

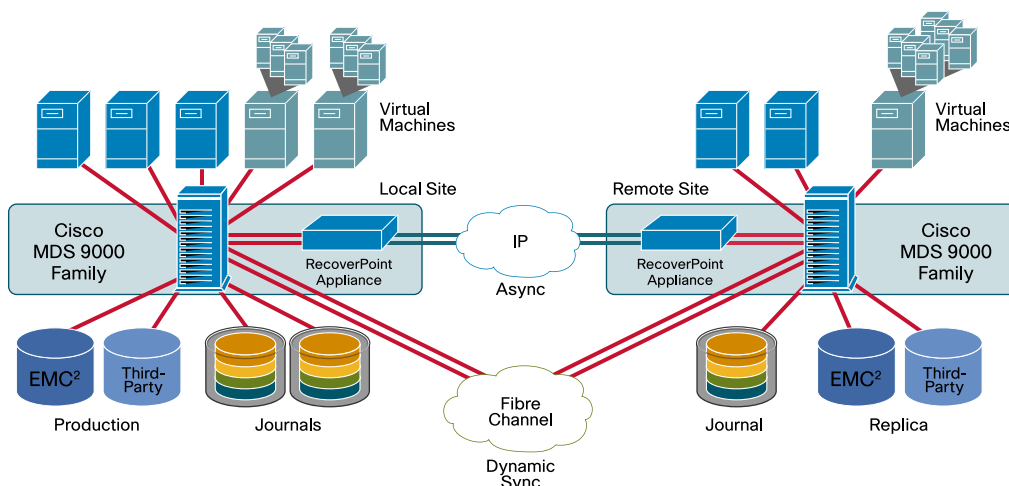
## Cisco MDS 9000 SANTap

### Product Overview

Cisco® MDS 9000 SANTap is one of the intelligent fabric services offered by the Cisco MDS 9000 Family. Cisco MDS 9000 SANTap operates as a tap in the SAN, providing a reliable copy of storage write operations to a partner appliance. Cisco MDS 9000 SANTap enables partner applications to provide data continuity, data protection, online data migration, storage performance, and service-level agreement (SLA) monitoring without the drawbacks of in-band data-path or out-of-band host-based devices.

Cisco MDS 9000 SANTap enables customers to deploy EMC RecoverPoint, a single product solution for local data protection, remote replication, and disaster recovery. EMC RecoverPoint with Cisco MDS 9000 SANTap can replicate heterogeneous storage without compromising the integrity, availability, and performance of the I/O operations between the host and the primary target (Figure 1).

**Figure 1.** Cisco MDS 9000 SANTap Enabling EMC RecoverPoint



EMC RecoverPoint offers a single solution for local data protection, remote replication, and disaster recovery. Based on scalable out-of-band appliances that use intelligent write splitting, EMC RecoverPoint can be deployed in three configurations: continuous data protection (CDP), continuous remote replication (CRR), and concurrent local and remote (CLR) data protection of the same data with recovery to any-point-in-time.

EMC RecoverPoint CDP provides block-level local replication between logical unit numbers (LUNs) in the same SAN that reside in one or more arrays at the same site and enables recovery from a local failure or data corruption. CDP technology logs every write operation for later recovery to any point in time.

EMC RecoverPoint CRR provides block-level asynchronous replication between LUNs in the two different SANs using near-CDP technology that journals groups of write operations for later recovery to significant points in time.

The local CDP copy enables recovery from a local failure or data corruption, whereas the CRR copy enables the LUNs to be replicated to a remote site where they can be brought online with little downtime in case of a major disaster.

