

# Phi, fa, virág Egy csokor gyorsító

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# SGI Strategy and Focus



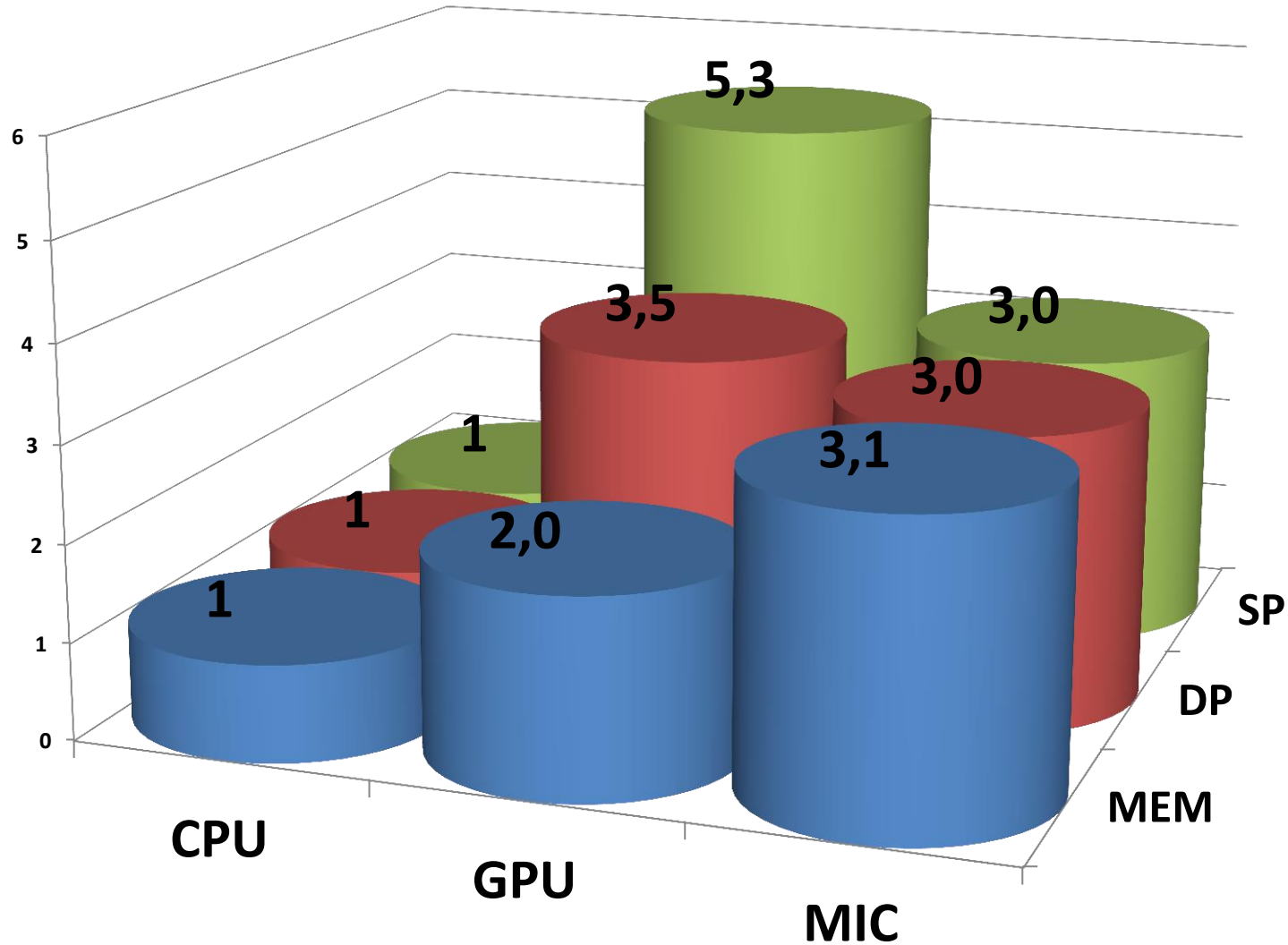
# Nvidia Tesla sorozat

Features	M2075	M2090	K10	K20	K20X
Number and Type of GPU	1 Fermi GPU	1 Fermi GPU	2 Kepler GK104s	1 Kepler GK110	
Peak double precision floating point performance	<b>515</b> Gigaflops	<b>665</b> Gigaflops	<b>190</b> Gigaflops (95 Gflops per GPU)	<b>1.17</b> Tflops	<b>1.31</b> Tflops
Peak single precision floating point performance	<b>1030</b> Gigaflops	<b>1331</b> Gigaflops	<b>4577</b> Gigaflops (2288 Gflops per GPU)	<b>3.52</b> Tflops	<b>3.95</b> Tflops
Memory bandwidth (ECC off)	<b>150</b> GBytes/sec	<b>177</b> GBytes/sec	<b>320</b> GB/sec (160 GB/sec per GPU)	<b>208</b> GB/sec	<b>250</b> GB/sec
Memory size (GDDR5)	<b>6 GB</b>	<b>6 GB</b>	<b>8 GB</b> (4 GB per GPU)	<b>5 GB</b>	<b>6 GB</b>
CUDA cores	<b>448</b>	<b>512</b>	<b>3072</b> (1536 per GPU)	<b>2496</b>	<b>2688</b>

