Supermicro evolutionary 4U twin architecture and PUE-optimized solutions“

Peter Maas
Application Engineer manager
Super Micro Computer B.V.

Agenda

SUPERMICRO®

Supermicro Company Profile
Supermicro's innovative platforms
Low power Atom Solution
MicroCloud Solutions
FatTwin solutions

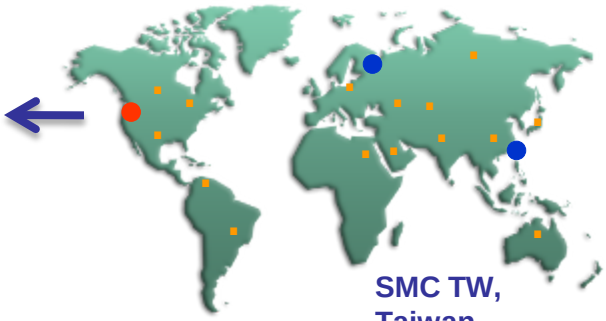
We Power the Cloud

Supermicro Overview

SUPERMICRO®

SMC Inc., HQ
San Jose, CA

SMC BV,
The Netherlands



SMC TW,
Taiwan

Founded in 1993, HQ– San Jose, CA / NASDAQ: SMCI

BladeSystems insight '10 AWARD WINNER for BEST Blade-Based Solution

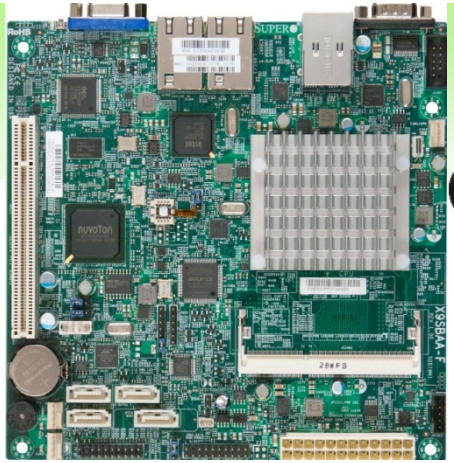
Revenues:	FY10 $721 MM → FY11 $942 MM → FY12 $1B
Global Footprint:	>70 Countries
Production:	US, EU and Asia Production facilities
Engineering:	70% of workforce in engineering (30% growth through recession)
Market Share:	#1 Server Channel (SMCI enables ~10% of global server market)
Brand Equity:	Growing public profile since 2007 IPO
Partners:	500+ Global System Integrator, VAR and Distributor Partners
Corporate Focus:	Energy Efficiency, Earth-friendly, Technology Innovation

SUPERMICRO®

Low Power Atom and Space-Saver Server

SuperServer® SYS-5017A-EF

Power and Space-saver Server



front view

rear view

KEY FEATURES

Processor
Intel Atom SoC S1260 CPU, 2C/4T, 32nm
(Centerton, 8.5W)

Chipset
N/A (System on Chip)

Memory
Up to 8GB DDR3-1333 ECC SO-DIMMs

Expansion
1x PCI 32-bit 3.3V on riser

External I/O
VGA, Serial, 2x GbE i350AM2, 2x USB 3.0

Storage
4 x SATA3, 6Gb/s ports
2x 3.5” fixed SATA3 w/ RAID options (opt 4x 2.5”)

Power Supply
200W Power Supply

Additional
Disk-on-Module (DOM) power connector
IPMI 2.0 on dedicated LAN port
Supports 2.5” HDD/SSD via optional bracket

- **Space-efficient, compact design 9.8” (249mm)**
- **Fast to build and deploy**
- **Great for gateway, file-serving, security**
- **Remote management, RAID options**
- **3 year limited warranty, 24 hour support hotline**

5017A-EF Drive Options

Up to 2x 3.5”

RAID options

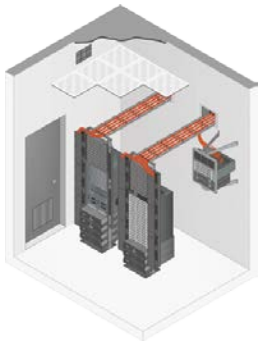
Up to 4x 2.5”

MCP-220-00044-0N

MCP-220-00051-0N

1. Up to 4 drives
2. Use bracket for 2.5”
3. RAID 0, 1, 5, 10

Where do these servers fit?



School

Office

Net/Security Closet

- Network/security closet
- Home, office, other building or facility
- Anywhere you need a compact server function

5017A-EF Selling Points

- **Leveraging the Mobile ECC Promotion**
  - Atom ECC is part of Intel's high profile launch
  - SMC is leader in servers, so this is an emerging opportunity
- **Entry level SMB Server/Storage Solution**
  - Enhance I/O performance for entry level NAS, rackmount SMB Storage/Server
  - VT-x Intel 64 bit CPU Virtualization and Hyper-Thread Technologies
- **Energy efficient**
  - CPU is S1260 2C/4T, 2.0GHz ,8.5W, TDP up to 60W typically
  - High density for low-end hosting and sub-entry tiers
- **IPMI 2.0 for remote management**
  - Matrox VGA with KVM function using Nuvoton NCT6776F
- **Many built-in features**
  - SATA DOM support, port headers, fast multi-port networking, and much more to support a wide range of applications

SUPERMICRO®

MicroCloud SuperServer solutions.

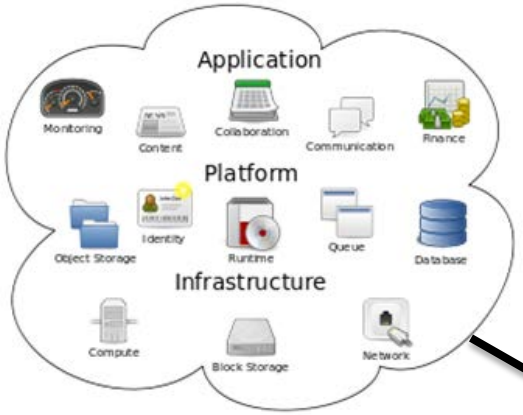
High Density, Enterprise Performance, Cost Effective UP servers

What is MicroCloud?

