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#SupermicroSummit

What's Ahead for This Afternoon?

Agenda	Time
Supermicro Welcome and Opening Remarks	1:00--1:15
Opening Keynote: A Report from Tomorrow from Tony Scott, America's CIO	1:15--2:00
One–on–OneInterview with Supermicro President and CEO, Charles Liang	2:00--2:30
Key Note: Disaggregated Computing Powers One of the World's Most Efficient Data Centers, Shesha Krishnapura, Intel Fellow CTO of Intel IT	2:30--3:15
Supermicro Product Showcase	3:15--3:35
Networking & Refreshment Break	3:35--3:45
One–on–OneInterview: The Wall Street Perspective: Morgan Stanley's Sudhir Kalra, Global Head of Enterprise Datacenters	3:45--4:10
Panel: Starting Today, What Enterprises Need to Do Right Now to Prepare Their Data Centers for the Future	4:10--4:55
Closing Remarks	4:55--5:00
Networking Happy Hour and Product Showcase	5:00--6:00

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Some Important Details

Wifi:

Gallery network: Gallery Events
Pw: Dream2017#

Penthouse network: PHD Events
Pw: Dream2017#

Materials:

Agenda | Speakers | Visit www.supermicro.com/DCIS

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#SupermicroSummit

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KNOWLEDGE GROUP

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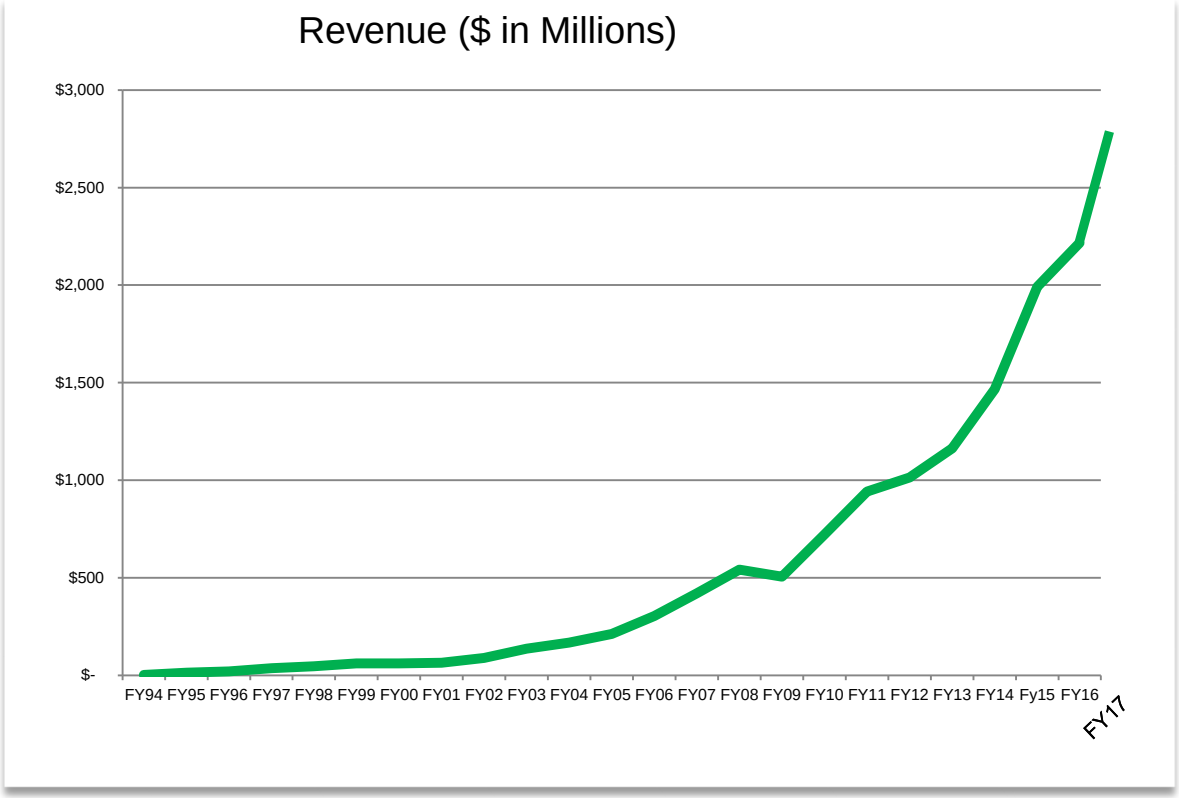
intel®

Supermicro Welcome and Opening Remarks

Michael McNerney
Vice President Software Solutions and Network Security
Supermicro

Supermicro

24 years of Non-stop Revenue Growth



REVENUE

~ $3B Run rate

25%+ Growth 3 Quarters Running

R&D

Doubled in last 4 years

GLOBAL MANUFACUTING AND SUPPORT PRESENCE

Headquarters – **Silicon Valley**

EMEA – Netherlands

APAC – Taiwan

5X Capacity Growth in the last 7 years

Tier 1 Datacenter Infrastructure

Enterprise

IoT

Hyper-Converged

Cloud Service Provider

Supermicro X11 Portfolio of Servers and Storage Systems

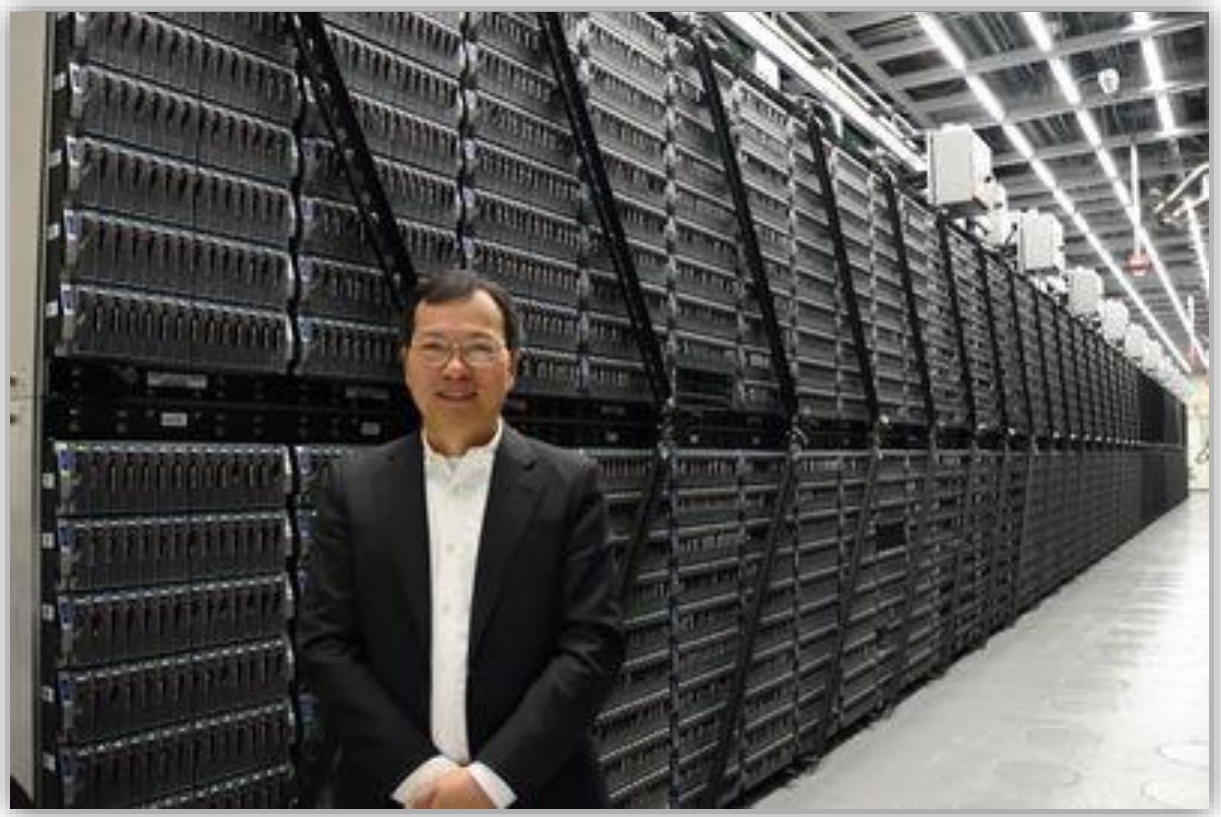
Worldwide Production

- **1.2M** Server / Storage and Sub-systems shipped in 2017
- **10%** approximate market share by volume
- **8** Production factories worldwide
- **3M** units per year in the mid-term
- Plug and Play complete rack solutions

