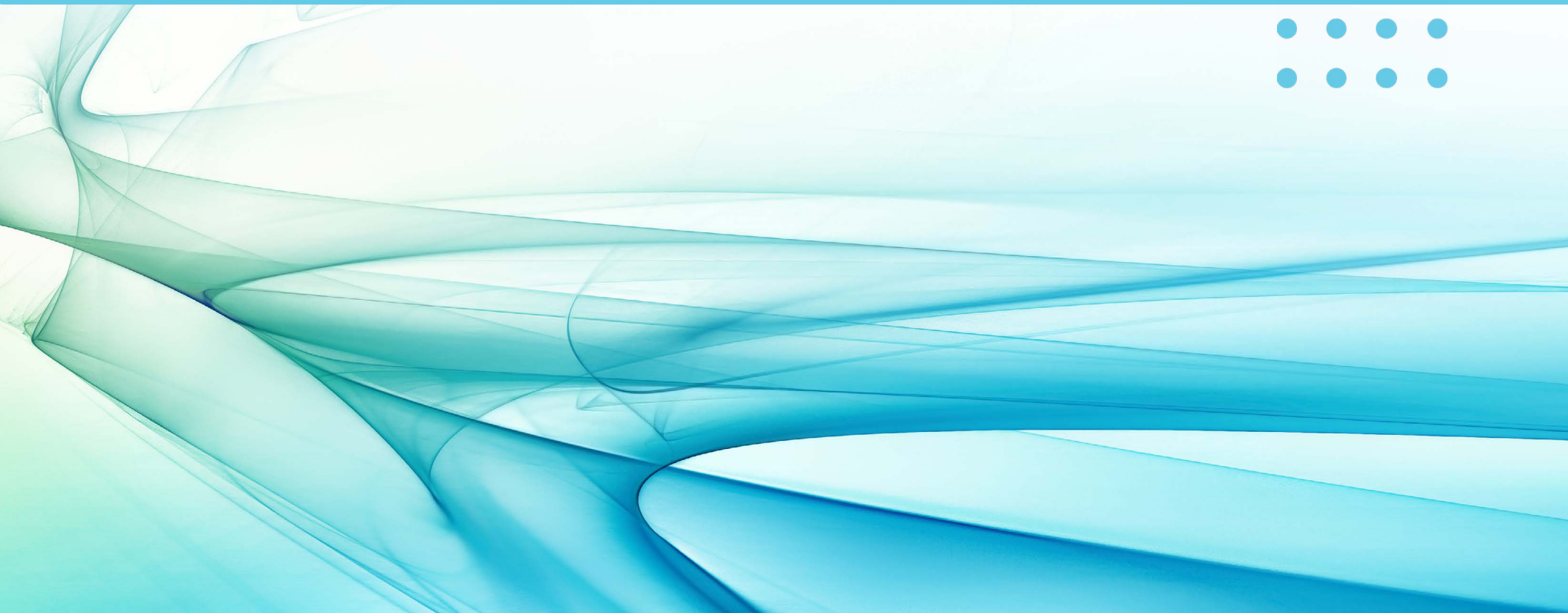
EVOLVING SOLUTIONS

A GUIDE TO MODERNIZING VIRTUALIZATION FOR BUSINESS VALUE



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INTRODUCTION

Virtualization has been an important part of the IT landscape for decades. Its history dates to the 1960s when IBM developed it for mainframes. VMware applied the concept to x86-based servers starting in 1999 and since then, workload virtualization has become a standard IT practice.

A lot has changed since 1999. The business pressures to become more agile in development, better able to manage the technology investment, and return value to the business are becoming more urgent.

An Opportunity to Modernize Virtualization

These pressures are prompting IT leaders to take a fresh look at virtualization and how to optimize it for a modern environment. In today's business landscape, organizations want modern solutions that enable them to differentiate through technology, and differentiation today tends to happen in the cloud and with containers. As a result, organizations with microservices architectures and containerized workloads may benefit from adopting a virtualization platform that is specifically designed for these environments — a solution that offers greater flexibility, better integration with public cloud providers, and more agility in deploying containerized workloads.

Since virtualization touches nearly every aspect of your IT infrastructure, migrating to a new hypervisor should be carefully considered and well planned. There are many things to think through before making a commitment.

