

Stratus Cloud Solution Beta: SDA for OpenStack Private Clouds

Simple Enterprise-Ready OpenStack Software Defined Availability (SDA)

Executive Summary

OpenStack has critical mass and is the de facto standard for deploying open source-based clouds. (See our OpenStack point-of-view [here](#).) With increasing levels of investment by service providers like AT&T, Comcast, and Rackspace and infrastructure vendors like Cisco, EMC, HP, IBM, Intel, and Red Hat, OpenStack private/hybrid clouds are becoming a strong alternative to traditional IT models for large enterprises. While moving to the cloud offers the promise of flexibility, scale, and cost savings, a standard cloud model is not inherently designed for enterprise-level availability. With multiple points of risk at both the hardware and software layers, many organizations are hesitant to move their business-critical applications to the cloud as potential costs may outweigh benefits.

Clouds are typically developed with low-cost commodity components which are not designed to be fault tolerant. Also, while the OpenStack cloud framework is gaining significant support, many of its elements are still immature. High availability is not on OpenStack's short list of high priority new features and must be addressed by vendors that specialize in availability. Leveraging their history in fault-tolerant solutions for enterprises, Stratus has developed a new software product to address the need for business-critical availability for OpenStack-based private clouds. Moor Insights & Strategy recommends to organizations that are experimenting with or conducting trial deployments of OpenStack based private clouds and require high availability for their applications to consider joining [Stratus's Cloud Solution Beta Program](#).

“Software Defined” and Availability

Software defined architectures abstract an overall system architecture into two “planes”: control and operations. Within this framework, [Software Defined Availability \(SDA\)](#) separates policy decisions about how to configure datacenter infrastructure from the underlying hardware and software infrastructure that will implement these policies.

Table 1 identifies the services each plane delivers and the functions each plane performs as well as SDA's role in each plane.

The only substantive requirement to implement SDA is software-configurable lower layers of infrastructure. SDA depends on software defined layers that are implemented using standard or easily accessible application programming interfaces (API). OpenStack's standard APIs to the Nova compute engine, the Swift storage system, and others make this framework an ideal fit for an SDA implementation.

Table 1: SDA Planes

	Service	Function	SDA's Role
Control Plane	Business policies (both continuous, discrete, one-time)	Tells operations plane(s) how to behave	Availability policies (e.g., preventing downtime, implementing fail-overs)
Operations Plane	Continuous service regardless of control plane instructions	Specific to each software defined domain (compute, networking, storage etc.)	Configure underlying hardware & software systems; monitor & report their status to the control plane

We believe that all cloud services eventually will have SDA built into them, either natively or via license. Built-in SDA is certainly not the case for most of these services today. Given that massively-replicated hardware resources are becoming the norm for cloud datacenter architecture—both for hyperscale and enterprise—our vision of widespread SDA adoption is a fairly reasonable prediction as datacenters strive to increase both their efficiency and service availability.

Stratus Enterprise Availability

Stratus has a long history of creating highly available, fault tolerant solutions for the enterprise. Their latest software product for converged virtualization environments, everRun Enterprise, is designed to prevent downtime and protect data for business-critical applications. Stratus claims that everRun Enterprise can be deployed in less than four hours on standard Linux and Windows x86 servers without requiring changes to existing applications. Many of the core tenets of everRun Enterprise— business critical availability, ease of deployment, and eliminating the need for changes to existing application software—are also highly applicable to private clouds. Stratus everRun Enterprise is supported on KVM (Kernel Virtual Machine), a hypervisor that is commonly used in OpenStack environments. Stratus's history with everRun Enterprise enables them to be well positioned to understand the needs for SDA in private cloud.

Stratus Cloud Solution for Private Clouds

Stratus Cloud Solution is currently in beta with slots available for enterprises deploying OpenStack private clouds. While other vendors are beginning to develop solutions for SDA, Stratus Cloud Solution offers some unique capabilities over competing solutions.

No Changes Required to Existing Applications

The current state-of-the-art for delivering multi-tenant availability at scale is via application architecture: explicitly designing an application for availability. Availability through application architecture requires that the architects and designers of each application understand availability concepts and have enough expertise with their multi-tenant environment to implement and robustly assess their availability.

