Departamento de Arquitectura y Tecnología de Computadores
UNIVERSIDAD DE GRANADA

TEMA 1. INFRAESTRUCTURA (3ª PARTE)

Centro de procesamiento de datos

Departamento de Arquitectura y Tecnología de Computadores, Universidad de Granada

CPD

Una vez que subdividimos en subsistemas Requerimientos → Límite de presupuesto.

IT: Information Technology

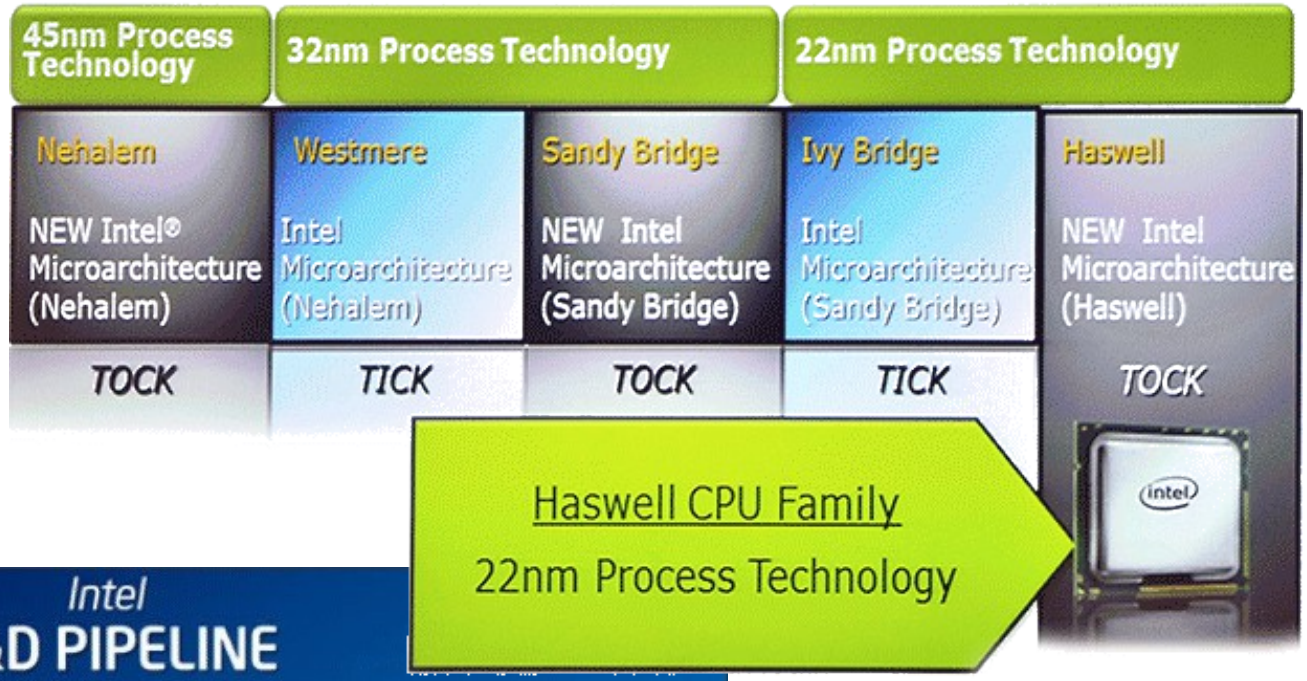
- **Cómputo (CPU & GPU)**
- **Memorias**
- **Almacenamiento**
- **Copias de seguridad**
- **Interconexión**
- **Sistema operativo**
- **Control remoto,KVM,IMPI**
- **Monitorización**
- **Redundancia**
- **Armarios**