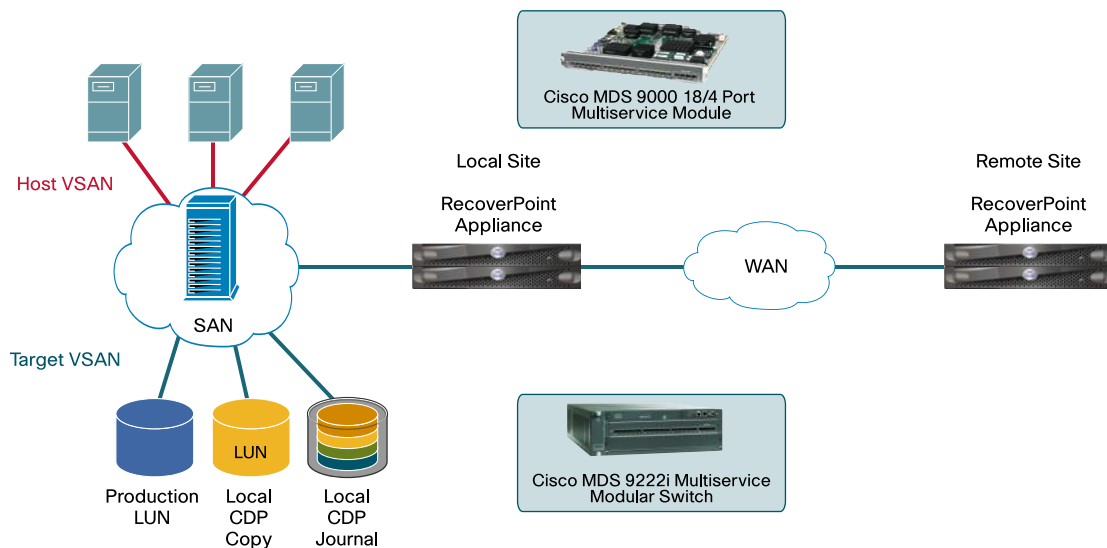
EMC RecoverPoint CLR provides simultaneous block-level local replication and synchronous or asynchronous block-level remote replication for LUNs, with one copy residing locally in the same SAN with every write operation journaled, and the second copy resides remotely in a different SAN with significant groups of write operations journaled. Recovery of one copy can occur without affecting the other copy.

EMC RecoverPoint CDP and CRR both provide bi-directional replication and any-point-in-time recovery capability, which allows the target LUNs to be rolled back to a previous point in time and used for read and write operations without affecting ongoing replication or data protection.

EMC RecoverPoint provides efficient, asynchronous data replication over IP. As of EMC RecoverPoint 3.2, synchronous CRR over Fibre Channel is also supported. When Fibre Channel is selected for CRR, all the EMC RecoverPoint appliances will automatically discover and configure their existing Fibre Channel ports on host bus adapters (HBAs) for remote replication.

Cisco MDS 9000 SANTap sends a copy of each write I/O operation to the back-end storage device and sends another copy to the appliance. The EMC RecoverPoint appliance can then use the I/O locally for CDP and journaling or transport it over the WAN link to a remote site (Figure 2).

**Figure 2.** SANTap Operating Procedure



A service node is a dedicated virtualization ASIC in the switch or line card that hosts the Cisco MDS 9000 SANTap application. The service node taps a copy of the primary write I/Os and sends it to the EMC RecoverPoint appliance. Upon receipt, the local EMC RecoverPoint appliance sends the write I/Os to a peering remote appliance and maintains a journal of all replication operations.

Use the Cisco MDS 9000 18/4-Port Multiservice Module for a SAN service core design, or the Cisco MDS 9222i Multiservice Modular Switch for a SAN service edge design.

Unlike in data-path appliances, Cisco MDS 9000 SANTap out-of-band fabric splitting provides a reliable copy of the write I/O operations to the appliance, preserving I/O integrity and availability (i.e. appliance errors do not affect the host I/O), without affecting application performance.

## Cisco MDS 9000 SANTap for EMC RecoverPoint Benefits

Cisco MDS 9000 SANTap provides the following benefits:

- Transparent deployment of the data protection appliance
- Helps ensure data consistency
- No disruption of the primary I/O operations from the server to the storage array
- Deployment flexibility and investment protection
- Unlimited scalability and no performance bottlenecks

EMC RecoverPoint provides the following benefits:

- Local site operational recovery
- Any-point-in-time recovery
- Integrated WAN compression
- Asynchronous and dynamic synchronous replication
- Remote-site disaster recovery
- Support for heterogeneous storage

