Global Financial Institution Selects Software-Defined Data Center

VMware Accelerate Advisory Services recommends a software-defined data center (SDDC) architecture that delivers substantial operating savings—as much as 75 percent annually—and reduces reliance on vendor roadmaps.
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Introduction

A global financial institution wanted to move forward aggressively to take advantage of opportunities in the marketplace. Like its peers, this enterprise had postponed major infrastructure initiatives because of both internal and external conditions. Now the company wanted to optimize operations and reduce costs to improve the bottom line and enhance its competitive edge in the marketplace.

The company’s organization itself posed challenges. It was comprised of a diverse mix of business units, each with specific requirements for business services. High-profile acquisitions plus organic growth had created a complex and unwieldy IT infrastructure. The company’s global operations included more than 20 data centers, dozens of business-critical applications and a complicated mixture of management and monitoring tools. In addition, the predominance of legacy technology with specialized requirements created redundancies and inefficiencies in the labor force.

In his previous positions, the company’s CTO had established a track record of success deploying VMware virtualization and cloud solutions. Now, less than a year after his hiring, he set his sights on driving an unprecedented infrastructure transformation. The initiative had two primary goals: save on operating costs—that is, reduce annual IT spending by at least 50 percent—and free the company from having to rigidly follow hardware roadmaps. The CTO also wanted to streamline and modernize the IT team to improve efficiency and agility.

A serial early adopter of viable technology solutions, the CTO was convinced that the software-defined data center (SDDC) was the ultimate direction for the company. However, he also knew that his IT team lacked the specialized expertise to evaluate the current state of SDDC technology and his organization’s readiness to migrate to an SDDC. As a result, he called in a team of consultants from a trusted vendor: VMware Accelerate Advisory Services.

Analyzing the Current State

To kick off the engagement, the VMware Accelerate team met with the CTO and his team to develop a deeper understanding of the current state of the company’s IT operations. The results of this discovery phase revealed a number of challenges:

- Individual data centers had been designed for specific purposes and were highly siloed, resulting in low utilization rates. The rigid infrastructure made it difficult to adapt to changing business and IT requirements; therefore, utilization rates were trending progressively lower.
- Servers, storage, and networking components were highly underutilized, leading to a low return on investment. Legacy applications with specific hardware requirements constrained the company’s ability to consolidate resources.
- Reliance on specific physical hardware components prevented competitive procurements and increased capital expenditures. Moving to a software-controlled infrastructure would offer more freedom to choose hardware components that provide the best combination of cost and features from a number of vendors.
- As a result of mergers and acquisitions, the IT staff included a large number of senior engineers and technicians with highly specialized skills who were supporting legacy applications. In addition to driving up operating expenses, this degree of specialization made it difficult to scale the labor force in response to changing requirements.

The VMware Accelerate team presented its initial findings to the CTO and IT staff. The CTO accepted the findings and authorized the next step: Determine the optimum architecture and organization to achieve the desired targets and define the IT roadmap and migration strategy.
Identifying Options

As noted earlier, the CTO had a strong conviction that an SDDC was the right direction for the company’s future—a decision that was validated by the Accelerate team. However, the current complexity of the legacy infrastructure and the rapidly evolving nature of SDDC-related technologies required a skillful and deliberate approach—one that carefully balanced risk and reward while positioning the company to take full advantage of technology advances as soon as they occurred.

Preliminary discussions between the Accelerate team and the internal IT staff identified two very different options: a converged data center or full SDDC.

Converged Data Center

One option was to upgrade the current architecture to a converged data center based on proven, readily available components such as unified blade servers, unified storage and industry-standard management tools (see Figure 1). This approach represented a conservative strategy that relied primarily on the company’s current vendors.

While this option had a relatively low risk profile, it did not move the company toward its goal of lessening reliance on vendor roadmaps. The Accelerate team pointed out another potential problem: the impact on the labor force. Based on their experience, the VMware consultants knew that it would be difficult for the CTO to make the business case for significant organizational and process changes—changes that were critically needed—if the architectural changes were perceived as minimal and incremental. There was a real concern that the IT staff would not embrace change but rather continue with their current practices, in other words, business as usual.