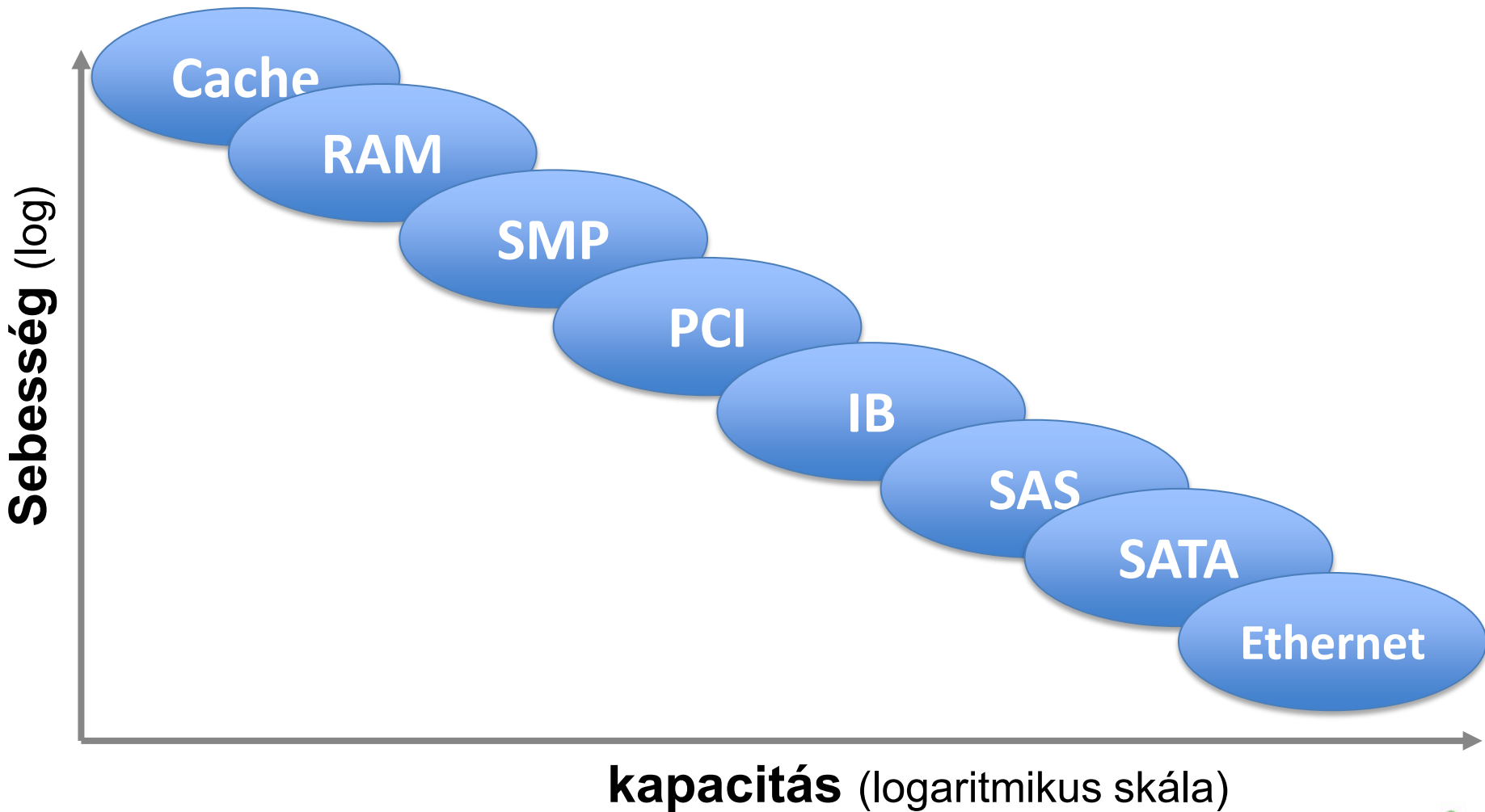
# Intel® Xeon Phi™ Coprocessor

	<u>5110P</u>	<u>3120A</u>	<u>3120P</u>	<u>7120P</u>	<u>7120X</u>	<u>5120D</u>
Code Name	<u>Knights Corner</u>					
Launch Date	Q4'12	Q2'13	Q2'13	Q2'13	Q2'13	Q2'13
# of Cores	60	57	57	61	61	60
Clock Speed	1.053 GHz	1.1 GHz	1.1 GHz	1.238 GHz	1.238 GHz	1.053 GHz
Peak double precision floating point performance						<b>1.011</b> TFlops
Peak single precision floating point performance						<b>2.022</b> TFlops
Cache	30 MB	28.5 MB	28.5 MB	30.5 MB	30.5 MB	30 MB
Max TDP	225 W	300 W	300 W	300 W	300 W	245 W
Max Memory Size	<b>8 GB</b> (16 channels)	<b>6 GB</b>	<b>6 GB</b>	<b>16 GB</b>	<b>16 GB</b>	<b>8 GB</b>
Max Memory Bandwidth	<b>320 GB/s</b>	5 GB/s	5 GB/s	5.5 GB/s	5.5 GB/s	5.5 GB/s

