



APPLICATION VIRTUALIZATION

WHITE PAPER

EXECUTIVE SUMMARY

Businesses cannot ignore the immense growth of cloud and mobile adoption, as well as IoT data & Business Intelligence that translates to never-seen-before data volumes, velocity, variety and distribution. Traditional IT silos, often bound by hardware and utilization, are not suited to the rapid DevOps-driven change that has completely altered how applications are defined, deployed and managed throughout their life cycles. Cloud adoption is not open to debate anymore; the challenge is how to implement applications both on premises and in the cloud, i.e. Hybrid Cloud implementation. The ability to tailor infrastructure to the needs of modern applications is limited, and while some point solutions address some challenges, there is no single, coherent solution making it all work in concert.

The complexity of clustered and distributed applications such as Hadoop, Cassandra and MongoDB make it difficult for IT to provision, run and optimize, often due to fragmented management — infrastructure management software, usually layered over the hardware.

RCP has unified the various software-defined components into a modern, coherent, application virtualization software optimized for container technology, with a clear design goal. Robin Cloud Platform (RCP) for Big Data and Databases enables the enterprise application-centric data center and helps you reach this goal.

INFRASTRUCTURE-CENTRIC TO APPLICATION-CENTRIC DATA CENTER

With the unification of various software-defined components, it is possible to have a platform that serves both as PaaS and IaaS, optimized for container technology with numerous benefits over the hardware-centric and the software-defined data center approach.

- » **100x Faster.** Maximize developer agility and productivity. Improve and simplify Dev/Test operations and user experience.
- » **50% Lower TCO.** Significantly reduce TCO without compromise via hardware consolidation.
- » **Guaranteed application performance.** Even in shared multi-tenant environments.
- » **Reduced risk.** Repeatable and automated processes such as 1-click cluster provisioning
- » **Operational excellence.** Optimize agility and significantly reduce risk by full application lifecycle management.

FOUR TYPICAL “CHALLENGES”

The typical challenges that restrict your modernization path:

Infrastructure & application automation are misaligned

This results in endless coordination across teams provisioning & aligning infrastructure resources with the requirements for each app. Continuous Deployment (CD) & Integration (CI) automation is still evolving – and this affects business agility.

Software-defined APIs differ across the application IO path

Both the infrastructure and application teams manually script workflows specific to each use case and need separate tools and skill sets for different infrastructure technologies. These gaps place a burden on business agility and drive up costs even more.

Applications are bound to specific resources

Because there is no way to guarantee IOPS in a multi-tenant shared environment, more often than not, utilization is low in anticipation of peak times, a noisy neighbor or denial of service. Workflows are app-specific manual scripts.

Application lifecycle management broken across the various tiers and teams

For example, there is no easy way to clone an entire application. The DB admin needs to know which tables need to be cloned, the application admin then needs to freeze the application state to clone, and the storage admin needs to know which volumes are relevant, as well as free/set cloning space. Nothing is automated, resulting in an uncoordinated mess.

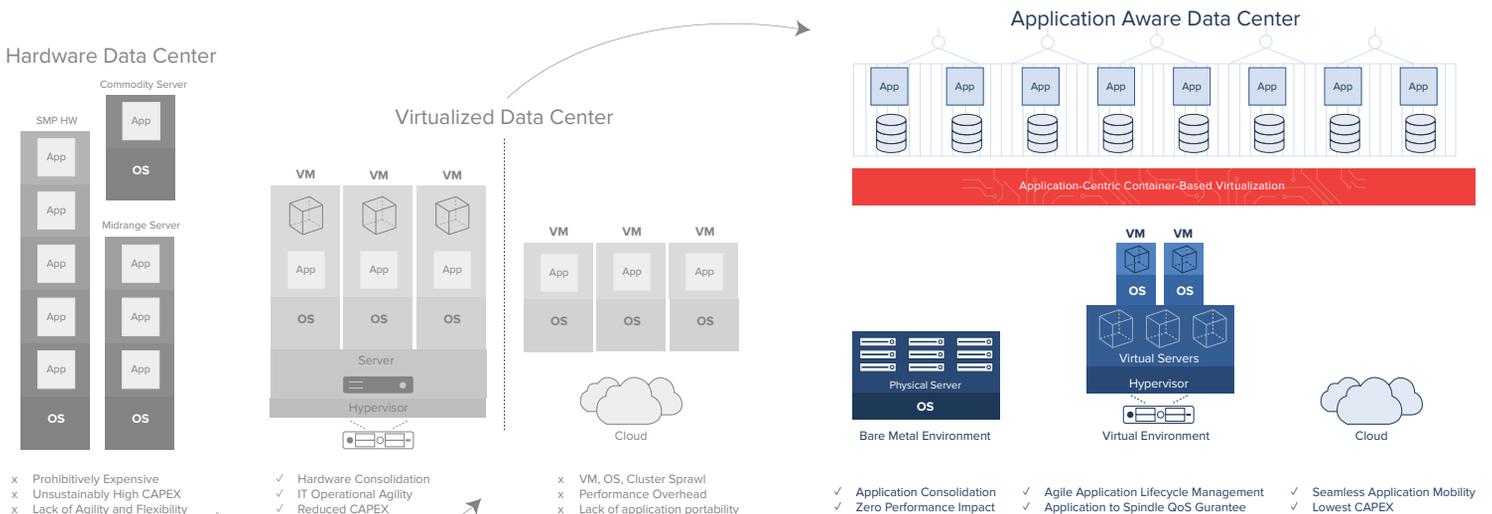
CIOs, LINE OF BUSINESS OWNERS - YOUR BENEFITS

