



IBS and Mellanox: High-Performance PostgreSQL Database Machine

Fully-integrated, optimized SKALA-SR / Postgres Pro system addressing the need for high-loaded databases

OVERVIEW

PostgreSQL is a very popular relational database management system, whose success is due in large part to its use of open source code, dynamic programmability, ease of configuration, and rich functionality. Among a growing number of applications supporting PostgreSQL as a database server, include ERP, CRM, and ECM and other packaged systems, as well as custom-developed applications.

WHY IBS & MELLANOX?

The IBS-Mellanox partnership addresses the increasingly complex needs of today's data-centers by extending the capabilities of the PostgreSQL database management system. Equipped with Mellanox Ethernet solution, IBS SKALA-SR / Postgres Pro database machines enable rapid and efficient deployment of database management systems (DBMS), as well as high scalability, manageability and compatibility between distributions.

The offering's enterprise-class characteristics are realized through a multi-node (cluster) architecture, using synchronous or asynchronous replication. For large highly loaded systems, the replication rate becomes a critical parameter that limits the performance of the entire complex. This is why IBS chose the Mellanox solution for Ethernet interconnect. First, Mellanox provides the required bandwidth with minimal latency. Secondly, accelerating the shipping of write-ahead logs, Mellanox RDMA offload significantly reduces the processing load on CPUs and increases the speed of the database machine as a whole.

THE IBS SKALA-SR/POSTGRES PRO PLATFORM

SKALA-SR / Postgres Pro is a converged software and hardware database consisting of off-the-shelf x86 servers with internal SSDs, high-speed Ethernet switches, and Postgres Pro Enterprise DBMS, equipped with a monitoring system that provides control of all components.

Postgres Professional, a Russian company founded by a team of PostgreSQL major contributors, has developed Postgres Pro Enterprise DBMS as a commercial fork of PostgreSQL. Postgres Pro Enterprise provides several enterprise-grade capabilities, including optimizations for multi-core systems, block-level compression and incremental block-level backup.

HIGHLIGHTS

- RDMA over Converged Ethernet (RoCE) acceleration for database servers
- True non-blocking, lossless switching fabric
- Simple to use and flexible for various configurations
- Best price/performance Ethernet solution

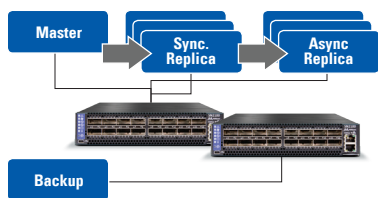


"IBS and Mellanox joint solution eliminates the bottleneck in the interaction of the Postgres cluster nodes and allows us to offer customers a productive solution – the SKALA-SR/Postgres Pro database machine."

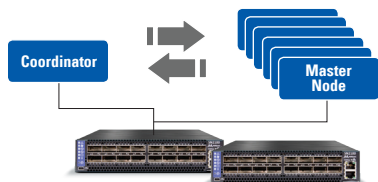
Peter Dubenskov,
Head of IBS Product Strategy and
Development Department

The special edition of Postgres Pro Enterprise used in the database machine includes crucial modifications to utilize RDMA capabilities, which provides Mellanox interconnect solution. SKALA-SR / Postgres Pro exists in 3 versions:

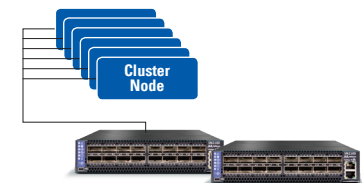
SKALA-SR / Postgres Pro Series 300



SKALA-SR / Postgres Pro Series 500



SKALA-SR / Postgres Pro Series 700



Series 300 – a production database machine, focused on OLTP workloads with a lot of reporting, which is typical for most of ERP, CRM and other operational-purpose enterprise systems. It consists of at least three nodes: two database servers with a high-performance storage subsystem, configured in synchronous or cascaded asynchronous replica mode, two Mellanox switches, and an additional node for storing transaction logs and backing up the database.

Series 500 – a hyper-converged database machine, which allows to combine database servers for functioning in the multi-master mode. It consists of at least three nodes, one of which operates in the coordinator mode, other nodes in the multi-master node, and two Mellanox switches.

Series 700 – a shared-nothing database machine, designed for OLAP workloads. It consists of at least three nodes: two database servers with a high-performance storage subsystem optimized for read operations and two Mellanox switches.

Mellanox Ethernet Interconnect

Designed to support high concurrency and large volume/interactive database workloads, PostgreSQL is at its best running on a server cluster with a reliable and high-speed interconnect. The Mellanox Ethernet solution, consisting of Spectrum switches and ConnectX network adapter cards, delivers non-blocking, line-rate connections from 10Gb/s to 100Gb/s. In addition, the RDMA hardware offload in the ConnectX NICs significantly reduces the network latency while maximizing the CPU utilization on database applications.

- RDMA over Converged Ethernet (RoCE) acceleration for database servers: Mellanox network adapters are built with RoCE offload, to deliver the highest performance, lowest latency, and lowest CPU utilization.
- True non-blocking, lossless switching fabric: Mellanox Spectrum switches forward data packets at full line rate performance—with ultra-low latency, very little variation, and zero packet loss.
- Simple to use and flexible for various configurations: Mellanox Spectrum switch SN2100 features the industry’s smallest 100 Gigabit-capable switch, supporting 1/10/25/40/500/100Gb/s operation. It has 16 ports with the option to scale to 64x 10/25G ports using breakout cables. Its half-width form factor allows placement of two SN2100s side-by-side in a single 1RU slot for HA.
- Best price/performance Ethernet solution: Best performance/latency, compact design, and low power consumption improve rack and server efficiency, thereby reducing the total cost of ownership.

About IBS

IBS is a major Russian developer of complex IT solutions founded in 1992. IBS offers services in system integration, business application implementation, IT infrastructure design and installation, software development. IBS delivers original infrastructure products (SKALA-R/ SKALA-SR convergent platform), business applications (asset management and business analysis management systems), cloud services, as well as IT and business process outsourcing. www.ibs.com.

About Mellanox

Mellanox Technologies is a leading supplier of end-to-end Ethernet and InfiniBand intelligent interconnect solutions and services for servers, storage, and hyper-converged infrastructure. Mellanox offers a choice of high performance solutions: network and multicore processors, network adapters, switches, cables, software and silicon, that accelerate application runtime and maximize business efficiency for a wide range of markets including high performance computing, enterprise data centers, Web 2.0, cloud, storage, network security, telecom and financial services. More information is available at www.mellanox.com.



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