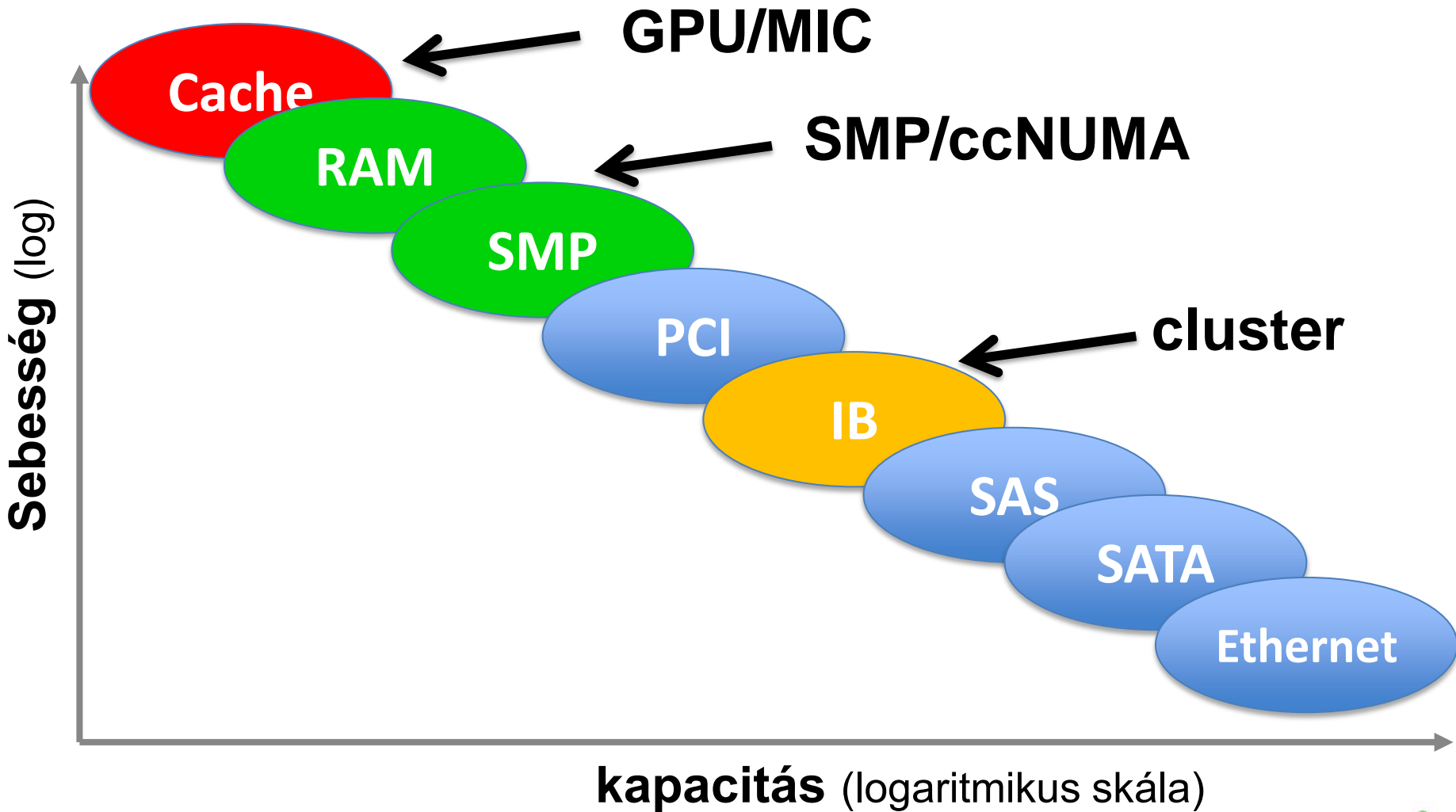
# CPU - GPU - MIC



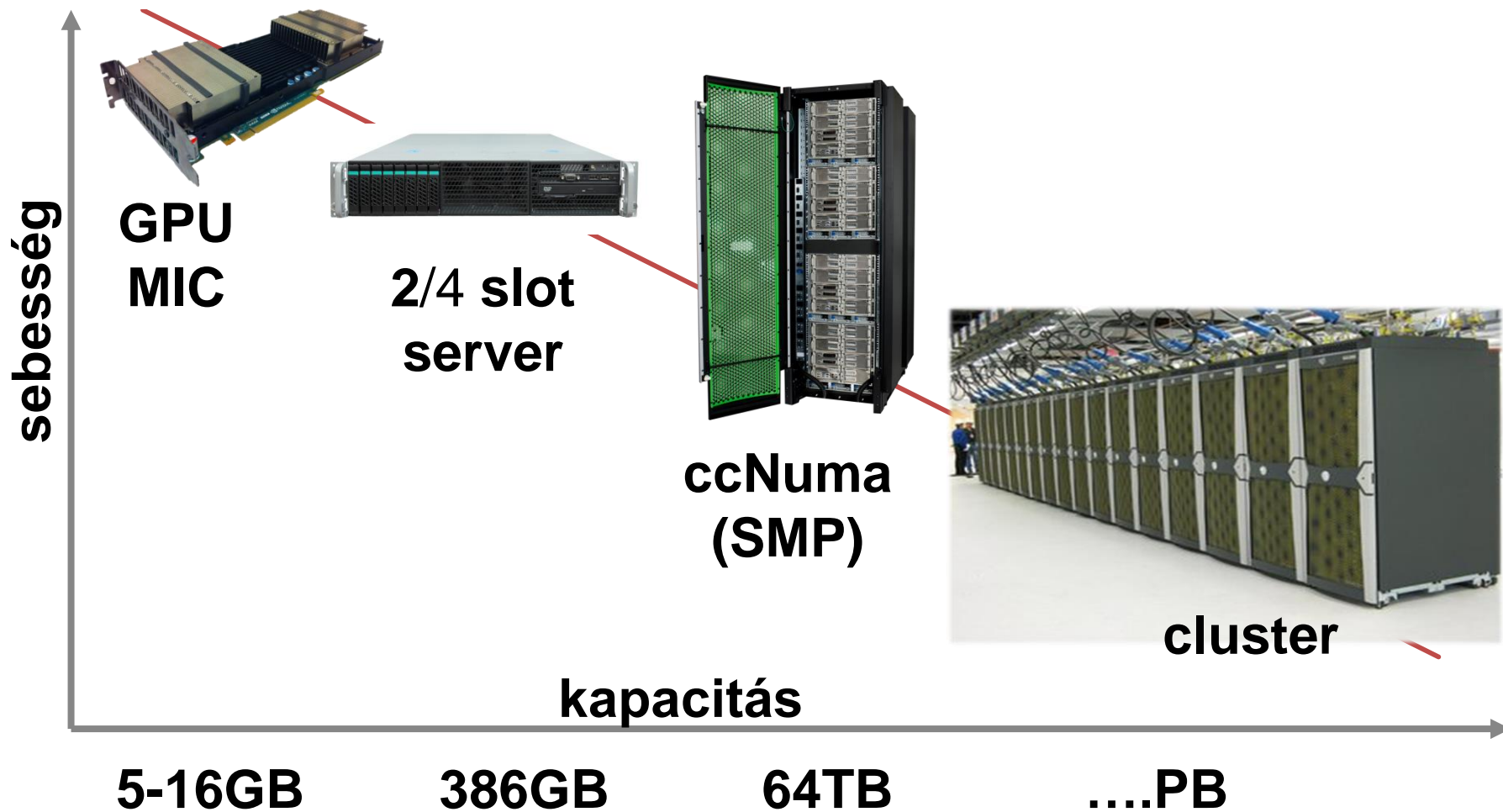
# Processzor ellátása adatokkal



# Processzor ellátása adatokkal

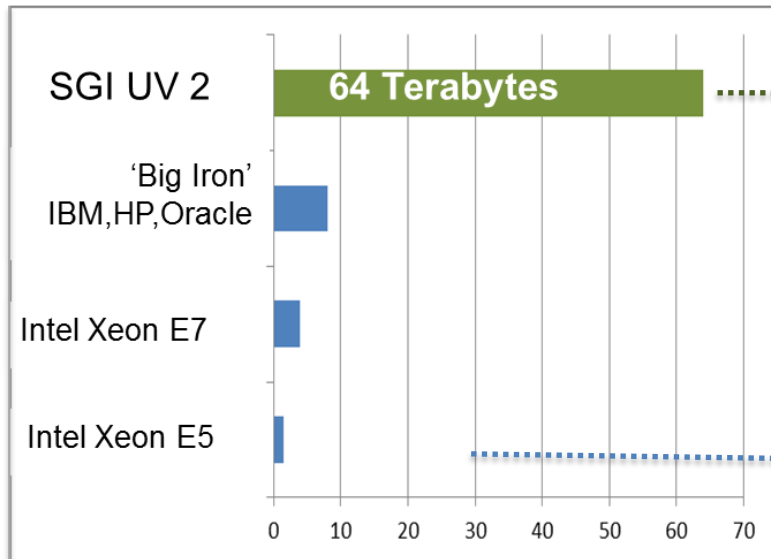


# Adatelérési sebesség vs. kapacitás





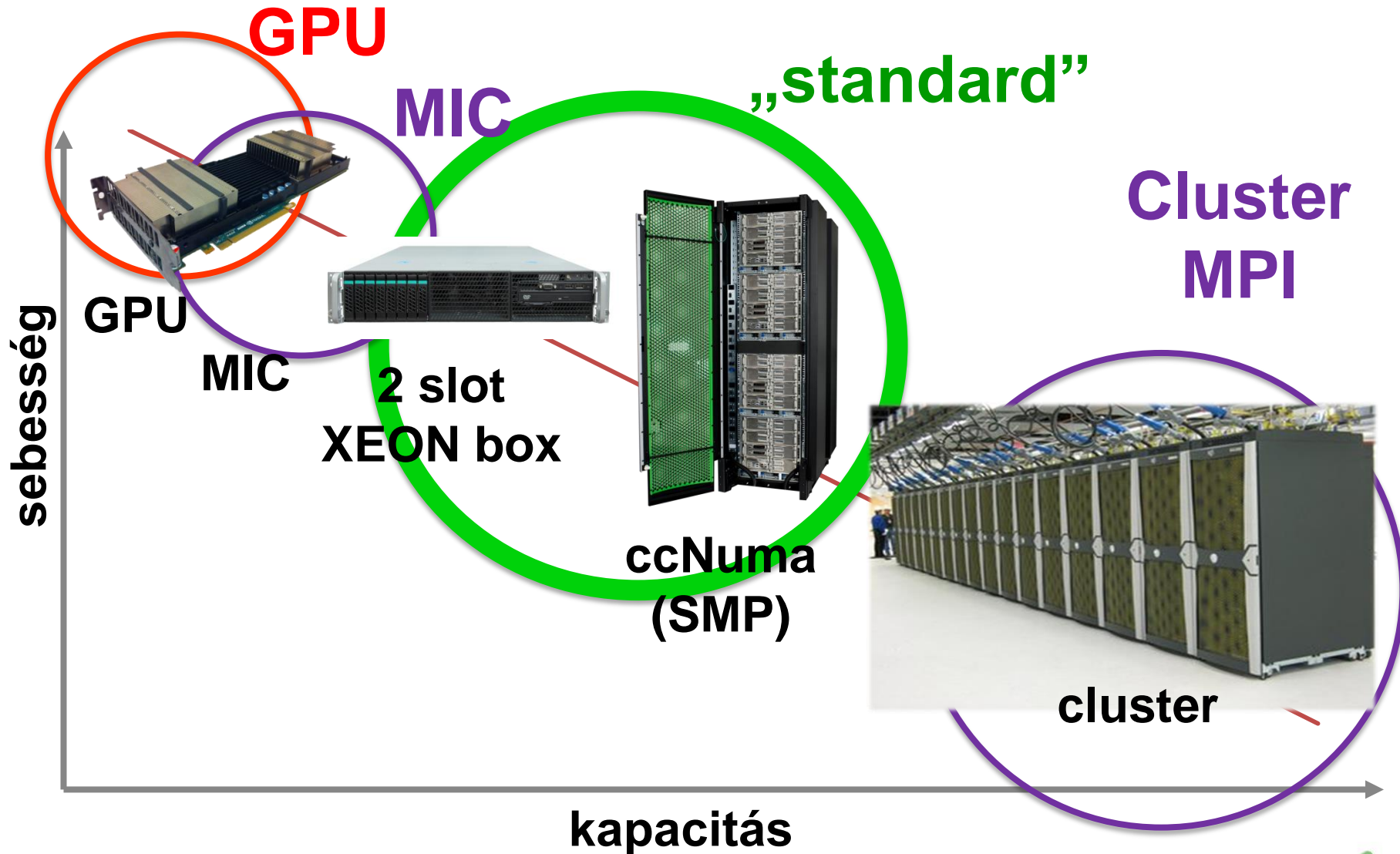
# SMP/ccNUMA vs cluster/GPU/MIS



Max memory per System, TB



# Program fejlesztési költség



# SGI Rackable® C1104G-RP5



## Compute GPU/ Co-processor support:

- Tesla M2075, M2090\*\*, K10, K20, Xeon PHI

## NVIDIA graphics GPU support:

- Quadroplex 7000

\*\*130W standard Max CPU TDP. 135W CPU TDP with ambient temp. restrictions

<b>Chassis Profile</b>	1U standard-depth
<b>Servers/System</b>	One dual-socket
<b>Chipset</b>	Intel® C600
<b>Max. Processors</b>	Two Intel® Xeon® E5-2600 <b>Two Intel® Xeon® E5-2600 v2</b>
<b>Max. CPU TDP</b>	115W
<b>Memory Slots</b>	8 DIMM slots
<b>Memory Type</b>	<b>1866/1600/1333/1066/800 MHz</b> DDR3 ECC Reg
<b>Max. Hard Disk Drives</b>	4 x 2.5" drives
<b>Expansion Slot</b>	Three PCI-E 3.0 x16 (two internal and one external) double-width slots One external PCI-E 3.0 x8 low-profile slot
<b>Networking (Onboard)</b>	Dual-Port GigE controller (Intel® I350)
<b>IPMI Remote Management</b>	Integrated IPMI 2.0
<b>Power Supply</b>	1800W Redundant* Platinum Level