Charles Liang

Founder & CEO

Supermicro



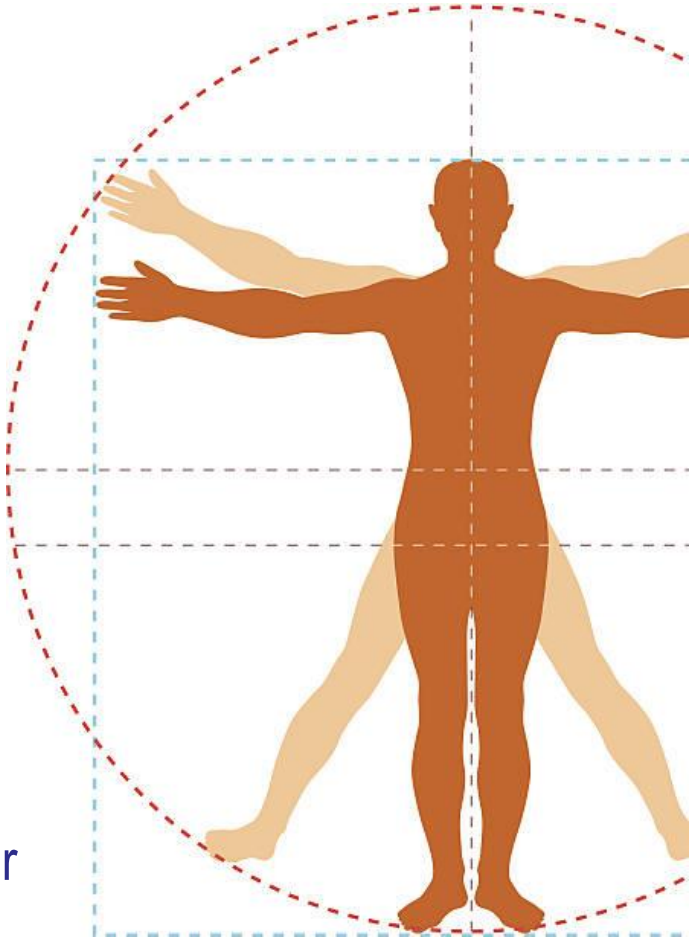
“Software, Social Networking, Big Data, Deep Learning AI and FSI are the core values of today’s Information industry.”

“Every software deserves the best hardware. Indeed, having the best-in-class hardware system is one of the keys to make any business successful.“

Supermicro is the BEST hardware solutions company

“Exactly the Best” Hardware Solutions

- **The New Technology Pioneer**
  - CPU, GPU, U.2 NVMe, Ruler and M.3, Twin, RSD
- **Green Computing Design**
  - Less Power Consumption ~ up to 25% Power Savings
  - Free Air Cooling for PUE ~ 1.05 or Even Better
  - Disaggregated Architecture for Resource Savings
- **Highest Bandwidth**
  - 25G, 100G, 200G, 400G, PCI-E x16/x32, PCI-E Gen 4…
- **Lowest Latency Solutions**
  - SSD for 50µs, NVMe for 10µs, Optane for sub 10µs and Apache Pass for 100ns.



Strong Body (Hardware) Supports Powerful Mind (Software)

BigTwin™

- **2U high density system with 4 high performance hot-swappable DP nodes**
- Each node (0.5/1 U) supports dual processors up to 165/205W and **1.5/3TB memory in 24 DIMMs**
- Up to **6 hot-swap, all-flash NVMe per node** or SAS3 Hybrid / SATA3 drive bays for application flexibility.
- **3 PCI-E 3.0** x16 I/O
- Unique redundant 2600W Titanium **power stick** design improves thermal efficiency – Free air cooling up to **42ºC**

Ultra Server/Storage

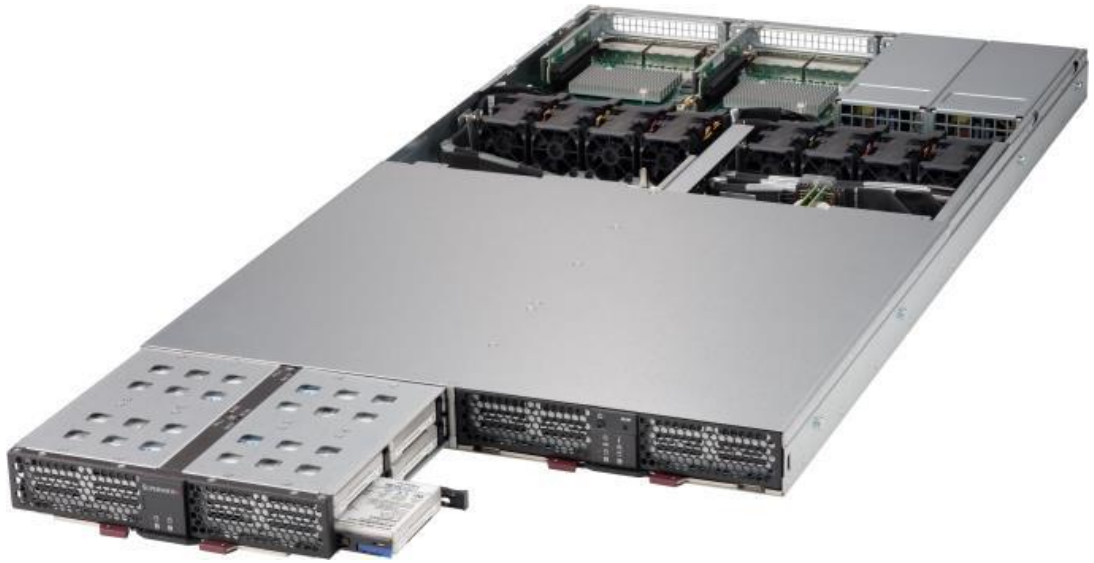
- **2U Ultra** with **20 direct attached** NVMe SSDs over 80 PCIe lanes - achieves up to **18 million IOPS**
- **New Version to support up to 23 million IOPS is coming soon**
- **1U Ultra** with **20 directly attached 7mm** NVMe drives - achieves up to **9 million IOPS**
- Supports the latest Intel® Xeon® Scalable processors at the 205W and **Free Air Cooling of up to 40-45ºC (113ºF)**

Ultra-Dense SuperStorage Solutions

- **Mainstream 60 bay top-load storage or short depth 45 bay and extreme density 90 bay**
- Doubling capacity with the **Simply Double** storage architecture
- **All-Flash NVMe** delivering up to **18M IOPS** of pure performance
- Delivers more than **10PB storage in one standard 42U** data center rack

JBOF and Server with U.2 or Rulers NVMe Solutions

U.2 JBOF / DP System



Ruler JBOF / DP System

- 1U **32X U.2 or Ruler** JBOF (Just a Bunch of Flash) or DP Xeon System
- Support 2 X16 PCI-E IO slots and Redundant Power.
- **Support 32 x 16TB = 0.5 PB NVMe in 1U Storage Server**
- **Support 32 x 32 TB = 1 PB NVMe in 1U Next Year**
- Expanding Product Line

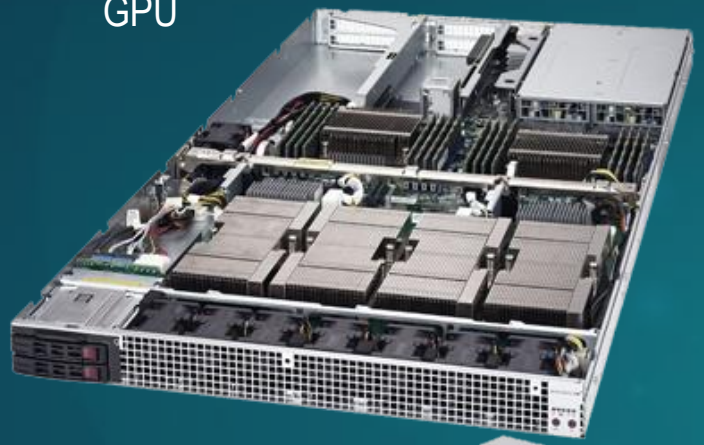
SuperBlade/MicroBlade

- **Lower Initial Acquisition Cost and a low Total Cost of Ownership(TCO)**
- **8U, 6U, 4U and 3U** form factors and open design with Redfish and STD IPMI - No vendor lockdown
- Available in UP, DP (2-socket half-height) and 4-socket full-height. Fabric choices include **100G EDR InfiniBand,100G Intel Omni-Path** or 25Gb/s Ethernet
- Unique optional **Battery Backup Power** Module to eliminate traditional UPS system
- Up to 95% Fewer Cable Savings

