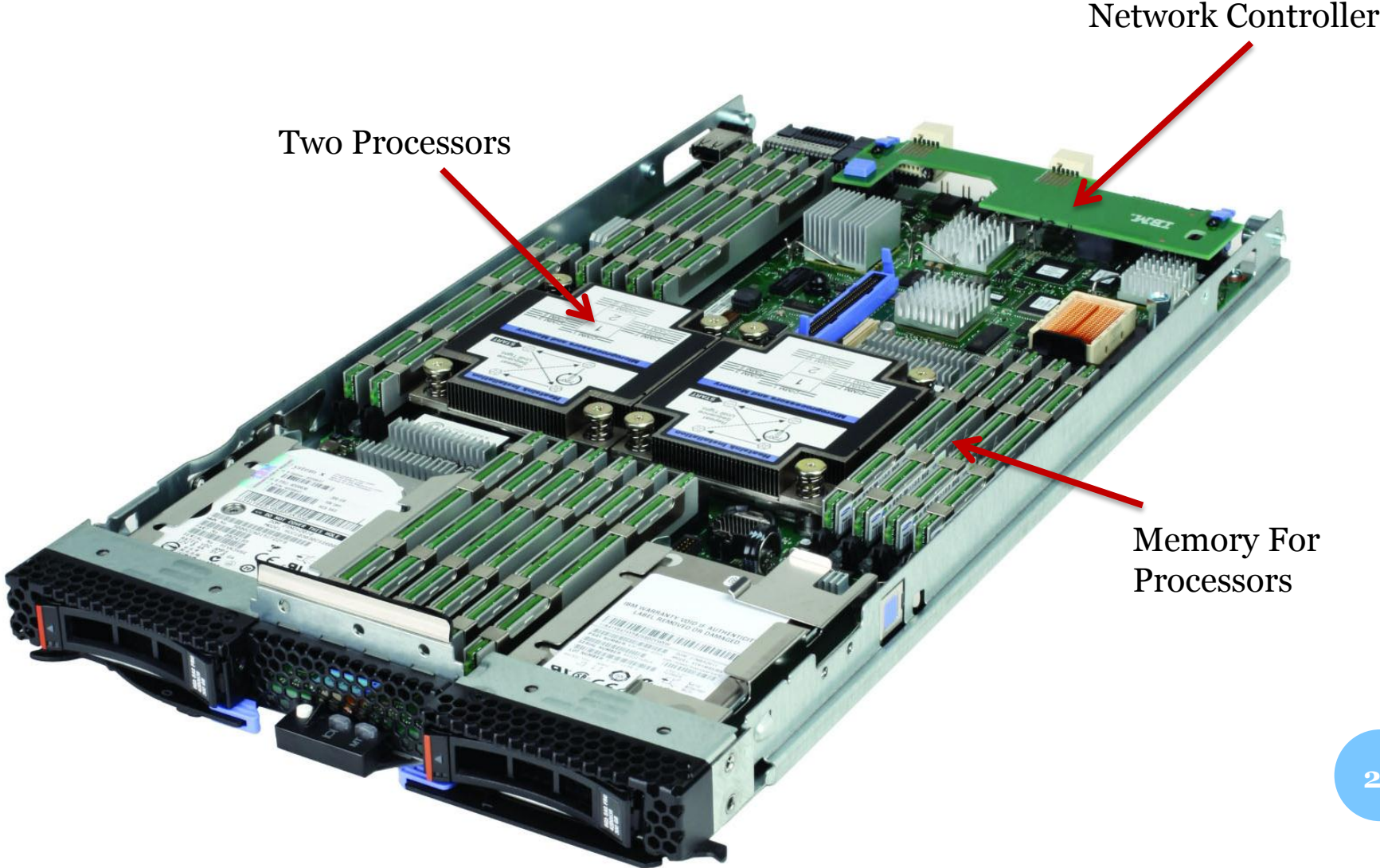# IBM BladeCenter

Presentation by **Vahid Farmani**

Blade Servers

- Thin servers inserted into a single rack-mounted chassis that supplies shared power, cooling, and networking infrastructure

- Servers are independent

- Modular design server

Blade Server

- Each server has its own processors, memory, storage, network controllers

- Minimize physical space and energy by removing unnecessary components

- As of 2009, up to 128 servers per rack are achievable

- Support intel x86 processors

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Blade Server

Network Controller

Two Processors

Memory For Processors

The Chassis

- Blade chassis holds multiple blade servers, provides power, cooling, networking, interconnections and management

- Simplifying cabling

A Rack-Mount Chassis

IBM BladeCenter

- Released in November 2002

✓ Goals:

