Guide to Modernizing your Data Center
Technology moves at a brisk pace. Keeping up with your competition requires an efficient infrastructure and secure data center, and this means your storage, server, and networks all updating and manual management. There are pitfalls to moving from an outdated system and antiquated hardware to a new agile, secure, and cloud-ready Hybrid IT model, but this Softchoice guide can help you make a successful transition. Inside, you’ll find insight, assessment, planning tools, and best practices, all designed to give you the knowledge you need to implement a modernized, Hybrid IT environment.

IS THIS GUIDE RIGHT FOR YOU?
A data center typically has three main components that require the greatest cost and time commitment: servers, storage devices, and a multi-layer network. This guide is designed for IT teams that want to modernize their servers, storage, and network, and take advantage of new automation and security features in existing or new software and hardware.

INDUSTRY TRENDS
Over the years, many data centers have evolved into a hodgepodge of legacy hardware and technology, patches, and software and applications of numerous iterations, both on-premises and in the cloud. This has slowed down IT’s ability to respond to the needs of the business and is a key contributor to the rise of so-called “shadow IT”: when individuals or lines of business cannot get what they need, when they need it, they simply bypass IT altogether.

When it comes to your business, we know you typically have three main goals: improve your customers’ experience, manage risk, and reduce or control your costs. But running a traditional data center takes a toll on your company’s time, budget, and performance. Did you know that it takes an average of seven weeks to deliver new hardware and applications across a corporate infrastructure, but only three days for
organizations that have successfully adopted Hybrid IT? Furthermore, on average, 67% of an IT budget is used to support legacy architecture like refreshes, upgrades, support contracts, and maintenance. Traditional data centers consume approximately 80% of staff hours just to keep things up and running. There has to be a better way.

Increasingly, CIOs are taking a serious look at Hybrid IT infrastructure.

**HYBRID IT**

Hybrid IT is just what it sounds like: an IT infrastructure that exists in both real and virtual space. Transitioning to a Hybrid IT model usually involves three main stages: public cloud adoption, data center transformation, and network transformation. In this guide, we discuss the second stage – data center transformation – which involves three key elements:

- **VIRTUALIZATION**
  Since most Softchoice clients have already virtualized their servers, this guide will primarily concentrate on storage and network virtualization and automation.

- **INTEGRATION**
  Moving away from the traditional three-tiered architecture of server-storage-network to a single server with integrated components and a common interface that allows for a single-pane view.

- **OPTIMIZATION**
  An optimized data center enables innovation by using software-defined policies that reduce time and costs, and increase agility. Together, these contribute to business growth.

**WHAT YOU’LL FIND IN THIS GUIDE**

In Part 1, we walk you through how to calculate the size and determine the type of new data center infrastructure you will need, and how to make a business case for it. This includes a gap analysis to understand the costs and benefits of data center modernization, and tools to assess your current setup, obtain buy-in, and achieve internal alignment. Part 2 describes planning and executing your transition to Hybrid IT. In Part 3, we look at what remains to be done after the infrastructure has been modernized – namely, monitoring and optimization.
PERFORMING A GAP ANALYSIS
The first step in this process is to establish the scope of change required. You’ll want to perform a gap analysis, which is a system of assessing the differences in performance between your current data center and your business requirements. It helps to understand the status of your devices in terms of their life cycles, and to get expert recommendations for simplifying contract and license management, and supporting future planning. Most importantly, a gap analysis will quantify the financial impact of the system you have, enabling you to mount an objective, compelling business case for investing in modern infrastructure.

Simply put, your gap analysis is a holistic review of virtualization, server, storage, and networking to identify areas for improvement. It should help educate and align all teams that deal with storage, networking, servers, and security. It should also detail how existing processes will change from manual to automated and policy-based, to ensure that the business goals of transitioning to Hybrid IT are successfully addressed.
DATA ANALYSIS
How well does your data center meet the demands of your business? We recommend considering this question from the following four perspectives:

1. **IS IT COST-EFFECTIVE?**
   There are numerous options available for how and where to run workloads. Analyzing your environment from a cost perspective will help you determine which applications or servers make fiscal sense to run on-premises, and which should be in the public cloud. Multiple cloud options are available at a range of costs, and putting your applications in the right place at the right time, and employing automation and policy thresholds, will allow you to maximize your investment in current and future architectures and give you the agility needed to accelerate business growth.

2. **IS IT AGILE?**
   In your current environment, how long does it take to deploy a new server, networking switch, firewall, or storage resource? Are you able to spin up new virtual machines, storage, and networking using automation and policies? An agile data center will allow you to adapt to your ever-changing business requirements without undue disruption.