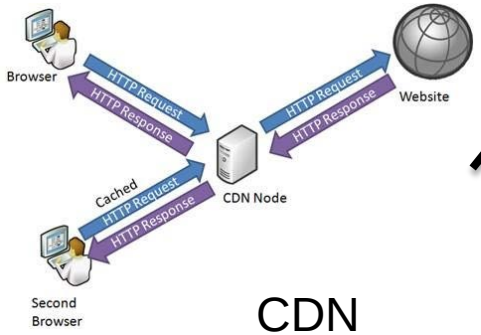
- SuperServer with a large number of UP nodes to maximize shared resource utilization and provide a cost-effective alternative to typical rackmount servers without any compromise.

- Evolutionary design to expand Supermicro's presence in high-efficiency Cloud computing infrastructure deployments

Market Opportunity



Cloud



CDN

SYS-5037MC-H8TRF

MicroLP Card

- High Density with 8 Nodes in 3U
- Intel IvyBridge E3-1200 V2 CPU upto 95W
- up to 32GB DDR3 1600 MHz
- 1 x PCI-E Gen3 x8 LP slot
- Cost effective solution

SYS-5037MC-H86RF

SUPERMICRO X9 SERVER PLATFORMS

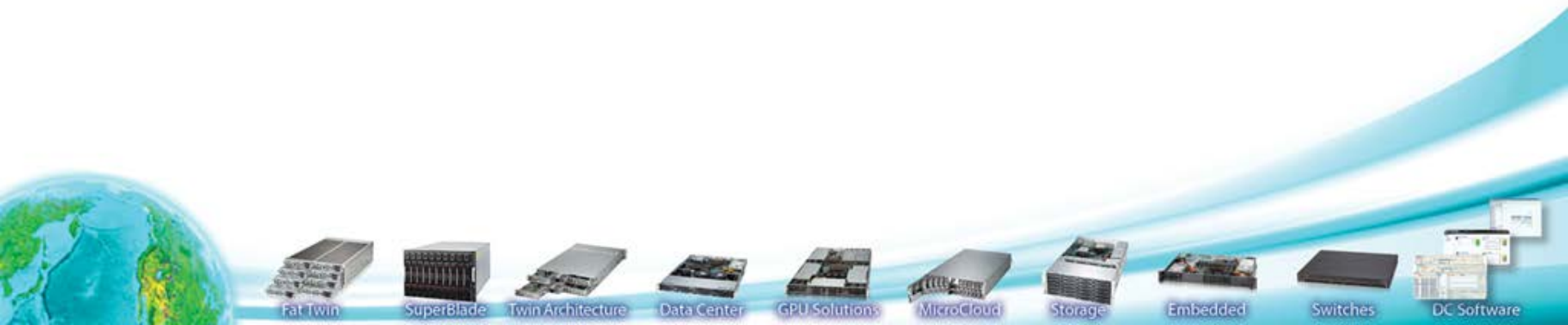
80 PLUS PLATINUM

intel Ivy Bridge

AOC Cards

- High Density with 8 Nodes in 3U
- Intel Ivy Bridge E3-1200 V2 CPU to 95W
- up to 32GB DDR3 1600 MHz
- 2 x 3.5" hot-swap SAS/SATA HDD with selected AOC card
- 1 x PCI-E Gen3 x8 LP slot

X9 Romley MicroCloud™



SYS-5037MR-H8TRF

SUPERMICRO X9 SERVER PLATFORMS

Digital 80 PLUS PLATINUM

intel Sandy Bridge

- High Density with 8 Nodes in 3U
- Intel Romley E5-2600 CPU to 130W
- Up to 128GB DDR3 1600Mhz
- 2 x 3.5” hot-swap SATA HDD
- 1 x PCI-E Gen3 x8 LP slot
- Flexible SMC MicroLP card

MicroLP Cards

2nd Generation MicroCloud™

SYS-5037MC-H12TRF

SUPERMICRO X9 SERVER PLATFORMS

80 PLUS PLATINUM

intel Ivy Bridge

MicroLP Cards

- High Density with12 Nodes in 3U
- Intel E3-1200 v2 CPU support up to 69W/(87W)
- up to 32 GB VLP DDR3 1600Mhz
- 2 x 3.5” or 4 x 2.5” SATA HDD
- Flexible SMC MicroLP card

A+ Server AS-3012MA-H12TRF

- Motherboard: **H8SME-F**
- Mid Tower Chassis: **CSE-939H-R1K63B**

12 x Hot-Pluggable UP Nodes

1	**Processor Support & Chipset** **4/8 -core** AMD Socket **AM3+** Opteron™ 3000 Series
2	**Memory Capacity** **Up to** 32 **GB R/UDDR3 ECC 1066/1333/1600 Mhz in 8 DIMMs**
3	**Expansion Slots** **One Micro LP slot (Gb,10Gb,IB..)**
4	**I/O ports** 1x VGA ,COM2 ,USB port (via dongle) **1 dedicated LAN for system management (IPMI2.0)**
5	**Drive Bays** **2x 3.5" or 4 x2.5" internal drive bays**
6	**Power Supply** **1620W Redundant Platinum Level**
7	**System Cooling** **4-pin PWM fans w/ Optimal Fan Speed Control**

Key Features

- **High-density, Enterprise Performance, Cost-effective, Multi-node UP server**
- **Redundant 80Plus Platinum Level Power Supplies**
- **Dedicated LAN for System management (IPMI 2.0)**

Applications

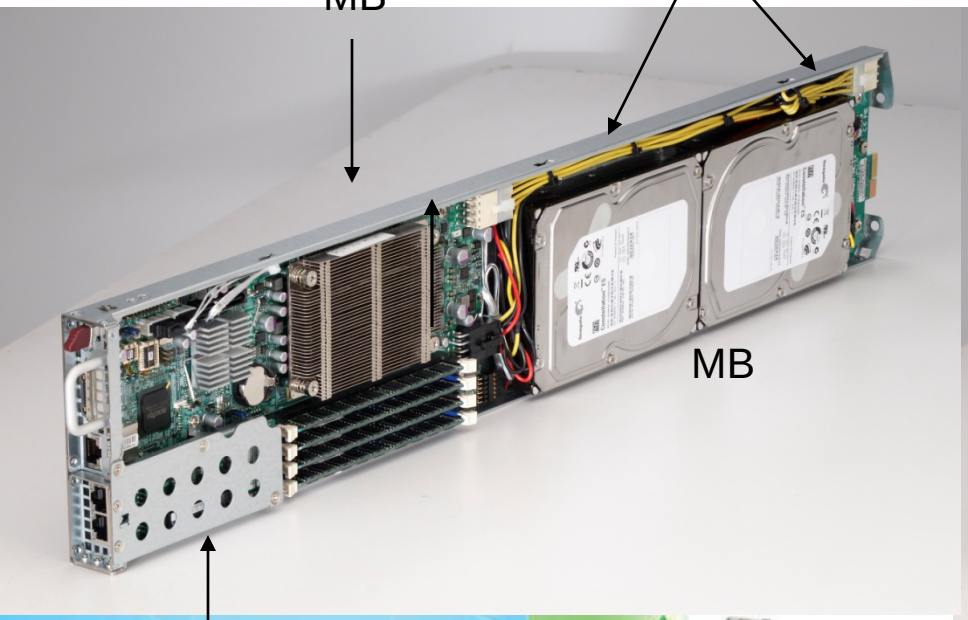
- **SMB application**
- **File & Print Server**
- **Mail server**

