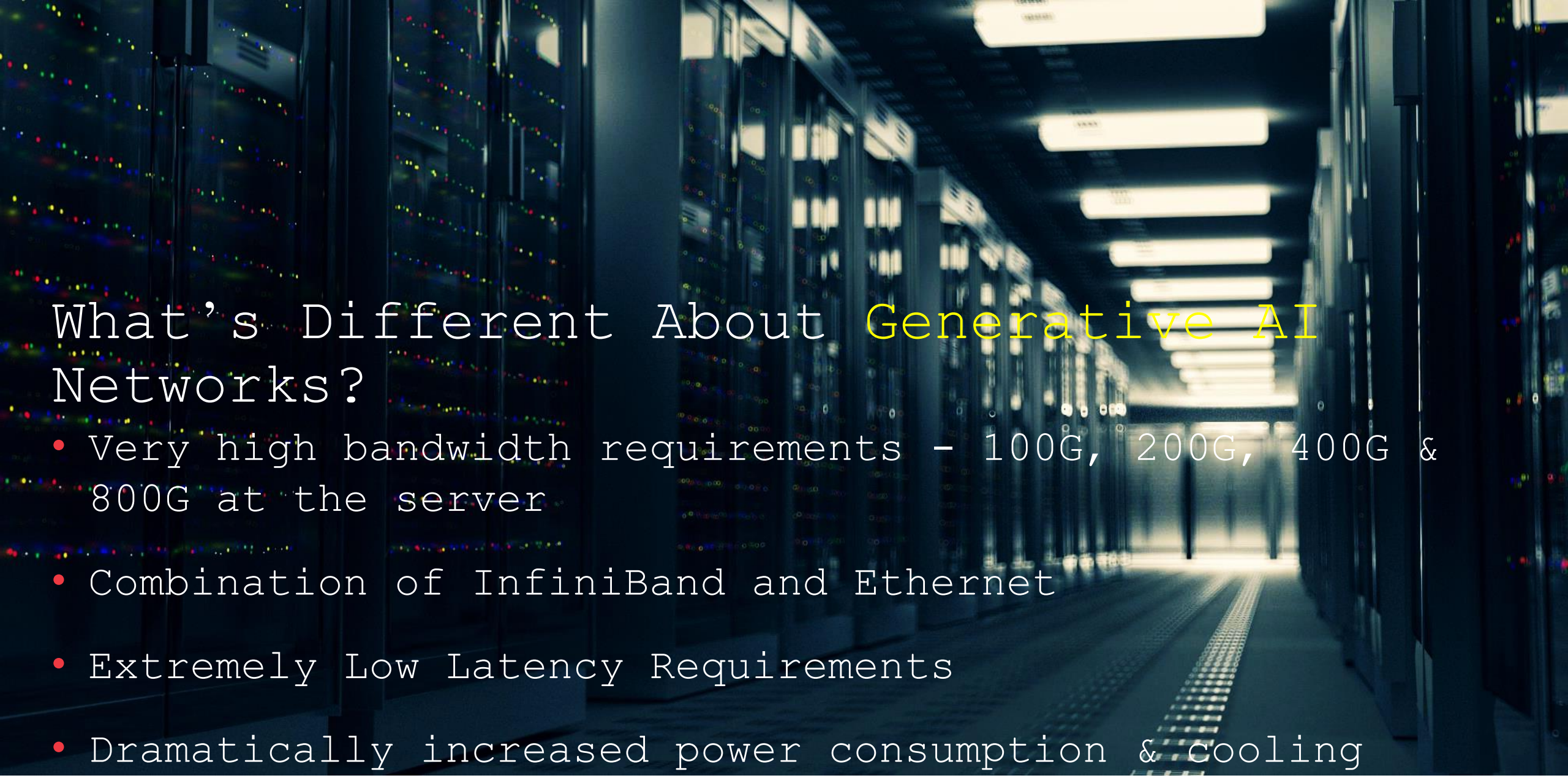


Source: Statista

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

www.siemon.com/cloudevo



What's Different About Generative AI Networks?

