Cisco Data Mobility Manager Q&A

Q. **What is Cisco® Data Mobility Manager (DMM) and what does it do?**

A. Cisco DMM is a storage area network (SAN) fabric-based software application that facilitates movement of block data from a source block device to a destination block device. Cisco DMM is designed to allow a storage administrator to complete the migration process without the application server outages typically needed when the storage subsystem is reconfigured. Because servers are administratively owned by systems administrators, and because a server outage affects the application, a storage administrator must coordinate any server outage with the systems and database administrators. This coordination is a very time-consuming process, and the storage administrator is not in control of the schedule to complete the migration task. Because Cisco DMM, when used in conjunction with the Cisco SAN Device Virtualization (SDV) feature, offers zero-outage capability, a storage administrator now has complete control over the data migration task and can complete data migration in a timely manner.

Q. **Why do data center storage administrators need Cisco DMM?**

A. Storage administrators may need to move data from an existing storage Logical Unit Number (LUN) to a new LUN in several situations, such as when a disk array is replaced. With new disk array technologies becoming available every few years, some companies incorporate the latest and best of array technologies as soon as they become available, and all data on an existing array must be moved to a new array before the application servers can access the new array. Another situation that entails movement of data is capacity reconfiguration. When the amount of data exceeds the capacity of an existing storage LUN, the LUN needs to be expanded. This capacity reconfiguration may require the movement of data from the existing LUN to a new and larger LUN.

Q. **What hardware and software components are needed to run Cisco DMM?**

A. The main component of Cisco DMM runs on the Cisco MDS 9000 Storage Services Module (SSM). This module must be available in the fabric. Neither the host initiator nor the target array needs to be directly connected to the Cisco MDS 9000 SSM card. The Cisco MDS 9000 SSM fits into the Cisco MDS 9216i and 9222i Multilayer Fabric Switches and the Cisco MDS 9506, 9509, and 9513 Multilayer Directors. The Cisco MDS 9000 family switch that houses the Cisco MDS 9000 SSM card used for Cisco DMM must be running Cisco MDS 9000 SAN-OS Software Version 3.2(1) or later. The switches to which the existing and new storage arrays are connected must also be running Cisco MDS 9000 SAN-OS Software Version 3.2(1) or later, because Cisco DMM needs the Fibre Channel Redirect feature available on the switches to which the arrays are connected.

Q. **Why use Cisco DMM when other solutions are available?**

A. Several solutions are currently available to the end user. These solutions can be categorized into host-based, array-based, and appliance-based solutions.

- Host-based solutions are available as basic tools such as a dump command, or they can be more sophisticated such as a volume manager. The negative aspect of host-based solutions is that the data migration task competes with the application for CPU and

bandwidth resources. Application performance can deteriorate by as much as 50 percent when administrative traffic such as that needed for the migration task competes for CPU and I/O bus bandwidth. In addition to this significant problem, in a host-based approach the storage administrator is dependent on the server and system administrators to complete the migration task. This dependency invariably results in a larger coordination effort and more time and resources than is optimal spent on the migration task.

- Array-based solutions are typically limited to homogeneous environments. Because the migration is delivered using the same tools as for disaster recovery, such a migration task typically requires considerable human involvement because storage administrators are dependent on array vendor services to configure the migration task, meaning that more coordination and time is needed to complete the migration task. Such a solution is acceptable when the customer needs to migrate data only infrequently, but the inability to complete a migration task without depending on others can be a very big problem for storage teams that must migrate data on a regular basis.

- Appliance-based solutions are typically used to move data across heterogeneous vendor arrays when the coordination needed by host-based solutions is considered unacceptable. Appliance-based solutions require two outages, so such outages must be acceptable in an environment that uses this approach.

Although some of these solutions work for some customers in some scenarios, no one solution works for all customers all the time. Cisco DMM, however, addresses the different limitations of all these approaches and so is a best-fit solution for most application scenarios.

Q. **What are the main features of Cisco DMM?**

A. Main features of Cisco DMM are as follows:

- Cisco DMM integrates into the existing environment completely transparently, so that neither the host server nor the storage array have to be reconfigured when Cisco DMM is introduced into the user environment, nor is any zoning configuration required. The storage administrator thus can complete the migration task without needing to inform the server, system, or database administrator that a migration is being planned.

- Cisco DMM can move data over long distances where the copy operation must be completed asynchronously with write I/O operations.

- Cisco DMM can securely erase the data from the existing storage so that this step can be completed before the array leaves the customer data center.

- Other features include capabilities to pace the data migration job, schedule the start and cutover times, and view the effect on the SAN of the extra traffic generated by the data movement. A configuration wizard simplifies setup and use, and a command-line interface (CLI) allows advanced users to complete their migration tasks using scripts.

