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vmware CERTIFIED ASSOCIATE DATA CENTER VIRTUALIZATION

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- "We have several servers that have very little disk usage but were configured with a large amount of disk space. It would be great to be able to minimize the impact this has on the overall disk usage."
- "I need a way to detect whether I am efficiently using the available resources in my environment."
- "My company has several different storage arrays that are used in the environment. Some of these storage arrays are high performance and cost a lot more to operate than others. Many times development users place virtual machines on the incorrect storage device, causing degradation of performance for the array, which we correct by moving the virtual machine to the right class of storage. We need an automatic way to ensure that users can choose the appropriate class of storage from the time of deployment."

Performance Optimization

Common performance optimization challenges often sound like the following statements:

- "I need a way to proactively ensure that I have a healthy environment so that I can get optimal performance of my hosts."
- "We need a way to prioritize network traffic to ensure that our mission-critical virtual machines get the peak performance possible."
- "My company needs to ensure that we can add resources to virtual machines in our environment on-the-fly to address performance problems if they occur."

SMB Versus Enterprise Challenges

The size of the company can have an impact on the challenges that might be faced in the environment. In this section, you learn about how the size of the business affects the decisions that must be made to ensure the environment is healthy.

Size of the Company

The challenges faced by small and medium-sized businesses and large enterprises are very similar. However, the solutions often differ dramatically. All companies are interested in the availability, scalability, optimization, and manageability of their environment. The size of a company, though, often makes the choice of a solution very different. This could be due to the available hardware in the environment or to the number of servers that need to be backed up.

Most solutions can, with some predictability, be used in any environment; others are not suited for certain environments or for certain levels of service. For example, vSphere Replication is a suitable technology to implement only if the RPO of the business is less than 15 minutes. Knowing when a solution fits a particular business size or use case is incredibly important to ensuring a properly operating environment.

In addition, the total amount of data that must be managed often greatly differs given the size of the environment. If the rate of change of data is greater than the possible bandwidth available to replicate that data, then it is not going to be able to meet the needs of the company. Thus, another solution will be needed. Whether that solution is to add more bandwidth or to be more selective as to which data is replicated, there must be a compromise. This compromise is typically in the form of cost versus function because the price for some solutions might not be viable for all companies.

The following is a list of common challenges that might need to be taken into account when assessing the environment:

Key Topic

- **Amount of available bandwidth—**In smaller businesses, the bandwidth concerns might not be as much of an issue as in a larger enterprise where there is a heavier workload. The cost of additional bandwidth can be more than is possible for the function being performed.
- **Backup strategy—**It is easy to build a solution that says "Back up the entire environment every night"; however, this might not be possible in an enterprise that has several thousand VMs. Often the amount of time becomes prohibitive to this type of solution.
- **Availability strategy—**In an enterprise, it is a lot easier to ensure that there are available resources to recover from a failure. Whether the failure is a single host or an entire site, resources are available. In a SMB, however, losing a single server could be reducing capacity by a significant amount. Thus, appropriate solutions and policies must be set to ensure proper recovery.
- **Centralized management—**It is easy to have everything centrally managed in a smaller business because fewer hosts typically must be managed. When you are an enterprise business with multiple sites and many more servers, this is a lot more difficult to accomplish. In multisite scenarios, network bandwidth, latency, and redundancy become larger concerns than in smaller, single-site environments.
- **Compliance and configuration management—**In an SMB, keeping tabs on environment changes that would violate compliance regulations can be easier, and specialized software might not be required. In enterprise environments,

software such as vSphere configuration manager (VCM) are a must because with thousands of hosts and virtual machines, it is next to impossible to quickly validate compliance.

These are only a few examples to make you start to think about the types of differences between SMBs and enterprise environments. Some might amount to nothing, while others might end up being a deal-breaker for the technology.

Summary

In this chapter, we discussed the various types of challenges an administrator must consider when designing and implementing an environment. Availability, management, scale, and optimization of the environment are key to being able to design an infrastructure that meets the standards for the business:

- Availability enables an administrator to take into account any environmental failures, from a single server up to the entire site. Ensuring that you are able to meet the RPO or RTO appropriately for the workload will dictate how available the environment needs to be.
- Management is specific to managing the resources in the environment. Centralizing the management of resources and the ability to perform maintenance without impact to resources are often the cardinal needs of the business.
- Scalability of the environment is all about what is needed to be able to do the work in the environment. In many cases, this equates to how much work can be done in the datacenter before resources are taxed to the maximum possible.
- Finally, optimization is the ability to monitor the environment for the health of the environment and any anomalies that might occur during regular operations. The datacenter will have peaks and valleys in terms of utilization, to which an administrator needs to ensure that the health does not decline.

How these challenges can be met is discussed in Chapter 6, after you learn how virtualization concepts can be applied to meet these challenges

Exam Preparation Tasks

Review All the Key Topics

Table 2-2 provides a detailed discussion of the key topics. Use this table as a quick reference to the settings you need to make or verify in any system. Examples of these and other settings are provided in the following sections.

Table 2-2 Key Topics for Chapter 2

Key Topic Element	Description	Page
List	The types and challenges associated with availability	25
List	The types and challenges associated with management	28
List	The types and challenges associated with scalability	31
List	The types and challenges associated with optimization	33
List	The types and challenges associated with smaller versus bigger businesses	35

Definitions of Key Terms

Define the following key terms from this chapter, and check your answers in the glossary.

Availability Challenges, Management Challenges, Scalability Challenges, Optimization Challenges, SMB Versus Enterprise Challenges

Review Questions

The review questions section is for you to review your knowledge of the topics in the chapter. You can find the answers in Appendix A.

1. Which of the following is an availability challenge?
   a. Centralized management of a few hosts.
   b. Ensuring that downtime is minimized.
   c. We want to use our disk space as efficiently as possible.
   d. Trending on resource utilization.

2. Your manager has asked you to ensure that the mission-critical virtual machines in the environment are protected in case of environmental disaster. Which type of challenge is this?
   a. Scalability
   b. Management
   c. Optimization
   d. Availability

3. Which of the following is a management challenge?
   a. IT operations require a single pane of glass view for the servers available in the environment.
   b. Monitoring the environment for bottlenecks.
   c. Needing an automated system to correct unbalanced resources during growth periods.
   d. Needing the ability to quickly test a disaster recovery plan.

4. Your boss wants to reduce the power and cooling requirements of the datacenter. Which type of challenge is this? (Choose all that apply.)
   a. Management
   b. Scalability
   c. Optimization
   d. Availability

5. You need to be able to add more RAM to a VM. Which type of challenge is this?
   a. Optimization
   b. Availability
   c. Scalability
   d. Management

6. Which of the following is a scalability challenge?
   a. Prioritization of storage bandwidth
   b. Centralized management of resources
   c. Minimizing the downtime caused by hardware failures
   d. Small sites that do not have any available space to add additional CPUs

7. Which of the following is an optimization challenge?
   a. Viewing how efficiently the datacenter is operating
   b. Growing the environment very quickly
   c. Hardware maintenance for a failing server
   d. Having a single pane of glass view for the environment

8. You need to ensure that the datacenter is healthy. Which type of challenge is this?
   a. Scalability
   b. Optimization
   c. Management
   d. Availability