

**Пакеты расширения RSC Tornado Expansion Pack**



* Пакет расширения **RSC Tornado HPC Expansion Pack**, ориентированный на высокопроизводительные вычисления с использованием двух сопроцессоров Intel® Xeon Phi™ 7120X, позволяет повысить производительность вычислительного узла до 3,74 ТФЛОПС;
* Пакет расширения **RSC Tornado VDI Expansion Pack** предназначен для задач виртуализации и удаленного доступа к рабочим местам, а также областей CAD/CAM/CAE. Построен на основе карт AMD FirePro™ S10000 или NVIDIA GRID™ K1/K2 и высокопроизводительного твердотельного накопителя Intel® SSD DC P3700;
* Программно-аппаратный пакет расширения **RSC SDM Expansion Pack** позволяет реализовать концепцию RSC Software Defined Management, улучшая управляемость и увеличивая доступность вычислительных систем для пользовательских приложений;

Возможно создание и других специализированных пакетов расширения согласно конкретным запросам заказчиков.

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| **TECHNICAL SPECIFICATION** | |
| **Architecture** | [RSC Tornado Cluster Architecture](http://www.rscgroup.ru/en/our-technologies/267-rsc-tornado-cluster-architecture) |
| **Features** | A complete solution in one cabinet   * Direct liquid cooling system (“Warm water” mode support); * Communication system; * Data Storage; * Single Point of Monitoring and Management |
| **Unique features** | * Low-noise; * Energy effectiveness; * Absence of moving parts, such as fans and traditional hard disk drives (solid state drives are used instead); * Compact; * Flexible installation options: limited by space and mass requirements only – doesn’t require additional forced air cooling |
| **Scalability** | Not supported |

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| **COMPUTE CABINET (BASIC CONFIGURATION)** | |
| **Compute Field Type** | Homogeneous (Heterogenous with RSC HPC Expansion Pack) |
| **Performance (RMax)** | 60 TFLOPS |
| **Compute resources** | Up to 32 basic x86 architecture compute nodes  (306 processors, 6732 cores, 13464 threads Intel® Xeon® E5-2699 v4) |
| **Memory** | 8 TB |
| **System management** | Fully integrated software stack for High Performance Computing “RSC BasIS”:   * Single System Management Point, * Flexible Software Configuration System, * Supercomputer and Data Center view and management system |
| **Operating Systems** | Linux (RedHat, SUSE, Debian, CentOS, Scientific Linux), MS Windows |
| **Job management** | SLURM, Altair PSB Professional, Adaptive Computing Moab, IBM Platform LSF |
| **Parallel File Systems** | Lustre, Panasas, GPFS, FhGFS and others |
| **Libraries, Compilers and Tools** | Intel® Cluster Studio, PGI compilers, standard MPI libraries |
| **Power consumption** | Up to 35 kW |
| **Cooling** | “RSC Tornado” direct liquid cooling system: up to 50kW per Cabinet;  Option: integration with existing customer’s cooling system |
| **Formfactor** | 24U |
| **Dimensions** | H 1.2m (40 in.) х W 0.8m (32 in.) х D 0.8m (32 in.) |
| **Weight** | Up to 430kg (1,874 lbs.) |
| **Power** | Up to 125A at 400/230V (three-phase, neutral and ground) |

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| **COMPUTE NODE (BASIC CONFIGURATION)** | |
| **Processor** | 16-core Intel® Xeon® E5-2697A v4 (2.6GHz, 32 threads, TDP 145W) or other Intel® Xeon® E5-2600 v4 family processors;  2 processors per node;  Intel® Turbo Boost Technology is permanently enabled (+300MHz with all cores utilized) |
| **System board** | Intel® Server Board |
| **Memory** | DDR4-2133/2400, up to 256GB per node |
| **Local storage** | Solid State Drives; up to 2 SSDs per node |
| **Communication I/O interfaces** | Integrated I/O: FDR InfiniBand, 56Gbps; QDR InfiniBand, 40Gbps; 10 GigE; Optional enhancement (PCIe x16 gen3): Dual-Port InfiniBand EDR, Intel Omni-Path Fabric, Quad-Port 10/40 GigE, FibreChannel |
| **Service I/O interfaces** | 2x GigabitEthernet, IPMIv2 support |
| **Cooling** | Water cooled, coldplate, “Hot Water” mode support (up to 650C inlet water) |
| **Power** | Independent per node, 180-240V 50Hz |
| **Formfactor** | High Density Blade |
| **Expansion** | Supported, with RSC Expansion Pack |
| **Hot Swap** | Supported, with no influence to any other nodes |

## RSC Tornado Expansion Packs