

# MRV's Lab Automation Solution for the Storage Environment

## OVERVIEW

For a storage system manufacturer, the test lab environment presents unique challenges including increased competitive pressure to get products and services to market and increased complexity of tests to ensure delivery of a quality product. The numerous protocols used in the storage industry complicate the testing environment even further. In a storage test lab, flexibility and multi-protocol support is paramount to efficient operation.

Today, test labs are moving toward test automation with sophisticated software, but the physical connectivity of equipment remains a laborious manual process. The Media Cross Connect from MRV provides the missing link to true lab automation. Connect all test beds and equipment one time to the MCC, and all changes in topology are controlled through software to increase test velocity and minimize capital expense through equipment sharing.

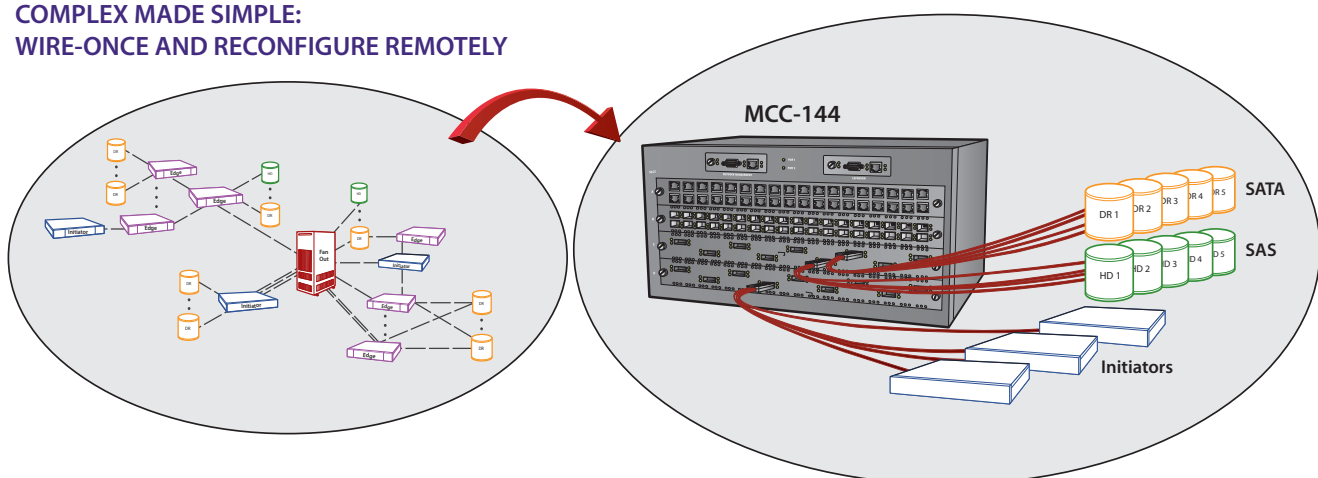
## MEDIA CROSS CONNECT

When the MCC is initially wired to all lab devices, test technicians can connect and remotely configure storage equipment of various types and protocols with greater setup flexibility and improved operating efficiency. Wire-once technology allows expensive test equipment or test beds to be easily shared among users in the same building or on the other side of the globe, reducing capital expenses. Often-used topologies can be stored and recalled by any authorized user. Test time and configuration errors are reduced and repeatability of tests like disaster or fault simulation is simplified. The MCC helps to ensure that test commitments are met while increasing test quality and improving test velocity in demanding test and simulation environments.

## MRV'S STORAGE SOLUTIONS

MRV offers the most complete solution for the demanding environments of the storage industry. Using the MCC in a storage test lab enables lab personnel to dynamically connect storage equipment of various types and protocols providing greater flexibility and improved efficiency. By supporting 2/4/8 Gbps Fibre Channel, iSCSI, FCoE and 1.5/3.0/6.0 Gbps SAS/SATA in one system, the MCC can accommodate any combination of interfaces required. The flexible architecture allows system customization for the individual needs of each lab environment.

### COMPLEX MADE SIMPLE: WIRE-ONCE AND RECONFIGURE REMOTELY



## Application Note

The MCC uses software commands to configure and store test topologies for later recall, which reduces test time and configuration errors. Automating test topologies allows quick and accurate switching between complex storage network configurations. Repeatability of tests such as disaster or failover simulation is simplified, and lab efficiency is improved. The MCC also allows you to:

- Configure SAS/SATA, Fibre Channel, FCoE, and more using the same system.
- Simplify the complexities of testing clusters, RAID, and other storage array configurations.
- Increase test lab productivity and decrease time to market for new products.
- Cover more corner cases in product design.
- Simulate cable breaks or intermittent links for fabric reconfiguration testing.
- Dynamically reconfigure host-to-target configurations for software regression and QA testing.