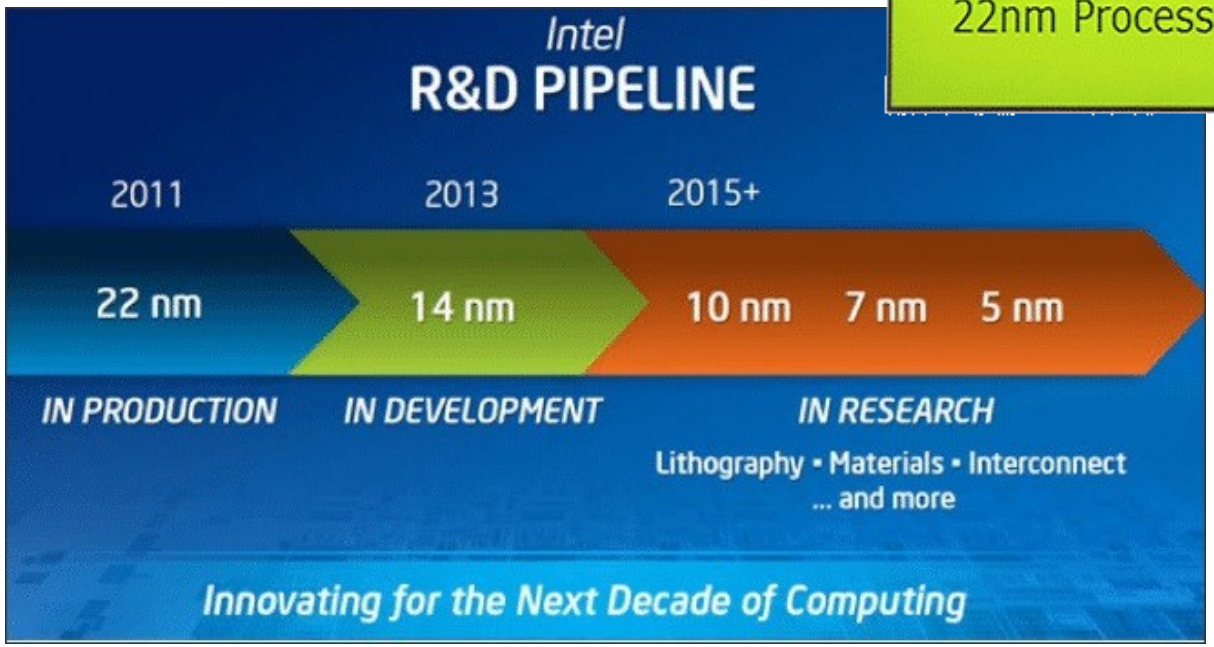
PCFE: Power, Cooling, Floor Space and Environmental health and safety

- Consumo
- Climatización
- Eficiencia energética
- Ubicación física
- Emisión CO2
- SAI
- Generadores