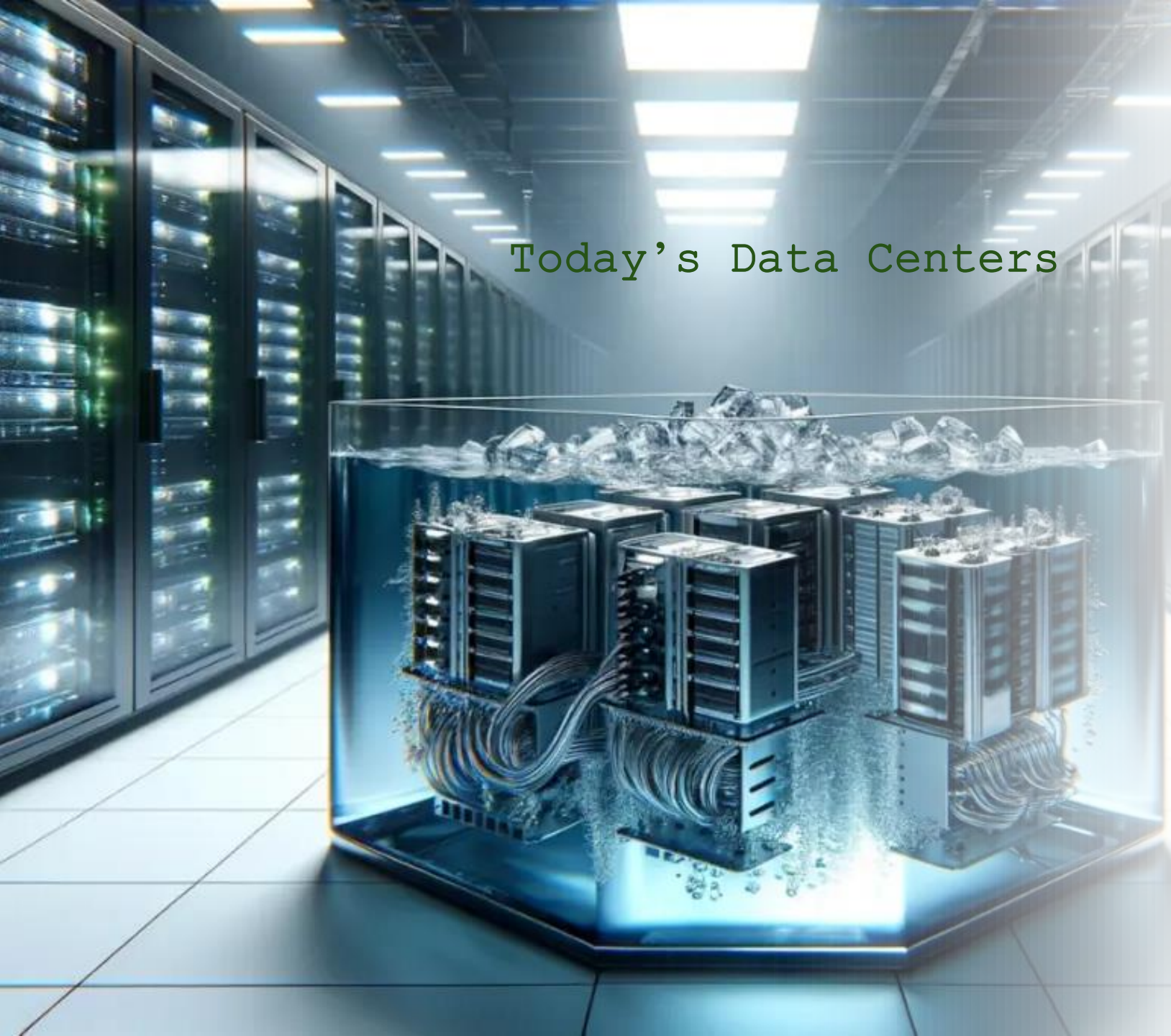
- Very high bandwidth requirements - 100G, 200G, 400G & 800G at the server
- Combination of InfiniBand and Ethernet
- Extremely Low Latency Requirements
- Dramatically increased power consumption & cooling

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.