MicroCloud Server with 3.5”HDD/2.5”HDD skus

3.5” HDD SKU

2X 3.5” HDD

MB



Micro LP card

2.5” HDD SKU

4X 2.5” HDD

Micro LP card

SUPERMICRO®

Fat Twin™ Server Solution

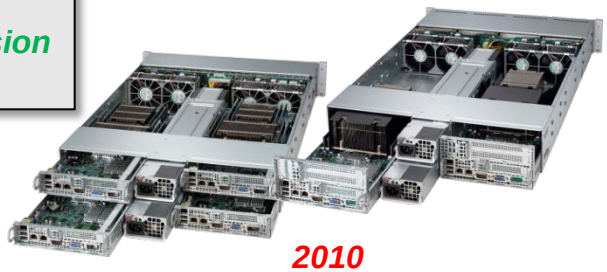
Twin Revolution

High-Capacity Scalable Multi-Node Computing Solutions

High-density compute
Improved storage capacity
Better expansion
High efficiency

2012

High-density compute
Modest storage & expansion
Moderate efficiency



2010

2008

- ✓ *Extremely high power efficiency*
- ✓ *High storage capacity*
- ✓ *High MIC/Xeon phi capacity*
- ✓ *Highly configurable computing*
- ✓ *for both compute and I/O*
- ✓ *Excellent expansion capability*
- ✓ *Accessibility and maintainability*

Why choose Fat Twin™

Confidential
Confidential

- ► Optimized design for different applications
  - Datacenter/ Cloud/ HPC applications
  - Science/ Research/ GPU application
  - File server/ Storage server
  - General server/ Enterprise server

- ► Free-air cooling and PUE optimized
  - Efficient air cooling design (PUE ~1.1)
  - 135W XEON CPU support up to 35°C
  - 130W XEON CPU support up to 47°C

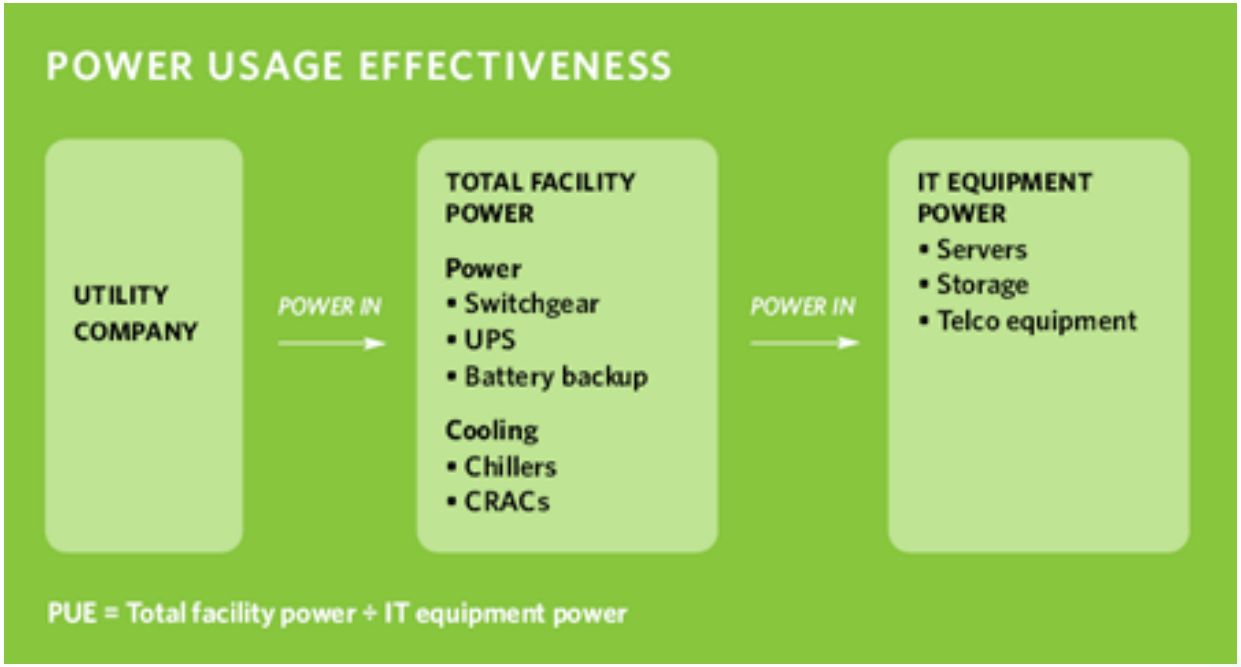
- ► Flexible, easy to maintain and Cost effective
  - Flexible and configurable node structure
  - Hot-plug MB node access from front side, easy for maintenance
  - Resource sharing in design, tooling, inventory and components for cost effectiveness
  - Support standard rack

- ► High density, high performance and lower power consumption
  - High density: support DP 16 DIMM & 8 x 3.5” hot swap HDD per 1U
  - High density: support DP 16 DIMM & 3 GPU per 1U or 8 GPU per 2U
  - High efficiency design for MB and sharing cooling with 3 -10% less power usage
  - High operation temperature support (47°C Free-air-cooling, PUE~1.1)

Define PUE

- PUE is determined by dividing the amount of power entering a data center by the power used to run the computer infrastructure within it.

- PUE was created by members of the Green Grid, an industry group focused on data center energy efficiency.