\*Redundant per configuration

# SGI Rackable® C2110G-RP5



## Compute GPU/ Co-processor support:

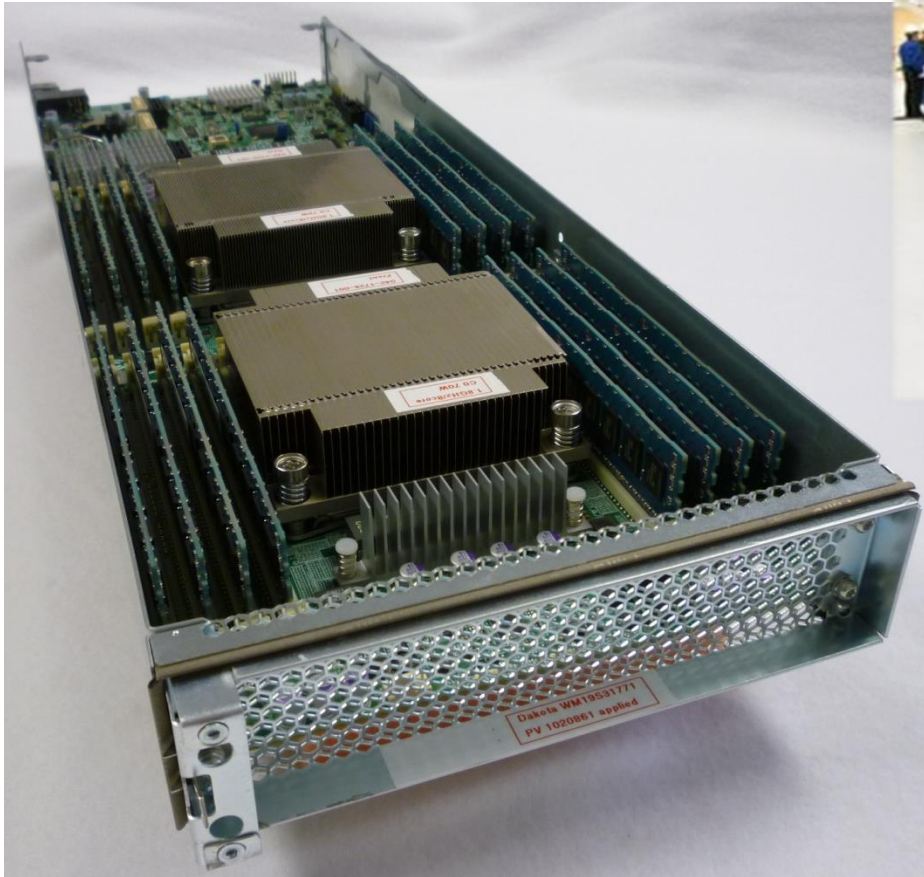
- Tesla M2075, M2090, K10, K20, Xeon PHI

## NVIDIA graphics GPU support:

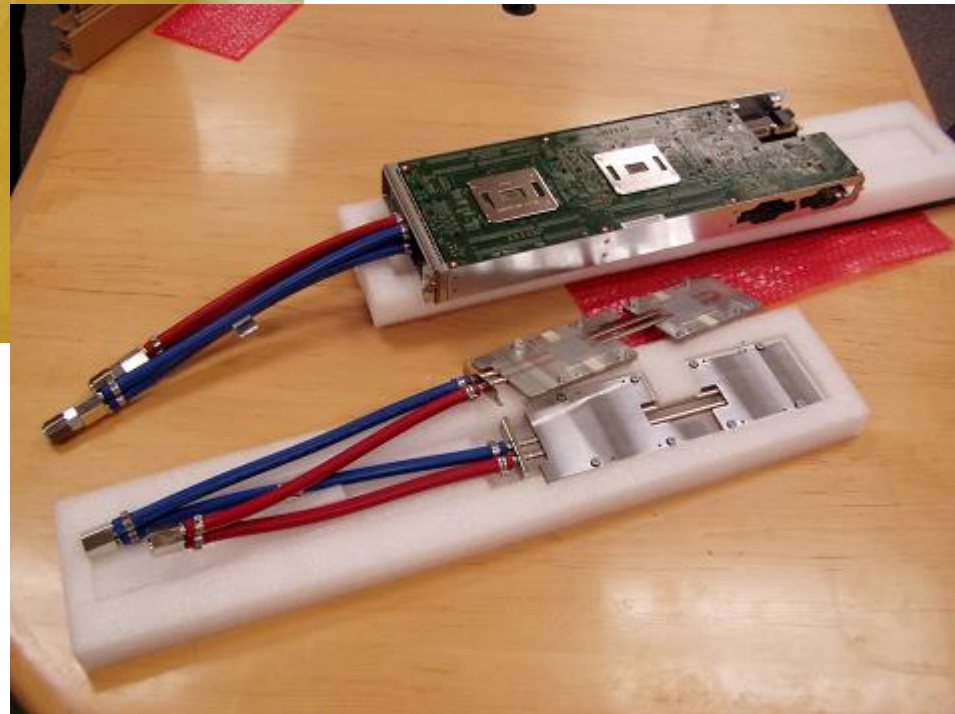
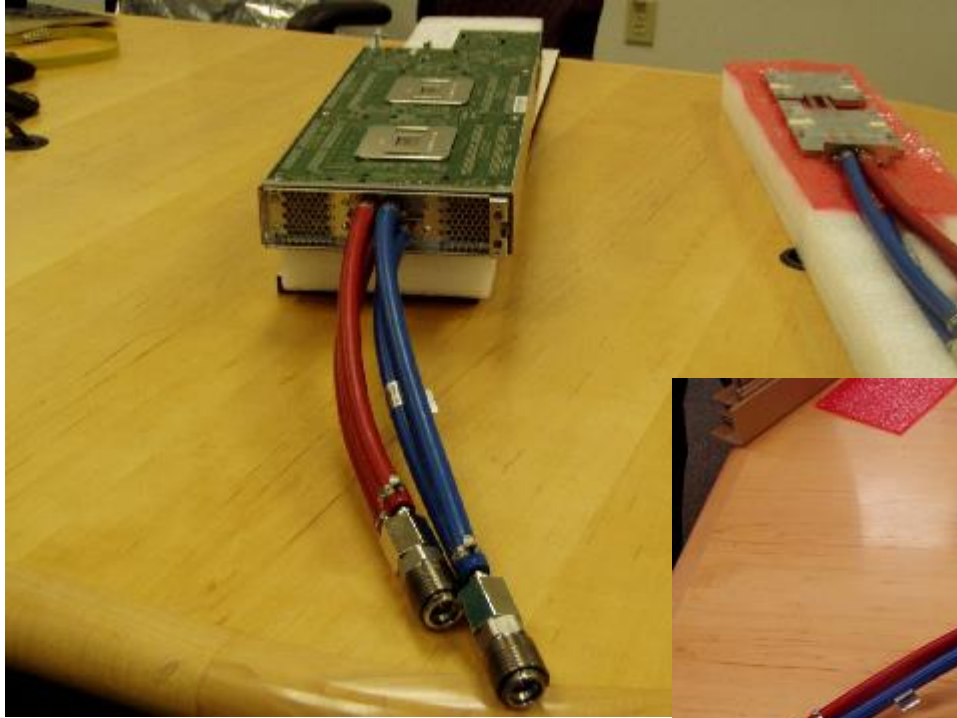
- Quadroplex 7000