### NEXT GENERATION MCC CHASSIS FOR STORAGE SOLUTIONS

MCC solutions are built on a family of 19" rack-mountable chassis designed to be fully non-blocking in all configurations. The chassis accommodate interface blades to customize each system for specific applications. The modular chassis family includes models that accommodate two, four, or eight interface blades. Each chassis is powered by hot-swappable power supplies with optional redundancy. Each chassis is also equipped with a management module that provides local and remote administration of the entire MCC system.

MRV product family for storage applications includes two types of MCC chassis. The 4.25 Gbps (4X) backplane supports the first generation MCC blades. The 8.5 Gbps (8X) backplane maintains compatibility with existing MCC blades while supporting faster protocols. This 8 Gbps chassis has four slots that provide up to 144 non-blocking 8-Gbps mappings.

### INTERFACE BLADE SOLUTIONS FOR STORAGE

The architecture of the MCC supports different types of blades in a single system. The type and quantity of ports available on each MCC chassis system is determined by the blades installed in the chassis. Each blade has up to 36 ports, depending upon the interface type, and they support a variety of protocols and data rates.

The SFP, SFP+, and XFP blades are designed to operate with MSA-compliant transceivers, so the protocols supported are limited only by market availability. In addition, MRV has developed unique SFPs providing SAS/SATA support for the MCC. Installing both copper and SFP blades within the MCC chassis provides media conversion that can reduce the need for external devices in some applications.

**SFP Blade (EMPMC-36SFP)** has 36 protocol-independent ports supporting data rates up to 2.5 Gbps including Ethernet, Fast Ethernet, Gigabit Ethernet, SONET (OC-3, OC-12, OC-48), and Fibre Channel (1 and 2 Gigabit). SAS/SATA (1.5G and 3G) is also supported using MRV's unique SFPs.

**Fibre Channel CDR SFP Blade (EMPMC-36SFP3R)** has 36 protocol-independent ports supporting data rates up to 4.25 Gbps. The FC SFP supports 4 Gbps Fibre Channel in addition to the data protocols supported by the basic SFP blade. It includes on-board Clock and Data Recovery (CDR) (3R) for the 4 Gbps Fibre Channel protocol to eliminate accumulated jitter associated with higher data rates and multiple-hop applications. The CDR function can be activated or deactivated independently on each port.

**10G XFP Blade (EMPMC-9XFP)** has 9 XFP ports, each supporting both 10-Gig Ethernet LAN (IEEE P802.3ae) and 10-Gig Fibre Channel. All ports perform 3R signal retiming. The 10 Gig XFP blade can be equipped with a copper XFP to provide support for 10G applications using a copper interface.

**RJ-45 Blade (EMPMC-36RJ)** provides 36 independent 10/100/1000Base-TX Ethernet ports with 3R signal retiming. Each port supports auto-negotiation, speed, duplex, link match, MDI/MDI-X auto-sensing, and jumbo Ethernet packets.

The blades listed above are compatible with all MCC chassis.



## Application Note

The blades listed below require the 8 Gbps MCC chassis.

The **9-Port SAS/SATA Blade** (EMPMC-36SAS) supports 1.5, 3.0, and 6.0 Gbps data rates using the standard Mini-SAS 4x connector with full transparency to any end devices. Input signal detection and the ability to disable the signal transmissions to simulate cable breaks are also supported.

**High Density 8G SFP+ Blade** (EMPMC-36FC8G) has 36 protocol-independent SFP+ ports supporting data rates up to 8.5 Gbps. It supports 2, 4, and 8 Gbps Fibre Channel protocols, and it is backward compatible with SFP-based 2 and 4 Gbps Fibre Channel protocols.

### ABOUT MRV

Founded in 1988, MRV is a leading supplier of network infrastructure equipment for networks that scale in size, speed, and complexity. The company's switches, routers, and optical transport systems including free space optics (FSO), operate in some of the world's largest networks. Our remote presence solutions manage lab and data centers around the world.

MRV's test management and automation products increase the efficiency in the test lab environment, enabling more tests in less time with fewer resources. Remote control and management of cable topologies, lab devices, power distribution, and KVM optimizes the lab for responsiveness with best use of capital expenditures.

For more information, visit our website at [www.mrv.com/tap](http://www.mrv.com/tap), call our sales hotline at (800) 338-5316, or email [info@mrv.com](mailto:info@mrv.com).

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