Q. **What Cisco DMM configurations are supported?**

A. From a SAN switch perspective, mixed switch vendor environments are possible, but use of such a configuration is discouraged for the initial release of Cisco DMM, until the mixed switch vendor environments have been thoroughly tested. Thus, initially, Cisco DMM is assumed to be employed in an environment that uses exclusively Cisco MDS 9000 family switches.

In addition, existing and new storage must be connected to Cisco MDS 9000 family switches that are running Cisco MDS 9000 SAN-OS Software Version 3.2(1) or later. In the optimal configuration, existing and new storage is connected to the same switch. Also, while the Cisco

MDS 9000 SSM card can be placed in any switch in the SAN, in an optimal configuration the Cisco MDS 9000 SSM is in the switch to which the existing and new storages arrays are connected. This optimal configuration will result in optimal network flows, minimizing any latency introduced through the alteration of these flows.

When mixed switch environments are deployed (in a later release), existing and new target arrays still must be connected to a Cisco MDS 9000 family switch running Cisco MDS 9000 SAN-OS Software Version 3.2(1) or later. This requirement means that only hosts can be connected to other vendors' switches.

Another important configuration consideration is the combination of host operating system, multipath driver, host bus adapter (HBA), and array. Because avoid interoperability problems, the specific combination of components needs to be tested before the configuration is deployed in a production environment. For each Cisco MDS 9000 SAN-OS Software release, Cisco will publish the interoperability matrix supported by Cisco DMM.

Q. **What steps do I need to complete to schedule migration?**

A. The first step is to check the interoperability matrix to verify that the components involved in the migration are supported.

The next step is to make sure that the switches to which the existing and new storage targets are connected are running Cisco MDS 9000 SAN-OS Software Version 3.2(1) or later.

Typically, each storage network involves two SANs. Host and target servers are connected to each SAN to create a redundant network. A host typically has access to the array (also called a path to the LUN) through each SAN. In such a configuration, the user must verify that each SAN includes a Cisco MDS 9000 SSM. The Cisco DMM feature must be enabled on the switch where the Cisco MDS 9000 SSM card is present. At this point, a SAN administrator is ready to schedule migration.

To begin the migration process, first schedule a job. When creating a job, the administrator must identify every initiator and target pair that represents a path to a LUN. Failure to do so will result in incorrect operation.

After a job is created, the administrator can query a list of LUNs on the existing and new target servers between which data can be moved. Each pair of LUNs represents a session. There can be multiple sessions per job. However, there can be only one job at a time for a set of initiator and target pairs.

The actual movement of data is subject to the start time configured for each job.

Q. **Is a license required to deploy Cisco DMM?**

A. Yes. There is an end-user license specifically associated with Cisco DMM.

Q. **What other Cisco MDS 9000 SAN-OS Software features does Cisco DMM use to deliver zero-outage capability?**

A. Cisco DMM eliminates the one or two outages typically needed by other solutions before migration can start. Cisco DMM can complete all migration steps, including the movement of data to the new storage array, without any outages.

When the data is available on the new array, the host can stop interacting with the existing array and complete I/O operations exclusively on the new array. The host thus must now interact with a new entity, or World Wide Name (WWN). Some host operating systems can communicate with a

new WWN in real time, but others can do this only in the boot process, which means that the host must reboot at the point of cutover to the new storage array.

Cisco DMM addresses this limitation of host operating systems by working with a separate feature available on the Cisco MDS 9000 family platform: SDV. When SDV is available, the host talks to a virtual WWN. The virtual-WWN-to-physical-WWN mapping can be changed dynamically without any entity in the SAN noticing this change. When this capability is used in conjunction with Cisco DMM, zero-outage capability is achieved.

Q. **Does Cisco provide deployment support services for DMM and associated hardware?**

A. Cisco's Data Center Advanced Services team can assist customers in the planning, design, configuration and deployment of the DMM solution. Our Advanced Services team has developed best practices and methodologies to ensure your deployment is a success. Please contact your Cisco Services Account Manager for a custom statement of work that meets your requirements.

Q. **How will I get support if my storage vendor does not support DMM and associated hardware?**

A. Customers purchasing DMM directly from Cisco, an authorized ATP partner or as an RPQ item from the storage vendor can also purchase SMARTnet, Cisco's award winning technical support service that provides direct, 24x7 access to Cisco engineers. Cisco will directly support DMM even when the rest of your solution is provided by your storage vendor. SMARTnet includes advance hardware replacement with next business day or 24x7 with 2 or 4 hour options to ensure your MDS solution can meet even stringent mission critical requirements. Cisco TAC engineers are trained to support all your MDS needs including advanced features like DMM.

Q. **What if I am interested in a temporary DMM license?**

A. SMARTnet SKUs are available for temporary DMM licenses. The length of the support contract matches the period the DMM license is valid.

Q. **How do I know DMM works with my configuration?**

A. Customers should check the DMM operability matrix for tested and supported configurations. Customer purchasing DMM from Cisco or an ATP partner can be assured that Cisco will support DMM on any configuration in the operability matrix.

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