



Data Center in a Rack (DCR)

Joint Solution by Stratoscale & Mellanox

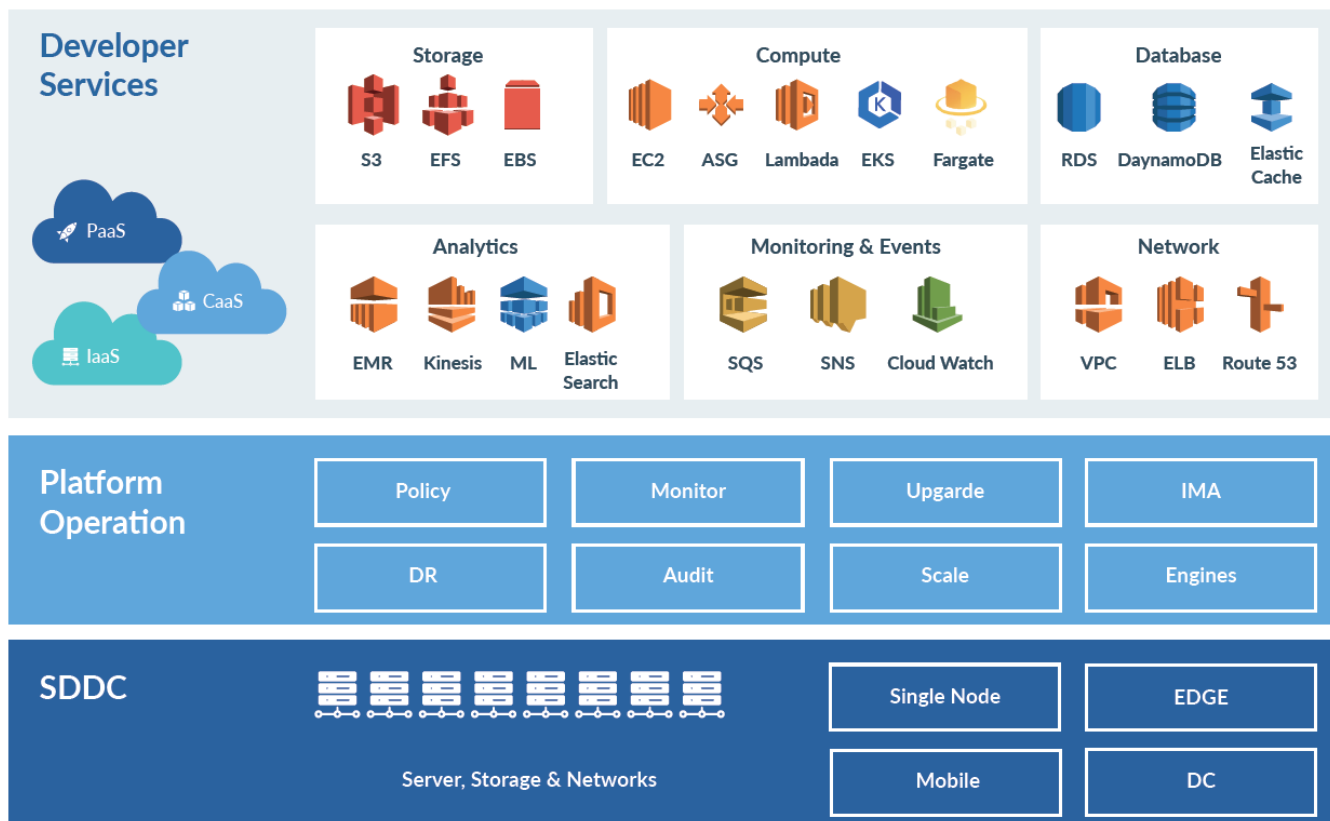
Bringing the power of the public cloud to
any enterprise environment

There is no denying the attraction of the cloud computing paradigm: cloud services deliver high value building blocks to accelerate application development coupled with rapid provisioning of new workloads and the minimal management overhead (of compute, storage, and networking) required to support these workloads. Mellanox and Stratoscale have collaborated to create a joint solution that combines the agility and simplicity of the public cloud with the security and control of on-premises equipment.

This joint Stratoscale/Mellanox private cloud solution delivers a high performance integrated rack fully populated with compute, storage, and network resources that are aggregated and managed as a single, holistic system.

Stratoscale Symphony delivers a software-defined data center platform that enables true IaaS, PaaS and CaaS in data centers and edge locations. Symphony runs on any hardware and is combined with cloud management features such as centralized user access management, self-service portals, integrated metering for showback, chargeback, and more.

In addition, Stratoscale delivers a suite of managed open source platforms for developers to accelerate application development and delivery. By offering AWS compatible APIs, Stratoscale enables multi-cloud and hybrid applications and supports advanced DevOps and Infrastructure-as-Code in enterprise environments.