Figure 1. Converged Architecture
Full SDDC Implementation

At the other end of the innovation spectrum, the company could choose to implement a full SDDC across the entire organization—adopting the philosophy that “the future is now.” The Accelerate team stressed—and the CTO agreed—that an SDDC is technically viable now and will get much stronger in the near future (see Figure 2).

![Figure 2. Full SDDC Architecture](image)

This so-called greenfield approach was highly innovative and aggressive—but in the eyes of the Accelerate team, there were reasons to delay this approach. A critical part of this SDDC option—the storage management software—is still evolving rapidly and will not be fully mature for another 12 to 18 months. The timing of any change to the storage infrastructure was critical, since the company required continuous access to business-critical information and could not afford significant downtime. Consulting with the VMware Accelerate team, the CTO decided to postpone the implementation of software-defined storage for the present.

The VMware Accelerate team conferred with the CTO to home in on a solution that would realize many of the benefits of the SDDC today and be ready to incorporate the SDDC storage management software when the time was right.
SDDC-Enabled Infrastructure

To limit risk while moving aggressively forward toward the ultimate goal of a full SDDC implementation, the Accelerate team defined a third option: Begin to migrate to an SDDC-enabled infrastructure today based on standard server and networking x86 hardware managed by software. The storage infrastructure would be a combination of tier-1 storage solutions and cloud-ready virtualized storage appliances. This option—also a greenfield approach—would achieve many of the organization and operational benefits of an SDDC while paving the way for an eventual seamless migration to the full SDDC implementation.

Figure 3. SDDC-Enabled Architecture
Building the Financial Model

Given the overriding target of cost savings, the VMware Accelerate team now turned its attention to the financial model. The goal of this phase was to establish credible financial metrics for each of the three architectural options.

The team started by gathering data on costs, resources, processes, staff and workloads. They analyzed the information to calculate the expected cost reductions for each of the options by categories including labor spend, data center operating costs, data transmission costs and depreciation. The team built the costs bottom-up based on the hardware, software and labor that would be needed for each option. Their analysis also took into account legacy business applications that could not be migrated to the greenfield environment and therefore would continue to run in the existing data center.

The findings from the financial analysis team showed that each option offered significant annual reductions in the current run rate:

- Converged data center: 34–38 percent
- SDDC-enabled: 49–54 percent
- Full SDDC: 73–75 percent

Then the Accelerate team reviewed the analysis with the CTO. It was immediately apparent that both greenfield options (SDDC-enabled and full SDDC) would satisfy the desired goal of a 50 percent annual reduction in operating expenses. The projected savings for full SDDC were dramatic, validating the ultimate goal of the infrastructure transformation. At the same time, the cost savings for the SDDC-enabled approach were substantial—far greater than the converged data center option and well on the path to the savings that could be realized with a full SDDC.
The Solution: SDDC-Enabled Now, Full SDDC in Future

When all the factors—cost savings, technology maturity, risk and organizational impact—were considered, the CTO chose the SDDC-enabled option as the optimum near-term strategy for the company for a number of reasons:

• **Financial benefits:** As described earlier, SDDC-enabled has a significant advantage in cost savings over converged data center. This factor alone was sufficient to justify SDDC-enabled.

• **Maturity of storage technology:** At the time of the decision, the SDDC storage management software was not as mature as other SDDC technologies. The SDDC-enabled option takes advantage of mature SDDC technologies while maintaining the existing storage solution.

• **Greenfield opportunities:** Even though the current infrastructure included a significant private cloud deployment, the SDDC-enabled option requires a new data center architected to support the new environment. It would be too costly and disruptive to attempt to modify the existing data center and using the existing organization and processes to achieve transformation would have a low probability of success.

• **Smooth transition:** The converged data center option involves only moderate changes to the legacy architecture and operating procedures. In contrast, the SDDC-enabled approach involves significant changes—for example, organizational rationalization—that are needed in a full SDDC. Therefore, SDDC-enabled represents an incremental approach that will stage the migration to full SDDC when the time is right.

