## Storage Area Network (SAN) Learning Path

Benefits any storage professional who deploys and manages multi-site, multi-vendor SAN environments.

You will learn to configure Brocade and/or Cisco SAN switches, CLARiiON and/or Symmetrix Storage and Server Configurations including PowerPath.

Prepare for your Specialist Level Storage Area Network (SAN) Certification.

### Certification Alignment

<table>
<thead>
<tr>
<th>Level</th>
<th>Exam Code</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specialist</td>
<td>E20-532</td>
<td>Page 10</td>
</tr>
<tr>
<td>Associate</td>
<td>E20-001</td>
<td>See Page 10</td>
</tr>
</tbody>
</table>

### Specialist Courses

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Prerequisite</th>
<th>Duration</th>
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<tbody>
<tr>
<td>SAN Management (Instructor-Led)</td>
<td></td>
<td>(4 Days)</td>
</tr>
<tr>
<td>Symmetry Foundations (Prerequisite)</td>
<td></td>
<td>(2 Hrs)</td>
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<tr>
<td>CLARiiON Foundations (Prerequisite)</td>
<td></td>
<td>(2 Hrs)</td>
</tr>
<tr>
<td>Introduction to Fibre Channel (Prerequisite)</td>
<td></td>
<td>(1.5 Hrs)</td>
</tr>
<tr>
<td>Basic Network Environment (Prerequisite)</td>
<td></td>
<td>(5 Hrs)</td>
</tr>
<tr>
<td>IP SAN Technologies (Prerequisite)</td>
<td></td>
<td>(2 Hrs)</td>
</tr>
<tr>
<td>PowerPath Configuration and Administration (Prerequisite)</td>
<td></td>
<td>(2 Hrs)</td>
</tr>
<tr>
<td>Connectrix B Series Architecture and Management</td>
<td></td>
<td>(2 Hrs)</td>
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<tr>
<td>Connectrix MDS Series Architecture and Management</td>
<td></td>
<td>(2.5 Hrs)</td>
</tr>
<tr>
<td>Connectrix M Series Architecture and Management</td>
<td></td>
<td>(2 Hrs)</td>
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### Course Objectives

- **SAN Management (Instructor-Led)**
  - Perform switch management tasks using native switch tools
  - Manage SAN environment (hosts, switches, and storage) using EMC tools
  - Explain SAN management best practices including performance, monitoring, and reporting

- **Symmetry Foundations (Prerequisite)**
  - Draw and describe the basic architecture of Symmetry DMX
  - Explain Symmetry DMX theory of operations, connectivity options, and key features

- **CLARiiON Foundations (Prerequisite)**
  - Describe the basic architecture and features of a CLARiiON disk array and differentiate among the various models
  - Illustrate the key high availability features of the CLARiiON
  - Use Navisphere to perform common management tasks

- **Introduction to Fibre Channel (Prerequisite)**
  - Discuss Fibre Channel protocol basics and identify key differences between various Fibre Channel topologies
  - Define WNN and explain its role in Fibre Channel environments

- **Basic Network Environment (Prerequisite)**
  - Describe the components of a typical network infrastructure
  - Identify basic network concepts that will help to configure and manage EMC products

- **IP SAN Technologies (Prerequisite)**
  - Describe and discuss IP convergence in the SAN and its implications
  - Explain the basic architecture of iSCSI, FCIP, iFCP, and potential IP SAN topology solutions

- **PowerPath Configuration and Administration (Prerequisite)**
  - Describe PowerPath architecture and its load balancing policies
  - Explain PowerPath connectivity and configuration in both SCSI and Fibre Channel environments

- **Connectrix B Series Architecture and Management (Prerequisite)**
  - Describe the various B-series switch models and their architectures
  - Identify the tools available for configuring and managing the B-series switches

- **Connectrix MDS Series Architecture and Management (Prerequisite)**
  - Describe the various MDS-series switch models and their architectures
  - Identify the tools available for configuring and managing the MDS-series switches

- **Connectrix M Series Architecture and Management (Prerequisite)**
  - Describe the various M-series switch models and their architectures
  - Identify the tools available for configuring and managing the M-series switches

### Purchase Options

<table>
<thead>
<tr>
<th>Option</th>
<th>Code</th>
<th>Price</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAN ValuePak</td>
<td>CE-VALPAK</td>
<td>$4,950</td>
<td>Includes one Instructor-Led course and 9 self-paced e-Learning courses.</td>
</tr>
<tr>
<td>SAN Video ValuePak</td>
<td>CE-VIDVPSAN</td>
<td>$3,960</td>
<td>Includes one Video-ILT and 9 self-paced e-Learning courses. For more information on purchase options, see page 9</td>
</tr>
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For more information on delivery modes, see page 8.

Get curriculum details and course schedules at: [http://education.EMC.com](http://education.EMC.com)
### Storage Area Network (SAN) Learning Path (continued)

The expert courses benefit Specialist Level Professionals who plan and provision SAN storage.

You will learn to assign, reclaim, and re-configure storage for different host operating environments.

<table>
<thead>
<tr>
<th>Expert Courses</th>
<th>Course Objectives</th>
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</table>
| Host to Storage SAN Connectivity <br> (Instructor-Led) | • Describe, qualify and prepare the environment  
• Connect and configure a host to a SAN  
• Configure a SAN switch and perform basic operations  
• Perform advanced host configurations such as OS tuning, multi-pathing, volume management and filesystem creation  
• Provide an overview of storage management techniques including assigning, reclaiming, and reconfiguring storage for different host operating environments |
| SAN Monitoring and Policy Management | • Describe the key areas to monitor in a SAN  
• Provide a generic overview of policy management  
• Describe SAN management standards, key features and benefits  
• Provide a detailed overview of SAN monitoring and policy management |
| SAN Planning and Design Concepts | • Describe the SAN planning process  
• Explain SAN design options as they relate to topologies, FC switch concepts, iSCSI solutions, IP distance solutions, and virtualization solutions via Invista  
• Specify design impact on performance, availability, and scalability |

<table>
<thead>
<tr>
<th>Additional Courses</th>
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</table>
| Invista Operations and Management <br> (Instructor-Led) | • Navigate Invista Element Manager V2.1  
• Provision storage elements from storage arrays, create virtual volumes |
| Invista Overview and Architecture | • Understand the concept and benefits of storage virtualization  
• Design goals, benefits, features, and competitive advantages of Invista  
• Describe how components work together to achieve storage virtualization  
• Describe basic configuration, implementation, and migration strategies |
| Implementing Cisco Storage Networking Solutions 3.0 <br> (Instructor-Led) | • Implement a SAN with multiple virtual fabrics using the full range of features and capabilities provided by the Cisco MDS platform, so that the SAN demonstrates high availability, scalability, performance, and interoperability  
• Configure and use fabric management, performance management, and security services on the Cisco MDS platform so that the SAN can be effectively managed, tuned, and secured  
• Diagnose and correct software configuration issues and inoperable hardware components, so that the problems are resolved with minimal disruption to the SAN environment  
• Identify and configure the appropriate iSCSI features to meet customer requirements |