- » Gain easy access to all operational metrics through end-to-end visibility to assure application SLAs.
- » Be able to track and modify KPIs as well as chargeback and related usage metrics.
- » Gain access to all the information collected, get the entire picture, and look into potential trends.

THE TRANSFORMATION

For a business to be really effective and application-driven, any solution requires orchestration of multiple resources and components' dimensions: Placement & Portability, Performance Guarantee, Data Protection, High Availability, Security, as well as OPEX and CAPEX optimization.

The key to the transformation to a futuristic data center is agility and simplified life cycle management from the perspective of an application, bundled with repeatable and automated IT processes, as opposed to the typical static inefficient and ineffective siloed provisioning of resource islands. By transforming from Hindsight to Insight IT can offer business owners the ability to deploy apps without worrying about typical traditional data center infrastructure, in a sense unifying PaaS and IaaS.

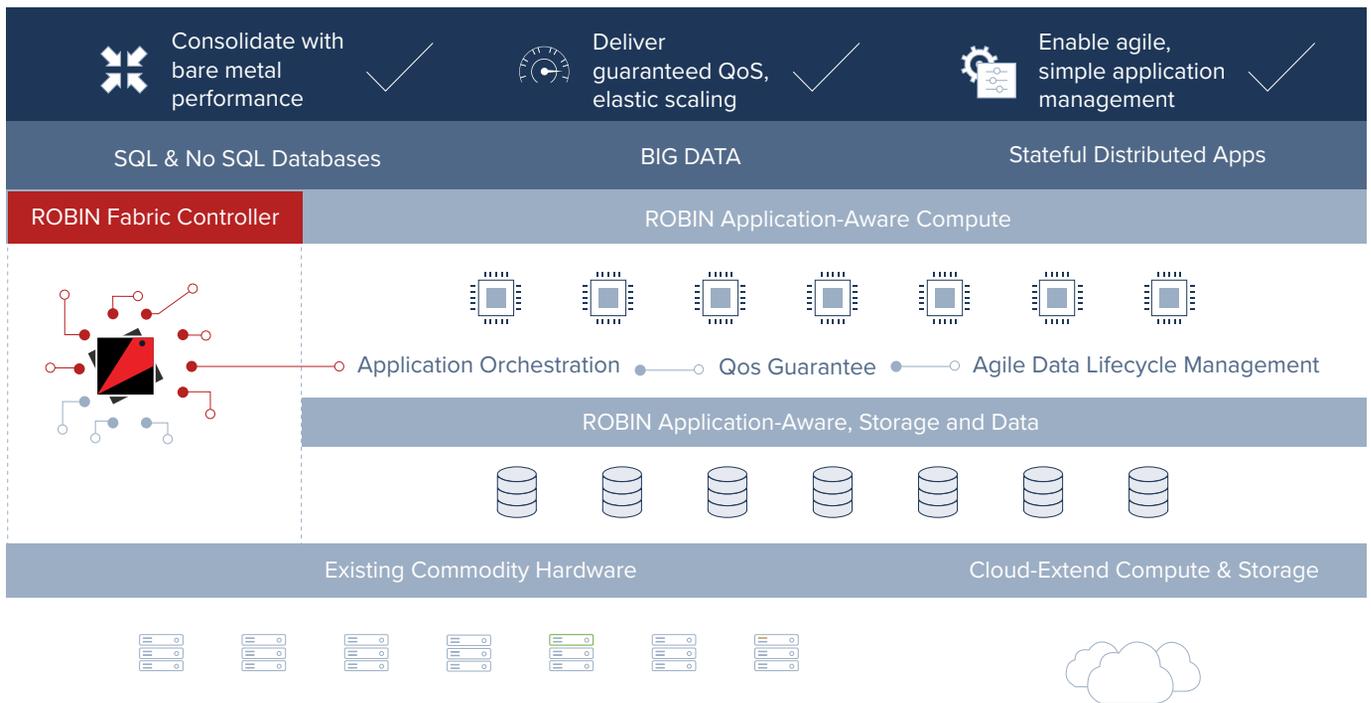


AN APPLICATION-CENTRIC APPROACH

As innovation in the application space continues to accelerate, it is imperative to adopt a technology that treats applications as first class citizens. We need a platform that not only liberates all applications from complex time-consuming deployment processes but also ensures isolation of system resources between all running applications via in-built monitoring. With cloud adoption, the data center has become amorphous, scaling across private and public data centers. Applications now need to be portable and able to move across the boundaries of data centers with the click of a button. This is what Robin Systems delivers. Our goal is to herald the age of the application-driven enterprise.

When used with bare-metal servers, RCP enables “zero-performance-impact” application consolidation of databases, Hadoop clusters, and other distributed applications such as Elasticsearch, resulting in significant operational efficiency gains and cost reduction.

ROBIN CLOUD PLATFORM (RCP) - for Big Data & Databases



Application Orchestration

RCP provides the simplest, easiest and most versatile way of running your modern microservices applications, as well as containerized legacy applications in production.

Traditional storage technology is not designed to handle the rigors of the containerized environment. RCP’s container-aware software-defined storage is designed from the ground up to support agile sub-second volume creation, 100,000-plus-variable-sized volumes, and varied file systems and data protection needs of applications running within the containers.