Based on experience in a number of similar engagements, the Accelerate team knew technology alone would not achieve the company’s business and IT targets. The solution needed to holistically address technology, organization and processes.

**Technology**

The technology portion of the SDDC-enabled solution incorporates VMware software solutions for key functions such as cloud automation, network virtualization and financial management (see Figure 4). The proposed architecture will require highly skilled software defined data center resources—in particular, experts in software defined infrastructure configuration and monitoring—and requires all workloads to be virtualized.
The portfolio of VMware products used in the SDDC-enabled implementation includes:

- VMware vCloud® Suite Enterprise Edition
- VMware vCenter™ Operations Management Suite™
- VMware vCenter Chargeback Manager™
- VMware IT Business Management Suite™
- VMware vCloud Automation Center™
- Nicira® Network Virtualization Platform (NVP)

**Organization**

With the SDDC architecture, IT is organized around a fundamentally different principle. IT shifts from its traditional emphasis on servers, storage, networking and security to concentrate on service delivery—IT now functions as an internal service provider.

Becoming a service provider requires significant changes in the organizational structure, in effect, modeling the IT group on the Center of Excellence model (see Figure 5).

![Figure 5. Center of Excellence, Block Diagram](image)

The top levels of the institution’s IT group are first and foremost service-oriented. They are responsible for service design, service implementation, service management and service delivery. Technical and service roles are blended into the service-oriented organizational structure.

The skill level of the company’s staff also reflects the SDDC architecture. Since the infrastructure layer consists of standard x86 hardware, break-fix becomes a matter of simply replacing a component, which can be accomplished by junior IT staff. The IT group relies more on solution architects and engineers fluent in SDDC management and monitoring tools and can retrain and reassign higher-cost personnel specializing in vendor-specific storage and networking technologies.

The company has approved funding for the new service-oriented IT organization. To launch the new group, senior managers will be transferred from other departments. The company will also hire engineers and analysts who are fluent in cloud technologies and operations management to populate the structure.
Processes
The SDDC-enabled architecture, like the full SDDC, incorporates a high degree of automation. The software for many key processes in the data center—for example, automated provisioning, proactive incident management, and security and compliance—is highly mature and stable. The management plane is the logical place to focus on the process and organizational changes that will be needed in a full SDDC.

In the area of provisioning—a time-intensive task for IT groups—the company’s goal is 100 percent automation. The legacy patchwork of vendor and custom application tools is replaced by purpose-built tools that provide intelligent and timely analytics.

The new management tools provide intelligent and timely analytics, which profoundly improve the trouble-shooting process. Instead of a reactive break-fix approach, the IT group can shift to a proactive mode in which service managers can predict problems based on analytics and institute corrective action before service quality deteriorates.

Business Value
At the start of the VMware Accelerate engagement, the CTO had identified key goals: cut annual IT spending by 50 percent, reduce reliance on vendor roadmaps, and increase operational efficiency and agility. The solution proposed by VMware meets and exceeds these targets.

Cost Savings
The CTO’s original goal of reducing annual IT spending by 50 percent can be realized with the SDDC-enabled option, unlike the converged option which can deliver 38 percent at best. When the company moves to the full SDDC option, the savings could grow to as high as 75 percent (see Figure 6).

![Figure 6. Estimated TCO Reduction by Architectural Option](image)
The Accelerate team’s financial analysis provided detailed metrics for the expected per-workload costs, measured against the publicly available benchmark from Amazon and Google of about $6,000 cost of ownership per virtual machine per year (cost/VM/year).

The company currently pays about $13,000 cost/VM/year, a figure that will drop precipitously as more and more workloads are migrated to the SDDC architecture. cost/VM/year will equal the Amazon/Google benchmark after about a year of operation and will ultimately reach $3,800—an 80 percent overall reduction. (See Figure 7).

As part of its due diligence, the company’s executive staff asked whether it might make sense to simply wait 12 to 18 months before implementing changes to the infrastructure. The Accelerate team calculated the per-day cost of that course of action—that is, “the cost of doing nothing” (see Figure 8). The analysis showed convincingly that the opportunity costs were substantial—the impetus to move forward at once was compelling.
Operational Efficiencies

The move to a SDDC-enabled architecture will pave the way to significant operational efficiencies in a number of areas:

• More staff time for innovation: As an outcome of automated provisioning and the lower-cost infrastructure options, the company’s highly skilled IT staffers will have more time to work on innovative tasks. In particular, the IT group can engage in continuous process improvement to drive additional efficiencies and cost savings.