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

1 MTP/MPO Fiber Equipment Cords

2 MTP/MPO Fiber Jumpers

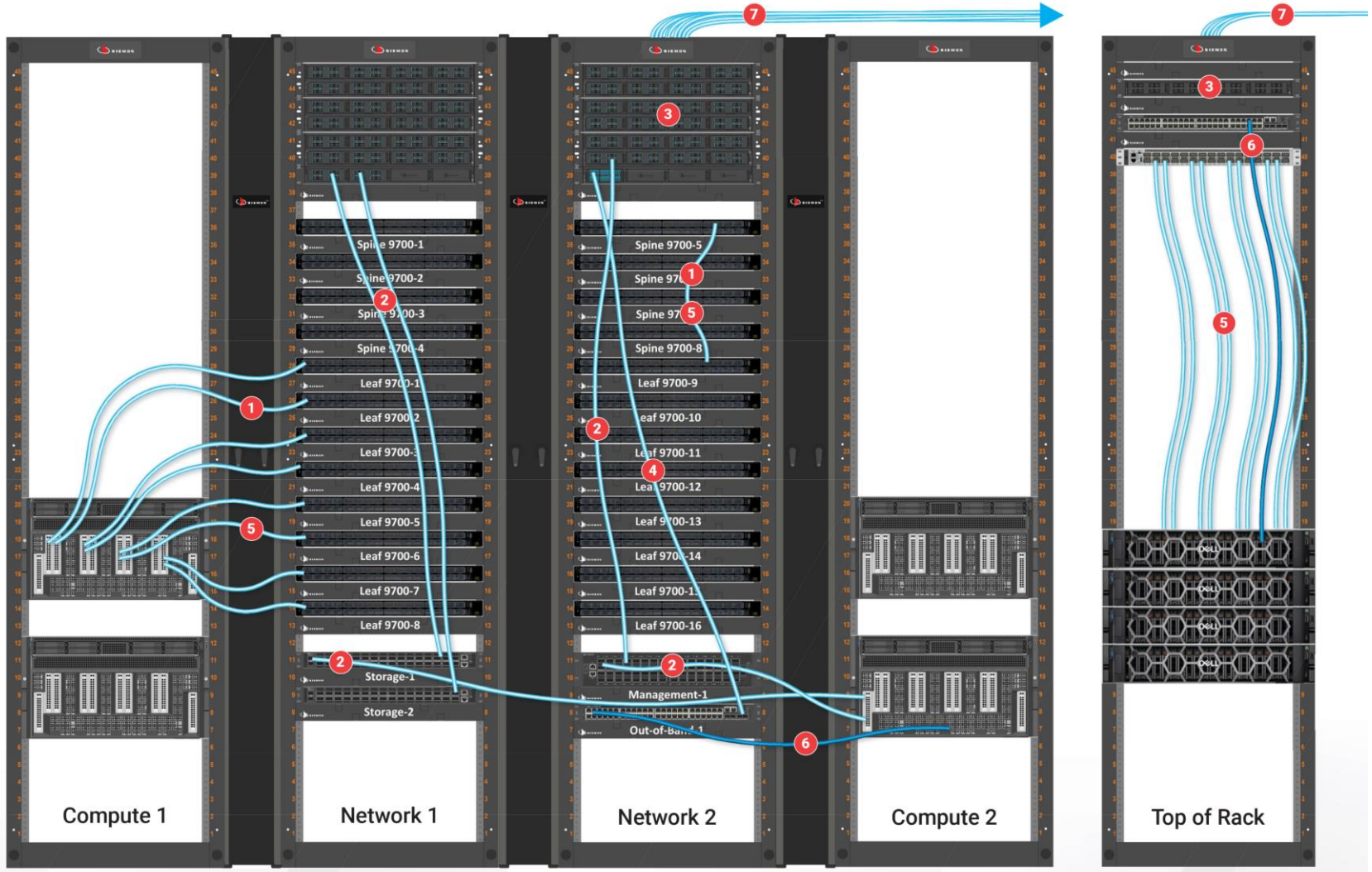
3 LightVerse® Fiber Optic Cabling System