Why We Virtualize

Workload virtualization has been around so long that many people do not know or have forgotten why their organization uses virtual machines (VM) to run workloads. The original primary benefit of virtualization is cost savings. It enables organizations to run multiple concurrent workloads on one server, which helps efficiently utilize server capacity to avoid buying a server for every workload. In addition, the ability to separate software from hardware has provided organizations with flexibility such as the ability to run legacy applications on a legacy operating system or test new applications in an isolated environment. Since then, the ability to separate software from hardware has also increased the availability and resilience of workloads. For these reasons and many others, virtualization is here to stay.

HOW VIRTUALIZATION SUPPORTS MODERN OPERATIONS

The philosophy of modern operations is about building a resilient and high-performance hybrid cloud environment that is easy to administer. Modern operations is developer-friendly, and automated “end-to-end” to simplify operations. A modern operations environment consists of multiple platforms and systems to manage things like security, networking, automation, and workload virtualization. So, virtualization, like other modern operations capabilities, should fully support a hybrid cloud infrastructure.

Administrative Consistency Across the Environment

To make hybrid cloud administration manageable, organizations need to have a stable and consistent administration experience among on-premises and cloud platforms, for example, having a consistent set of tools to secure and enforce policies across infrastructures, including the observability tools used to monitor how things are running in the virtualized environment.

Organizations should work towards having the ability to manage, secure, and scale in both environments in a consistent manner, as well as manage performance and resilience. For virtualization, that means having the same or similar virtualization tools and processes on-premises as in the cloud.

Migrating to a new hypervisor is an opportunity to incorporate cloud-like administration processes into your virtualization environment, which many alternative hypervisors offer, including Red Hat Virtualization, Nutanix AHV, Microsoft’s Hyper-V, and Azure Stack.

WHAT TO CONSIDER WHEN LOOKING FOR A NEW HYPERVISOR

Researching an alternative hypervisor is a good opportunity to ensure your goals for virtualization align with the goals of the business. Before considering how virtualization will support workloads, think through how virtualization will support the business, both now, and looking forwards to the future. The results of the business conversation will help narrow down possibilities when getting to the technical conversation.

Business Considerations

Evaluate Your Application Portfolio Strategy

Start the business conversation about the future of virtualization in your organization around your application portfolio and how each application supports the business today and how each application may or may not evolve for the future. Understanding the broader application strategy is the foundation for all the choices that happen later.

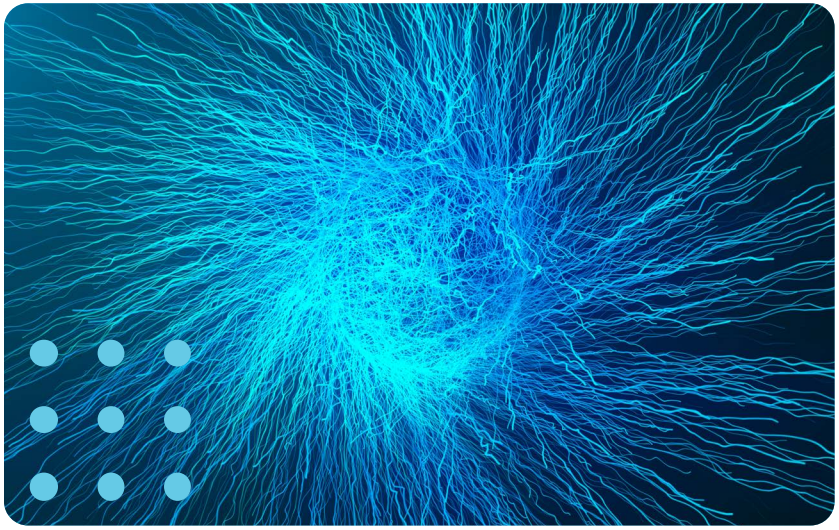
Focus on What Differentiates Your Business

The application portfolio discussion should focus on the applications that differentiate your business, for example, a mobile app for field sales or your e-commerce platform. These are the applications that are driving revenue and delivering significant business value to your company. Generally, applications like this are evolving, improving, and incorporating new features. You will want to select a hypervisor that is advanced, flexible, and agile enough to support the continued growth and development of these applications.