Cómputo

- Intel





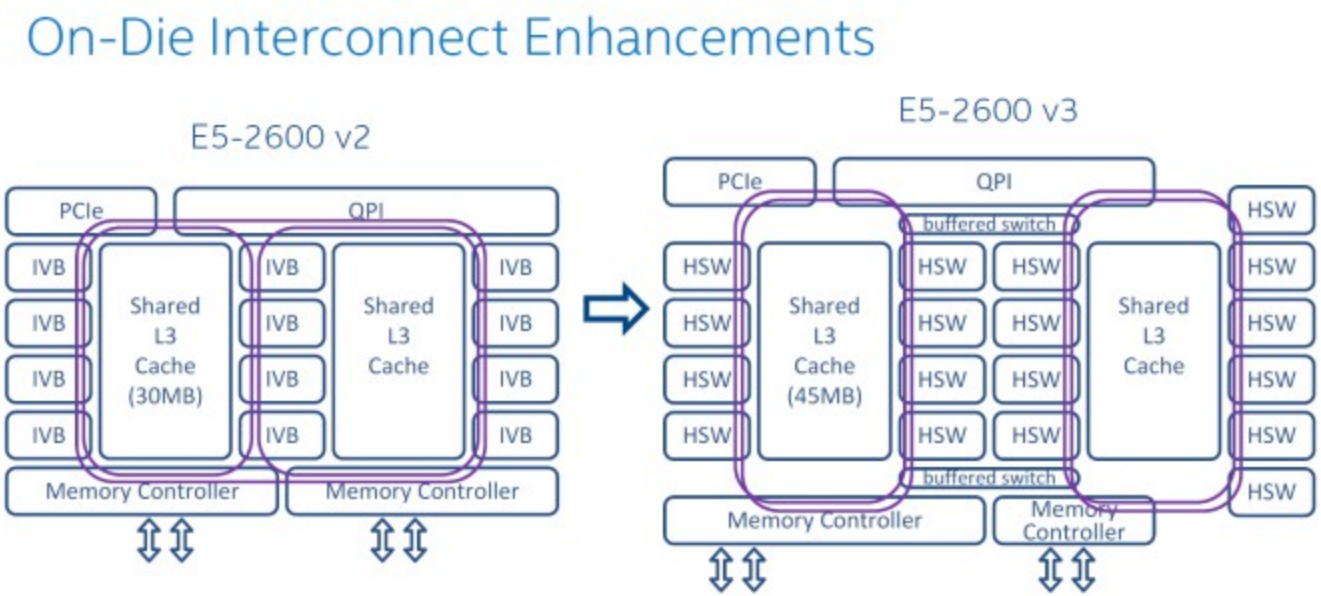
Intel® Datacenter Group Public Roadmap

2014 → 2015/Future

Mission Critical

Itanium	Boxboro-MC Platform Intel® Itanium® processor 9500 series Intel® 7500 Chipset, Intel® 7500 Scalable Memory Buffer, OEM chipset	(in planning) Future Kittson Processor
Expandable	Brickland Platform Intel® Xeon® processor E7-8800/4800/2800 v2 product families Intel® C602J chipset, Intel® C104/C102 Scalable Memory Buffer	
Efficient Performance	Romley-EP 4S Platform Intel® Xeon® processor E5-4600 v2 product family Intel® C600 series chipset	
Efficient Performance	Grantley-EP Platform Intel® Xeon® processor E5-2600 v3 product family Intel® C610 series chipset	
Workstation	Grantley-EP Workstation Platform Intel® Xeon® processor E5-1600 v3 product family Intel® C610 series chipset	
Entry 1 Socket	Denlow Platform Intel® Xeon® processor E3-1200 v3 product family Intel® C220 series chipset	Intel® Xeon® processor E3-1200 v4 product family Intel® C220 series chipset
SoC	Edisonville Platform Intel® Atom™ processor C2000 product family	Intel® Xeon processor D-1500 product family Denverton
Many Integrated Core (MIC)	Intel® Xeon Phi™ Product Family Intel® Xeon Phi™ coprocessor 7100 / 5100 / 3100 family	Future 14nm Knights Landing

Intel E5-2600 v2 y v3



DDR2, DDR3 y DDR4

- Reducción de voltaje y consumo.
- Aumento del anchod e banda MT: 800 MT/s →1600 MT/s

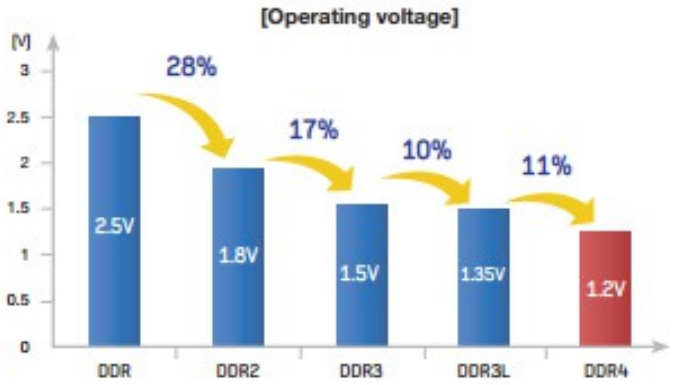


Figure 4. Reduced operating voltage requirements of DDR4 compared to DDR3L

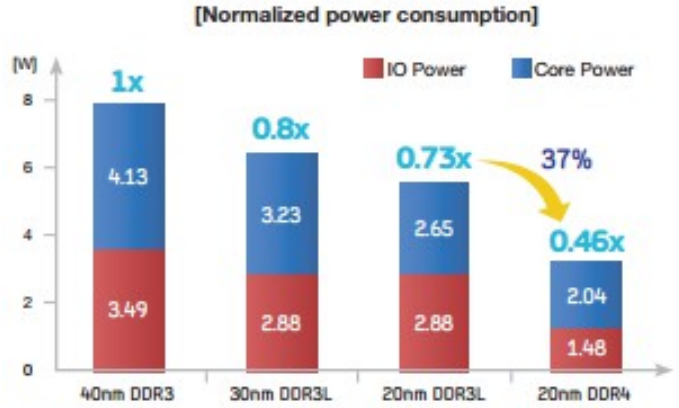
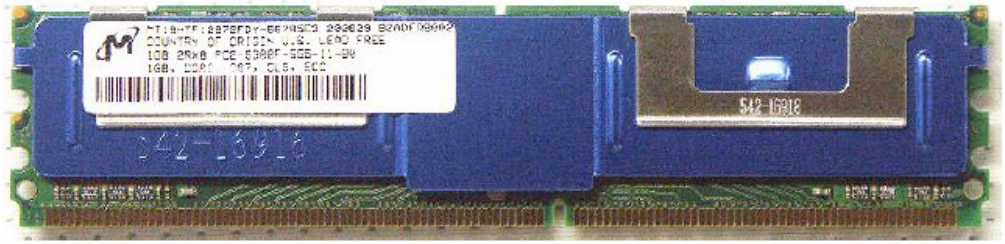