3. **IS IT EFFICIENT?**
   Are you able to determine the current capacity for new virtual machines, and are you using automation to ensure that your applications are running at the optimum performance level from a server, storage, and networking perspective?

4. **IS IT SECURE?**
   Are you able to pass a security audit to ensure that applications, databases, and servers are all protected in both the virtual and physical environment?

**BARRIERS TO CREATING A SOUND ANALYSIS**
Developing an accurate gap analysis requires the resources of people, skills, and tools. Think about whether your organization has these in place, or if you’ll need to fill these gaps by hiring, outsourcing, or purchasing software.

**BANDWIDTH**
Often, an IT team is working at capacity just to keep the existing infrastructure functioning – they do not have the bandwidth to commit to the additional task of planning and coordinating a data center upgrade. To address the bandwidth issue, many businesses outsource, hire temporary staff, or postpone existing projects.

**NICHE LICENSING EXPERTISE**
Every product and service has its own licensing contract. A thorough understanding of these contracts is critical, as misuse can put the company at risk of infringement. Reading and interpreting licensing contracts is often the responsibility of the IT team, but the task requires specialized knowledge that the average IT person simply does not have. Some teams bring in outside expertise to ensure they are properly briefed about their licensing responsibilities. Often, it is difficult to know whether software is being utilized to its maximum potential.

**NICHE TECHNICAL EXPERTISE**
The field of IT is vast, and time and money for professional development is limited. As a result, teams often find that they do not have all of the skills needed to fully track, analyze, and manage their IT environment, let alone modify it.
For example, your IT team may not know that when a virtual machine is created, a firewall rule changes, or a network segment is added. With a modern Hybrid IT infrastructure, network security policies and firewall security rules can be maintained virtually, applied automatically, and deleted when no longer needed. Finding these knowledge gaps is a crucial first step in making an informed decision about how to proceed. This exercise is called process engineering.

**TRACKING**

Do you have an accurate and comprehensive inventory of your physical and virtual assets? For asset tracking, many companies don’t use asset management software, but instead keep their records as spreadsheets. An incomplete inventory is one of the most common shortfalls we encounter with clients. A meaningful gap analysis requires a complete picture of your data center infrastructure.

**OBTAINING BUY-IN AND INTERNAL ALIGNMENT**

Your data center affects everyone in your organization, and it’s likely they will have concerns about the IT modernization process. You will want to get organization-wide buy-in for the change in order to make the smoothest possible transition.

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**BENEFITS TO DATA CENTER MODERNIZATION**

In order to obtain buy-in, share these concrete benefits of modernizing your data center:

- **SECURITY**
  A modern network guards against viruses and malware, which translates into fewer hours spent rooting out bad files.

- **COST**
  A modernized data center can save money, reduce costs and automate manual tasks.

- **DISASTER RECOVERY**
  Disasters happen, but an up-to-date data center means they won’t cripple your entire operation.

“"We had a customer who was doing a merger and acquisition of another company. The only way to merge the networks was to manually re-IP all servers and workstations. Using a product called VMware NSX, we were able to save them hundreds of hours of manual work, and run the same network IP ranges side by side. In addition, they gained a highly granular and segmented security profile.””

Scott Mathewson
Softchoice Data Center Virtualization Expert
**BENEFITS OF NETWORK VIRTUALIZATION**

Similar to a virtual machine for computing, a virtualized network is a fully functional network in a software container, provisioned independently of the underlying hardware or topology.

- **SECURITY**
  Virtualization increases the granularity of security segmentation for business-critical virtual machines. Security profiles are distributed to, and enforced by, virtual ports and move with virtual machines. Also, success on security audits means better protection from a wide variety of threats.

- **TIME SAVINGS**
  Virtualization reduces the time—from weeks to seconds—that it takes to provision custom, multi-tier network topologies and enterprise-class security services.

- **COST SAVINGS**
  Automation eliminates manual configuration from the network provisioning process and simplifies network hardware requirements, which reduces both OpEx and CapEx.

**BENEFITS OF STORAGE VIRTUALIZATION**

Software-defined storage (SDS) dynamically creates and delivers policy-controlled services for each virtual machine.

SDS is:

- **TRANSFERRABLE**
  SDS can be implemented across a wide range of server and storage types from different vendors, preventing vendor lock-in.

