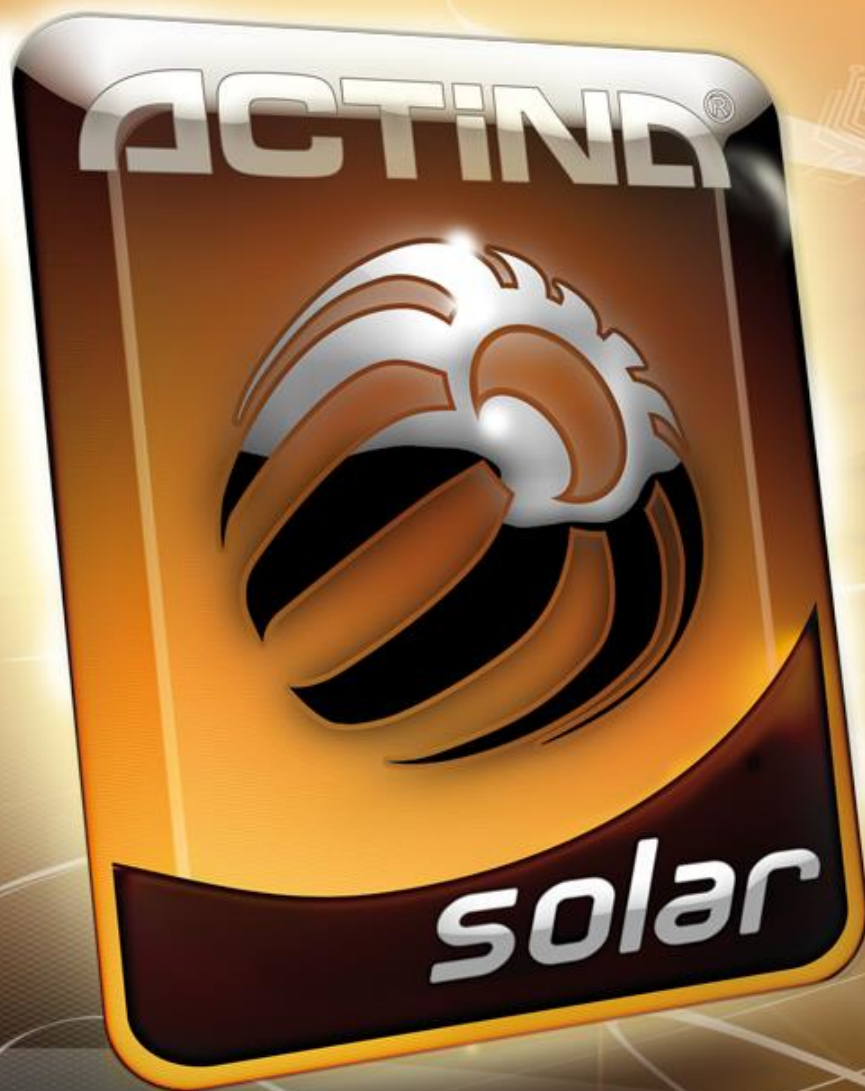




Implementacje nowych technologii serwerowych



Technologie serwerowe - nowości

- Nowe generacje procesorów, proces technologiczny
- Serwery w nowych formach:
2U TwinPro2, 2U Twin, FatTwin, MicroCloud
- Rozwiązania GPU, koprocesory
- Rozwiązania do przechowywania danych,
technologie dyskowe i SSD
- Technologie sieciowe



Ciągły postęp – w równym rytmie

45nm Process Technology		32nm Process Technology		22nm Process Technology	
Nehalem	Westmere	Sandy Bridge	Ivy Bridge	Haswell	
NEW Intel Microarchitecture (Nehalem)	Intel Microarchitecture (Nehalem)	NEW Intel Microarchitecture (Sandy Bridge)	Intel Microarchitecture (Sandy Bridge)	NEW Intel Microarchitecture (Haswell)	
TOCK	TICK	TOCK	TICK	TOCK	
					

Nowa mikroarchitektura w procesie technologicznym 22 nm



Budowa procesora E5-2600 v3 (Haswell)