<b>Code Name</b>	<b>“Pyramid 2U”</b>
<b>Chassis Profile</b>	2U standard-depth
<b>Servers/System</b>	One dual-socket
<b>Chipset</b>	Intel® C600
<b>Max. Processors</b>	Two Intel® Xeon® E5-2600 <b>Two Intel® Xeon® E5-2600 v2</b>
<b>Max. CPU TDP</b>	130W
<b>Memory Slots</b>	8 DIMM slots
<b>Memory Type</b>	<b>1866/</b> 1600/1333/1066/800 MHz DDR3 ECC Reg
<b>Max. Hard Disk Drives</b>	10 x 2.5” drives
<b>Expansion Slot</b>	Four internal PCI-E 3.0 x16 double-width One external PCI-E 3.0 x8 low profile and one PCI-E 2.0 x4 full height
<b>Networking (Onboard)</b>	Dual-Port GigE controller (Intel® I350)
<b>IPMI Remote Management</b>	Integrated IPMI 2.0
<b>Power Supply</b>	1800W Redundant** Platinum Level

# SGI Altix ICE X (cluster)



# SGI ICE vízűtéses XEON+PHI blade



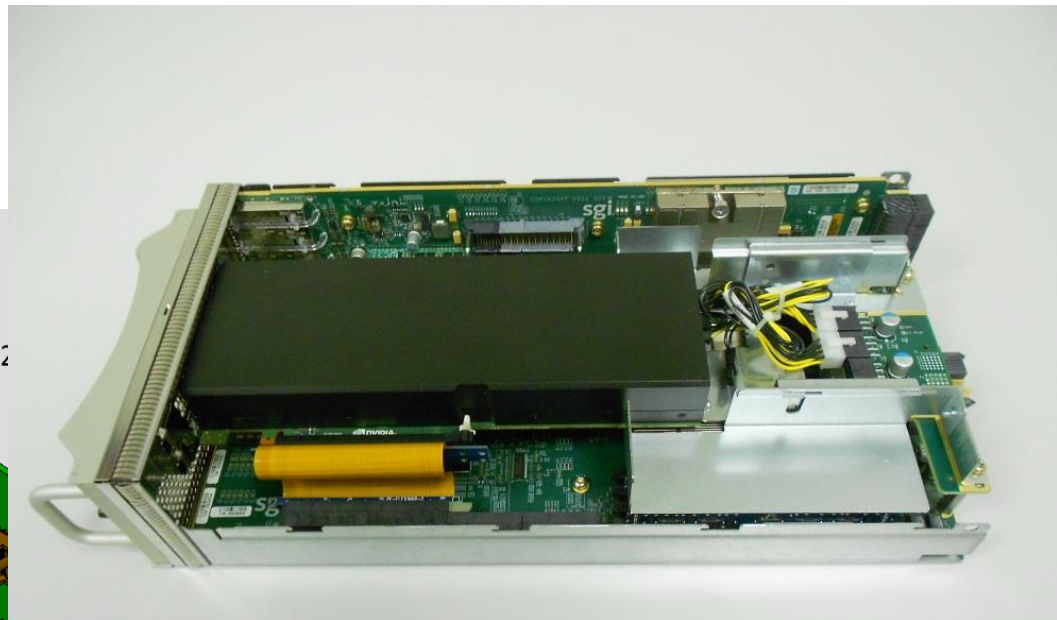