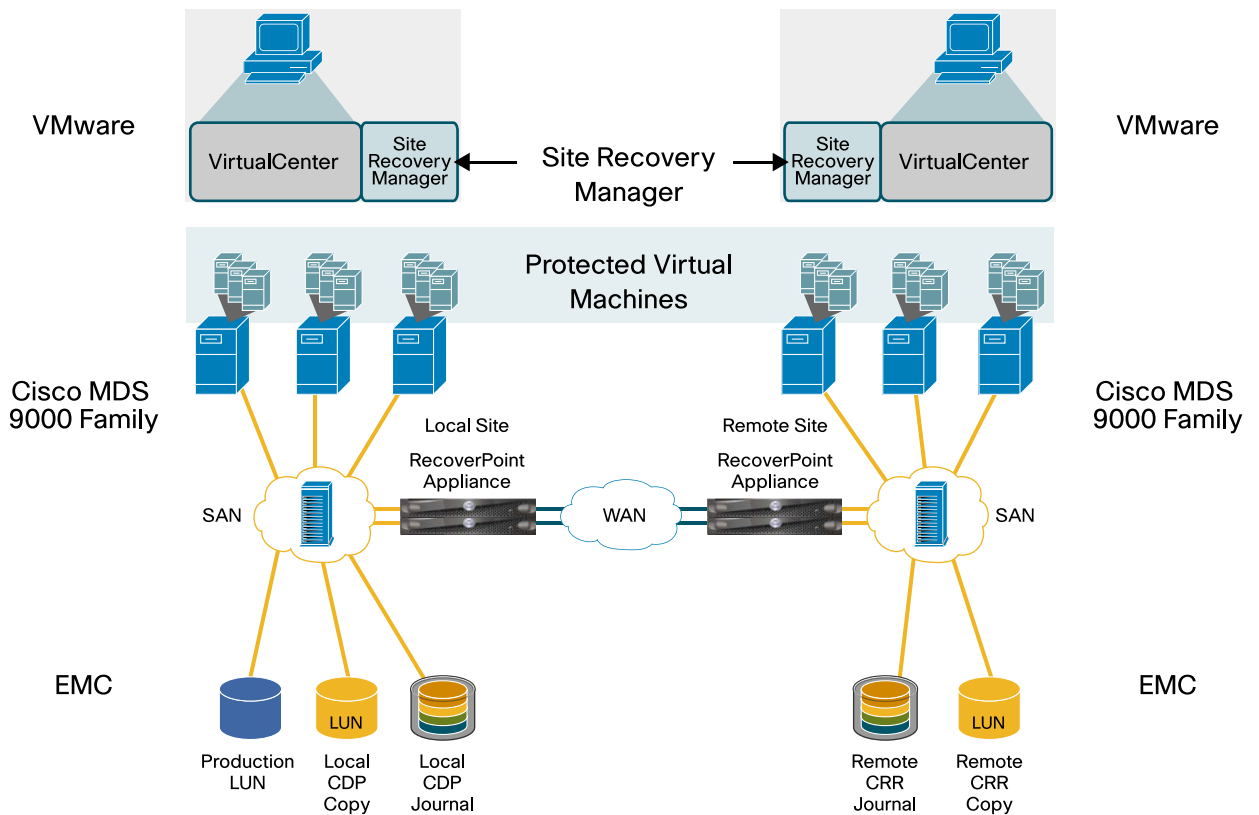
By splitting the traffic in the fabric as opposed to disrupting the traffic at either the host or the storage subsystem, Cisco MDS 9000 SANTap provides unique scalability and performance enhancements for protecting VMware infrastructure environments.