Twin Architecture

47C

135W

4/8 Nodes

2.74 TFlops

128 TBytes

Supermicro Fat Twin Solutions

FatTwin Rear I/O

4U with 4-node/8-node
PUE optimized –
130W/135W
Flexible
Dense storage 8 HDD/1U
- 2.5”/3.5” SAS/SATA;
More add-on cards

FatTwin Front I/O

4U with 4-node/8-node
PUE optimized –
130W/135W
Front I/O cabling
Redundant hot-plug fans
Cost effective storage

GPU Optimized Front I/O

4U with 4-node
Densest GPU solution
12x PCI-E 3.0 x16 supports
12 Double-Width
GPU/MiC Cards

Hadoop Front I/O

4U with 4-node
Lower cost storage
for Big Data
12 HDD/1U
-3.5” Fixed SAS/SATA
Drives.

Standard 19” Racks, Front Access Server Nodes, Industry Standard IPMI 2.0
Highest Efficiency Redundant Power Supply (95%+)

Supermicro FatTwin Decision Tree

I/O Access?	Node	HDD	DIMM Slots	RAID	Graphics	Expansion
Front Or Back?	4 or 8?	2.5”or 3.5”	8 or 16?	Software Or Hardware	GPU Or MIC	1, 2 or 3 PCI-E Slots

Power Supply – 1280 or1600 Watts, Digital Supplies

Wide Choice - 20 Plus Models to choose from

* Hadoop 4Node Cluster also available

4-Node Front I/O

SYS-F627R3-FT/SYS-F627R3-F73

Intel® Xeon® Sandy Bridge E5-2600 Series Socket R

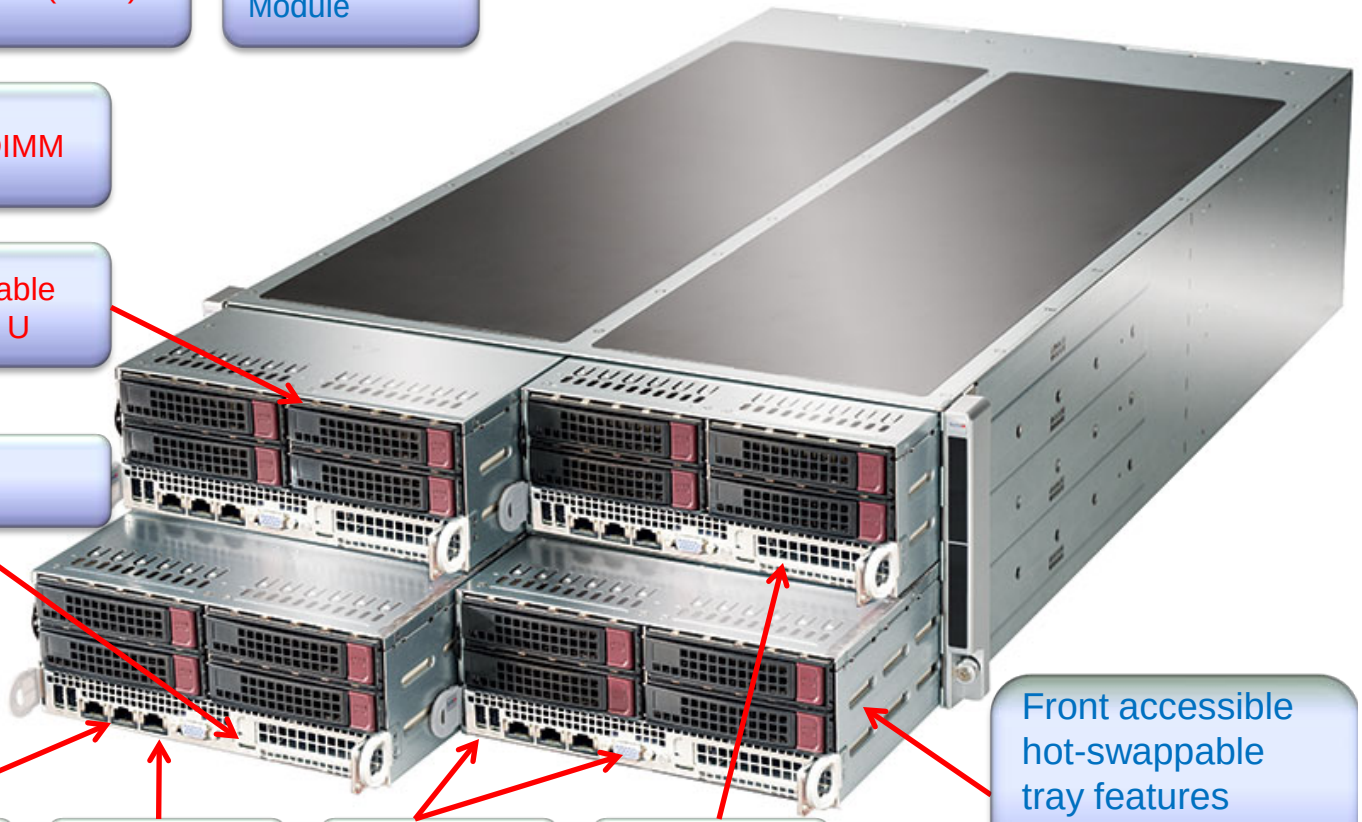
SAS2 S/W RAID (2308)