22nm Process Technology

PCI Express* 3.0
40 Lanes

Intel® Hyper-Threading Technology (2 threads/core)

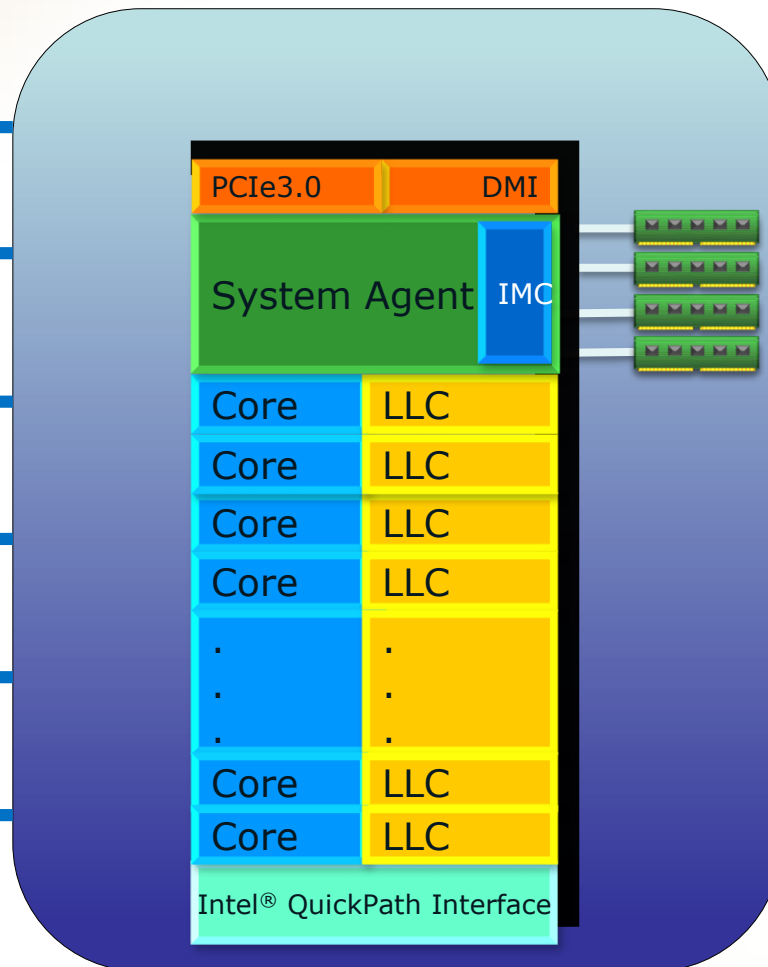
Intel® Turbo Boost Technology

Up to 18 Cores

Integrated Voltage Regulator

Nowe funkcjonalności

Istniejące funkcjonalności



Power Management:

Per Core P-State (PCPS)
Uncore Frequency Scaling (UFS)
Energy Efficient Turbo (EFT)

Memory Technology:

Socket R3
4xDDR4 channels
1333, 1600, 1866, 2133 MT/s

~2.5 MB Last Level Cache/Core
Up to 45 MB total LLC

Intel® AVX 2.0 / Haswell New Instruction (HNI)

Intel® QuickPath Interface (x2)