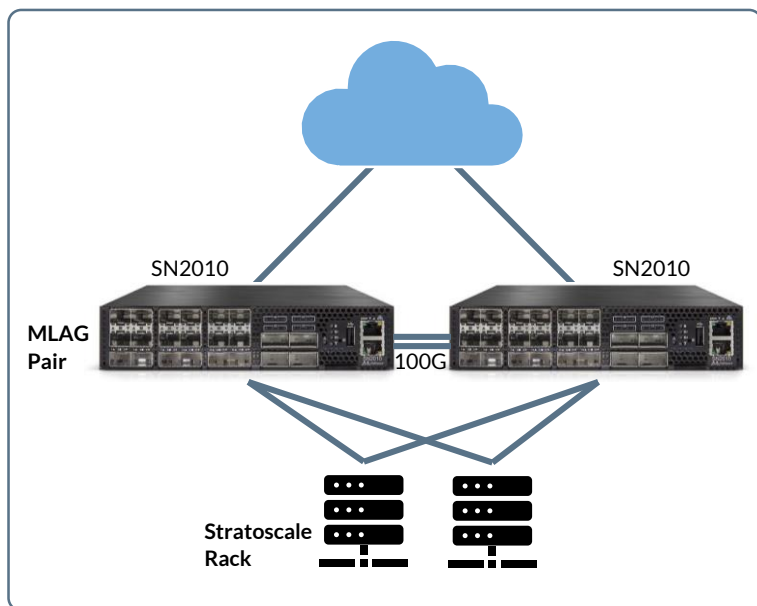
This “Data Center in a Rack” solution builds on the “Bring Your Own Hardware” (BYOH) principle, applying it to a specific set of compute, storage, and network components that were selected to maximize the amount of cloud computing capacity that can be achieved within a single 42RU data center rack.

The network that ties the compute and storage together must be scalable, reliable, and above all: high performance. Mellanox specializes in creating the best-in-class 25/100G Ethernet switches with a focus on performance, with the lowest latency, highest packet rate, highest throughput, smallest form factor, and lowest power consumption switches in the industry. All that performance would be useless if the management of it was not easily integrated into cloud orchestration tools. To that end, Mellanox created a powerful platform for managing scale-out computing networks called Mellanox NEO™.

Data Center in a Rack Solution:

This joint Stratoscale/Mellanox solution defines a high performance integrated rack that is filled to capacity with compute, storage, and network resources, with the goal of serving up the maximum level of workload scalability to fit in a single rack. Beyond combining sheer numbers of cloud computing components, Stratoscale and Mellanox have integrated this joint solution in a way that this mammoth herd of workhorse compute entities and network devices can be managed as a single, aggregated system.

The Stratoscale private cloud solution supports maximum efficiency and ultimately the return on investment that the private cloud offers. It eliminates the separation between compute, storage, and network subsystems.



Server Details:

- 47 Server Nodes
- 940 Cores (Xeon® E5-2660 v3 2.6GHz)
- 12TB RAM
- 680TB HDD
- 9 SuperMicro 6028TP-HC0R chassis
- 11 SuperMicro 6028R-E1CR12L chassis
- 40 Rack units for servers

Highly Available Network Design

- 2 Mellanox SN2010 Switches
- 2 SN2010s in 1RU for HA
- 100GbE inter-switch links
- 40/100GbE uplinks
- 36x 10/25GbE server links
- 2 Rack units for networking
- MLAG keeps all ports active

The Advantages of Stratoscale Software-Defined Private Cloud Solution:

FAST AND EASY DEPLOYMENT

From zero to cloud in minutes with a single software package, including all infrastructure components, installed on any type of hardware host. Automatic hardware and network discovery keep setup time to a minimum.

SELF-SERVICE INTERFACE

Provides full IaaS, CaaS (Containers-as-a-Service) and PaaS (Platform-as-a-Service) capabilities, while ensuring governance through user quotas and policies. With just a few clicks, users can create new VMs on-demand and consume a wide range of cloud services using Stratoscale's intuitive GUI or CLI.

RESOURCE POOLING

Large-scale IT resources can be pooled to serve multiple cloud consumers and tenants, utilizing distributed host disks for storage resource pooling. The statistical demand behavior is leveraged to squeeze the most out of the underlying infrastructure investment. In addition, the system supports multiple resource flavors and different price models, such as spot, reserved and reserved instances.

POLICY-BASED RESOURCE ALLOCATION

Efficient and intelligent allocation of resources according to the defined criticality level or SLA of an application, tenant, or specific workload helps avoid resource overprovisioning.

HIGH VM DENSITY

Compute storage and networking metrics are factored in VM and container placement decisions, automatically and transparently ensuring optimal resource utilization.

LINEAR SCALE OUT

Web giant operational efficiency can be achieved at any scale, aligned with demand. You purchase only the required physical resources, and only when they are needed. With Stratoscale it is easy to instantly add resources. You can start small and grow based on the needs of the organization.

SECURITY

Stratoscale lets you build your cloud services, located on your premises, behind your perimeter firewall. Once deployed, you can implement your security policies by effectively defining and configuring logical networks to control traffic between machines and tenants.

HIGH AVAILABILITY

A fully distributed architecture ensures high availability and protection against multiple node failures. Stratoscale self-healing and self-balancing help prevent system failures and loss of data.