4 LC BladePatch® Fiber Jumpers

5 Direct Attach Cables and Active Optical Cables

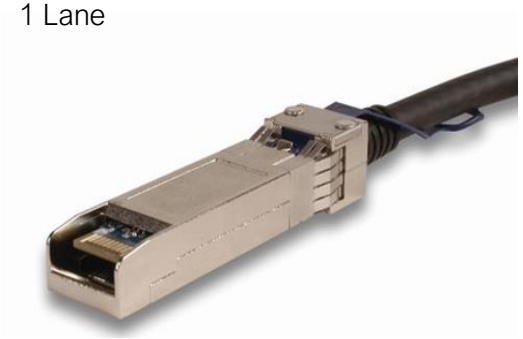
6 Category 6A and 6 Modular Cords

7 Plug and Play Fiber Trunks and Assemblies



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

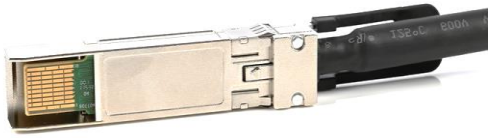
SFP
Small Form Factor Pluggable
1 Lane



QSFP
Quad-Small Form Factor Pluggable
4 Lanes*

QSFP-DD
Quad-Small Form Factor Pluggable Double Density
8 Lanes*

SFP-DD
Small Form Factor Pluggable Double Density
2 Lanes



OSFP-RHS
Octal-Small Form Factor Pluggable

Riding Heat Sink
4 Lanes*#

*Can be half loaded (2 Lanes)

OSFP-FT
Octal-Small Form Factor Pluggable

Finned Top
8 Lanes#

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

50G per Lane Connector

Singlemode Ultra Low Loss Solution

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

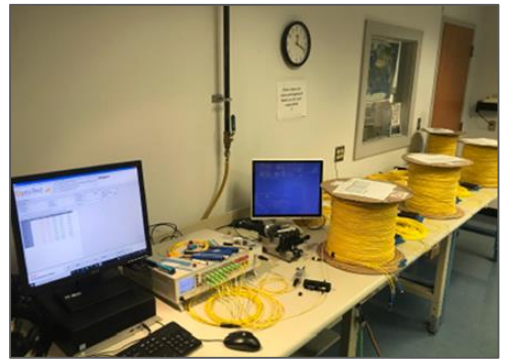
SIEMON™

High Speed Low Loss

	Singlemode LC/UPC	Singlemode MTP	Singlemode MTP-LC Module
			
Standard Loss	**0.40 dB**	**0.60 dB**	**1.00 dB**
Low Loss	**0.20 dB**	**0.30 dB**	**0.50 dB**

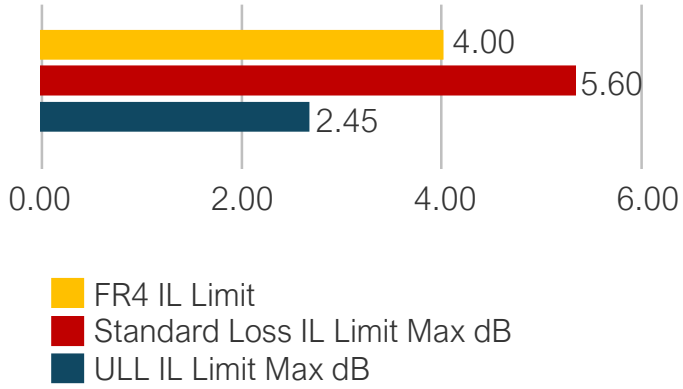
400GBASE-FR4 channel with (5) x MTP-LC modules + 1 MTP pair over max allowed channel of 2km

intertek
Total Quality. Assured.