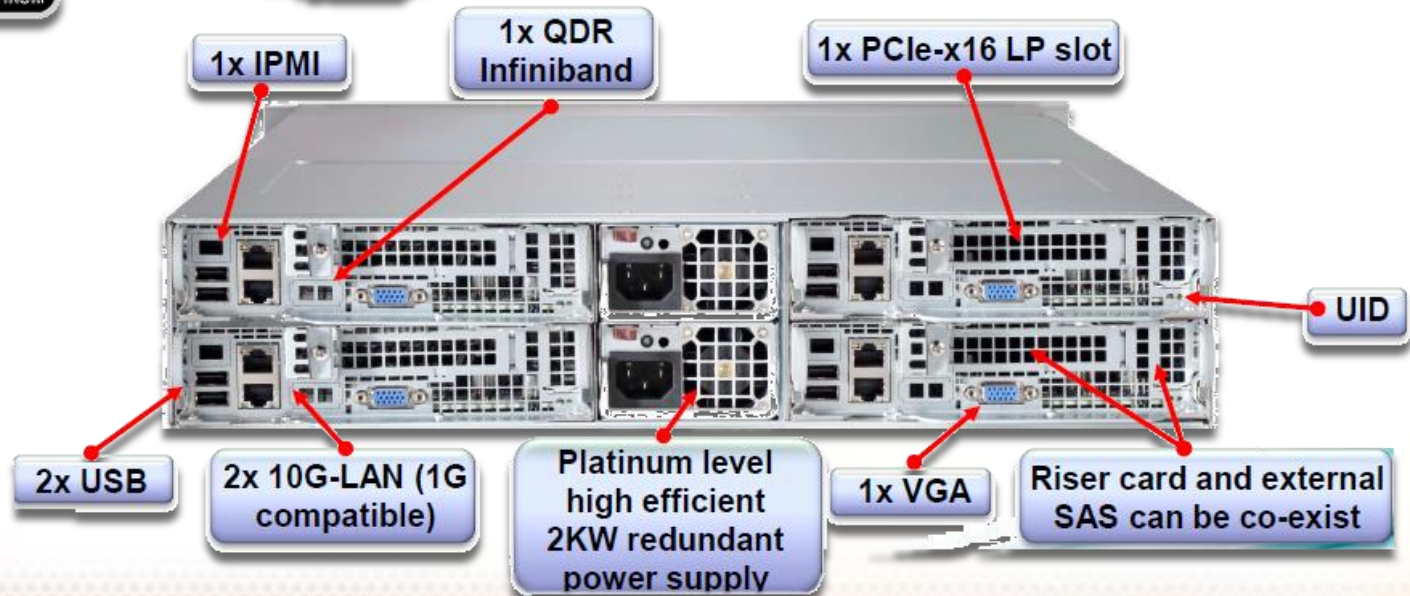
TwinPro²



Rozwiązanie TwinPro²



- 0 Slot
- SATA-DOM
- M-SATA





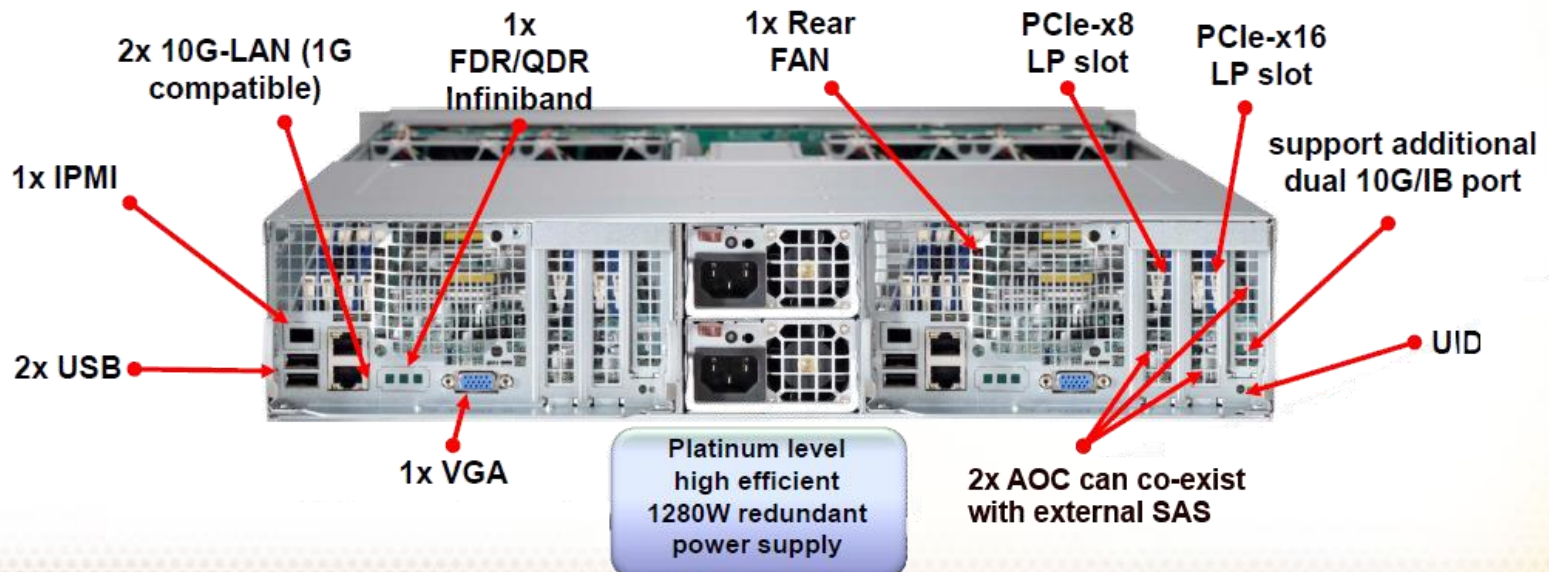
TwinPro 2U



Rozwiązanie TwinPro 2U



- 0 Slot
- SATA-DOM
- M-SATA
- GPU
- PCI-e SSD





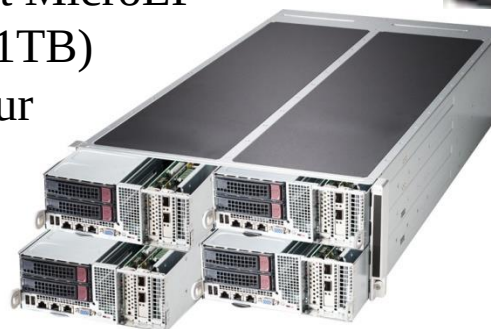
FatTwin



Różnorodność rozwiązań FatTwin

• Główne zalety:

- Gęstość upakowania – w obudowie 4U jest 8 węzłów dwuprocesorowych (lub 4 węzły storage/GPU)
- do 8 dysków hot-swap 3.5” na 1U (storage) lub 12 dysków 2.5” na 1U (6szt na moduł w wersji 8-modułowej)
- redundantne zasilanie (4 zasilacze po 1620W) klasy 80PLUS Platinum (do 94% wydajności)
- zintegrowany na płycie adapter Infiniband FDR/QDR (Układ Mellanox-a ConnectX-3)
- Slot PCI-Express x16 – low profile lub slot MicroLP
- 8-16 gniazd pamięci (max. do 512GB lub 1TB)
- wsparcie dla szerokiego zakresu temperatur powietrza wlotowego (free cooling)





Główne typy rozwiązań FatTwin

Rear I/O



F627R3-R72B+/RTB+



F617R2-R72+/RT+

4U with 4-node/8-node
PUE optimized – 130W/135W
More flexible, dense storage
- 2.5"/3.5" SAS/SATA; 8 HDD/1U
More add-on cards

Front I/O



F627R3/2-F72+/FT+



F627R3-F73/FT

F617R2/3-F73/FT

4U with 4-node/8-node
PUE optimized – 130W/135W
Redundant hot-plug fans

16 DIMMs

GPU

F627G3/2-F73+/FT+



12 GPUs
Front I/O



F617H6-FT+

F517H6-FT



48 HDDs
Front I/O

Lower cost storage for Big Data
Much more features...