Deep Learning

Best–In-Class Design to Scale Deep Learning Models Towards Exaflop Computation

GPU



Knights Landing
Knights Mill
Nervana

Rack Scale Strategy

- **Future-Proofs Composable Computing Investment**
  - Leverage Supermicro System Building Blocks
  - Supports Current and Future Generation Technologies
- **Maximizes Resource Utilization**
  - Resource Pooling and just-in-time Allocation
- **Factors Hardware Design Dependencies**
  - Power and Thermal Zones
  - Node Location Schema
- **Abstracts the Management to Rack Level**
  - Unifies Management Experience
  - Industry Standard Redfish RESTful APIs

Supermicro 3.0

A Billion Dollar Investment Bringing Cloud Scale To The Enterprise

World's Broadest Portfolio

Workload Optimized, First To Market Innovation

Worldwide Expansion

Doubled In-House Engineering & Tripled Manufacturing Capacity in 4 years

Global Operation, Service and Support

70+ Countries

RANK 2016	Company
1	**NATURAL HEALTH TRENDS** *(Rolling Hills, CA)*
2	**VIPHOP HOLDINGS** *(Guangzhou)*
3	**FACEBOOK** *(Menlo Park, CA)*
4	**INSYS THERAPEUTICS** *(Chandler, Ariz)*
5	**DOUGLAS DYNAMICS** *((Milwaukee)*
6	**LIGAND PHARMACEUTICALS** *(San Diego)*
7	**SKECHERS U.S.A** *((Manhattan Beach, CA)*
8	**ABIOMED** *((Danvers, Mass)*
9	**AMBARELLA** *(Santa Clara, CA)*
10	**LENDINGTREE** *(Charlotte)*
11	**TAL EDUCATION GROUP** *(Bejing)*
12	**NOA HOLDINGS** *(Shanghai)*
13	**AERCAP HOLDINGS** *(Dublin)*
14	**FEDERATED NATIONAL HOLDINGS** *(Sunrise, FL)*
15	**SKYWORKS SOLUTIONS** *(Woburn Mass)*
16	**JINKOSOLAR HOLDING** *(Shangrao, China*
17	**GILEAD SCIENCES** *(Foster City, CA)*
18	**SUPERMICRO** *(San Jose)*
19	**BEAR STATE FINANCIAL** *(Little Rock)*
20	**NETFLIX** *(Los Gatos)*

SUPERMICRO®

#18

On Fortune's Top 100

Fastest Growing Companies Worldwide

RANK 2016	2015	Company
#18	98	**SUPERMICRO** *San Jose*

18th fastest growing Company among the world's largest US publicly traded companies

#1 fastest growing IT Infrastructure company

Fortune's Fastest Growing 100 Companies for the second year in a row

Opening Keynote: A Report from Tomorrow

Tony Scott
Former Federal CIO
U.S. Government

Tony Scott

Federal CIO US Government (2015-2017)

CIO VMware (2013-2015)

CIO Microsoft (2008 – 2013)

CIO The Walt Disney Company (2005-2008)

CTO General Motors (2005-2009)

A Report from Tomorrow

How Changes in Technology and other Trends are Impacting our Future

My Journey….

GM

The
Walt Disney
Company

Microsoft

vmware®

THE WHITE HOUSE
WASHINGTON

Just a little trip down an information systems memory lane….

IBM
SYSTEM 360

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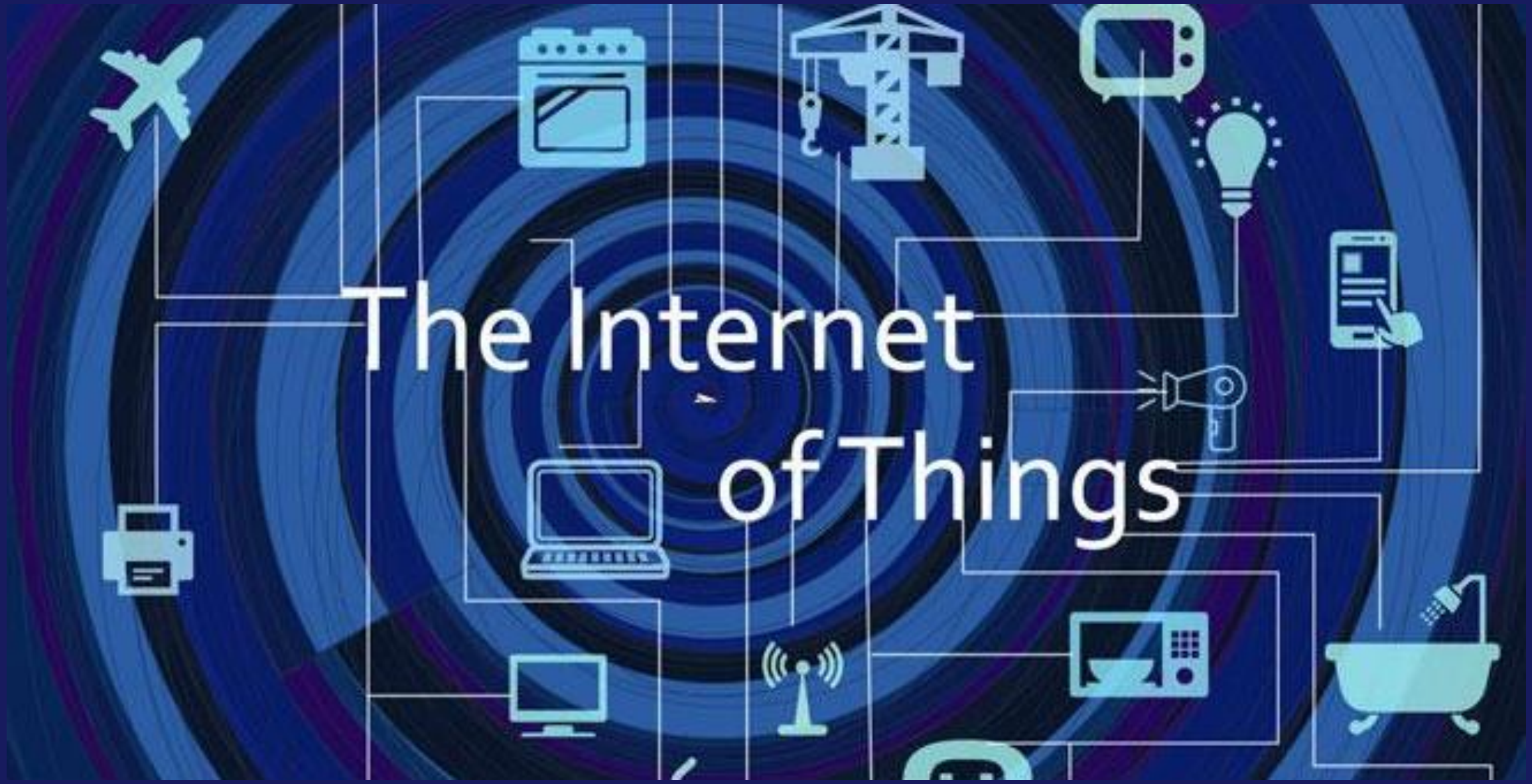
Questa è la tastiera di Apple.
Cerca il tasto RETURN sulla
tastiera e premilo.
(Puoi usare il tasto ESC se hai
già usato questo programma prima.)
disk II
disk II

IBM

10:10 AM
Wed, July 20
99°F
Dallas
Clear
Allison Ruth Kirk
Happy Birthday!
AP
Travel Company
NOKIA
Nokia Music
Nokia City Lens
Redmond, WA
SAMSUNG
10:37 PM
Sun. 01/15
Google
BlackBerry
BlackBerry World
Browser
ThinkPad
Justin


The Internet
of Things

Technology on the Move

Chips:

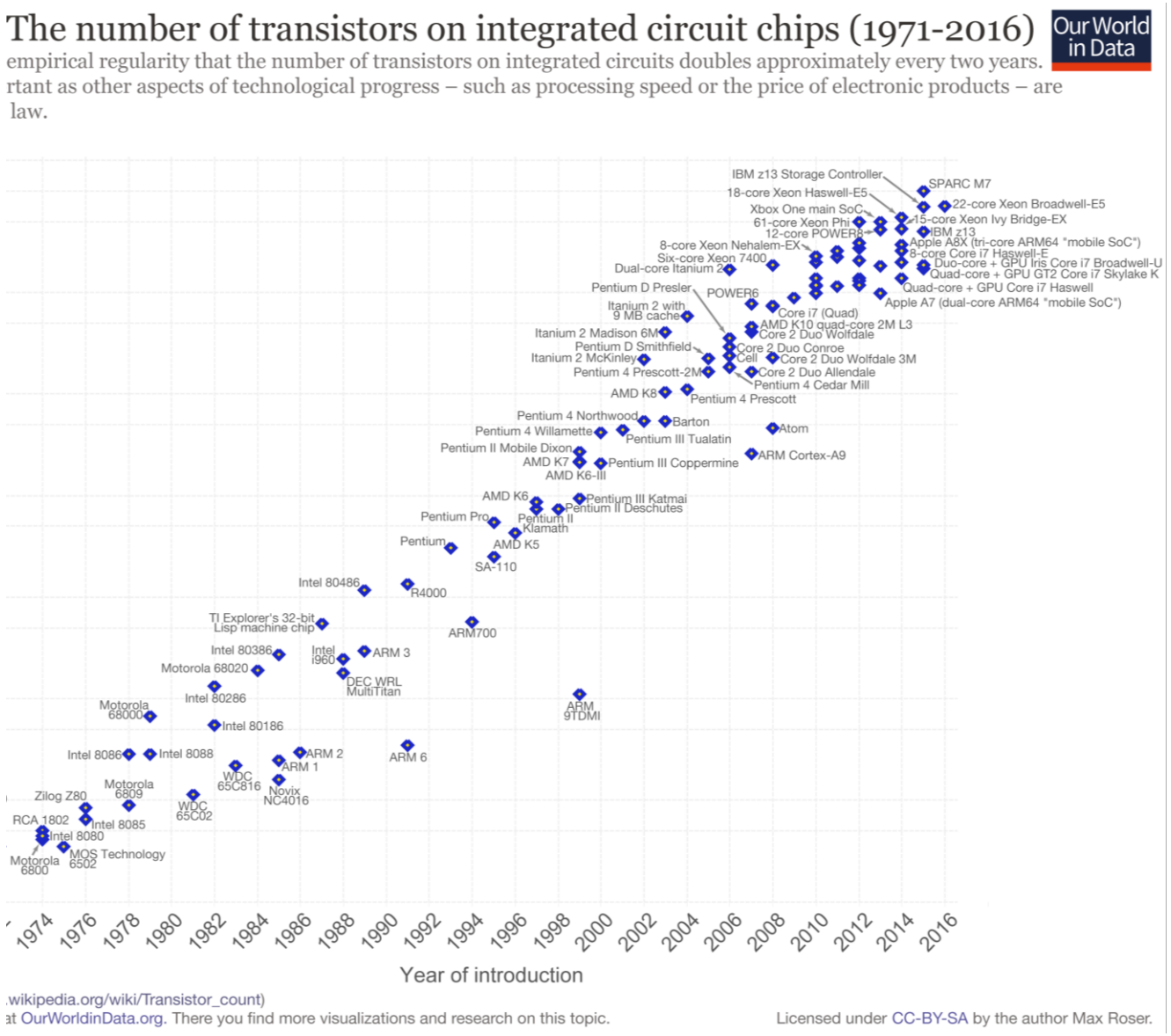
- 10 NM Technology
- FPGA's
- Graphics Processors

Storage:

- 3D NAND
- NVMe
- HAMR

Network:

- 5G
- SDN
- Network Function Virtualization



Transformative Influences

- Cybersecurity & Privacy Driven Architecture
- Blockchain Technology
- Maturing of the Cloud (IaaS, PaaS, etc.)
- Machine Learning / AI
- 5G Wireless Networks

Implications – Cybersecurity & Privacy

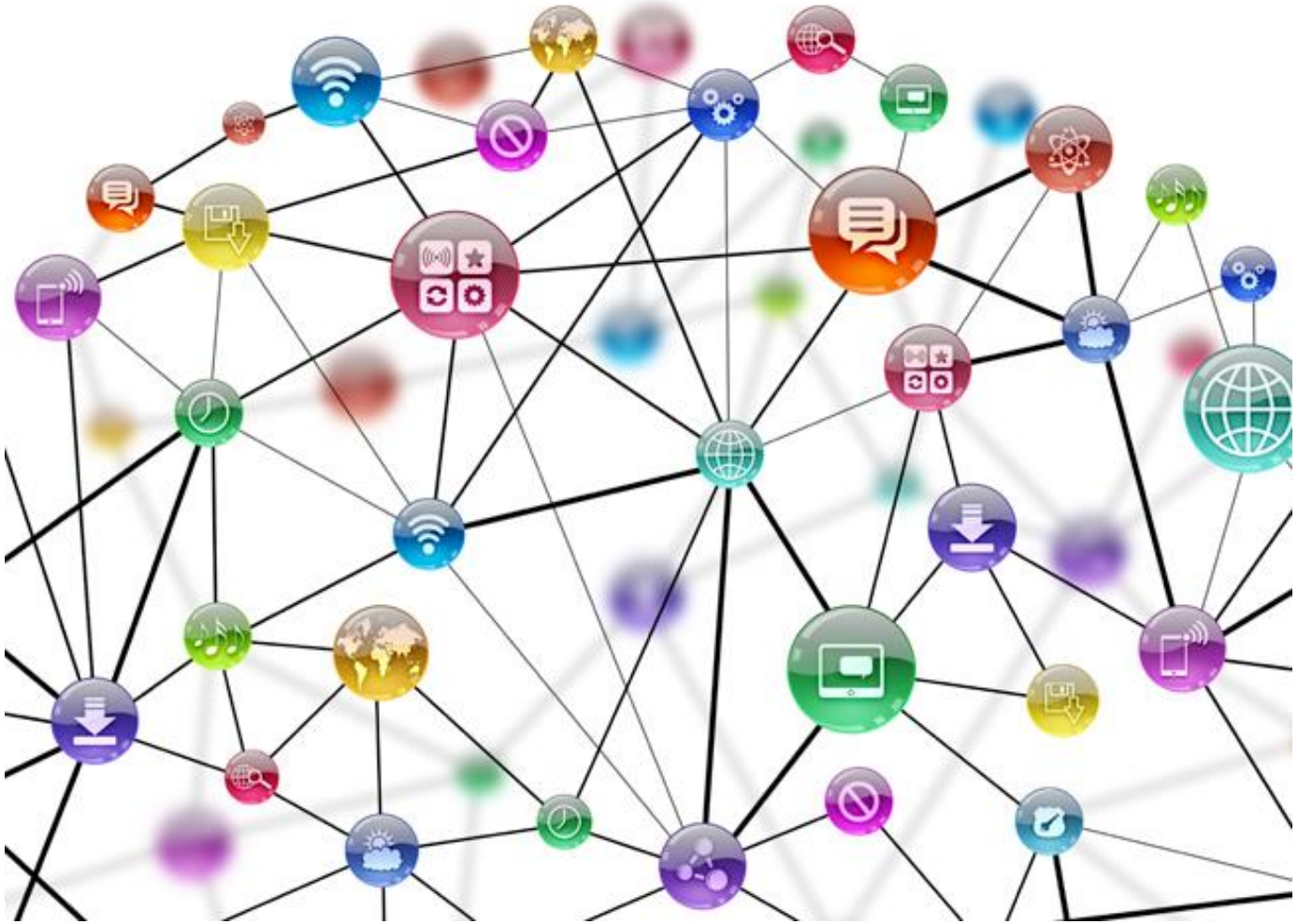
- Cybersecurity Driven Architectural Transformation
- Security after the fact, vs. Secure by Design
- Enterprise trustworthiness as a core Consumer/ Citizen Issue
- Redefinition of “Privacy” to meet modern reality
- Citizens / Customer Digital “rights” and data ownership

Security After the Fact, or Security by Design?