SATA Disk on Module

8 Reg. ECC DIMM

4 Hot-Swappable 3.5” HDD per U

Alarm LED



2X GbE ports

Dedicated IPMI port

2 USB and 1 VGA ports

Low Profile x16 PCIe Slot

Front accessible hot-swappable tray features better serviceability

8-Node Front I/O

SYS-F617R3-FT

Intel® Xeon® Sandy Bridge E5-2600 Series Socket R

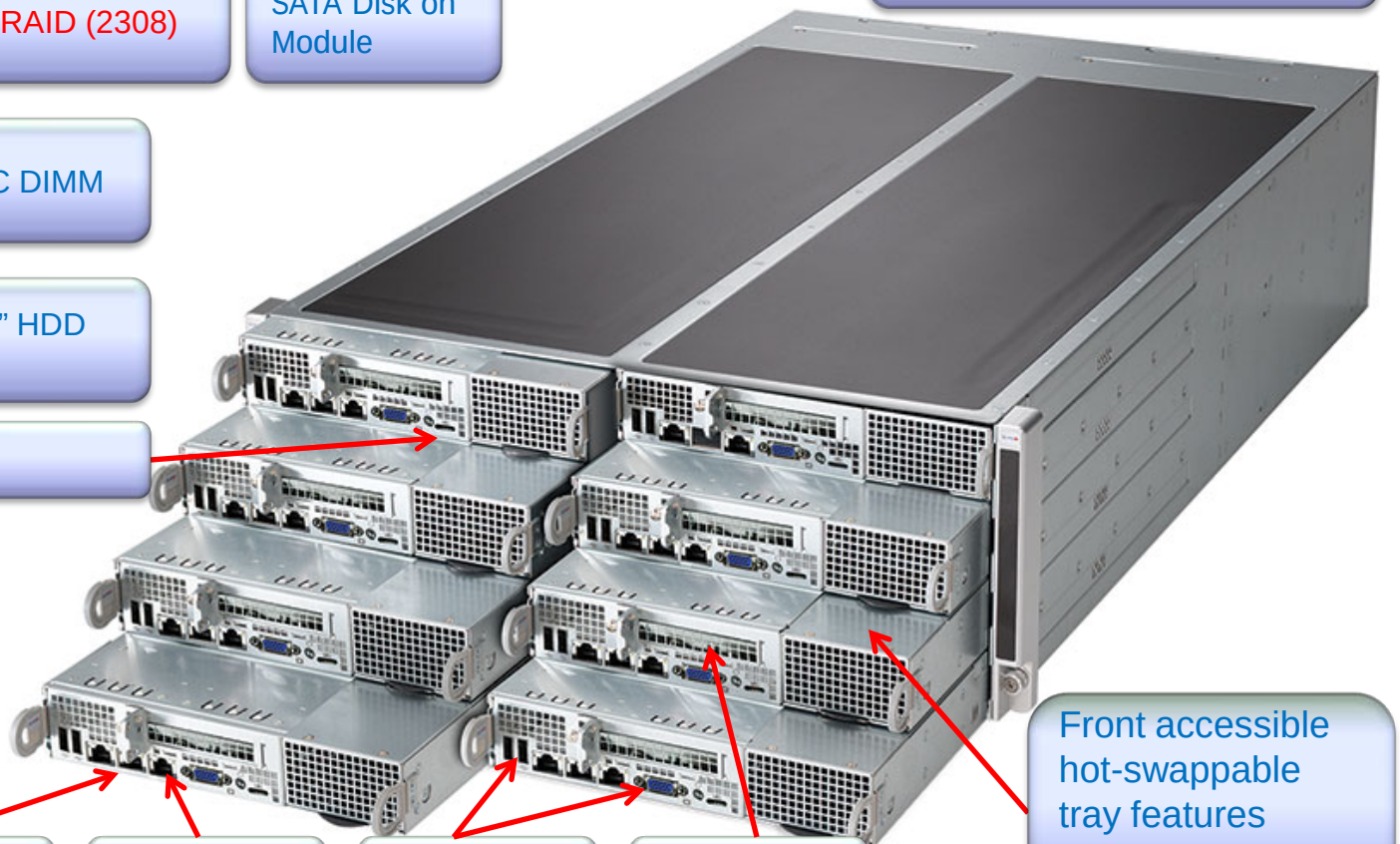
SAS2 S/W RAID (2308)