MicroBlade



MicroBlade – procesory Xeon i Avoton



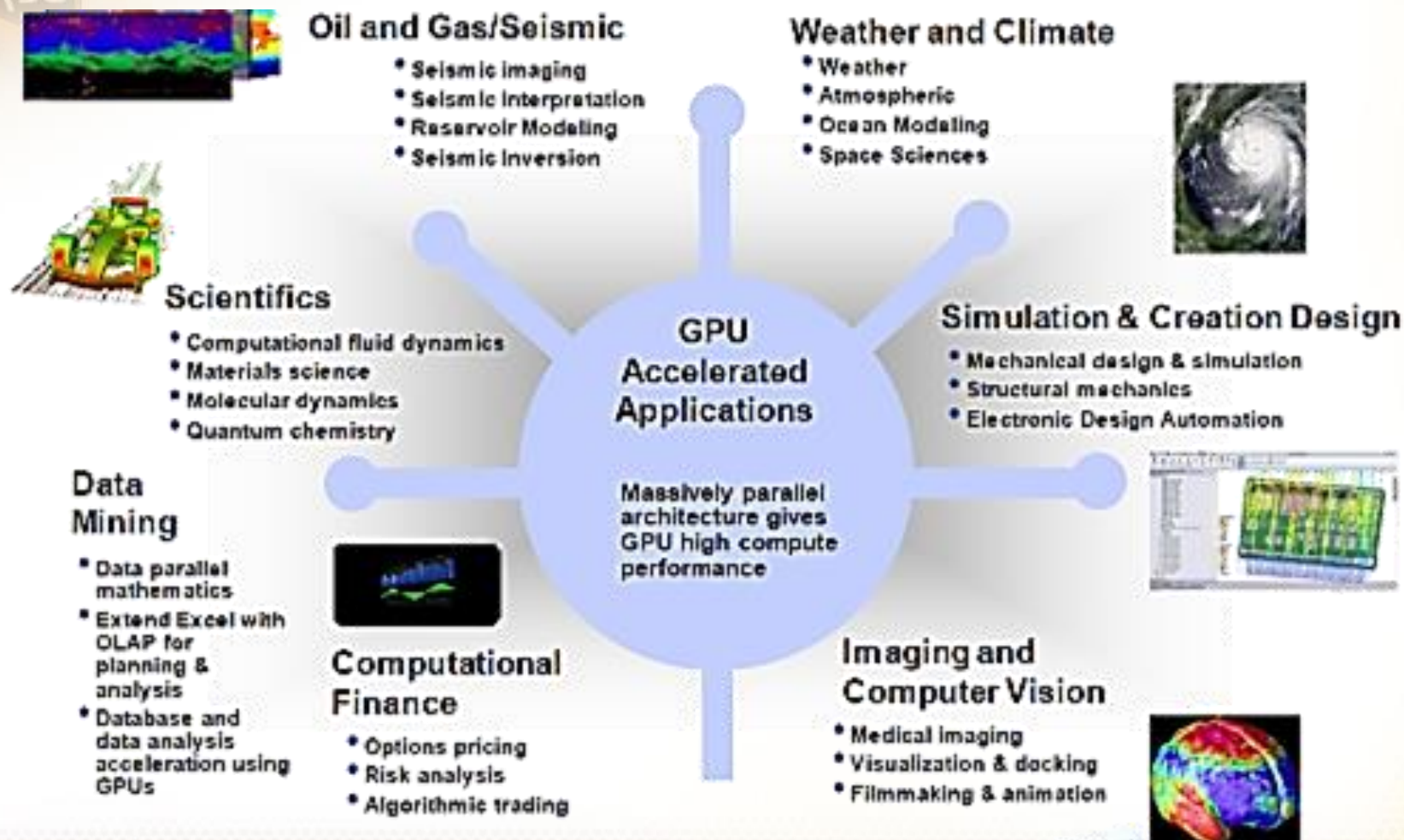
- 112 Avoton / 28 Xeon DP nodes in 6U
- 95% high efficiency power supply
- 99% cable reduction
- Redundant GbE switches with (40G/10G) uplinks
- Redundant power supplies
- Redundant cooling fans
- Unified remote management
- Hot-plug front loading
- Easy to manage, maintain & deploy



GPU Koprocesory

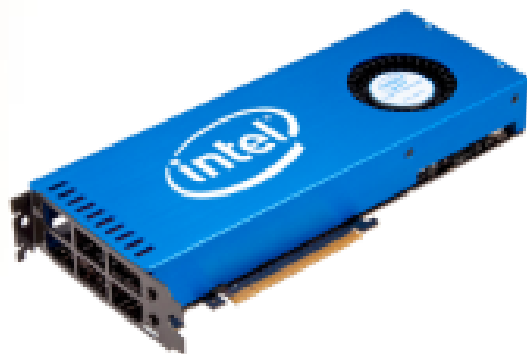


Obszary zastosowań GPU/Koprocesorów





Koprocesor - programowanie



Single Source



Compilers
and Runtimes





Storage



Serwer dyskowy – 4U/ 72 dyski

3x IT Mode Storage Adapters (LSI2308)
24X SAS/SATA devices per/Controller for
maximum performance