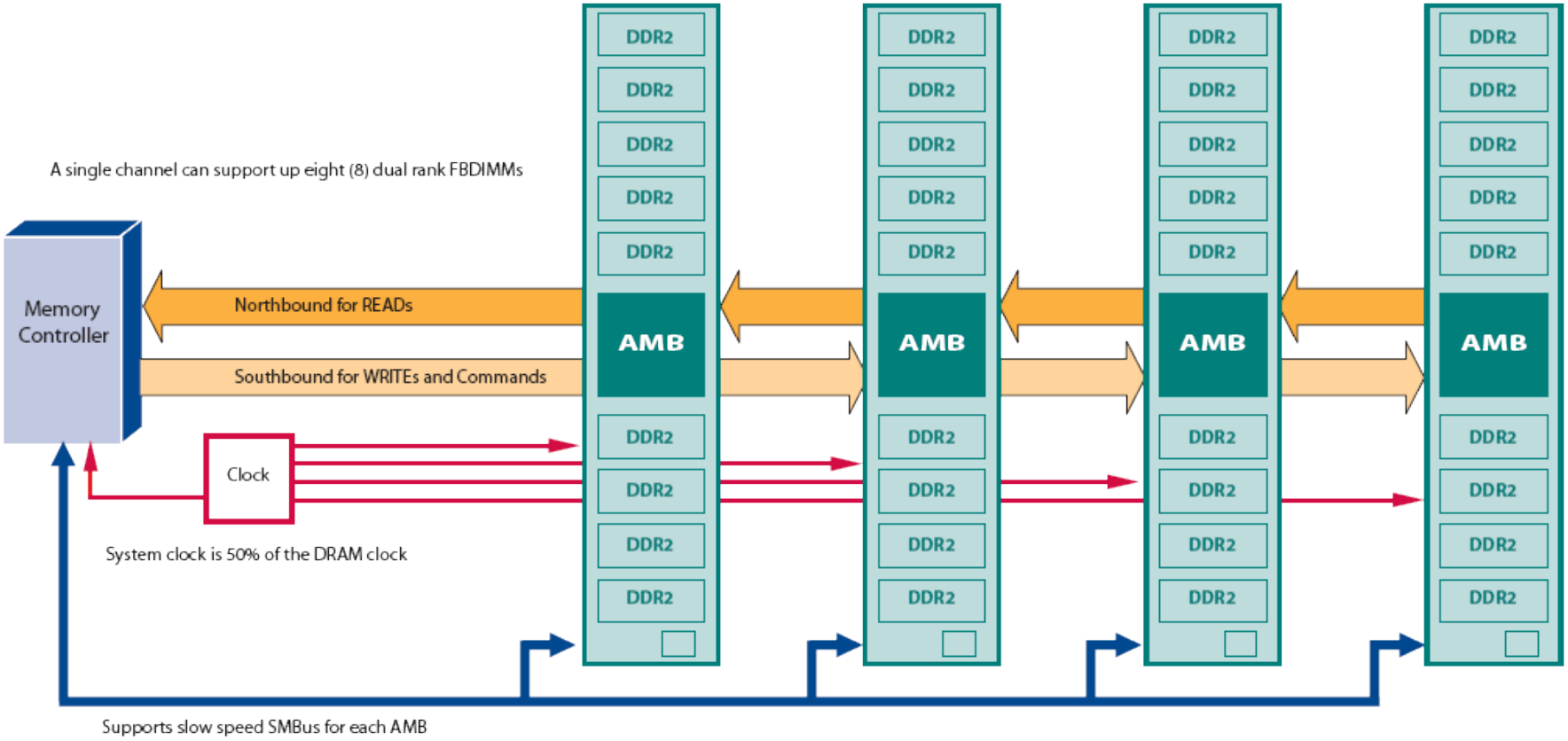
Figure 5. Reduced normalized power consumption requirements of DDR4 compared to DDR3L