- **VIRTUAL MACHINE-CENTRIC**
  Administrators no longer have to pre-allocate storage into logical unit numbers (LUNS) or volumes. Storage is dynamically allocated for each virtual machine, eliminating the guesswork associated with LUN sizing and also improving storage utilization.

- **POLICY-DRIVEN**
  With SDS you can encapsulate storage requirements in policies which allows you to monitor and enforce compliance, and assign policies to workload.

- **SIMPLIFIED**
  Abstract physical storage resources with a common user interface eliminate the need to rely on multiple vendor tools to provision and manage storage, which simplifies operations and troubleshooting.

- **SERVER-SIDE**
  VMware’s virtual SAN minimizes storage latency by accelerating read/write disk I/O traffic with built-in caching on enterprise-grade, server-side flash technology.

- **FAILURE TOLERANT**
  SDS ensures that data is never lost if a disk, host, or network fails.

- **EASILY-PROVISIONED**
  Single pane-of-glass management eliminates the need for training on specialized storage interfaces and the associated overhead of operating them. Provisioning is now as easy as two clicks.

- **GRANULAR AND NON-DISRUPTIVE**
  Users can easily and non-disruptively expand the capacity of the virtual datastore by adding hosts to a cluster or disks to a host.
It’s important to develop an updated internal plan to determine how storage and networking will be allocated. Some processes may have to be updated or changed when automation policies are developed for storage and networking. An approval chain workflow is one way to approve or change storage allocations. Codifying thresholds on changes is another strategy.

**FUNDING**
The bottom line is often just that, so it’s important to be able to show that IT modernization makes good business sense. As a starting point, try out the total cost of ownership calculator, which compares VMware server virtualization and private cloud solutions to a Microsoft setup: < here >.

**CREATING A COMPREHENSIVE DATA CENTER TRANSFORMATION PLAN**
Before you are ready to detail your transition plan, you need to ensure you have considered all aspects of your new environment. We recommend you look at everything from the goals you’ll be expected to achieve to such granular details as how you will handle licensing.

Download this Softchoice Cheat Sheet for a list of the questions you should cover.
PART 2
Planning your Hybrid IT transformation

Once you have determined the gaps in your current infrastructure and identified areas that need to be addressed in the transformation, you will need to plan your next steps for the modernization of your network and storage environments.
PLANS AND GOALS YOU WILL NEED TO HAVE IN PLACE

BUSINESS GOALS
Identify the business goals of your Hybrid IT transformation. Are you looking to decrease costs? Improve your agility and the time it takes to deploy resources? Increase security? Make sure you’re clear about your business goals, in order of priority.

CLOUD STRATEGY
Do you currently have resources in a public cloud provider, and if so, what are the monthly costs for those resources? Can you move workloads seamlessly between on-premises and the cloud? Is your data secure in the cloud?

DISASTER RECOVERY PLAN
Do you perform backup on-premises or in another hosted environment? Do you have backup to a cloud service?

BACKUP PLAN
Do you know the recovery time and recovery point objectives that are currently in place? Are you aware of other types of backup options like backup as a service?

PLANNED MERGERS AND ACQUISITION ACTIVITIES
Does your organization have plans to integrate or acquire in the future? Do you have a requirement for short burst workloads for seasonal business?

SECURITY
Do you have security concerns? Are you aware of the current risks in a highly virtualized environment? Are you able to pass a security audit?

BE PREPARED! HERE IS THE INFORMATION YOU WILL NEED:
- Storage metrics
- Network metrics
- Measures of storage, network, and server capacity (present and forecast)
- Physical or virtual performance metrics
- Information about what is over- or under-provisioned in your environment
- Completed application rationalization
- Up-to-date cloud strategy
- Disaster recovery plan
- Backup plan
- Disaster recovery backup
- Recovery point objective (RPO)
- Recovery time objective (RTO)
- Growth in services per year
- Planned merger and acquisition activities
PLANNING TO MODERNIZE YOUR NETWORK

STEP 1: HARDWARE
Ensure you have the required hardware to complete the network modernization project. You can check various sizing calculators for networking < here >.

STEP 2: SYSTEM REQUIREMENTS
Understanding your current underlying network hardware and versions is also essential. Gather information on your current network hardware versions and the expiration dates of your contracts to determine the underlying networking equipment required to support your current growth plans. A tiered leaf and spine-designed network of core application access layers is typically sufficient.

STEP 3: TEAM READINESS
Make sure you have the networking skills and the necessary understanding of the new software to complete the transformation. As discussed previously, a process engineering exercise helps the organization ensure it has the proper training and resources to execute a successful transition.