Go far beyond containers as a means to an end. Run your stateful and stateless applications with end- to-end life cycle coverage – from snapshot and clone to scale-out/relocate and hybrid distribution. Benefit from application isolation for performance and security even in multi-tenant shared environments.

From do-it-yourself composable infrastructure to fully automated and templated application-defined operational infrastructure combining PaaS & IaaS -

- » Enjoy a flexible and open architecture supporting the Docker ecosystems, and enabling third-party services via REST APIs.
- » Enable single-click deployment of complete clustered application pipelines such as Hadoop/Kafka/Spark.
- » Simplify application bundle (complex pipelines) YAML definition – roles, pre-/post-launch scripts, pre/post requisites, performance requirements (mem/CPU/IOPS/network), resource pools and isolation.

IT OPS

- » Easily define and orchestrate all available resource pools and service tiers.
- » Provide your developers and application users with autonomy to accommodate their needs via GUI, CLI or REST APIs – all with no IT involvement.
- » Trust your infrastructure backbone automation to safeguard your users' operations and required SLAs.

Enterprise Grade Composable Infrastructure

RCP is designed and optimized for data-heavy applications in a containerized world. RCP's fabric controller drives the elastic compute and storage planes to effortlessly handle varying data loads, velocity, and variety so common for IoT & Big Data. RCP enables running all the pipe-line applications for risk/fraud, analytics, and marketing personalization with single-click provisioning.

RCP facilitates deployment of complex distributed clustered applications and databases in minutes as opposed to a typical deployment that requires many hours to days and weeks.

RCP allows you to pull or define Docker images of your choice, define your application preferences (or use predefined defaults) and click to launch – it is that simple.

RCP takes care of your continuous integrations (CI) across the application pipeline components; watching for newer images, components, and interfaces. Continuous deployment (CD) can't get any easier than this.

With its App-to-Spindle IO Path views, RCP can provide a quick insight into overall health and potential threats and trends. RCP can easily scale up/down in place by simply changing min/max IOPS guarantee and metrics – CPU, memory and network – on the fly. Compute and storage is scaled independently so the effect on the overall

framework is minimized. Scale-out is also a mouse click away – select the application to scale, select resource pool and how much to extend, click submit and done.