SINGLE-PANE-OF-GLASS

Stratoscale's centralized administration eliminates the hassle that comes with multiple device and stack management, resulting in higher operational efficiency.

ADVANCED AUTOMATION

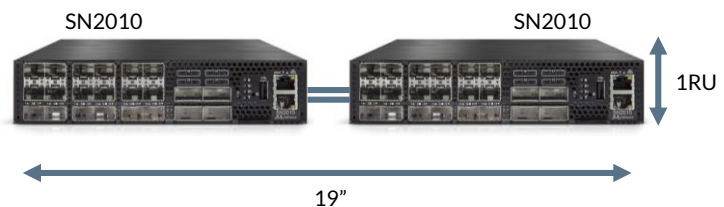
Stratoscale offers public cloud APIs to enable advanced DevOps and Infrastructure-as-Code, automating against public cloud APIs.

LOWEST TCO

Stratoscale automated management eliminates the need for multiple specific system experts as well as software licenses, traditionally required for each and every individual component. In addition, the use of a single solution eliminates dependencies on expensive centralized systems, such as external storage. The result is a reduction in both upfront capital outlays and operational expenses.

Key Features and Benefits of the Mellanox Ethernet Switch:

The Mellanox SN2010 Ethernet switch used in this configuration brings industry leading rack density, power efficiency, and latency. The SN2010 is the first half-width 10/25G top-of-rack (TOR) switch providing unmatched performance advantages while lowering operating expenses.



The Mellanox SN2010 is a 10/25G TOR switch with 18 ports of 10/25GbE and 4 splittable ports of 40/100GbE, it delivers line-rate throughput between the compute nodes in this solution as well as line rate connectivity with the existing client network. Based on Mellanox's Spectrum® silicon, the SN2010 features an industry-leading latency of 300ns and 57W power efficiency while providing optimal performance. The unique form factor of the SN2010 makes it the perfect TOR switch for storage and hyperconverged racks where high availability is hard required. Two SN2010s can be installed side-by-side in 1U rack space, providing high availability at TOR and enabling high density rack design.

The Mellanox SN2010 switch has a rich set of networking and application performance features, making this switch the perfect component for building the network fabric of this DCR solution. Whether it runs database applications, analytics, virtual desktop infrastructure, or other cloud computing applications, a high performance, lossless fabric is integral to the success of this solution.

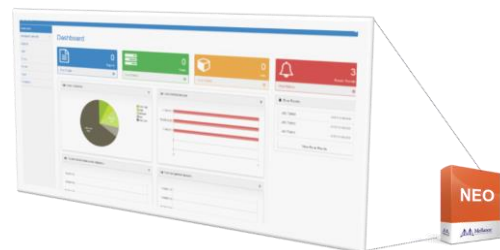
The two Mellanox SN2010 switches in this solution will coordinate packet forwarding by operating in Multi Chassis Link Aggregation (MLAG) mode, which enables all server ports to be teamed together in an active/active mode (LACP) and all inter-switch ports to forward simultaneously in an active/active fashion with no blocked ports from Spanning Tree. Any link failure event is detected at the physical layer and recovered from in under a second. This MLAG mode is accomplished with a very simple configuration, where both switches in this solution have functionally identical configuration files, making network provisioning simple and field replacement of switches head-ache free.

The network fabric for this solution is ultra-low latency, with an average node-to-node latency of well under a microsecond.

This network advantage improves Application-level performance with decreases in time to completion durations and faster live migrations of Virtual Machines within the rack.

The Mellanox SN2010 is the physical connection between the Stratoscale solution and the rest of the client infrastructure. The ability to interoperate with the rest of the network is an implicitly important consideration, as any incompatibility at a physical layer, like optical connectivity, or at logical layer, like a protocol stack, would limit the ability to deploy this solution. The interoperability capabilities of the SN2010 has been tested and verified by the largest server EOMs, in 3rd party labs, and in live deployments world-wide, which enables a worry free deployment of this solution into any modern data center.

To ease the management of the internal network, this solution includes Mellanox NEO™, which provides a single unified interface to the fabric, thus extending existing tools capabilities into monitoring and provisioning the data center network. Mellanox NEO™ uses an extensive set of REST APIs to allow access to fabric-related data and provisioning activities.



Leveraging the advanced telemetry capacity of SN2010 switches, Mellanox NEO™ automates the provisioning and monitoring of the modern data center fabric, the configuration of devices, provides deep visibility into traffic and health, and enables the early detection of errors and failure events.



Conclusions

Stratoscale is redefining the data center, developing a hardware-agnostic, software platform converging compute, storage and networking across the rack or data center. This self-optimizing platform automatically distributes all physical and virtual assets and workloads in real time, delivering “rack-scale economics” to data centers of all sizes with unparalleled efficiency and operational simplicity.

Combining the control and scale of Stratoscale software with the performance of Mellanox switching hardware enables this Data Center in a Rack integrated infrastructure solution to be optimized for performance, power consumption, and ease of use.



For additional information please visit:

www.mellanox.com

www.stratoscale.com