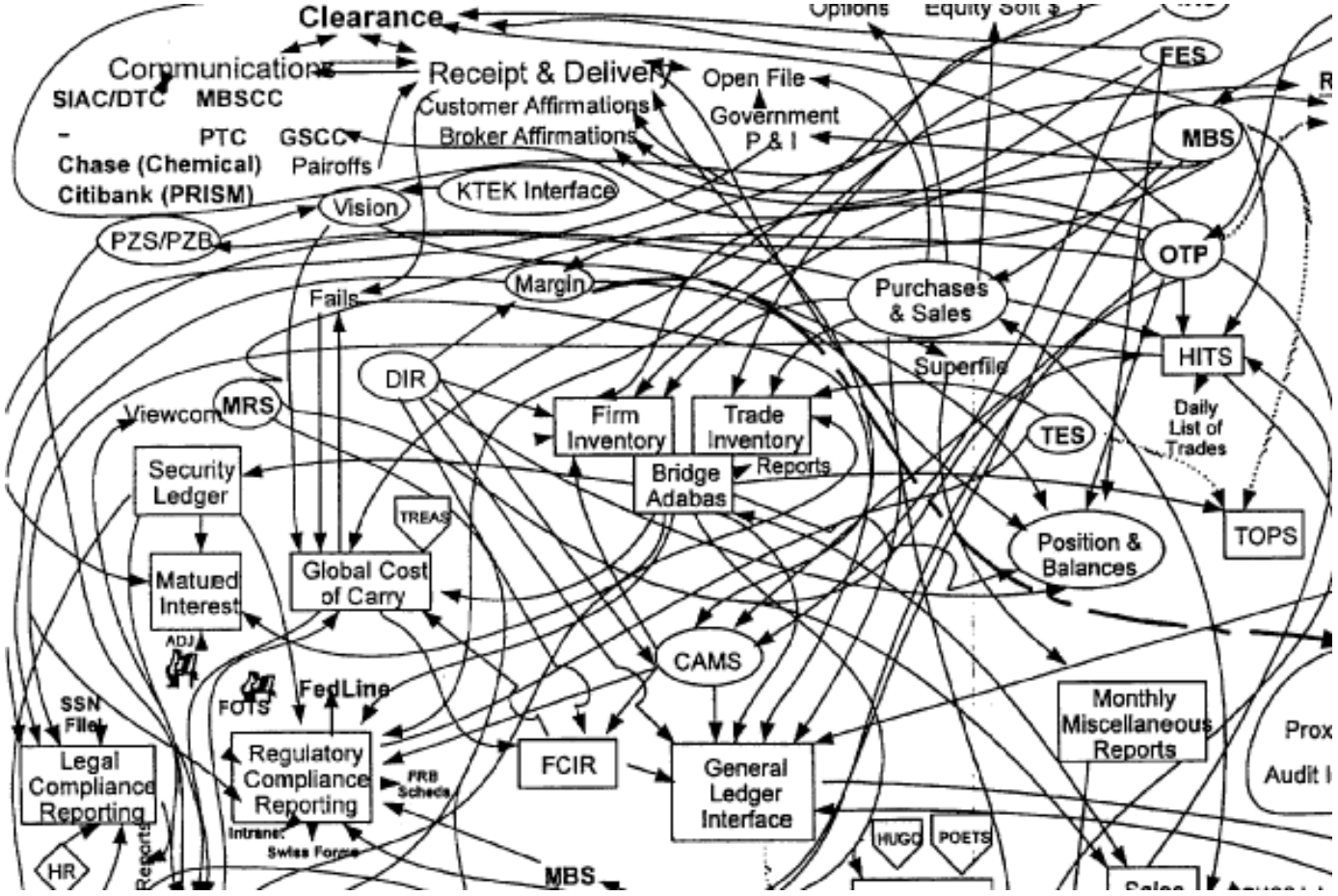
1965 Mustang

2017 Mustang

Historical Focus on Interoperability and Interfaces



Cybersecurity is missing in the Design



Bubble Wrap and Duct Tape....

Secure By Design

Implications – Blockchain Technology

Reduction in Importance of the Vast Middle (brokers, distributors, etc.)

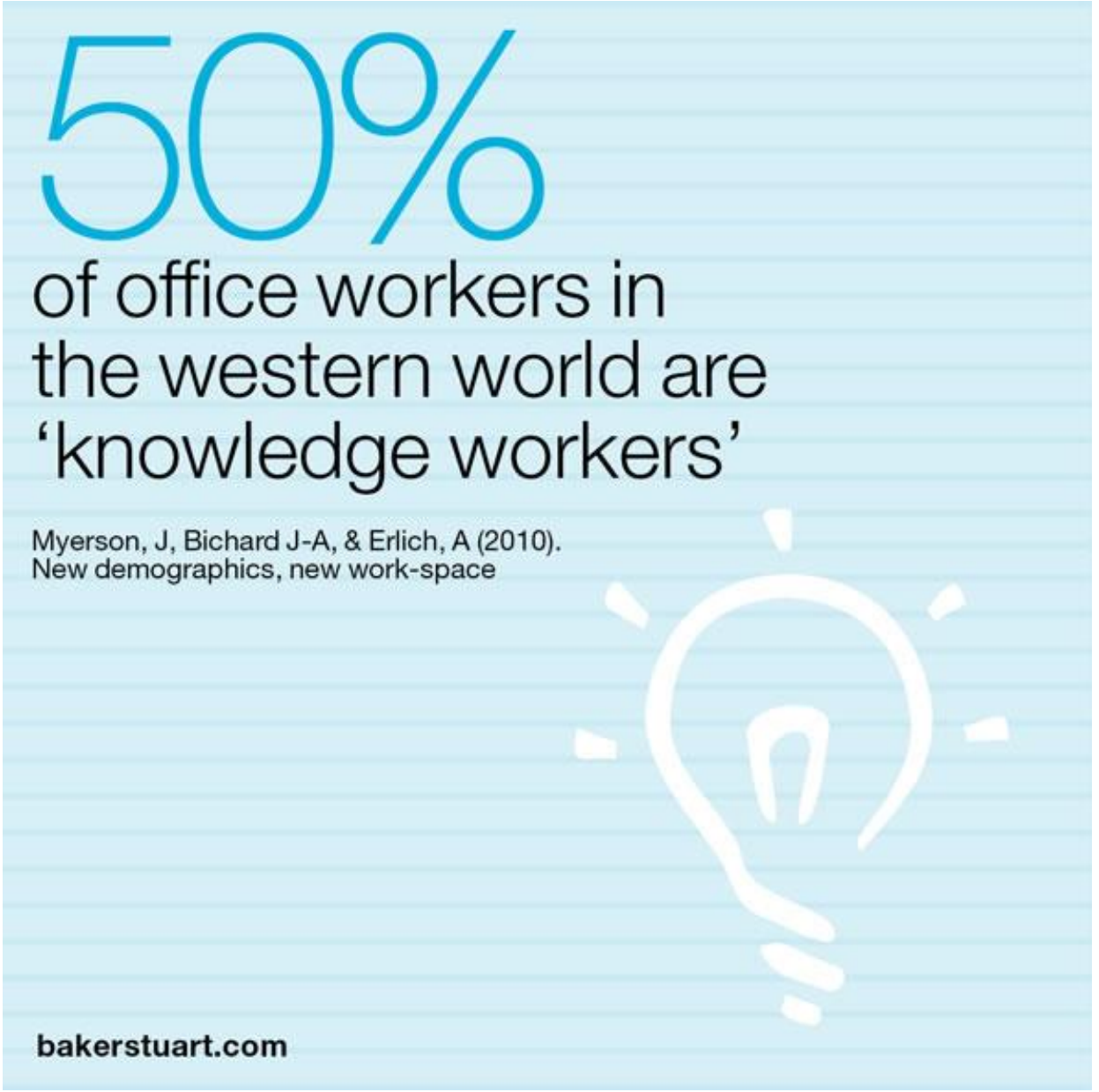
Change in Economic Efficiency (particularly in the developing world)