Ease of administration

More cost efficient

Less space and power

Blade Vs. Rack-Mount

Blade

✓ Shared power supply, networking and storage

✓ Easy to deploy, grow faster

✓ Able to hot-swap

✓ Less space and power

✓ More cost efficient

✗ Still have cooling issue

Rack-Mount

✓ Separate fans help cooling

✗ Each has its own supply

✗ Difficult to deploy

✗ Large space required

IBM BladeCenter Chassis

- IBM BladeCenter S

- IBM BladeCenter E

- IBM BladeCenter H

- IBM BladeCenter T

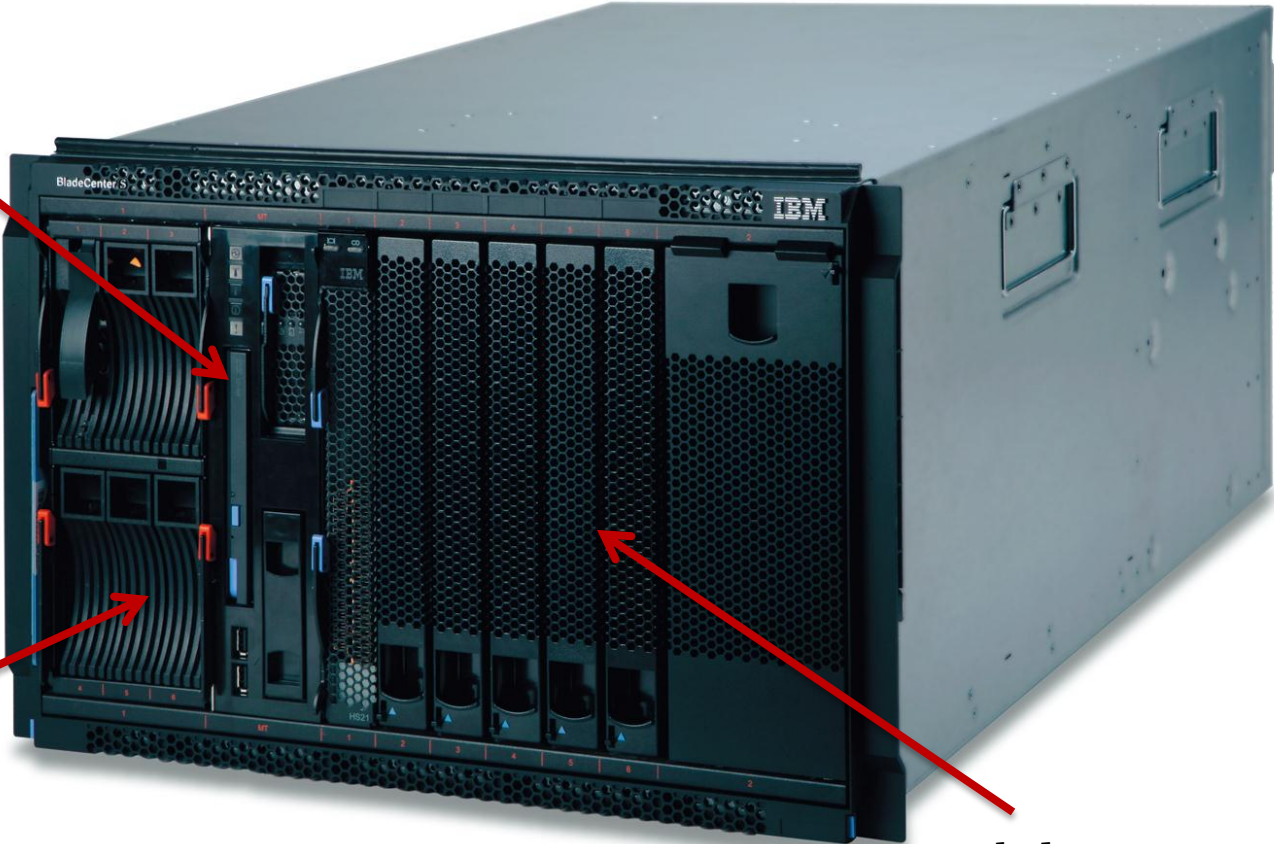- IBM BladeCenter HT

IBM BladeCenter S

- For small offices

- Up to 6 blades, 7U design   (U → 4.445 cm)

✓ Easy set up

✓ Lowest total power consumed and heat output

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IBM BladeCenter S Front View