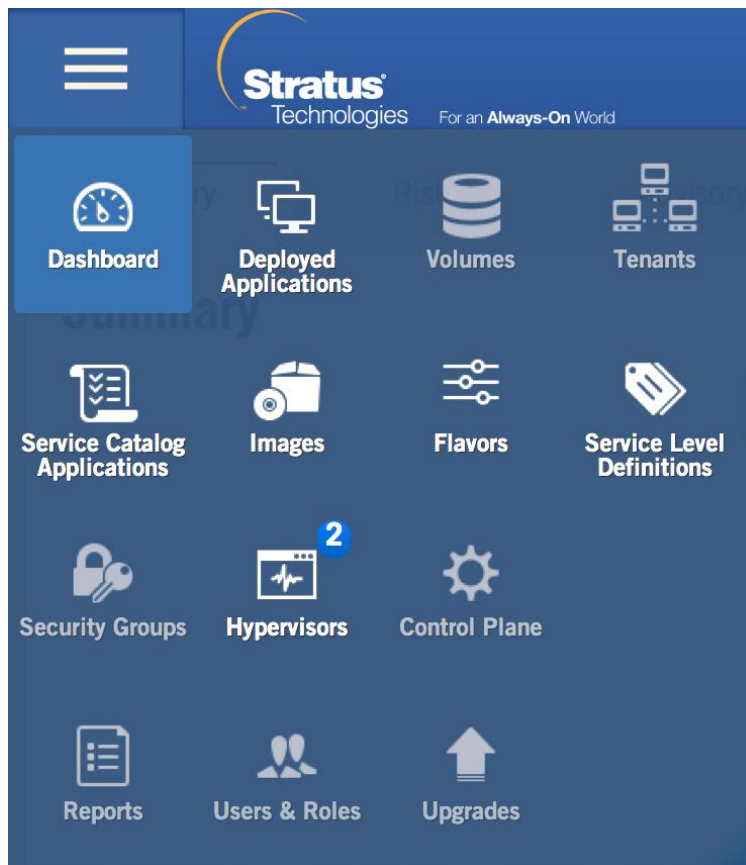
One of the most important benefits of Stratus’s approach is its ability for service providers to use the Linux and OpenStack distributions of their choice and to run their OpenStack applications **without modification**. Applications that run in a supported Linux OS and hypervisor do not need to be “ported” or rewritten. All legacy business logic, applications, and other forms of code that already run in a hypervisor just simply run in the new highly available hypervisor.

Availability Service Level Selection

Not all tasks require high availability, fault tolerance, and high QoS. With Stratus Cloud Solution, IT can create a service catalog which matches each application’s requirements with the appropriate infrastructure to provide a predictable service level at a predictable cost. Based on business requirements for availability, an IT administrator or line-of-business executive can provide a basic set of workload service requirements (performance, size, criticality, etc.) and get a level of service appropriate for their application.

To ensure infrastructure is appropriately matched to the right application requirements (e.g., availability, performance, hypervisor type, storage type), IT can categorize their infrastructure resources using intelligent placement tagging. This tagging reduces the risk of human error and helps ensure business users’ SLAs are met.

Figure 1: Stratus Cloud Solutions Service Catalog



Infrastructure Protection

Other SDA approaches focus primarily on application protection and do not address the required protection for the underlying OpenStack infrastructure layers in a private cloud environment. Lack of protection on the infrastructure side creates additional risk for downtime and failures. Stratus Cloud Solutions is designed to protect both the control plane and the operations plane in a software defined architecture. Application containers based on the KVM hypervisor allow for the ability to manage an application, its underlying metadata, and its infrastructure resources as a package with everything tagged to a service offering and level. Stratus Cloud Solutions' built-in unified alerting system notifies the IT team and executives of issues regardless of where in the stack they occur.

Call to Action

Implementing an SDA approach for private cloud will allow for focus on other attributes of SLA QoS—such as workload response times and throughput—without having to buy expensive High Availability or Fault Tolerant hardware or engage in trial-and-error applications architecture.

We believe that all hyperscale, public cloud, and private cloud services eventually will have SDA built into them, either natively or via license. However, built-in SDA is certainly not the case for most of these services today. Stratus's approach of SDA for OpenStack private clouds requires no changes to existing applications and is a low risk approach to solving the availability gaps of cloud for business-critical applications. To learn more about the Stratus Cloud Solution beta program, go to <http://www.stratus.com/Products/Cloud-Solution>.

Important Information About This Paper

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