16x DIMM Slots Support up to
512 GB DDR3 ECC
Registered memory (RDIMM)

Intel® Xeon® Sandy
Bridge E5-2600



Five PCI-E 3.0 x8
Expansion slots

Two 3.5" HDD per Module

Platinum level
high efficient **1280W**
2+1 or **2000W** (1+1) power
supplies with Optional Battery
Backup Power (BBP)



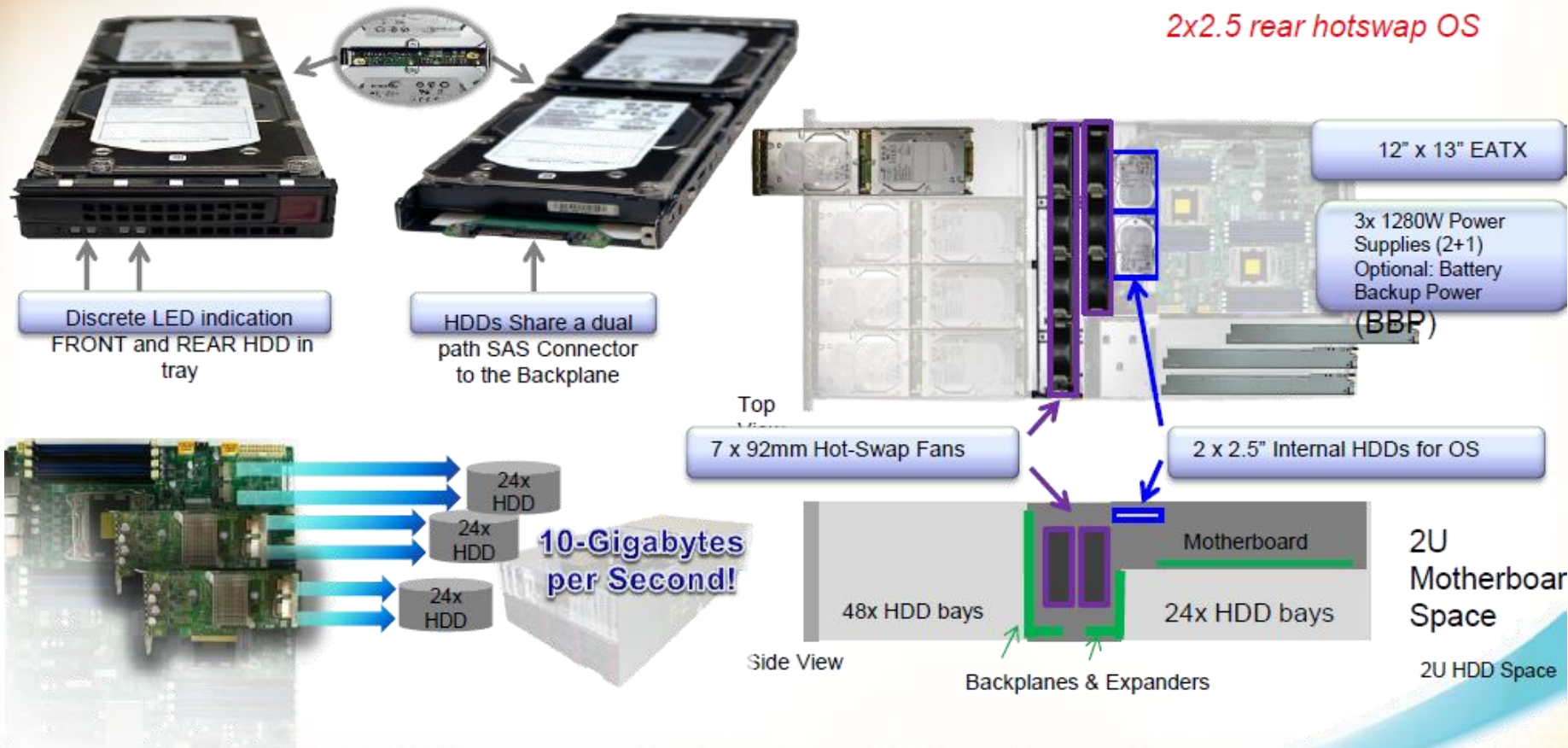
Hot-swap 72 x 3.5"
SAS/SATA/SSD Drive

Dedicated **IPMI** port
for out of band/remote
hardware



Konstrukcja wewnętrzna

SSG-6047R-E1R72L





Dyski SSD - NVMe



Consistent, Native PCIe* Performance

Up to 6X throughput, up to 2X latency reduction vs. SATA¹

- 2800/1900 MB/s (Read/Write)
- 460/180K 4K Random Read IOPS
- 250K 4K 70/30 Read/Write Mixed Workload IOPS
- 20/20µs sequential latency (Read/Write)



Stress-Free Protection

Data storage with multiple checkpoints helps protect data

- End-to-end data path protection
- Power loss protection with built in self-test
- 2.5" hot-plug capability
- Uncorrectable Bit Error Rate (UBER): 1 sector per 10^{17} bits read
- Mean Time Between Failures (MTBF): 2,000,000 hours, 230 yrs



High Endurance

Leading technology provides optimal price performance

- Intel® 20nm MLC NAND with High Endurance Technology
- 10 full capacity drive writes per day over 5 years*



High Capacity

Broad range of capacities in a single volume

- 400/800 GB 1.6/2.0 TB
- 2.5" x 15mm, SFF-8639
- Add-In-Card (AIC) half-height, half-length card



Technologie Sieciowe



Karty sieciowe – dedykowane platformy

Wydajne serwery 4-procesorowe

Fortville 40 GbE

4x10GbE / 2x40GbE