Media tray
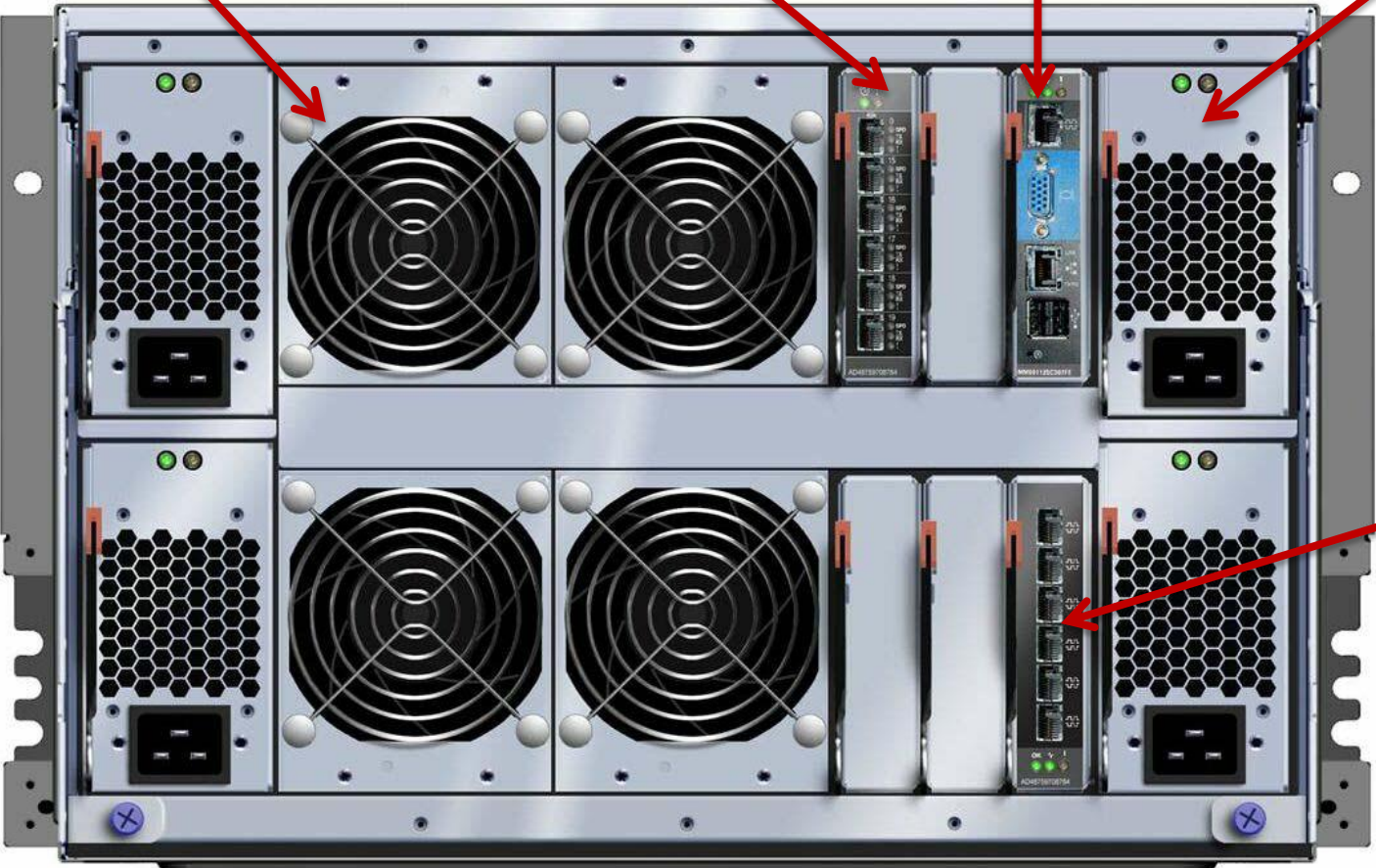
Power modules

Blades

IBM BladeCenter S Rear View

Blower
modules

I/O modules

Management
modules

Power modules

Serial
pass-thru
module

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IBM BladeCenter E

- Perfect for data centers

- Up to 14 blades, 7U design

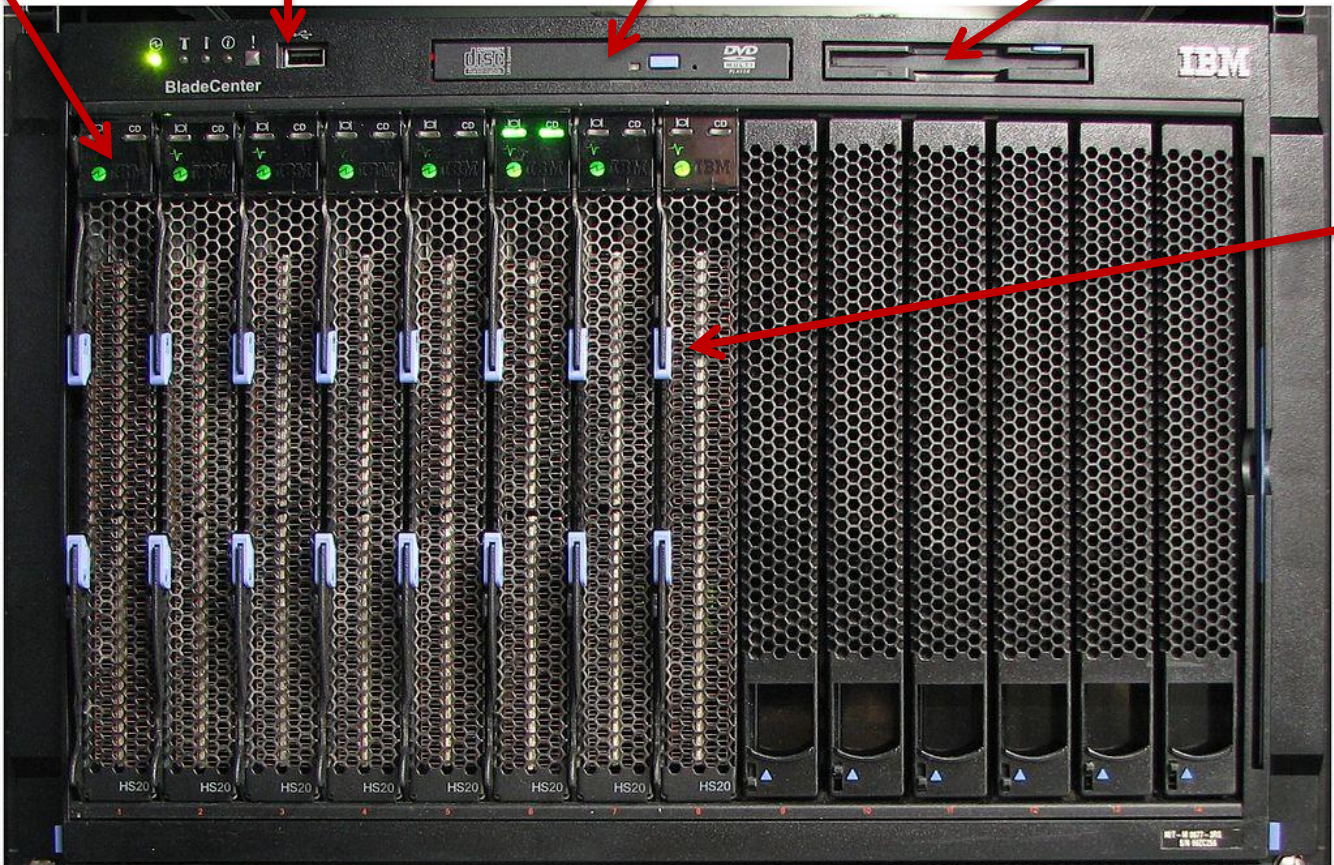✓ Best density and best energy efficiency