Rise in de-centralized informally coordinated business networks

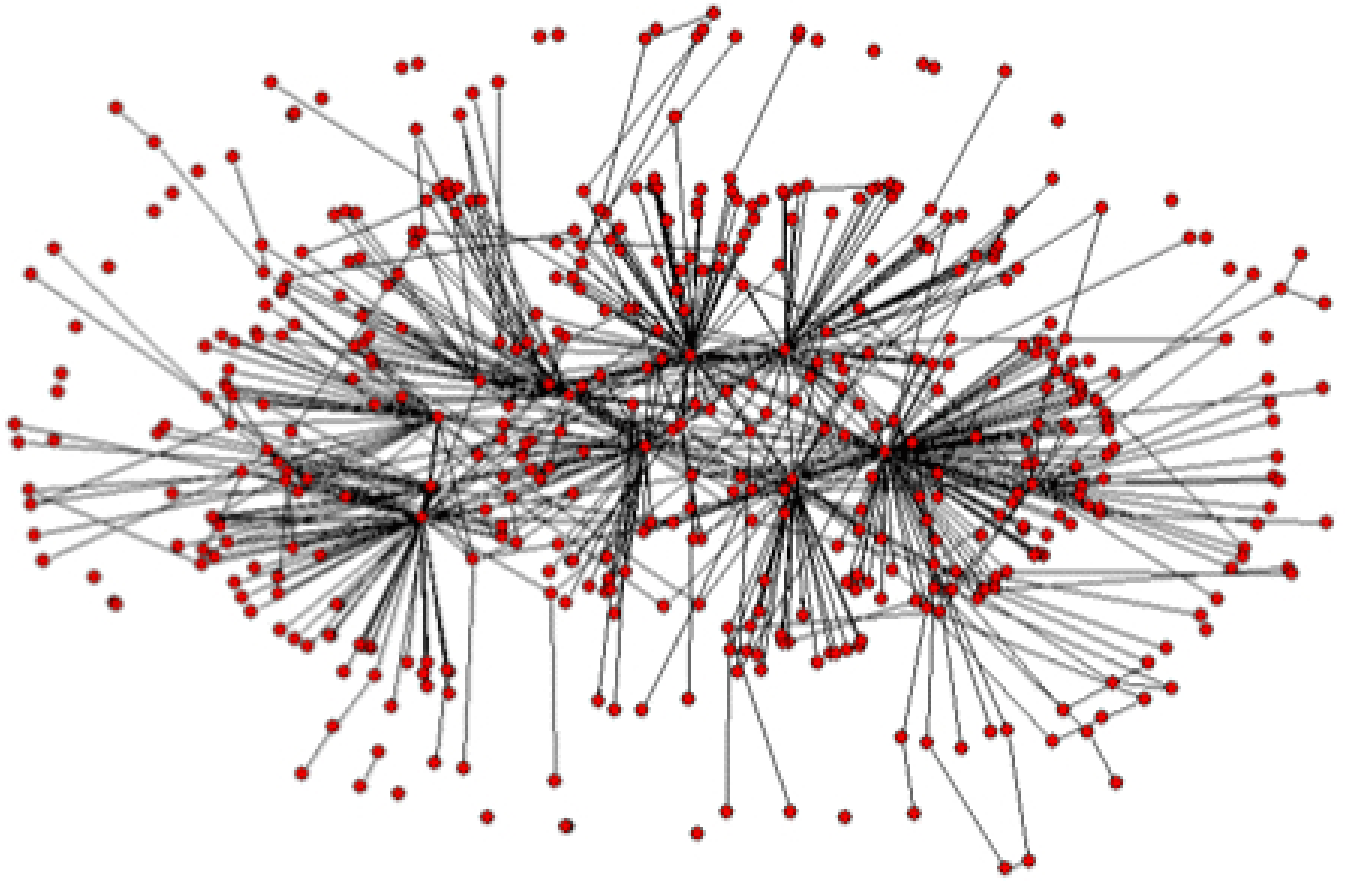
Decentralized Secure Identity Management