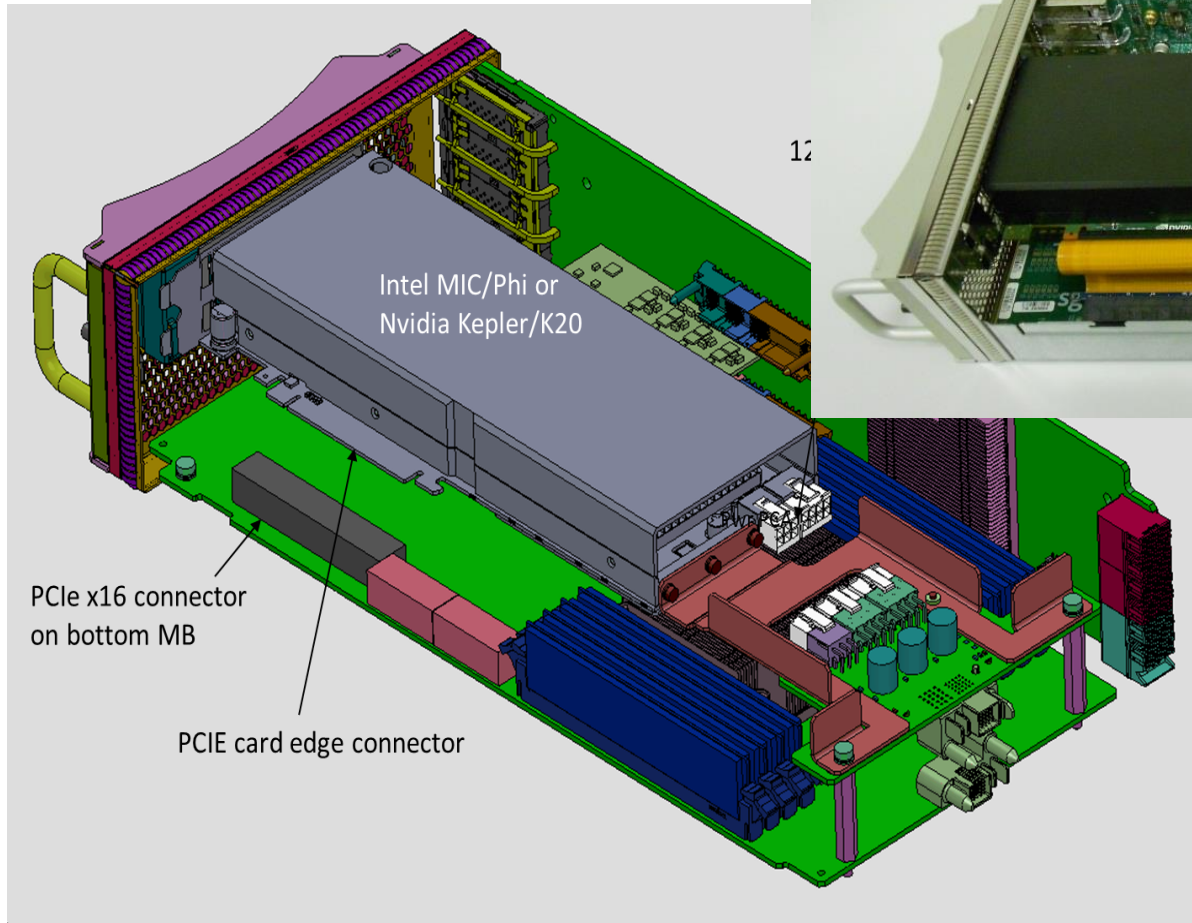
# SGI UV2000 – az egyetlen „nagy gép”

Az egyetlen SSI (single system image)  
géptípus 4 processzor felett

- 4-256 XEON socket
- 1-64TB ram
- Linux o.s.



# UV 2000 “MG” Blade



**Skálázhatóság:**

**Phi: 32 kártya**

**K20: 8(16) kártya**



# Próbálja ki!

A hazai felsőoktatás és kutató intézetek számára a NIIF által biztosított nagygépek:

- Cluster: SGI ICE  
Debrecen (18TFlops, 1536 core; 6TB ram)
- Cluster + GPU: HP  
Szeged (14TFlops, 2304 core; 5,6TB ram, 6xM2070)
- SMP/ccNUMA: SGI UV  
Pécs (10TFlops, 1152 core, 6TB ram)

[http://www.niif.hu/szolgalatasok/szuperszamitastechnika/altalanos\\_ismerteto](http://www.niif.hu/szolgalatasok/szuperszamitastechnika/altalanos_ismerteto)