IBM BladeCenter E Front View

Control panels

USB port
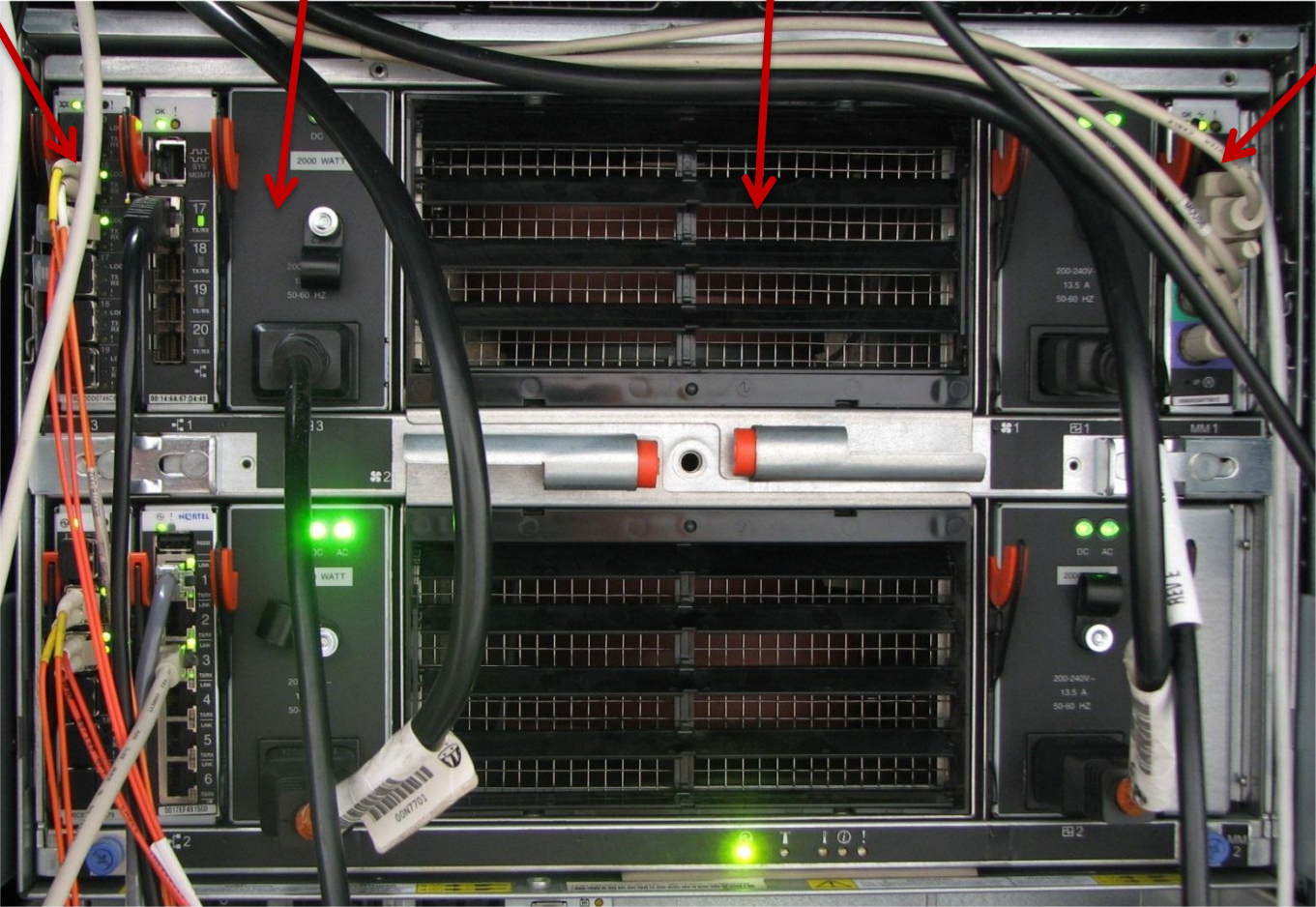
DVD drive

Floppy drive

Blades

17

IBM BladeCenter E Rear View

I/O modules

Power modules

Blower modules

Management modules

IBM BladeCenter H

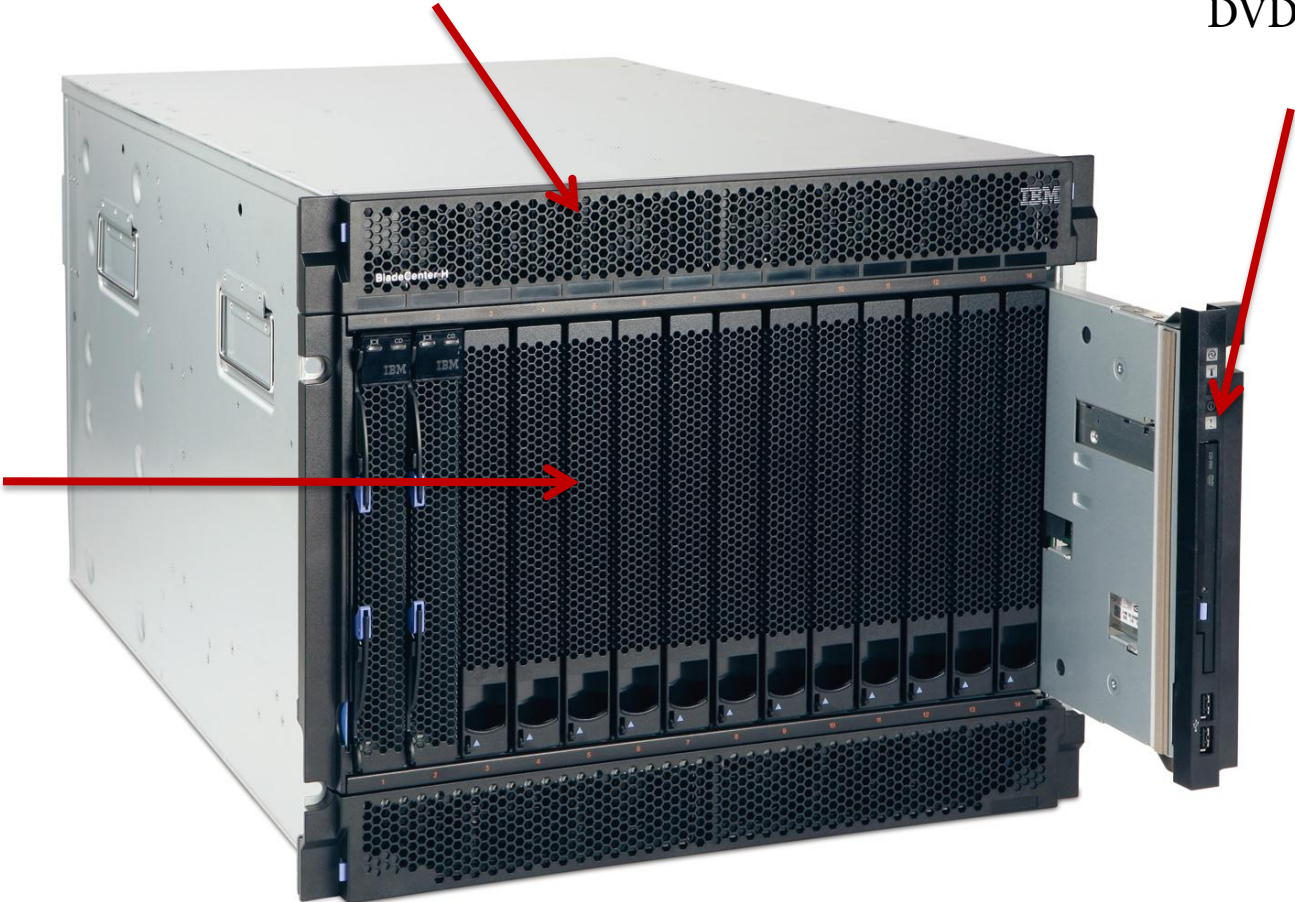- High-speed I/O