RCP introduces robust built-in storage high availability (HA) – from erasure coding to customized replication and data affinity/anti-affinity rules, policies and zones. For the first time, run a shared multi-tenant environment without application compromises on performance, isolation or scalability!

DEVELOPERS & APPLICATION USERS

- » Define your most complex application in natural language (YAML).
- » Provision large complex distributed clusters with a single click.
- » Monitor and manage entire application life cycle - snapshot, time travel, clone, thing provision, all with no help or support from IT.

Application Lifecycle: Simpler, Faster, Complete

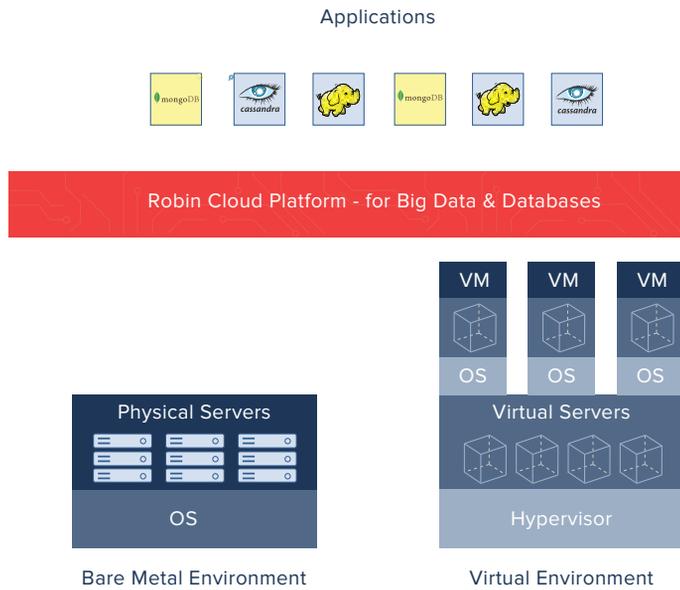
Within RCP, everything is managed from the application's perspective – the application is the logic entity for which everything is optimized.

- » You can use a single platform to run all your applications with the same blueprints. No surprises - From DevOps to staging to production, same APIs and infrastructure; pushing over code has never been easier or simpler.

Start by defining and modeling your application in a YAML natural language describing all components, roles, interdependencies, scripts & prerequisites, which can be easily templated and customized.

- » Define your runtime policies and preferred resource pools (IOPS, CPU, mem, network) that can be easily changed/scaled later as needed.
- » Easily monitor/report everything through the rich multi-level metrics or BYO monitoring software of choice.
- » Continuously snapshot your entire application (containers, configuration, states, storage volumes) so you can easily go back and forth in time with the click of a mouse.
- » Clone entire pipelines – production reproduction with masked data into dev with a single click.
- » Thin provision new apps so new storage growth progression can be manageable and cost efficient.
- » Move or scale containers or any other application component between hosts (bare-metal or virtual) to best optimize and utilize resources!

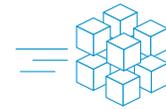
Typical Virtualized Application



Modern applications are built using containers (reflecting application microservices); each container can be run in a VM or bare-metal host; all containers can run on a single host or distributed; the storage volumes attached to the containers are directly attached and persistent.

Benefits

Robin Cloud Platform is architected from the ground up to deliver a complete shared platform for hosting all of an enterprise's data and data-driven distributed applications. Some of the key benefits are described below.



Operational Agility & Simplicity	Lower Costs	Better, Predictable Application Performance
Single-click provisioning of clusters and complex distributed applications	CAPEX Reduction – Potential savings of up to 40% with lower HW footprint	Application consolidation with bare metal performance
Push-button cluster extend, application cloning and snapshots	Lower software licensing cost through application consolidation on shared hardware	Automatic Application-to-Spindle performance SLA enforcement

CONCLUSION

Modern data-driven distributed applications need a new kind of infrastructure. An infrastructure that makes machine boundaries functionally invisible. An infrastructure that “understands” the application topology along with the data and is capable of managing data lifecycle. An infrastructure that enables successful multi-tenancy of clustered applications to analyze this data. An infrastructure that gives each application that runs on it complete, dynamic control over its performance and elasticity needs. And an infrastructure that is built with commodity hardware, but provides enterprise-class reliability.