Cisco MDS 9000 SANTap provides the following benefits in VMware operating environments:

- Hardware offload of traffic-split operation
- Support for physical Virtual Machine File System (VMFS) and Raw Device Mapping (RDM) data volume replication
- Support for guest OS boot volume replication (VMFS and RDM)
- Support for VMware Distributed Resource Scheduling (DRS), VMotion, and Site Recovery Manager (SRM)
- Support for P2V and V2V replication
- Support for up to 16 replicated virtual machines per VMware ESX Server
- Support for up to 1000 replicated volumes
- More I/O operations per second (IOPS) than host-based or array-based traffic splitting
- Multivendor disk array and multivendor OS support

VMware Site Recovery Manager integrates with EMC RecoverPoint to provide automated disaster recovery of virtual environments. With Cisco MDS 9000 SANTap used in this environment to provide a consistent copy of the primary I/O to the EMC RecoverPoint replication operation, this approach allows protected and replicated volumes to reside on any storage array on the EMC RecoverPoint Support Matrix (EMC or third party; Figure 3).

**Figure 3.** End-to-End Business Continuity for Virtualized Data Centers Leveraging Cisco MDS 9000 SANTap, EMC RecoverPoint, and VMware Site Recovery Manager



Each consistency group in EMC RecoverPoint can be identified as being managed by VMware SRM. The combined EMC, Cisco, and VMware solution helps ensure recoverability to point-in-time fail-time-consistent images for the VMware ESX platform, in which the recovery point objective (RPO) for every consistency group can be individually set and assigned by the administrator.

### Licensing

Cisco MDS 9000 SANTap is part of the storage services interface image release and requires the Cisco MDS 9000 Storage Services Enabler (SSE) Package. The Cisco MDS 9000 SSE Package provides the underlying infrastructure and program interface to enable intelligent fabric applications such as Cisco MDS 9000 SANTap. For more information, please consult the Cisco MDS 9000 SSE Package data sheet at [http://www.cisco.com/en/US/prod/collateral/ps4159/ps6409/ps4358/product\\_data\\_sheet0900aecd8017a6eb\\_ps6029\\_Products\\_Data\\_Sheet.html](http://www.cisco.com/en/US/prod/collateral/ps4159/ps6409/ps4358/product_data_sheet0900aecd8017a6eb_ps6029_Products_Data_Sheet.html).

### Ordering Information

Table 1 lists the components a customer needs to purchase to install and use the product. To place an order, visit the [Cisco Ordering homepage](#). To download software, visit the [Cisco Software Center](#).

**Table 1.** Ordering Information

Product Name	Cisco Part Number	EMC Part Number
Cisco MDS 9000 18/4-Port Multiservice Module	DS-X9304-18K9=	MDS-PBFI-1804
SSE license for the 18x4 module on MDS 95XX	M9500SSE184K9=	MDS-SSE-95MSM
Cisco MDS 9222i Multiservice Modular Switch	DS-C9222i-K9=	MDS-9222i
SSE License for native 9222i (slot 1)	M9200SSE184K9=	MDS-SSE-9222i
SSE License for MSM-18/4 in 9222i expansion (slot 2)	DS-C9222i-K9=	MDS-9222i

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## For More Information

For more information about Cisco MDS 9000 SANTap, including design guides, deployment guides, migration guides, and other detailed information about product and service offerings, please visit

<http://www.cisco.com/en/US/products/ps10746/index.html> or contact your local account representative or visit <http://www.cisco.com/go/storage>.

EMC RecoverPoint data sheets, white papers and specifications:

<http://www.emc.com/products/detail/software/recoverpoint.htm>.

Cisco MDS 9000 18/4-Port Multiservice Module product details:

<http://www.cisco.com/en/US/products/ps8425/index.html>.

Cisco MDS 9222i Multiservice Modular Switch product details:

<https://www.cisco.com/en/US/products/ps8420/index.html>.

Design guide, deployment guide, and migration guide for EMC RecoverPoint and Cisco MDS 9000 SANTap:

[http://www.cisco.com/en/US/products/ps5989/products\\_implementation\\_design\\_guides\\_list.html](http://www.cisco.com/en/US/products/ps5989/products_implementation_design_guides_list.html).

Configuration guide for Generation 2 and 3 switching modules:

[http://www.cisco.com/en/US/docs/switches/datacenter/mds9000/sw/4\\_1/configuration/guides/cli\\_4\\_1/gen2.html#wp1700274](http://www.cisco.com/en/US/docs/switches/datacenter/mds9000/sw/4_1/configuration/guides/cli_4_1/gen2.html#wp1700274).



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