- Up to 14 blades, 9U design

✓ Supports 10Gb Ethernet

✓ High Performance

IBM BladeCenter H Front View

Power modules

DVD drive

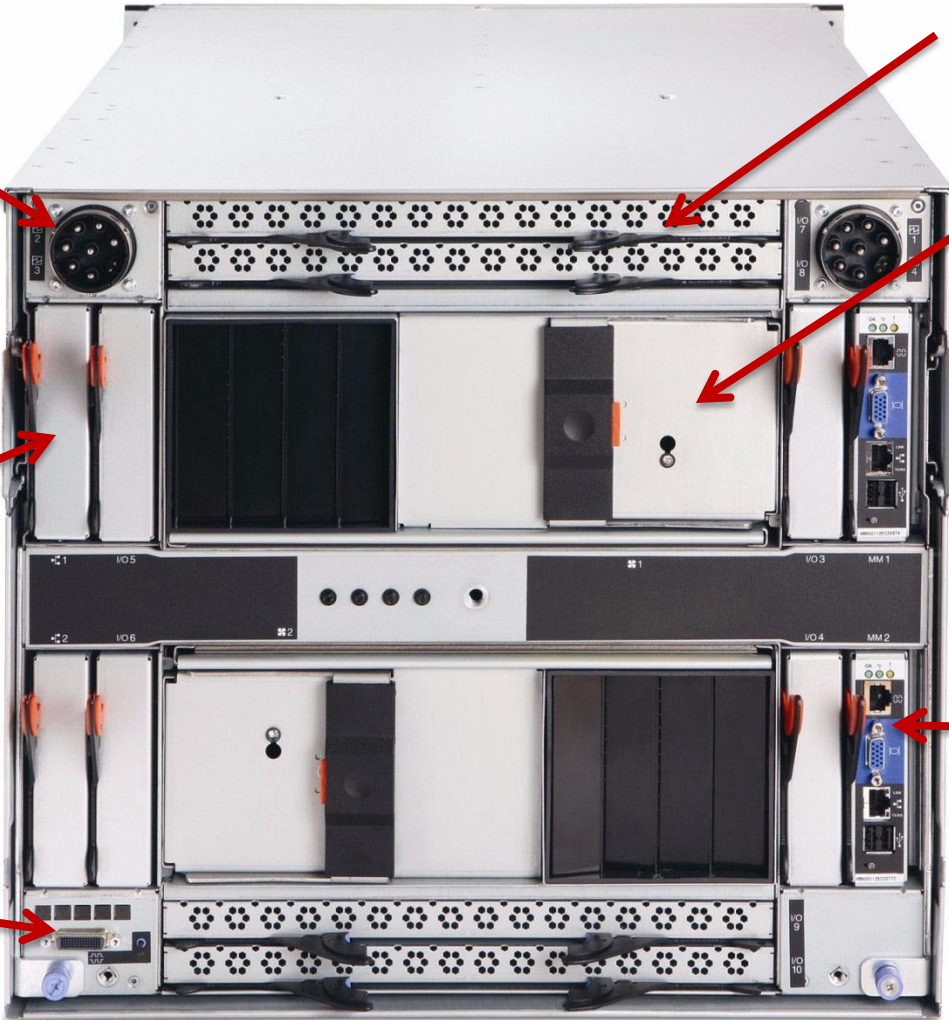Blades

IBM BladeCenter H Rear View

Power connector

I/O modules
(for high speed I/O)