PLANNING TO MODERNIZE YOUR STORAGE

STEP 1: HARDWARE
Do you have the hardware required to make the transition? All hardware used for a Virtual SAN deployment must be compatible, as we use servers with various types of drives in them. You can use a sizing guide here to determine the types of hard drive you need: < here >.

STEP 2: SYSTEM REQUIREMENTS
Understanding the read and write requirements for successful operation of the application is required, or a sizing guide is needed to determine the amount and type of storage drives needed in the servers. The compatibility of the servers and drives must also be aligned.

STEP 3: TEAM READINESS
Make sure you have a good working knowledge of the current storage system and the new software. This is often the best time to introduce a transition or readiness team.
COMMON PITFALLS TO TRANSFORMING YOUR STORAGE

LACK OF INSIGHT INTO EXISTING ARCHITECTURE
A certain amount of disruption is to be expected during the transition process. Make sure your team knows the system inside and out, along with the performance requirements and dependencies of each application and virtual machine.

SILO OPERATIONS AND INTEGRATION ACROSS TEAMS
During the transition, all teams need to stay in close communication. Schedule regular briefings to ensure that everyone is working together. Having a transition team and an approval process plan in place will help ensure that all of the system components are updated at the proper time and with the appropriate version.

LACK OF PLANNING AND ROADMAP DESIGN FOR EACH PHASE OF IMPLEMENTATION
An implementation roadmap details the step-by-step updating process and coordinates the work of multiple teams. A solid plan, bolstered by clear documentation, will help ensure your success.

KNOWLEDGE GAPS IN UNDERSTANDING THE STAGES OF ADOPTION
A successful implementation takes place in controlled stages. Make sure that everyone involved is aware of all the tasks and their timing.

BEST PRACTICES

START WITH A SMALL, CROSS-FUNCTIONAL TEAM
- Select change agents
- Define measures of success
- Communicate lessons and wins

INVENTORY AND ANALYZE EXISTING PROCESSES

AUTOMATE PROVISIONING AND MANAGEMENT
- Start with IT automation
- **QUICK WIN**: security automation
- **SELF-SERVICE**: portals and catalogs

DESIGN THE NETWORK AND STORAGE FOR SIMPLICITY AND RESILIENCY
- Throughput, scalability and robustness
- Workload mobility and portability
- Add networking and security to disaster recovery

IMPLEMENT NETWORK AND STORAGE VIRTUALIZATION INCREMENTALLY
- Focus on service quality
- Collaborate with stakeholders
- Develop service level agreements over time

CREATE APPLICATION-LEVEL VISIBILITY
- Start with existing tools
- Use the same instrumentation and protocols
- Using a blend of tools is perfectly acceptable
PART 3
Optimizing your data center

Once you have successfully transitioned your network or storage, you’ll need to continue to monitor your systems, tweaking as necessary to ensure the best possible outputs in terms of:

- **TIME**
  Measure how long it takes to deploy new virtual machines, storage and/or networking.

- **PERFORMANCE**
  Look for areas where performance optimization of key application servers needs to be completed.

- **SECURITY**
  Schedule audits to help determine a better security posture.

- **COST**
  Calculate savings in time, storage, and networking hardware.

**AREAS TO MONITOR**
After virtualization, make sure your team maintains visibility across the entire application stack. This involves monitoring and recording the following three areas:

- **OPERATIONS**
  Proactively identify and remedy any emerging performance, capacity, or configuration issues.

- **CAPACITY OPTIMIZATION**
  Watch resource consumption trends to inform capacity planning.

- **COMPLIANCE**
  Keep up to date on security-hardening guidelines, configuration standards, and regulatory compliance requirements.
BEST PRACTICES

COLLABORATION

› Ensure that people from multiple departments (IT, finance, security, etc.) are involved in IT projects so that there is a vested interest in their success.

› Have all boards and teams meet regularly to assess the projects underway and track progress toward meeting company business objectives.

› Use change request boards/documents and business case approval processes to make tasks that require cross-departmental collaboration more efficient and error-free.

MONITORING AND ANALYSIS

› Institute a quarterly performance analysis to compare the current project status with business objectives and key performance indicator (KPI) metrics.

› Use operations management software on an ongoing basis to be proactive rather than reactive and resolve problems before they impact users.

› Create dashboards that enable you to track your KPIs. This will help ensure that operations are running efficiently, and any problems can be resolved before they impact the business.

› Constantly monitor your system in real time to compare the current state with your benchmarks and goals.

