RSC Group, the leading developer and integrator of innovative solutions for HPC and data centers, offers a broad range of turnkey ultra high-dense energy efficient solutions containing from dozens (RSC DCmicro) to hundreds and thousands (RSC Data Center) computing nodes meeting various customer requirements. With a great diversity of solution technologies and architectures, from classical RSC Tornado cluster architecture to massively parallel RSC PetaStream systems you can solve efficiently the most complex scientific, technical, engineering, financial and other tasks in different fields and use your data center for various practical applications.

* Supports integration of multiple architectures within a single project
RSC PetaStream is a reasonable way to create exaflops-scale supercomputers while protecting software development investments. Revolutionary ultra-dense RSC PetaStream solution with RSC direct liquid cooling provides the performance level of 1.2 PFLOPS and supports execution of up to 250,000 threads on 1024 x86 Intel® Xeon Phi™ computing nodes in a single cabinet with just 1m² (10.76 sq ft) footprint. RSC PetaStream set the world’s leading computing and power density and beats world records in compact size.

**Massively Parallel System to address ExaScale needs**
- Right system for many-core processors
- The architecture that scales compute, storage and network to ExaScale levels

**Programmability and investment protection**
- Build on industry standard x86 architecture
- Utilize existing programming models, reuse existing apps
- Preserve investment into optimization for future many-core platforms

**Flexible to meet specific customer requirements**
- Choice of interconnects and topologies
- Provides options for innovative storage and interconnection designs
- Linear scalability

**Energy efficiency**
- Build on proven exhaustive RSC direct liquid cooling technology
- Efficient and innovative power delivery subsystem
- System management and monitoring

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**RSC PetaStream – Architecture**

**Compute module**
- 8 compute nodes
- Over 300 Gbps external IO bandwidth
- Direct liquid cooling of all components
- Integrated node management
- Effective DC 400V power system

**Compute node**
- Intel® Xeon Phi™ 7124D
- 16GB of RAM
- 64GBps IO bandwidth
- Linux µOS

**Compute chip**
- Intel® Xeon Phi™
- 61 x86 cores / 244 threads
- > 1.2TFLOPS peak perf.
- 352 GB/s peak mem. BW
- 30 MB shared cache

**System**
- Path to ExaScale
- Proven RSC Direct Liquid Cooling Technology
- Scalable/modular: tailored to customer’s needs
- Flexible network options
- Based on COTS components

**Cabinet**
- Over 1.2PFLOPS peak performance
- 250K threads / 1024 nodes
- Up to 400 kW
- Integrated management
- 1m² / 10.8 ft² space
RSC TORNADO CLUSTER SOLUTIONS

RSC Tornado energy-efficient high-dense expandable cluster architecture combines all advantages of the latest RSC technologies. This architecture enables record power density for HPC industry – over 280 TFLOPS per cabinet or 153 dual CPU computing nodes per a 42U cabinet with just 0.64m² (6.89 sq.ft.) footprint. It is intended for complex scientific, technical, engineering and other tasks in various fields and for applied usage.

Records: density, computing power and energy efficiency
- Up to 153 expandable x86 nodes with two top bin Intel® Xeon® E5-2600 v3 processors
- 280.6 TFLOPS in a standard 42U cabinet (80x80x200 cm)
- PUE (Power Usage Effectiveness) up to 1.06
- Hot water cooling (up to 65°C inlet water)

Cost reduction
- Using widely available components
- Leading computing efficiency – over 96% at LINPACK test
- High reliability (no moving parts and highly efficient RSC liquid cooling system)
- Scalability on demand to meet customers’ requirements

Easy to expand
- Independent expandable base computing node
- Broad range of expansion packages for specific tasks
- Supports node hot-swap without impact on other nodes
- Universal chassis with a revolutionary RSC liquid cooling system diverting 100 kW of heat from the cabinet

Independence and ease of data center creation
- Fully independent solution
- Modularity
- Does not need conditioning system
- Can be deployed in unprepared premises
- Energy efficient Power 400V (DC) or 240V (AC)
- No traditional UPS systems required

RSC Tornado – Architecture

RSC Tornado Expansion Packs
- RSC Tornado HPC Expansion Pack focused on high-performance computing with up to two Intel® Xeon Phi™ co-processors improves computing node performance to 3.74 TFLOPS;
- RSC Tornado Graphics Expansion Pack focused on high-performance computing with up to two NVIDIA® Tesla® K40 or AMD GPUs;
- RSC Tornado VDI Expansion Pack is intended for virtualization and remote workplace access and for CAD/CAM/CAE fields. It is based on AMD FirePro™ S10000 or NVIDIA GRID™ K1/K2 cards and on Intel® SSD DC P3700 high-performance solid-state drives;
- Hardware and software package RSC SDM Expansion Pack implements Software Defined Management concept developed by RSC specialists for RSC Tornado and RSC PetaStream computing nodes improving manageability and accessibility of computing systems for user applications;
- Other specialized expansion packs can also be easily created on specific requests of the customers.

RSC Tornado HPC Expansion Pack
- Up to 280.6 TFLOPS Peak performance or 153 servers based on top performance Intel Xeon (E5-2600 v3 family processors)
- Fully integrated software stack for High Performance Computing “RSC Basis”
- Single System Management and Monitoring Point
- 24/46/64 kW 3/3.6/6 H² Footprint
- Independent power distribution domains
- Easy for customer installation and setup
- Hot water cooling (up to 65°C inlet water)
RSC PetaStream – Technical Summary

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RSC Tornado – Technical Summary

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* Available within corresponding RSC Tornado Expansion Pack

ABOUT RSC GROUP

RSC Group is Russia’s and CIS leading developer and provider of next-generation supercomputing solutions based on Intel architecture and technology, advanced liquid cooling and its own extensive know-how. The company’s potential allows for practical creation of the most energy efficient solutions with record PUE, realization of industry highest computing density based on x86 standard processors, completely green design, the highest reliability of solutions, complete noiselessness of computing modules, 100 percent compatibility and guaranteed scalability, while ensuring lowest total cost of ownership and small energy consumption. Additionally RSC specialists are experienced in development and implementation of a complete software solution stack for increased effectiveness and usability of supercomputer systems ranging from system software to vertically oriented platforms on the basis of cloud computing technology.

RSC participates in the Intel® Technology Provider Program at Platinum level. Performance and scalability of RSC Tornado and RSC PetaStream based solutions are Intel® Cluster Ready certified. For more information please visit www.rscgroup.ru.

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