Blower module

I/O modules
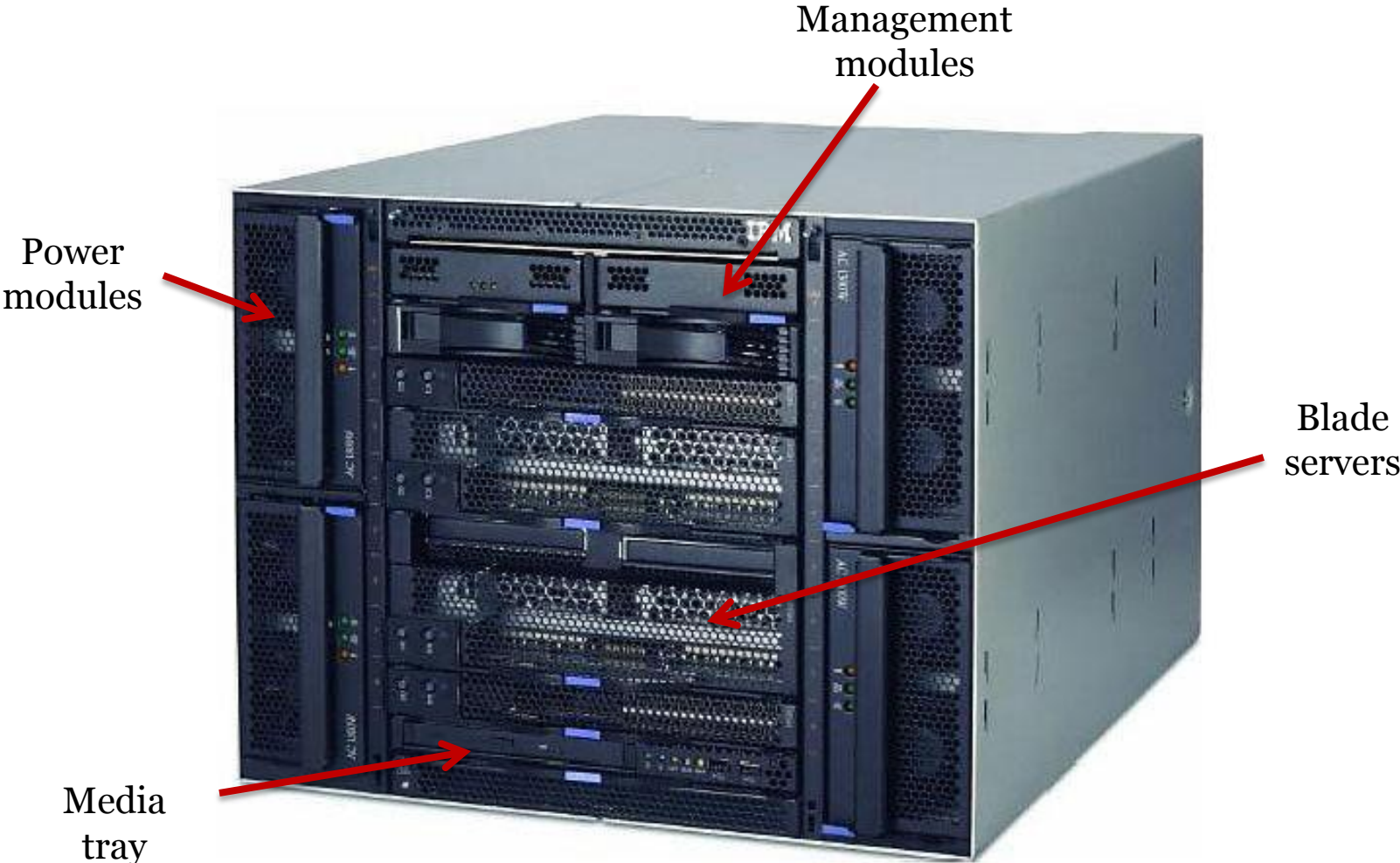
Management modules

Serial connector

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IBM BladeCenter T

- Ruggedized chassis ideal for telecom, military and medical-imaging applications

- Up to 8 blades, 8U design

- ✓ Available with either AC or DC power.