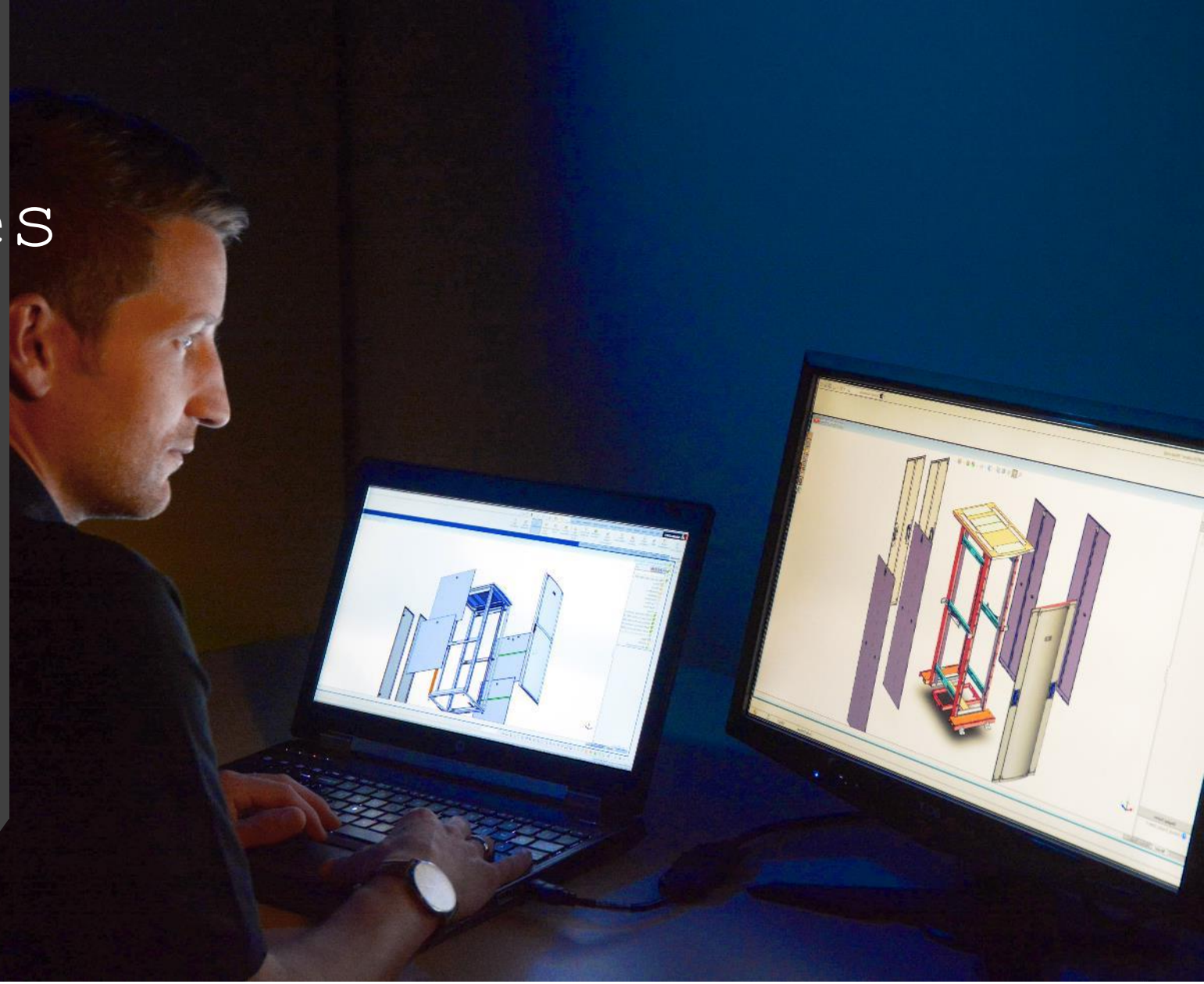
3rd Party 400G SM ULL Testing

400GBASE-FR4 Insertion Loss Margin

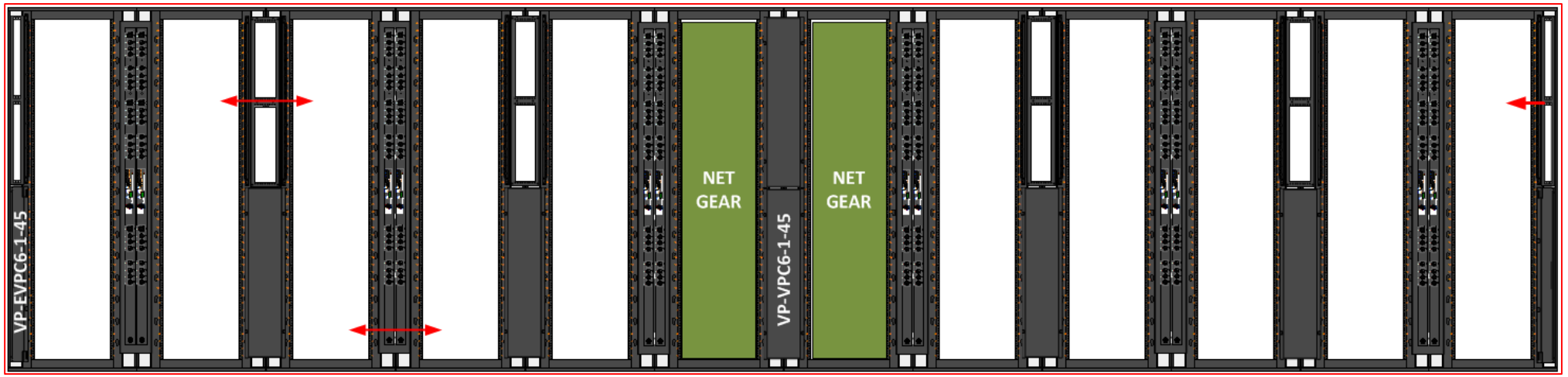