If your company relies on DevOps and custom code to run the business, you will want to gravitate towards a hypervisor that

supports this environment. If your company is already moving towards micro-services and containerization, then it may be important to consider a hypervisor that can support traditional virtual machines as well as containers.

However, you may have applications that you plan to sunset or replace in the next couple of years. The need to migrate applications like this away from your current hypervisor is low. In between, you may have “commercial off the shelf” (COTS) applications that deliver a core business function such as SAP or Oracle E-Business. Applications like these require stability but they are not core technology differentiators. A new hypervisor may or may not have advantages for these applications.



Technical Considerations

Once you understand how virtualization will support the business now and, in the future, you can shortlist platforms that meet your business requirements and narrow down the possibilities through a technical evaluation.

Securing VMs in Hybrid and Multi-cloud Environments

Organizations that have VMs running on different cloud providers will need to think through how their data and VMs will be secured. This is a scenario where it is important to use automation and orchestration to create a consistent administration experience across the whole infrastructure. Organizations may need to create custom tooling and methodologies to accomplish this.

Support for DR, Backup, and Replication

Do not assume that a new hypervisor will automatically support your current tools and processes for data protection, disaster recovery, backup, and replication. You will need to consider what changes need to be made to ensure that these processes will work with a new hypervisor and what adjustments need to be made to ensure that these processes continue to be robust and deliver the intended resilience. For example, your backup vendor may not support a particular hypervisor. It is best to clarify vendor support issues before making a commitment.

Features, Product Maturity, and Support

Any virtualization platform an organization chooses must have the features you rely on today and must be stable, mature, and enterprise ready. In addition, a new virtualization platform should have the features and functions required to run your VMs, including embedded tools for the types of monitoring, alerting, and networking you need.

It needs to be well supported by a vendor that is not about to go out of business or suddenly drop support for its product. This is particularly important if you are considering a free, open-source solution. In this case, your organization must own and manage its own support, which is not free.

Automation and Orchestration

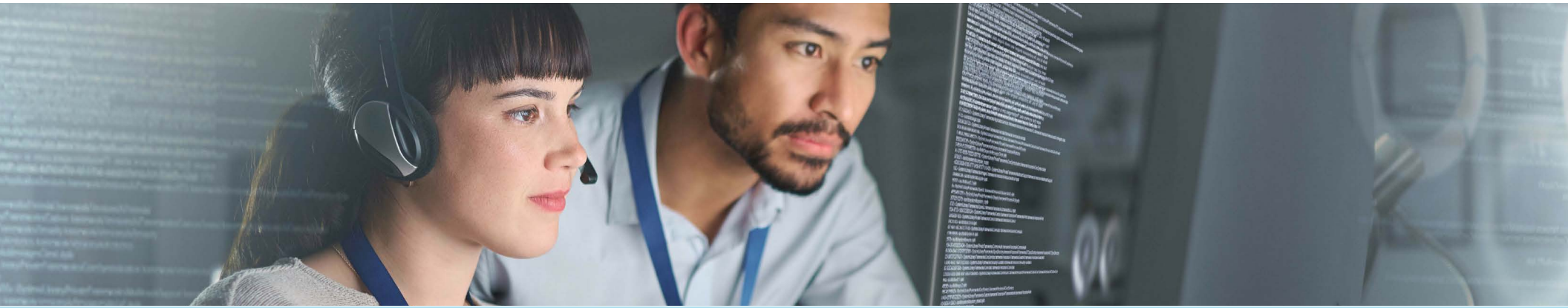
Ensure that a new hypervisor has the automation and orchestration features that meet or exceed your current needs. If your automation infrastructure is tuned for a specific hypervisor, you will need to know the resource requirement and performance needs for automation in a new virtualization platform.

The Cost of Migrating

At some point, you will need to estimate the time and cost of migrating to a new hypervisor. That includes the cost of new servers or other infrastructure, training support personnel, and retooling automation from the old hypervisor to the new one.

No Easy Button for Migration

A hypervisor migration is a big undertaking. Organizations need to weigh whether a hypervisor migration will deliver real value, because, while there are emerging tools, there is no “easy button” for migrating to a new virtualization platform. Some organizations may decide that it is simply not worth the time, cost, and effort to migrate and focus efforts on optimizing their current hypervisor for cost and performance.