SATA Disk on Module

8 Reg. ECC DIMM

2 fixed 3.5” HDD per node

Alarm LED



Front accessible hot-swappable tray features better serviceability

2X GbE ports

Dedicated IPMI port

2 USB and 1 VGA ports

Low Profile x16 PCIe Slot

Rear View of Front I/O

1+1 redundant 1620W
94+% PSU
Or
1280W 95+% PSU

80mm x 80mm
hot-swappable shared
heavy duty fan

4-Node Rear I/O

SYS-F627R3-RTB+/ SYS-F627R3-R72B+

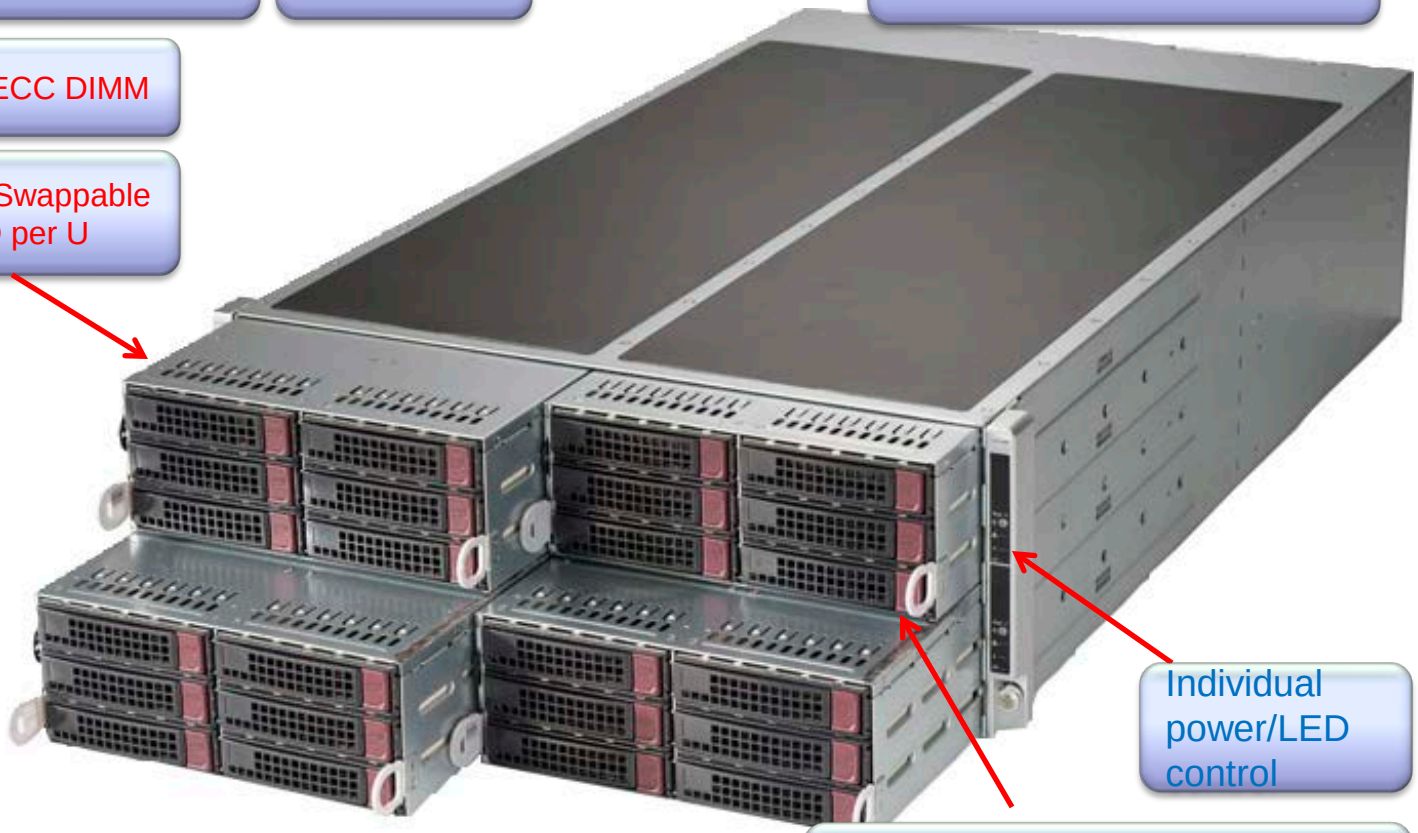
SAS2 H/W RAID (2208) with BBU support

SATA Disk on Module

Intel® Xeon® Sandy Bridge E5-2600 Series Socket R

16 Reg. ECC DIMM

6+2 Hot-Swappable 3.5" HDD per U



Individual power/LED control

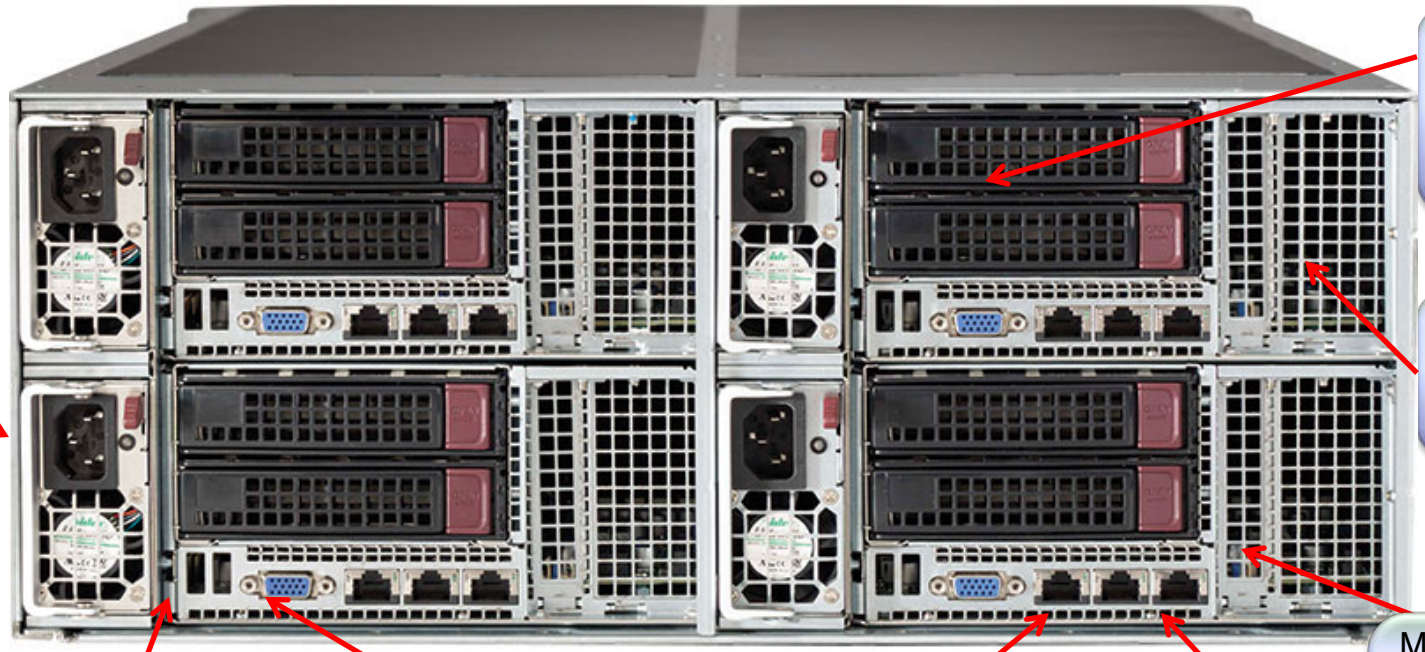
PUE Optimized