Blockchain Technology

Transformation in the Vast Middle



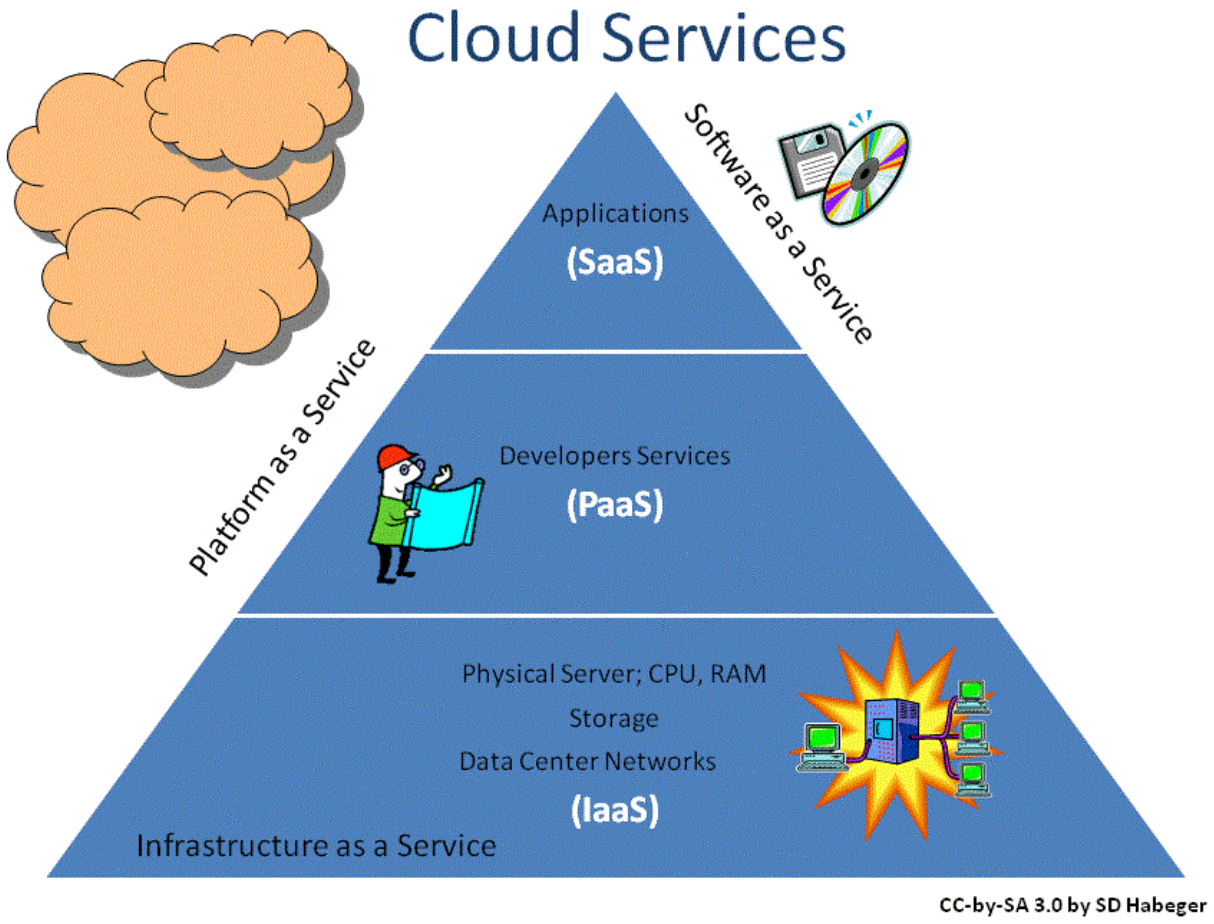
Decentralized Business Networks



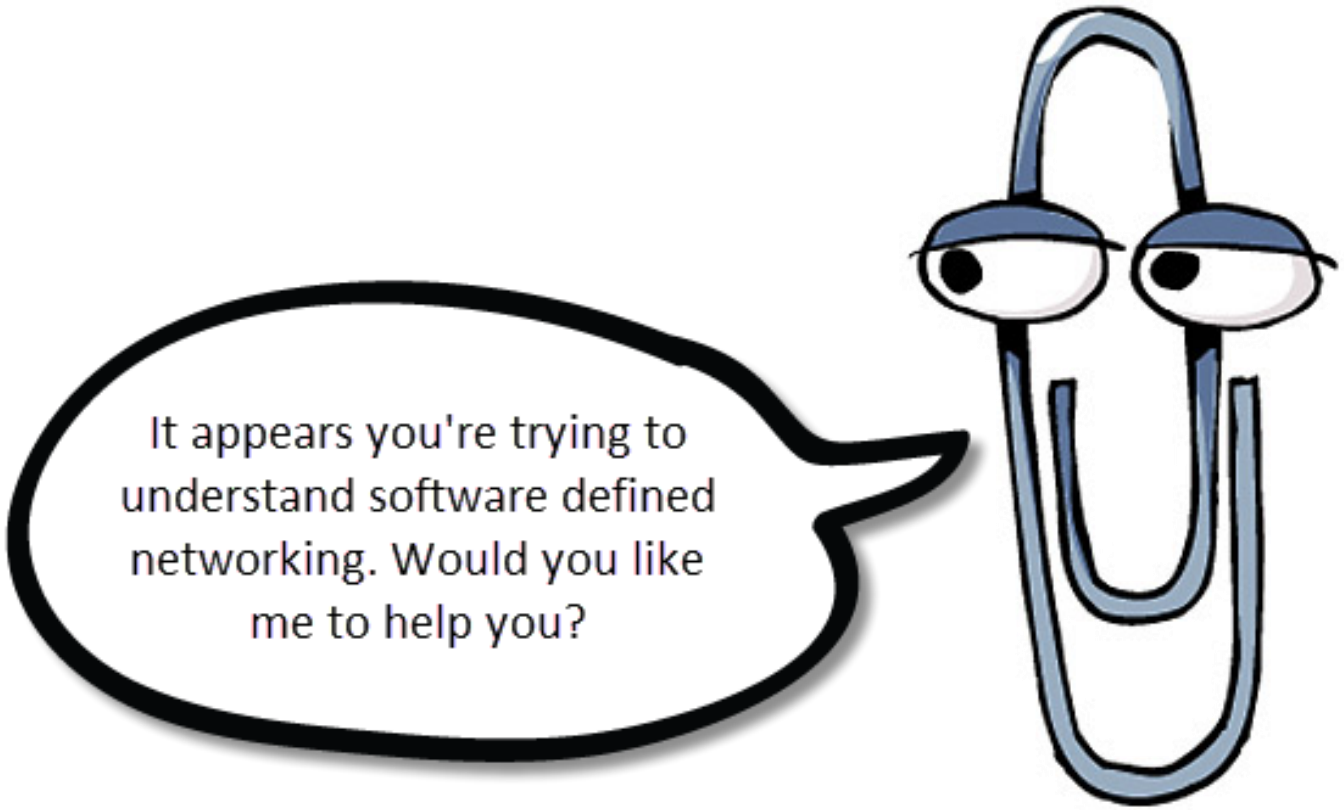
Implications – Maturing Cloud

- Assemble to Order Solutions
- Low Code / No Code Approaches
- Time to Market is the Major Driver
- Network Cost and Speed is biggest unsolved Issue (especially for big data driven orgs)
- Software Defined Everything (Compute, storage, network, security, etc.)
- Video and Audio are the new Interface

Maturing Cloud Computing



Software Defined Everything



Implications – Machine Learning & AI

- Will be a de facto part of every consumer interaction
- Will drive sharp changes in Human Capital in the Enterprise
- Training data and models – new & emerging Digital Supply Chain Opportunity
- Different Technology approaches by the Big Four (Google, Microsoft, Amazon, IBM)

Machine Learning

Stanislov Petrov

Implications – 5G Wireless Networks

$12 trillion market value

Key enabler for IOT generally

VR and AR become mainstream

Healthcare is biggest opportunity

5G Networks

Feature of
Wireless Technology
Better Coverage
Consume Law Battery
Cheap Rates
5G
upto 40 MHz
Strong Bandwith
Multi User MIMO
Radio Telephone
1G
Analog Telelphone
2G
SMS Service
3G
Video Call
4G
LTE High Speed

Final Thoughts

- Leadership will have to understand the strategic choices presented by technology
- Recentralization of IT Function Likely
  - CIO Role → Chief Digital Officer
  - CISO → Chief Risk Officer
- Technology risk and opportunity is Board Level discussion
- Increased Regulation is an almost certainty
- War for Talent will continue to intensify

Thank You!

tony.scott@tonyscottgroup.com

One–on–One Interview with Supermicro President and CEO, Charles Liang

Charles Liang
President & CEO
Supermicro

Michael McNerney
Vice President Software Solutions and Network Security
Supermicro

Interviewer:
Andrew Nusca
Digital Editor
FORTUNE

Key Note: Disaggregated Computing Powers One of the World's Most Efficient Data Centers

Shesha Krishnapura
Intel Fellow
CTO of Intel IT

Supermicro Product Showcase

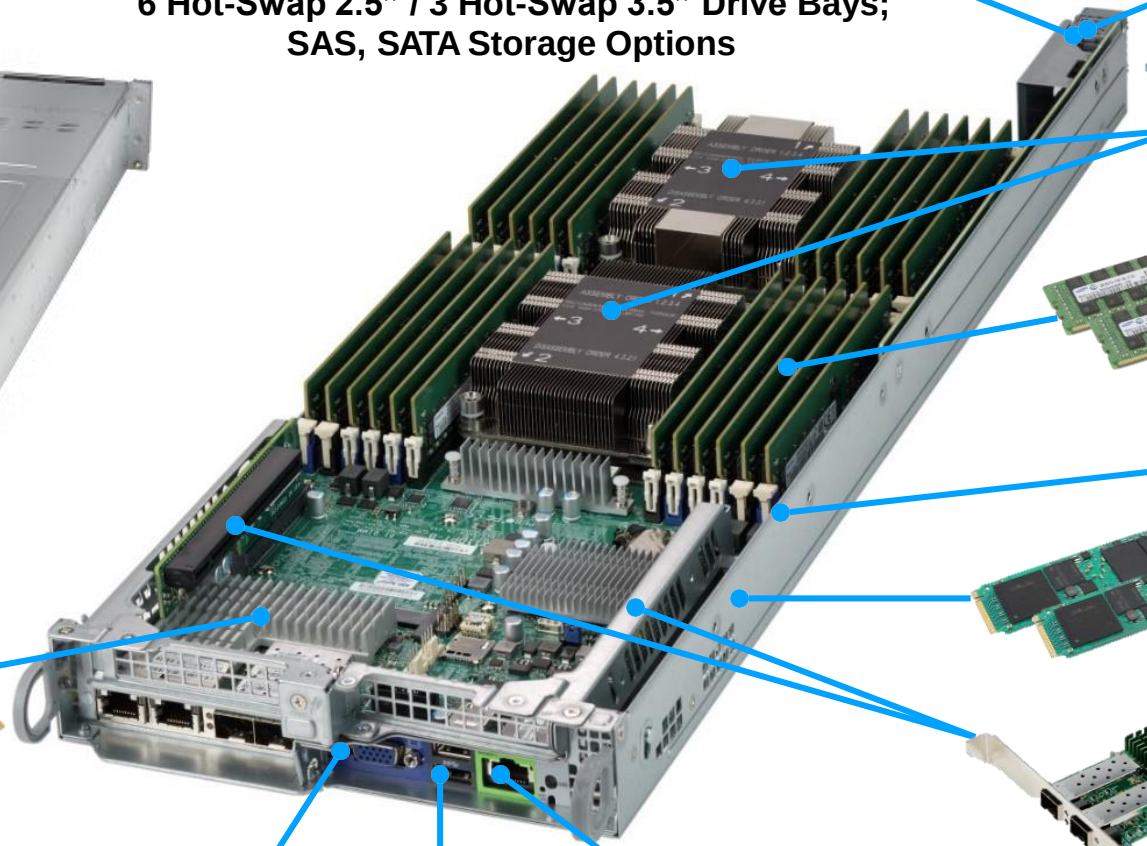
Don Clegg
Vice President of Marketing and Business Development, Supermicro

and

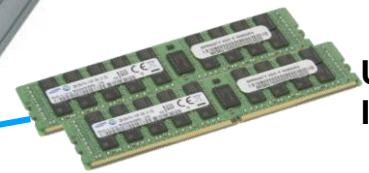
Supermicro Product Team

2U BigTwin² Single Node Features

6 Hot-Swap 2.5” / 3 Hot-Swap 3.5” Drive Bays;
SAS, SATA Storage Options



Up to 56 cores with
Dual Intel Xeon
Scalable
Processors Up to 165W



Up to 3TB DDR4-2666
In 24 DIMM Slots

SuperDOM port

2 SATA/NVMe M.2
Slots
(Optional via AOC-SMG3-2H8M2-B)

SIOM Slot
For Flexible Networking
Options;
1G, 10G, 25G, 50G, 100G

VGA Port

2 USB 3.0

Dedicated LAN Port
For Management

2 Low Profile
PCI-E 3.0 x16
Expansion
Slots

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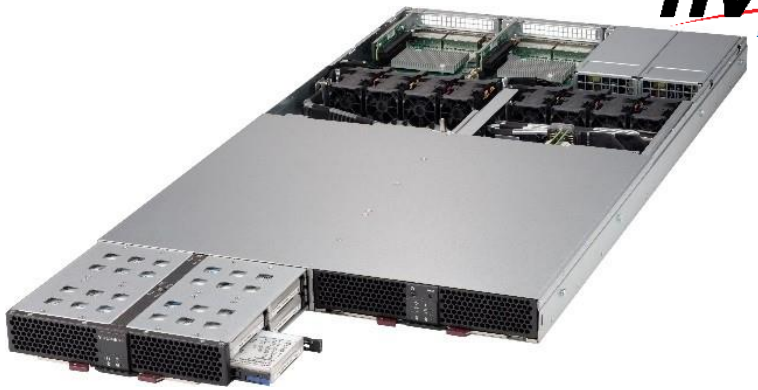
JBOF