Architecture Considerations

Migrating to a new hypervisor may impact system architecture, which will affect the total cost and timeline of a migration. Architectural considerations should be thoroughly thought through before making a commitment because your choice of hypervisor can significantly impact the complexity, cost, and time involved in moving to a new virtualization platform.

Converged vs. Hyperconverged

VMware supports the classic three-tier architecture, but many organizations are considering a move to a hyperconverged architecture that mimics the cloud and better supports a DevOps environment and containerized workloads.

Hypervisors such as Red Hat Virtualization and Microsoft Hyper-V support the three-tier structure. Others such as Nutanix AHV and Azure Stack support hyperconverged infrastructure. If you are gravitating to the latter, you may be looking at a complete hardware replacement. It is best to plan this level of change around an already planned hardware refresh. Since the server and storage tiers in a converged environment are replaced with one device in a hyperconverged environment, organizations will need to work through the nuances associated with budgeting for two different tiers as they are consolidated in the hyperconverged environment.

Storage Infrastructure

Most storage vendors support VMware's three-tier infrastructure very well. But storage such as Fibre Channel, iSCSI, or NFS Storage work differently in a hyperconverged environment and not every storage vendor has the same level of support for containerized workloads as they do for VMware. This is a layer of complexity that needs to be addressed early in the decision-making process.

Additional Resources to Support a Migration

The actual migration process from an old hypervisor to a new one will likely require servers and storage that are dedicated to the migration process. You will need to set up a workload in the new hypervisor and then switch from the old to the new. If you do not have extra servers and storage available, you will need to plan and budget for this.

People Considerations

Virtualization platforms are typically administered by a server team. But if you have containerized workloads, that is often handled by a Kubernetes administrator. These teams often have different skills and technical histories. It is a good idea to sort out ahead of time who will administer what.

Administrators also need to be skilled up for a new hypervisor. The learning curve is not necessarily steep, but you need to factor in training time.

Depending on the complexity of your environment, you may need to use automation and orchestration to create a consistent administration experience across clouds and on-premises. Otherwise, administrators could be overwhelmed by using different processes and tools for each platform. For example, you can use an API abstraction layer or API gateway to simplify some of the complexity and provide a more consistent experience across the infrastructure. Without automation, administrators will need to develop an elevated level of technical acumen for each infrastructure platform.

HOW TO PLAN A HYPERVISOR MIGRATION

If migrating to a new hypervisor looks like a promising idea based on the business, technical, and people considerations above, the next step is to develop a detailed plan for change that minimizes disruption.

Document Your Roadmap

Start by developing six-month, 12-18-month, and three-year architecture roadmaps for how your technology will evolve. The roadmap should clarify how virtualization will support workloads in the cloud and on-premises.

Follow the Data

The roadmap should be built around where the data lives and what is accessing that data. With a documented roadmap, you can work your way backwards to determine which hypervisor will support applications and the data they use.

If you are moving to containerized workloads or buying or upgrading commercial software that is delivered in containers, you need to consider how a new hypervisor may impact the performance of the databases these applications use.

If you have a few decentralized databases on VMs, the complexity is low. If it is a centralized database environment, it gets more complex. For example, if your databases are on Microsoft SQL Server or Oracle, and you have no plans to change that, changing the hypervisor could severely affect performance if it is not planned out properly.

Compatibility Concerns

Customers should take compatibility issues seriously because the likelihood of running into a challenge is very high. One of the larger challenges centers around the fact that many applications come prepackaged as an Open Virtualized Appliance (OVA) for a specific hypervisor and may need to be validated if it is supported on the new hypervisor.

In order to gather a comprehensive view of what is relying on VMware today, we recommend that customers detail all their applications and application dependencies, some of which may not be obvious.

Migrate in Chunks

Since nearly every workload runs on a virtual machine, you will want to ensure that you have a way to identify which workloads will be migrated, and in what order. This will give you a basis to estimate the cost of a new hypervisor and compare it with your estimated costs for VMware.