IBM BladeCenter T

Management
modules

Power
modules

Blade
servers

Media
tray

IBM BladeCenter T

I/O
modules

Blower
module

LAN
module

KVM
module

AC/DC
connector

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IBM BladeCenter HT

- Ruggedized chassis

- Up to 12 blades, 12U design

- High Speed I/O

- New version of IBM BladeCenter H

- Supports 10Gb Ethernet

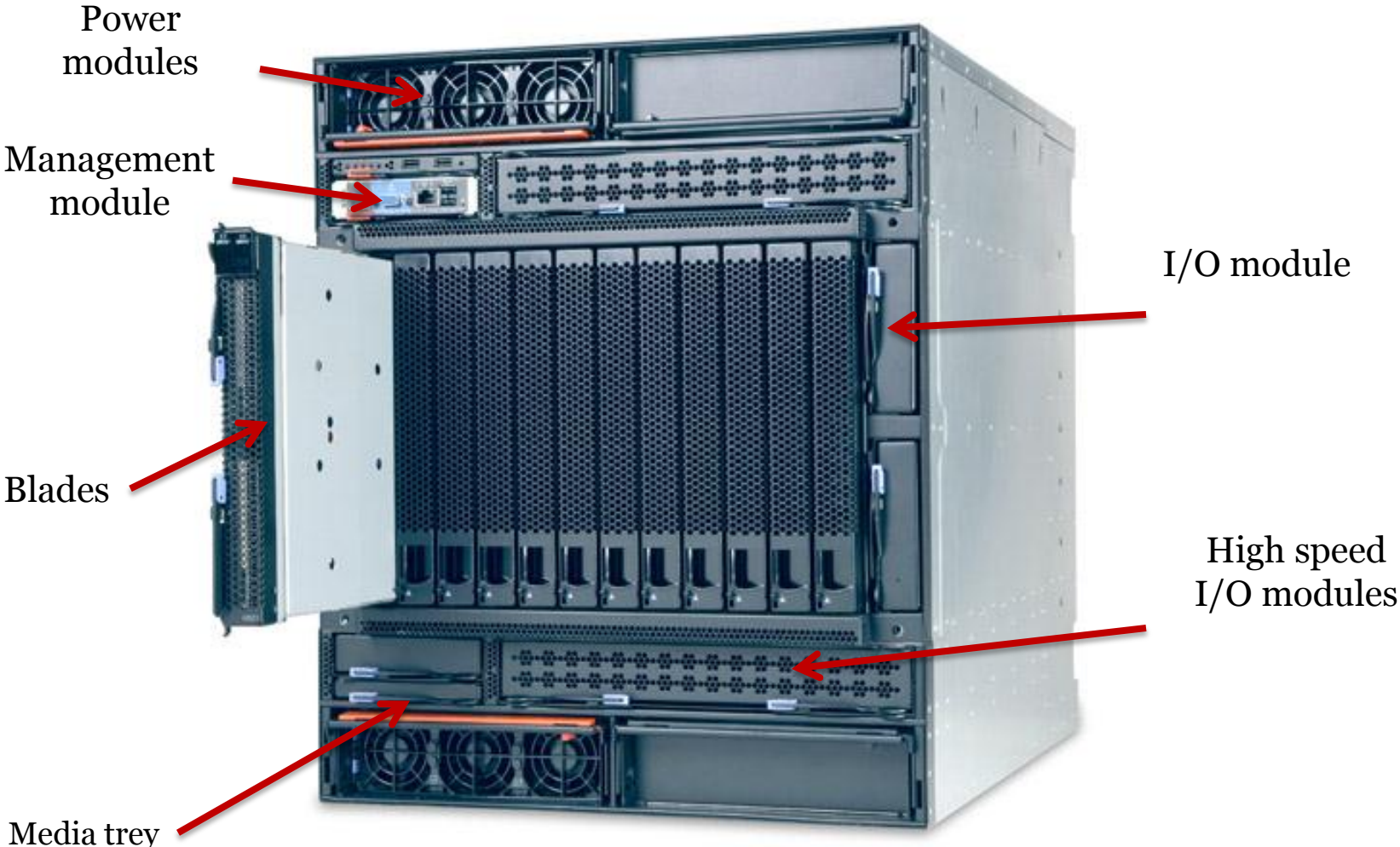# IBM BladeCenter HT

Power
modules

Management
module

I/O module

Blades

High speed
I/O modules

Media trey
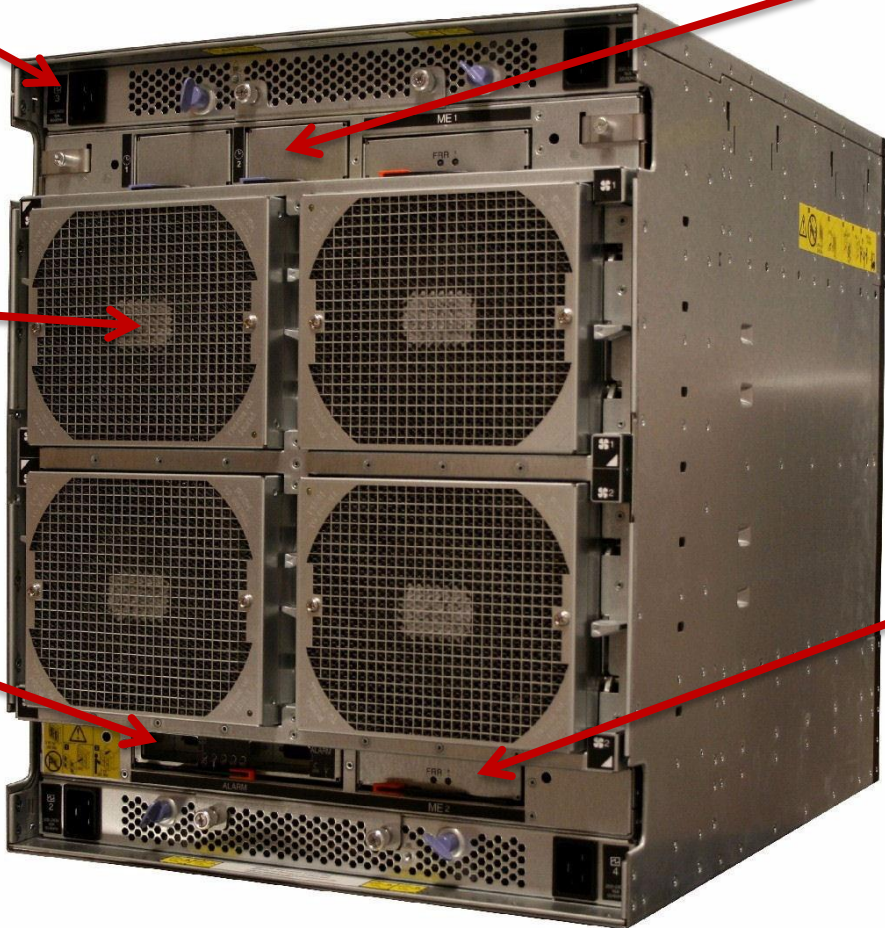
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IBM BladeCenter HT