SAMSUNG

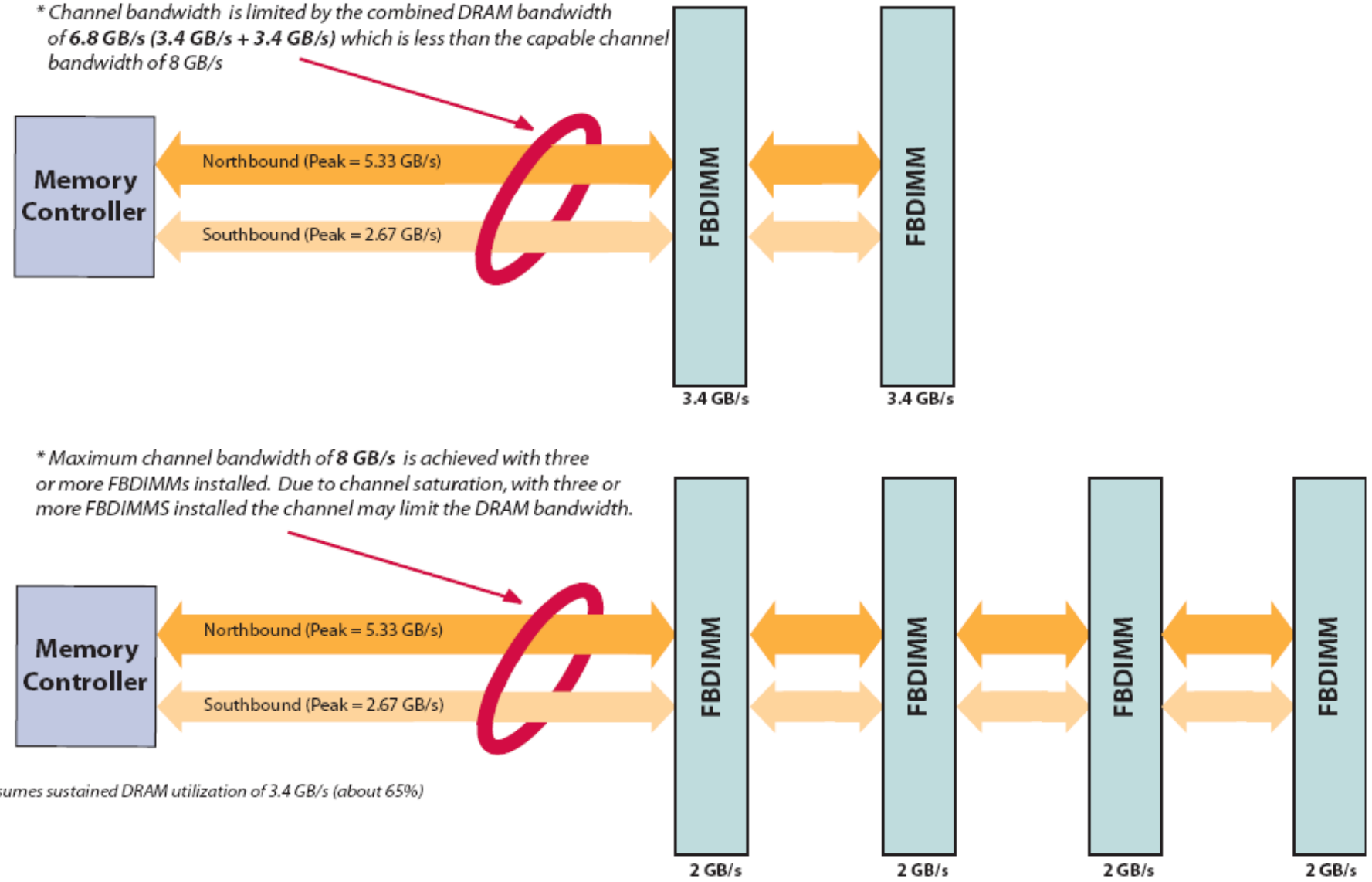
FBDIMM



- Basada en memorias DDR2 con una nueva topología de conexión mediante canales serie (modelo PCI-Express). Velocidad. 8 GB/s
- Permite un escalado virtualmente "ilimitado" reduciendo el número de pines
- **A**dvanced **M**emory **B**uffer. Permite lecturas y escrituras simultáneas.



Anchos de banda en FBDIMM



bandwidth = (FBDIMM bandwidth) x number of FBIMM in channel or peak channel bandwidth, whichever is less

Tipos de servidores

- Torre
  - < 4 nodos
  - Sistemas independientes

- Pizza box
  - 3..24 nodos, escalado masivo
  - Montar en Rack: 1, 2 ó 4 U
  - Armarios de 19”, 1U=1,75”

- Servidores Blade (> 24)
  - Gran densidad, **mayor coste**
  - Expansión limitada: Mezzanine B.
  - Algunos con KVM incluido

Otras alternativas actuales en CPDs

- Microservidores
  - Mejora de eficiencia para ciertas cargas de trabajo.
  - Rack Scale Architecture (RSA)
  - Software Defined Networking (SDN)
  - Virtualización de Red
  - Intel C2000 “Avoton”

- https://intel.activeevents.com/sf13/connect/fileDownload/session/A02B7458AF93EB0153BB728308E30F99/SF13_CLDS006_101.pdf