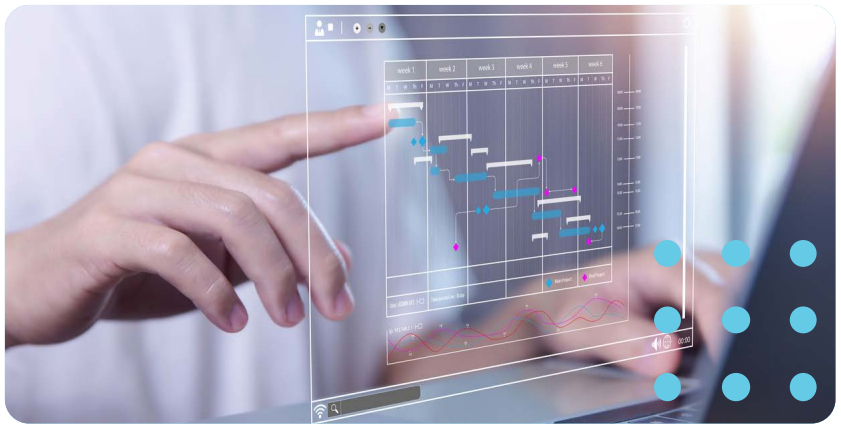
Start with the low-hanging fruit. Do not move the primary application first. Select chunks that will have a minimal impact if something does not perform well or does not work as expected. The idea is to get comfortable with the new virtualization platform and begin to master its intricacies. It is helpful to also have a backout plan in case the migration does not go well.

The migration plan should include thorough testing in a proof-of-concept environment before making a final commitment. Plan to do much of the migration manually. Vendors often include tools to help, but do not expect automation to handle the bulk of the migration.

In addition, you will need to plan for a hard cutover that will result in some level of downtime.

Timeline Will Vary

Organizations that are serious about making a change should start planning now. If your migration goal is centered on reducing licensing fees, and your virtualization provider only gives you a couple of months of notice for a price increase, migrating to a new platform will take much longer than that. It is best to assume that a hypervisor migration will take longer than you think.



HYPERVISOR MIGRATION CHECKLIST

Business Planning

- [ ] Evaluate your application portfolio strategy and identify workloads that differentiate the business
- [ ] Develop a roadmap for infrastructure that supports the goals of the business
- [ ] Research hypervisors options that support your future direction

Technical Research

- [ ] Verify that a new hypervisor will support reporting and monitoring requirements
- [ ] Verify that VMware-ready workloads will work with a new hypervisor
- [ ] Verify that core applications will work with the new hypervisor
- [ ] Verify that your backup, replication, disaster recovery, and data protection processes will work with a new hypervisor
- [ ] Think through how VMs will be secured
- [ ] Verify requirements for features and functionality, including automation
- [ ] Verify support for storage
- [ ] Document application dependencies to verify database performance
- [ ] Ensure compatibility with existing resources

Migration Planning

- [ ] Estimate the cost and time of standing up a new virtualization environment
- [ ] Determine who needs training and when
- [ ] Develop a detailed plan for how to migrate from the old hypervisor to the new
  - [ ] Migrate in chunks: identify low-risk workloads to get familiar with the new platform
  - [ ] Migrate the most critical applications last

HOW EVOLVING SOLUTIONS CAN HELP

Evolving Solutions has spent almost three decades helping organizations plan and implement complex migrations to enhance the business value of IT. As cloud and data center operations experts, we understand the whole IT environment and are uniquely qualified to help organizations optimize their IT operations for business value, including the knowledge and experience to help make judgments about the best environment to run a workload.

We can help you:

- Evaluate your infrastructure and workloads to help select a virtualization platform that meets your business and technical needs.
- Select the right platform and help you evaluate the trade-offs between which applications go where and how to get the best results from virtualization on-premises and in the cloud.
- Plan and implement a cost-effective hypervisor migration that supports your technical and business plans.
- Replicate the same or better resilience, backup, security, and scalability in your new virtualization platform as the one that you are replacing.

If a new hypervisor is not the best option for your organization, Evolving Solutions can help you optimize your current virtualization environment to minimize cost and maximize value.

EVOLVING SOLUTIONS

Exceptional Experience, Unparalleled Expertise

Our team members are among the most experienced in the industry — many have decades of experience working their way up to senior positions in the real world of systems administration, architecture, security, and operations, which gives us a unique empathy for our clients' challenges and opportunities.

www.evolvingsol.com

Let us help you get started down the right path.

Let's get to work!