Front accessible hot-swappable tray features better serviceability

X9DRFR

4-Node Rear I/O

8 hot swappable 3.5”HDDs per U



2x 3.5” HDDs or 2 PCIE 3.0 x8

1x LP PCIE 3.0 x16

1+1 1280W

80 PLUS PLATINUM

Micro LP
-2x GbE Port
-1x QDR IB
-1X FDR IB
-2x 10G SFP+

2x USB ports

1x VGA port

2X GbE ports

1x Dedicated IPMI port

8-Node Rear I/O

SYS-F617R2-RT+/SYS-F617R2-R72+

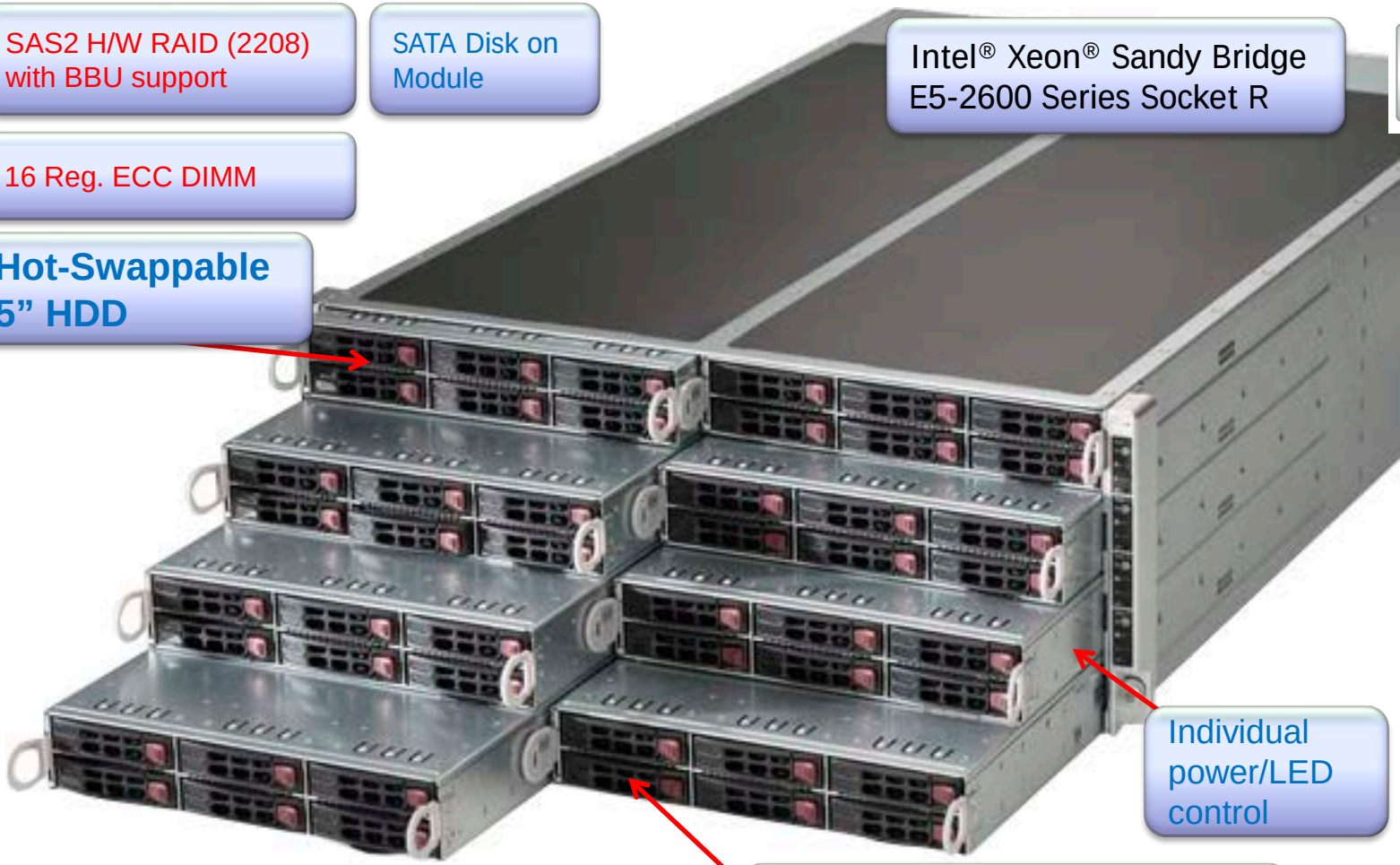
SAS2 H/W RAID (2208) with BBU support

SATA Disk on Module

16 Reg. ECC DIMM

6 Hot-Swappable 2.5" HDD

Intel® Xeon® Sandy Bridge E5-2600 Series Socket R



Individual power/LED control

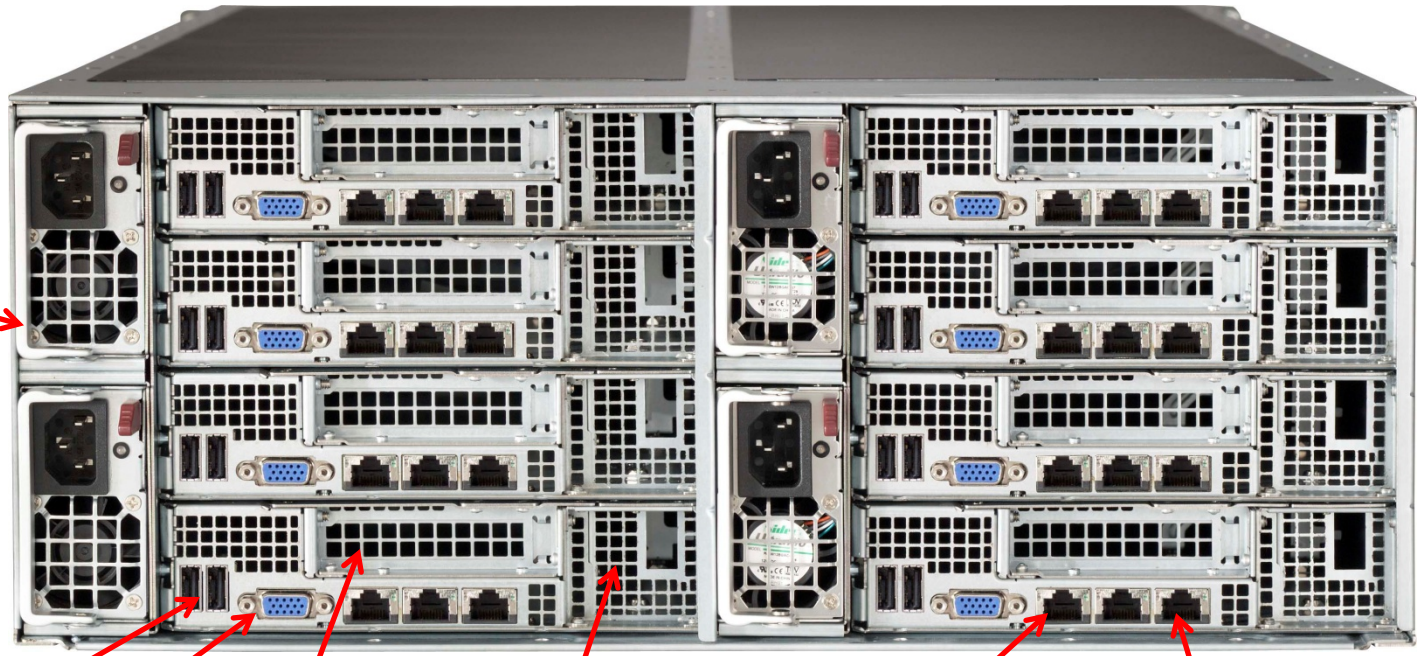
Front accessible hot-swappable tray features better serviceability