› Schedule a future assessment to quantify the improvements achieved by the implementation, and document the results.

THE #1 PITFALL

The most common error we see after the transition is failing to create a baseline report against which you can compare future performance in order to quantify gains and losses in cost savings, time savings, space reclaimed, and agility.
DATA CENTER TRANSFORMATION TOOLS AND RESOURCES

Few organizations have the complete skillset and bandwidth to successfully coordinate their data center transformation project. As well, many organizations seek outside help to optimize their new infrastructure once it is built. As you plan your transformation, keep these Softchoice assessments, and professional and managed services, in mind. Many of these services are complimentary for Softchoice customers, and they will help you better manage your entire data center life cycle.

ASSESSMENTS AND SERVICES

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<tr>
<th>Assessment</th>
<th>Cost</th>
<th>Delivered By</th>
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<tr>
<td><strong>INSTALL BASE REPORT (IBR) TECHCHECK</strong></td>
<td>Complimentary service for Softchoice customers</td>
<td>TechCheck Team and VMware Technical Architect</td>
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<tr>
<td>A review of your existing license holdings and support expiration dates, and a roadmap of the latest VMware solutions. Takes two to five business days.</td>
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<td><strong>VSPHERE OPTIMIZATION ASSESSMENT (VOA) TECHCHECK</strong></td>
<td>Complimentary service for Softchoice customers</td>
<td>TechCheck Team and VMware Technical Architect</td>
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<td>Understand where you need to focus your attention in order to improve system health, reduce risk, and drive further optimization through this detailed analysis of 30 days of data collection.</td>
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<td><strong>VMWARE NETWORKING ASSESSMENT – DATA CENTER TECHCHECK</strong></td>
<td>Complimentary service for Softchoice customers</td>
<td>TechCheck Team, Hybrid Systems Analyst, and VMware Technical Architect</td>
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<td>In just three to five days, the vRealize Network Insight Tool (vRNI) will measure and monitor the current vSphere distributed virtual switch traffic to:</td>
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<td>▶ Determine current traffic</td>
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<td>▶ Break down your data center traffic by east-west, routed, switched, etc.</td>
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<td>▶ Quantify risk exposure</td>
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<td>▶ Make firewall and micro-segmentation recommendations</td>
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<td><strong>HYBRID CLOUD ASSESSMENT</strong></td>
<td>Complimentary service for Softchoice customers</td>
<td>TechCheck Team and VMware Technical Architect</td>
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<tr>
<td>Compare cloud provider costs per virtual machine and get side-by-side cost comparisons in just three days by leveraging the vRealize Cloud for Business tool.</td>
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VMWARE STORAGE ASSESSMENT – DATA CENTER TECHCHECK
This software as a service-based virtual storage area network (VSAN) assessment takes less than seven days to complete and delivers a comprehensive analysis of your vSphere environment, and also provides technical and business recommendations.

For example, this assessment determines which virtual machines are suitable candidates for Virtual SAN – Hybrid or All Flash Sizing, along with providing hardware recommendations (i.e., number of servers, SSD, HDD). It also includes estimated storage CapEx and OpEx savings with a total cost of ownership (TCO) analysis and comparison.

PROFESSIONAL SERVICES (COST VARIES DEPENDING ON SCOPE)

VREALIZE OPERATIONS MANAGER ACCELERATOR
- Align with customer team(s) and determine factors for success, conduct needs analysis, and review solution overview and design.
- Establish clarity on use case models, and deploy and optimize Softchoice-designed dashboards and report designs based on use case models selected from a list in the statement of work.
- Conduct test case reviews and share results.

DELIVERED BY
VMware Subject Matter Expert

VSPHERE UPGRADE – UPGRADE TO VSPHERE 5.5
Upgrade to a newer version of VMware to access new features and improvements.

DELIVERED BY
VMware Subject Matter Expert

SOFTWARE-DEFINED NETWORKING DISCOVERY WORKSHOP (BRAND AGNOSTIC)
A whiteboard session and discussion about software-defined benefits will help you better address your business goals, upcoming projects, and IT investments. You’ll walk away equipped with a high-level blueprint and readiness scorecard you can use to inform your business case and determine your next steps.

DELIVERED BY
VMware Subject Matter Expert

NSX PROOF OF CONCEPT
In this engagement we’ll review a solution overview and plan, design, and implement the micro-segmentation and security use cases. You’ll walk away equipped with a much deeper understanding of micro-segmentation and security, and formal documentation of the proposed design and implementation.

DELIVERED BY
VMware Technical Architect