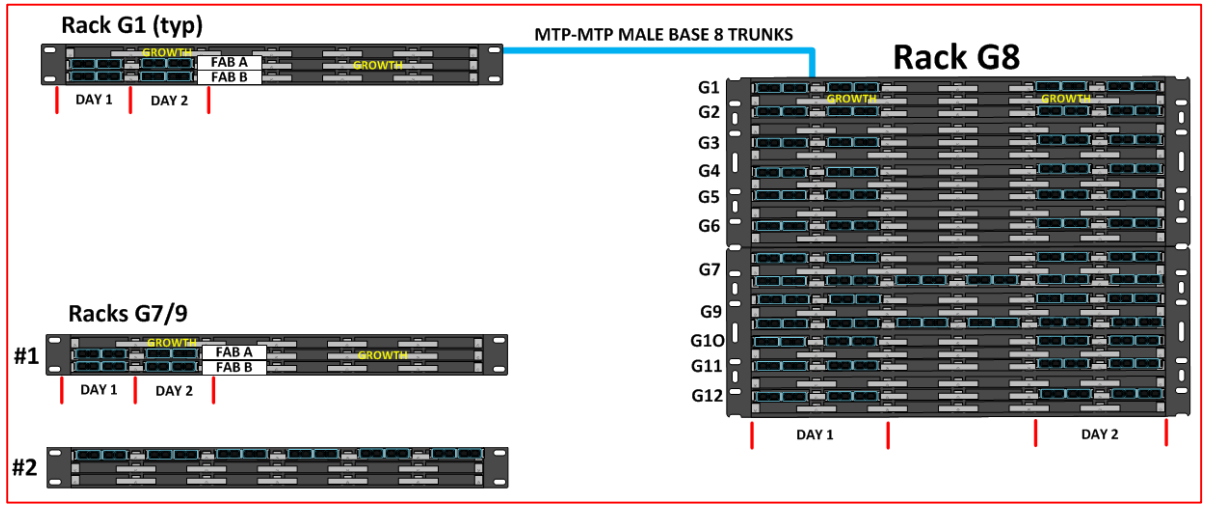
Data Center Design Services

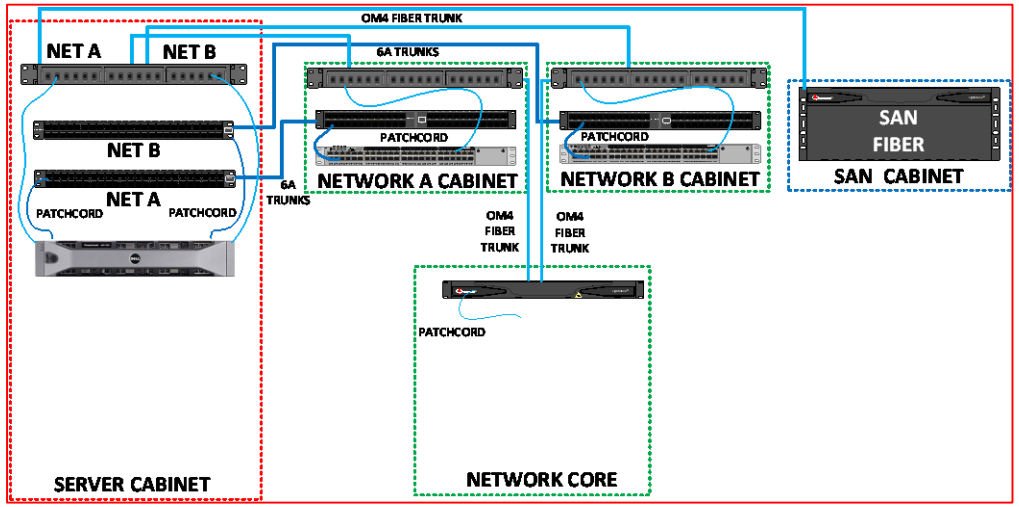
Our team of DC Design specialists are ready to provide expert advice and assistance to help your teams design, deploy or upgrade your data center spaces.