X9DRFR

8-Node Rear I/O

SYS-F617R2-RT+/SYS-F617R2-R72+

80 PLUS PLATINUM



1+1 redundant 1620W 94+% PSU

2x USB Ports

1x VGA Port

1x LP PCI-E 3.0 x16

Micro LP
-2x GbE Port
-1x QDR IB
-1 x FDR IB
-2x 10G SFP+

2x GbE Ports

1x Dedicated IPMI Port

GPU FatTwin Front I/O

SYS-F627G3-FT+

K10/K20/K20X

Intel Xeon Phi

Up to 12 Double Width GPU per 4U in 4 nodes

Intel® Xeon® Sandy Bridge E5-2600 Series Socket R

Hot-swap node

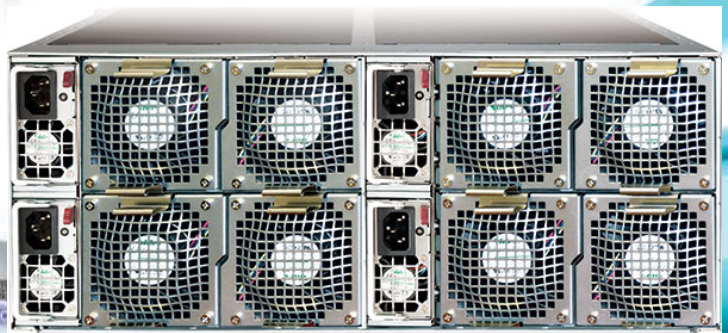
2 additional Gen 3 x8 slots

GbE / 10GbE onboard option

Best Cooling System Design

Platinum level
high efficient **1620W** redundant power supply & hot-swappable cooling fans

Hot-swap 2 x 3.5"/6 x 2.5"
SAS/SATA/SSD Drive



Hadoop 4-Node Front I/O

SYS-F617H6-FT+

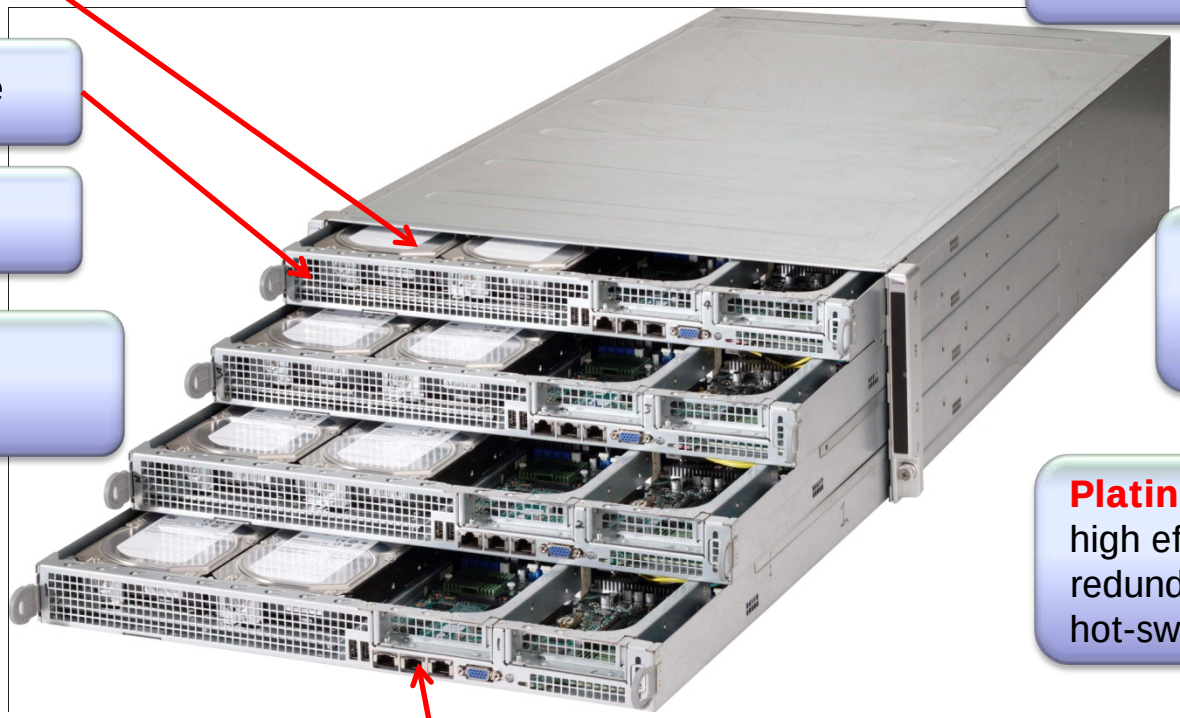
Up to 48 x 3.5” SAS/SATA HDD
4U in 4 nodes

Intel® Xeon® Sandy Bridge
E5-2600 Series Socket R

Hot-swap node

16 DIMM Slots

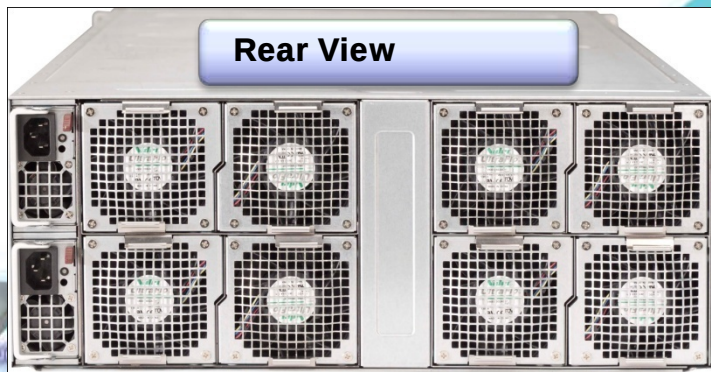
2 additional
Gen 3 x8 slots



Best Cooling System
Design

Platinum level
high efficient **1620W**
redundant power supply &
hot-swappable cooling fans

GbE / 10GbE
onboard option



Highest Optimized Architecture

Application Optimized

Scale-up and/or Scale-out

Data Center / Cloud / Hadoop

HPC/GPU

Science / Research

Finance / Oil & Gas

Performance Optimized

Maximum Compute & I/O Density

135W High-End CPU

8 Hot-Swap HDD Per 1U

16/24 DIMM Per Node

12 GPU Per Enclosure

FatTwin

Value Optimized

Performance/Watt - Performance/$

Lower Power Per Node

Shared/Redundant Resources

Platinum/Redundant/Digital Power

TCO Optimized

Free Air Cooling – 1.1 PUE

135W @ 35C

130W @ 47C

Front I/O or Rear I/O Flexibility

Eliminate UPS with optional BBP

Applications


Cloud Computing


Search Engine

Hadoop


Data Center


Engineering

Research


Simulation


Multimedia/Graphics

Enterprise IT


File System


Storage Server


Medical


Oil & Gas Exploration


Financial Simulation


3D Rendering/Gaming


GPGPU Application

Evolutionary Fat Twin Technology

Evolutionary Design in Twin Family
Flexibility, Performance, Density…
And Lower Power Consumption
Modular Design with variety of choices

SUPERMICRO®

Thank you!

Any Questions?