• Lower skill level required for infrastructure maintenance: The company’s infrastructure will be composed of a high percentage of standard x86 servers and networking components. As a result, most hardware problems can be fixed simply by replacing the component—a task that requires far less skill than it takes to troubleshoot and repair specialized components.

• Continuous process improvement: The restructured organization will include personnel focused on specific areas such as financial management, risk management and service-level agreement (SLA) management. This will give the company the ability to drive continuous process improvement in the SDDC environment.

Reduced Reliance on Vendor Roadmaps

The implementation of software-defined networking and server virtualization means that the company can procure hardware components that meet specific requirements, which leads to competitive procurements and lower capital costs. While supplier relationships—especially with select tier-1 vendors—are still important, the company now has more freedom to chart its own technology direction without being constrained by vendor roadmaps. The need for highly-specialized skills to support legacy components will diminish over time, reducing training costs and making it easier to redeploy IT staff as needed.
Summary

Acting on the recommendations of the VMware Accelerate team, this global financial institution plans to transform to an SDDC-enabled infrastructure that will create substantial cost savings and operational efficiencies from day one. The SDDC-enabled infrastructure will also be a significant step toward a full SDDC implementation, which the company is planning to implement in the next one to two years.

The SDDC-enabled infrastructure promises to deliver on the goals set by the company’s CTO at the start of the engagement:

- **Reduce annual IT spending by 50 percent in three years**: the SDDC-enabled option is projected to save 49 to 54 percent. Per VM cost will plunge from $19,000 to $3,800, which is substantially lower than the $6,000 cost/VM/year achieved by Amazon and Google.

- **Lessen reliance on vendor roadmaps**: An SDDC replaces specialized networking and storage components with standard x86 hardware controlled by management software, a combination that increases performance and optimizes utilization. As a result, the company will have the freedom to chart its own technology future without relying solely on vendor roadmaps.

- **Streamline the IT team to improve efficiency and agility**: The service provider model eliminates the siloes of the legacy infrastructure and creates a more efficient organizational structure. Automation of key processes reduces demands on IT staff, driving innovation. The high percentage of standard x86 hardware components allows the company to hire lower-skilled technicians for simple rack-and-stack repairs.

The benefits of moving to an SDDC are summarized in the following table.

### Summary of SDDC Benefits

<table>
<thead>
<tr>
<th>FROM…</th>
<th>…TO</th>
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<tbody>
<tr>
<td>Data Centers</td>
<td>Highly underutilized data centers that are designed for purpose</td>
</tr>
<tr>
<td>Hardware</td>
<td>Massive over-positioning of Tier 1 vendor infrastructure hardware</td>
</tr>
<tr>
<td>Tools / Process</td>
<td>Complex set of management and automation tools for managing environment</td>
</tr>
<tr>
<td>Labor</td>
<td>Expensive and poorly scaled labor structure</td>
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<tr>
<td>Applications</td>
<td>Legacy applications requiring high cost hardware and labor support</td>
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Why VMware Accelerate Advisory Services?

The software-defined data center (SDDC) is becoming a reality; more and more enterprises are choosing as SDDC to maximize the benefits of virtualization and shift the IT mentality to that of a service provider. However, designing and implementing an SDDC requires specialized expertise and experience to make the architectural choices that best meet the organization’s requirements for cost savings, operational efficiency and risk tolerance.

VMware Accelerate Advisory Services consultants are skilled at evaluating not only the technology and financial considerations of SDDC but also assessing the people and process changes that are required to realize the full potential of SDDC. Uniquely qualified in the industry, VMware Accelerate consultants can help design the optimum SDDC implementation today while anticipating the next three to five years of infrastructure evolution, ensuring a smooth path to the benefits of SDDC: tangible business value today, continuous and sustainable innovation for years to come.