1U 32-bay NVMe Storage Enclosure

SSG136R-N32JBF



- 1U Extremely High Density High Capacity NVMe Storage Enclosure
- Supports 32 NVMe Hot-swappable SSDs
- BMC for Remote System Power on/off and system monitoring
- Tool-less SSD tray
- Flexible to configure up to 12 Hosts
- Individual HDD power cycling
- PCIe External Cable Spec 0.7 compliant
- Slide Rail included

CHASSIS DIMENSIONS:

H 1.71" x **W** 17.26" x **D** 31.95" (43.6 x 438.4 x 811.7mm)

DRIVE BAYS:

32 x 2.5" NVMe Hot–swap SSDs

(2 sleds with 16 drives per sled)

HOST SCALEABILITY:

Supports up to 12 host systems with X16 AOCs

I/O:

4x X16 Mini–SAS HD ports , 2x X16 PCIe Slots, 2x IPMI ports, 1x UID button, 1x Reset button

POWER SUPPLIES:

2x 1000W (N+1) 96% efficient Digital Titanium Level Redundant Power Supplies

COOLING:

8 x 40mm high speed Hot--swappable Fans

APPLICATIONS

- High Throughput Ingest
- High Density Hot Storage
- HPC / Data Analytics
- Media/Video Streaming
- Content Delivery Network (CDN)
- Big Data Top of Rack Storage

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SuperStorage

Capacity Maximized Top-loading Storage

- **Flexible Design**: Supporting up to 6 NVMe SSDs, 24 DIMMs, high performance CPU and wide range networking choices with SIOM cards
- **Simplified Deployment**: Short depth, easy to deploy 45 Bay, mainstay 60 bay and extreme density 90 bay
- **Capacity Maximized:** Delivers more than 10PB storage in one standard 42U data center rack

-6x optional 2.5" NVME bays
-IT mode (L) / HW RAID (H)
-24x DIMM Slots (DDR4)
-Front 3.5" LCD display

45-Bay X11 Server

25.9"

60-Bay X11 Server

30.2"

90-Bay X10 Server

38.2"

Sample use cases:

- Ceph and Swift object storage, backups, archival and cold storage, etc

Open management based on industry standard:

- Redfish API, IPMI 2.0, Supermicro RSD

NVMe
SSD
HDD

©2017 Supermicro®

SuperStorage

SSG-6049P-E1CR45 H/L

Processor Support
Dual Intel Xeon Skylake (Socket P)

CHIPSET
Intel® C620 chipset

MEMORY
24 DIMM, Up to 3TB ECC 3DS LRDIMM, 768GB ECC RDIMM

Available for EXPANSION
2x PCI-E 3.0 x16 & 1x PCI-E 3.0 x8

EXTERNAL I/O SUPPORT
SIOM support for flexible networking options; 2x USB 3.0 ports

DRIVE BAYS & STORAGE CONTROLLER
45x Hot-Swap 3.5” SAS3/SATA3 drive bays
Optional 2x Hot-Swap 2.5” Rear SATA3 drive bays
6X Optional NVMe bays
LSISAS3108 HW RAID (N-series) or 3008 IT mode (L-series)

POWER SUPPLY
Redundant Power, 80PLUS Titanium

Key Features:

- Dual Intel Xeon Scalable Processors (Socket P)
- CPU support 3 UPI up to 10.4GT/s
- 45x Hot-Swap 3.5” SAS3/SATA3 bays
- Optional 6x dedicated NVMe bays
- 24x DIMM Slots (DDR4)
- Front 3.5” LCD display
- SIOM for flexible networking options

Key Applications:

- Software Defined Storage Applications
- Backup , Archive and Cold storage
- Data Replication & Business Continuity
- Virtual Tape Library

NVMe
SSD
HDD

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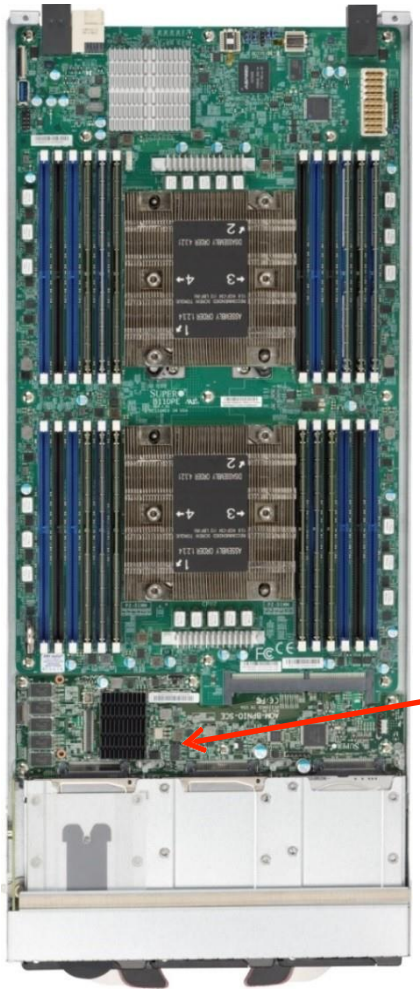
SuperBlade®

2/1-Socket Blade Servers (14/10 in 6U)

98 Servers/42U Rack, Maximum Performance

2S Blade Server

- 24 DDR4 DIMM slots
- 2x hot-plug NVMe/SAS3
- 3x hot-plug SAS3/SATA3
- 4x 25G/10G switches



Disaggregated Design

1S Blade Server

- 12 DDR4 DIMM slots
- 2x hot-plug NVMe/SAS3
- 3x hot-plug SAS3/SATA3
- 4x M.2 NVMe/SATA
- 4x 25G/10G switches

NVMe

SSD

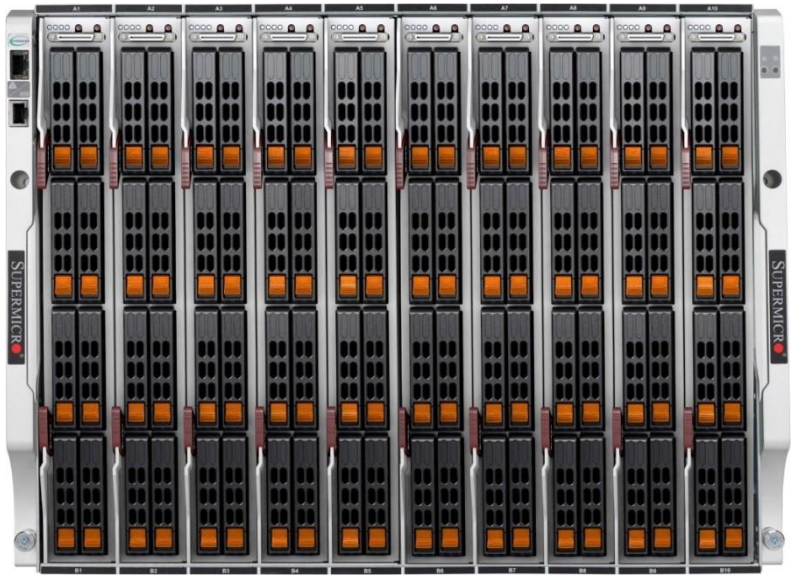
HDD

©2017 Supermicro®

SuperBlade®

4-Socket Blade Servers (10 in 8U)

50 Servers/42U Rack, Maximum Performance



- 48 DDR4 DIMM slots
- 8x hot-plug NVMe
- 4x hot-plug SAS3/SATA3
- 6x M.2 NVMe/SATA
- 4x 25G/10G Ethernet switches
- 100G EDR InfiniBand switch
- 100G Intel Omni-Path switch

NVMe

SSD

HDD

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#SupermicroSummit

Networking Refreshment Break

One–on–One Interview: The Wall Street Perspective

Sudhir Kalra
Global Head of Enterprise Datacenters
Morgan Stanley

Interviewer:
John Gallant
Editor
FORTUNE Knowledge Group

Panel: Starting Today, What Enterprises Need to Do Right Now to Prepare Their Data Centers for the Future

Sudhir Kalra
Global Head of Enterprise Datacenters
Morgan Stanley

Shesha Krishnapura
Intel Fellow
CTO of Intel IT

Vik Malyala
Vice President of FAE & Technical Marketing
Supermicro

Moderator:
Andrew Nusca
Digital Editor
FORTUNE

Networking Happy Hour and Supermicro Product Showcase