Example Customer Design







Data Center Design Services

Data Centers





SIEMON

Siemon Data Center Design Services

Copper Patch cord activaiton 100%

Fiber Patch cord activaiton 100%

			Server 8	Net 1	CPZ 1	MDF 2	Archive 3	Containement 1		CPZ	
Panel	Z-Max 24 port shielded panel, Empty	ZS-PNL-24E	1	13		1	1			0	26
Panel	Z-Max 24 port shielded panel, Angled, Empty	ZS-PNLA-24E			26					0	26
Panel	Angled panel cover, black	PNLA-CVR-01			4					0	4
	Cat6A, Shielded, Z-MAX 6A, RJ45-RJ45, LSOH, T568A/B, White, Stranded, 01M	ZM6A-S01M-02		104	104					0	208
	Cat6A, Shielded, Z-MAX 6A, RJ45-RJ45, LSOH, T568A/B, White, Stranded, 02M	ZM6A-S02M-02		104	104	12				0	232
	Cat6A, Shielded, Z-MAX 6A, RJ45-RJ45, LSOH, T568A/B, White, Stranded, 03M	ZM6A-S03M-02	8	104	104	12	8			0	320
	Cat6A, Shielded, Z-MAX 6A, RJ45-RJ45, LSOH, T568A/B, White, Stranded, 05M	ZM6A-S05M-02	8				8			0	88
	Cat6A, Shielded, Z-MAX 6A, RJ45-RJ45, LSOH, T568A/B, White, Stranded, 07M	ZM6A-S07M-02	8				8			0	88
	RACK MOUNT FIBER PANEL FOR 4 ADAPTER PLATES,1RMS	PPM-SPNL4-01	1	9		2	1			0	24
	PNL ASSY, FILLER 96 STR 1U FIBER ENC	PPM-BLNK		6	8					0	14
	PLG&PLY,MODULE,12-PRT,LC,OM4,50-125 10G-MM,BLK	PPM-12-LC5V-01	4			4	4			0	52
	PLG&PLY,MODULE,24-PRT,LC,OM4,50-125 10G-MM,BLK	PPM-24-LC5V-01		26	52					0	78
	PLG&PLY,MODULE,24-PRT,LC,SM,BLK	PPM-24-LCSM-01		4	8					0	12
	PLG&PLY,MODULE,12-PRT,LC,OM4,50-125 10G-MM,BLK	PPM-12-LCSM-01				4				0	8
	DRAWER ASSY, 96 STRAND,1U FIBER ENCLOSURE	FCP3-DWR-4A			16					0	16
	BladePatch, LC - LC, Duplex, OM4, LSOH, 2m	FBP-LCLC5V-02AH		156	156	12				0	336
	BladePatch, LC - LC, Duplex, OM4, LSOH, 3m	FBP-LCLC5V-03AH	8	156	156	12	8			0	424
	BladePatch, LC - LC, Duplex, OM4, LSOH, 5m	FBP-LCLC5V-05AH	8				8			0	88
	BladePatch, LC - LC, Duplex, OM4, LSOH, 7m	FBP-LCLC5V-07AH	8				8			0	88
	BladePatch, LCU - LCU, Duplex, Single Mode OS1/OS2, LSOH, 2m	FBP-LCULCU-02H		24	24	12				0	72
	BladePatch, LCU - LCU, Duplex, Single Mode OS1/OS2, LSOH, 3m	FBP-LCULCU-03H		24	24	12				0	72
Cabinet										0	0
	RS Aluminium extra-deep cable management rack system, 45U	RS-07E			2					0	2
	RouteIT Double-Sided vertical cable manager 10" Width	VCM-10D			3					0	3
	Vertical Dividers for RouteIT Double-sided vertical cable managers 10" Width (set c	VCM-10D-RB			1					0	1
	Cable Tray Rack, Black #12-24 4U	CTR-04-01	1				1			0	11
	Ladder Rack Mounting Kit for Cable Tray Rack	CTR-LRK	1				1			0	11
	RouteIT 19 in. Horizontal Cable Manager w/6 in. Fingers, 1U	HCM-6-1U			2					0	2
	RouteIT 19 in. Horizontal Cable Manager w/6 in. Fingers, 4U	HCM-6-4U			4					0	4
	SnapFitTM Toolless Thermal Blanking Panel, 1U (box of 10)	PNL-TBLNK010-1S	2				2			0	22
Contain										0	0
	Roof Panels, 1200mm wide top frame panels, V600	VC-RPA-V6N-A12B						4		0	4
	Door, 45U, window, no lock, Double self closing	VC-DRA-DSN-AB						1		0	1
	End panel, 45U	VC-EPA-A12B						1		0	1
	Riser Brackets V600,3U	VC-RB-V6N-AB								0	0
PDU										0	0
	PDU,BASIC,VERT,IEC 60309,C13 (24) + C19 (6),230V/32A	8BV22-BA24E-K1A			2					0	2

Why Siemon?

- Our **global footprint...**allows us to seamlessly deliver to our multi-national 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
- Company stability and rich experience… privately held **since 1903**
- **Technology, Innovation and Quality – The legacy continues will continue for the next 100+ years**

▪ A Trusted Data Center Leader ▪ Rich History of Innovation ▪ Committed to Industry Leadership ▪ Global Manufacturing, Installation & Logistics





Please visit/meet us at our booth for further discussions.