Power connector

Network clock

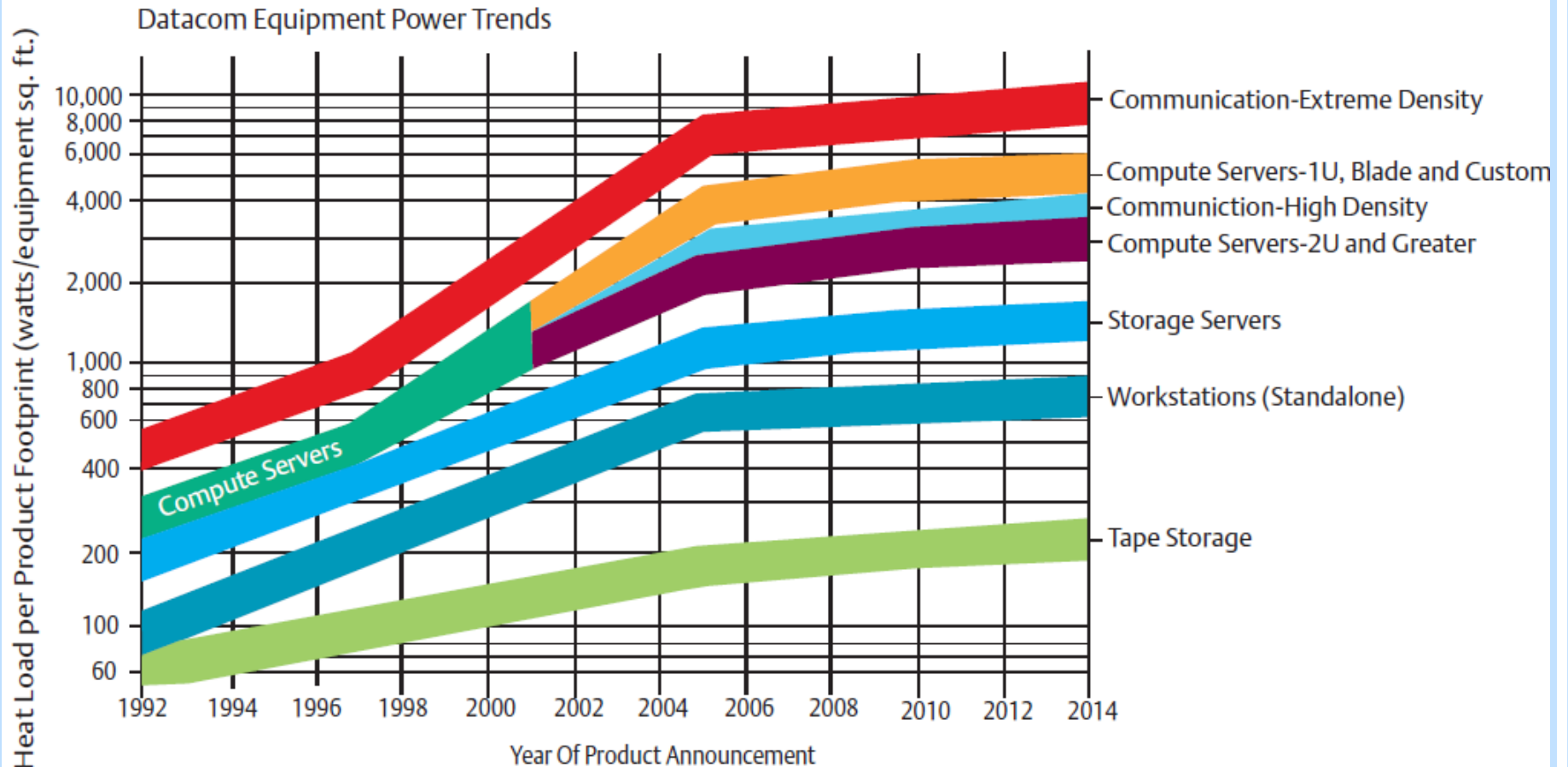Fan modules

Alarm panel module

Multiplexer expansion module

Power

- The blade enclosure's power supply : provides a single power source for all blades within the enclosure → reducing number of PSUs

- Redundant power supplies → failure of one power source does not affect the operation of the computer

Power Density

Datacom Equipment Power Trends

Heat Load per Product Footprint (watts/equipment sq. ft.) vs *Year Of Product Announcement*

Legend:
- Communication-Extreme Density
- Compute Servers-1U, Blade and Custom
- Communiction-High Density
- Compute Servers-2U and Greater
- Storage Servers
- Workstations (Standalone)
- Tape Storage
- Compute Servers

Trivedi A. Thermo-mechanical solutions in electronic packaging: component to system level. MS thesis. The University of Texas at Arlington ,2008.

Storage

- No external storage needs to be purchased

- Internal storage → depends on vendors

Uses

- Public uses → Data Centers, Medical application, Military, …

- Individual uses → Small offices

- Can add more processing power, memory to blade servers without interrupting the system

References

- "IBM BladeCenter Products and Technology", I. Krutov, A. Grechnev, M. Sakurai, 2012

- "IBM BladeCenter Chassis Product Guide", September 2008

- "Strategies for Deploying Blade Servers in Existing Data Centers", N. Rasmussen, 2006

- www.ibm.com

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با تشکر از توجه شما