Optimized 10G/40G Blade,
Rack LOM, Mezz Cards, and
NICs

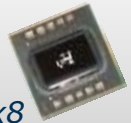


- PCIe3* x8
- Integrated KR/KR4/XLAUI PHY
- Intel® VT-c (VMDq, SR-IOV)
- DCB, iSCSI, FCoE, EVB and MFP
- Power management: EEE, DMA coalescing
- IPMI, NC-SI, MCTP over SMBus/PCIe

Ekonomiczne serwery 4-procesorowe

Twinville (X540)

2x10GBASE-T PCIe Gen2 x8



- Small package, <12W
- Intel® VT-c (VMDq, SR-IOV)
- DCB, iSCSI, FCoE, and EVB
- Power management: DMA Coalescing
- IPMI, NC-SI, MCTP over PCIe

Serwery 2-procesorowe

Powerville (I350) 2 / 4x1 GbE

- Power Mgmt: EEE, DMA Coalescing
- VMDq, SR-IOV, iSCSI, NC-SI, MCTP over SMBus

2x Springville (I210)

- Power management: EEE, DMA Coalescing
- iSCSI, AVB, NC-SI, MCTP over SMBus/PCIe



Serwery 1-procesorowe

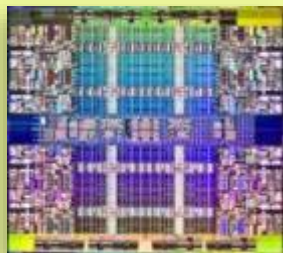
Clarkville + Springville (I210)

- Two GbE ports, Smallest form factor, AMT Support
- Power management: EEE





Zrównoważony rozwój konstrukcji



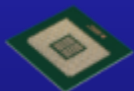
Intel® E5-2600 v3 product family

- Up to 18 cores/36 threads per socket
- Haswell New Instructions
- DDR4 Memory support
- Integrated PCIe* with Atomics
- IVR-enabled Platform Efficiency



Intel Platform Technologies

Wellsburg



Chipset

Intel® Xeon Phi™ (Knights Corner)



Intel® MIC
Architecture

P3700 P3600 P3500



NVMe SSD

Fortville



Networking

Enables key usage models across high growth segments

**Private
Cloud/
Enterprise**

**Public
Cloud**

HPC

Storage

**Networking
and SDN**

Workstation



- Dziękuję za uwagę