

TrueNAS® Expansion Shelf Connection Guide

Version 1.1



Storage and Servers Driven by Open Source

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TrueNAS® SAS Connections

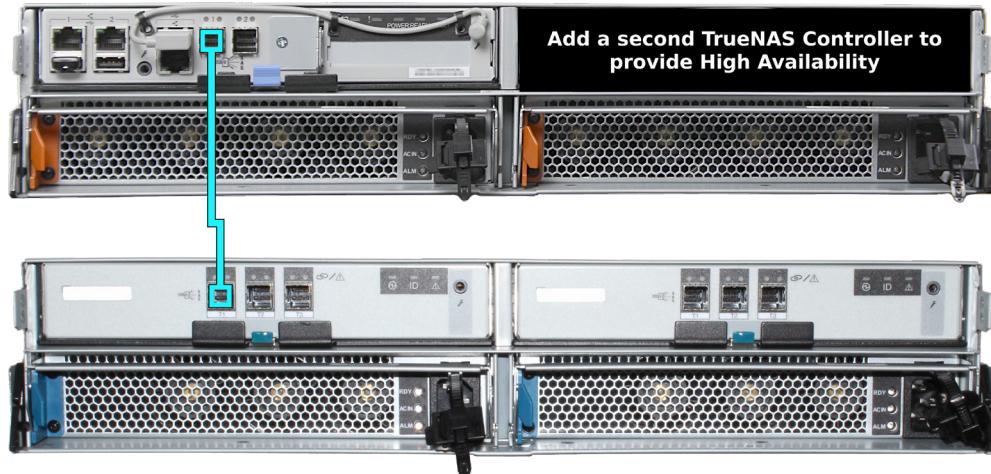
This guide shows examples of connecting TrueNAS expansion shelves to multiple TrueNAS products. A simple example is shown first, then special SAS configurations are discussed. The rest of this guide shows connecting a High-Availability TrueNAS system with two TrueNAS controllers to two expansion shelves of the same model. The TrueNAS X10 and X20 share the same back panel configuration and are shown together in the examples as a single X-Series system. The M40 and M50 back panels are similar, but the SAS ports are in slightly different locations. These are shown separately in the connection examples.

Expansion Shelf Compatibility

	Max Capacity			
	Base Unit	ES12	ES24	ES60
TrueNAS X10	168 TB	504 TB (two shelves)	Not supported	Not supported
TrueNAS X20	168 TB	504 TB (two shelves)	Not supported	720 TB (one shelf)
TrueNAS M40	336 TB	672 TB (two shelves)	1 PB (two shelves)	2 PB (two shelves)
TrueNAS M50	336 TB	2.35 PB (twelve shelves)	4.37 PB (twelve shelves)	10.4 PB (twelve shelves)

1 Simple SAS Connections

TrueNAS systems with a single TrueNAS controller do not offer High Availability (HA). The SAS connection procedure is similar for all of these systems. This example shows connecting one ES12 to an X-Series with a single TrueNAS controller:

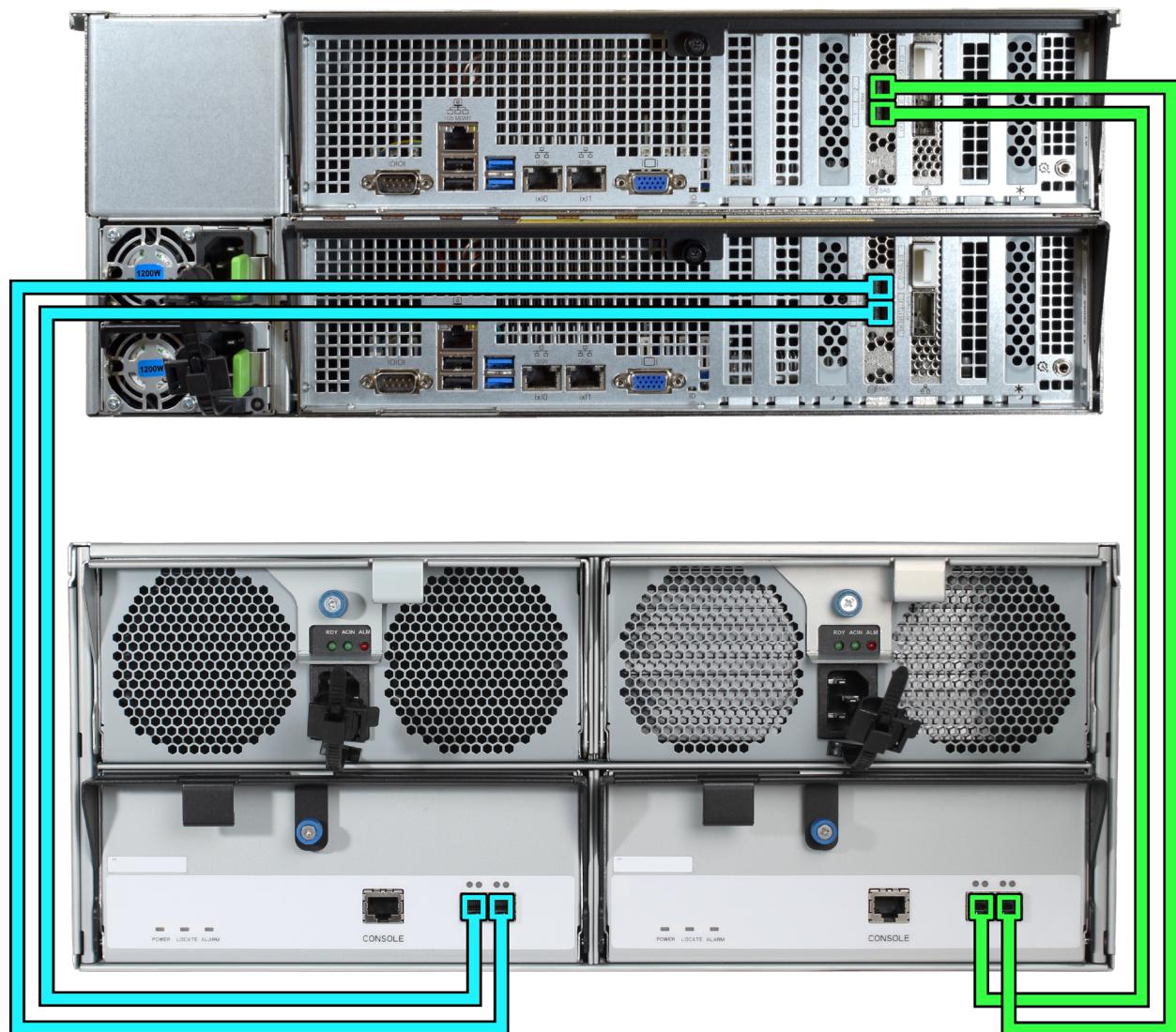


2 Wide Porting SAS Connections

Configurations that consist of a single TrueNAS connecting to a single Expansion Shelf can be wide ported. By connecting both SAS ports on a TrueNAS controller to both SAS ports on an Expansion Shelf Expansion Controller, the connection becomes wide ported. This doubles the bandwidth between TrueNAS and the connected Expansion Shelf. This is especially useful with Expansion Shelves that have all flash disks installed or when a single, completely full ES60 is attached to a TrueNAS system.

However, because wide-porting uses the extra SAS port, the number of connectable Expansion Shelves is reduced. The wide-port can be removed to add another Expansion Shelf with a standard connection, but the bandwidth between TrueNAS system and the first Expansion Shelf is reduced.

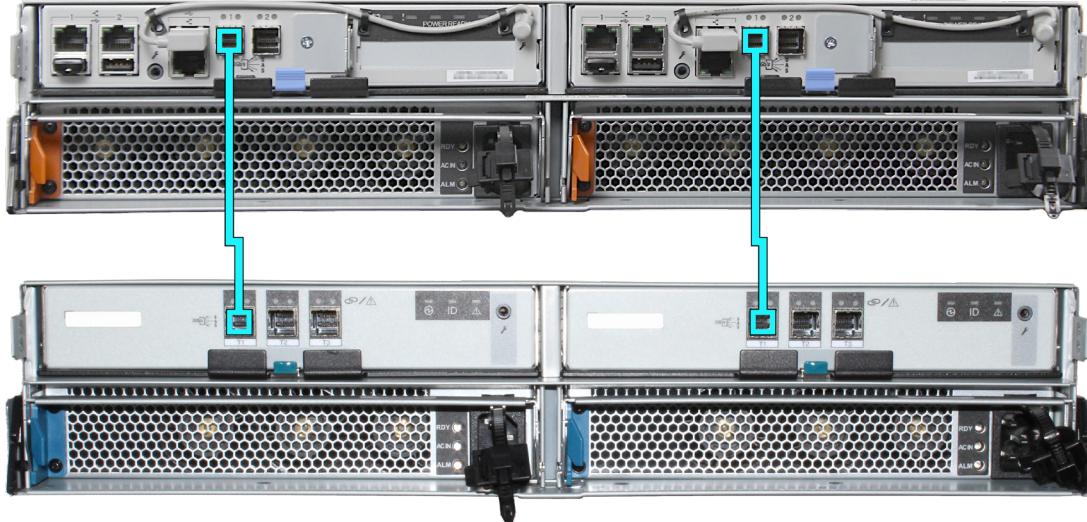
Here is an example of wide-porting an HA TrueNAS M40 with a single ES60:



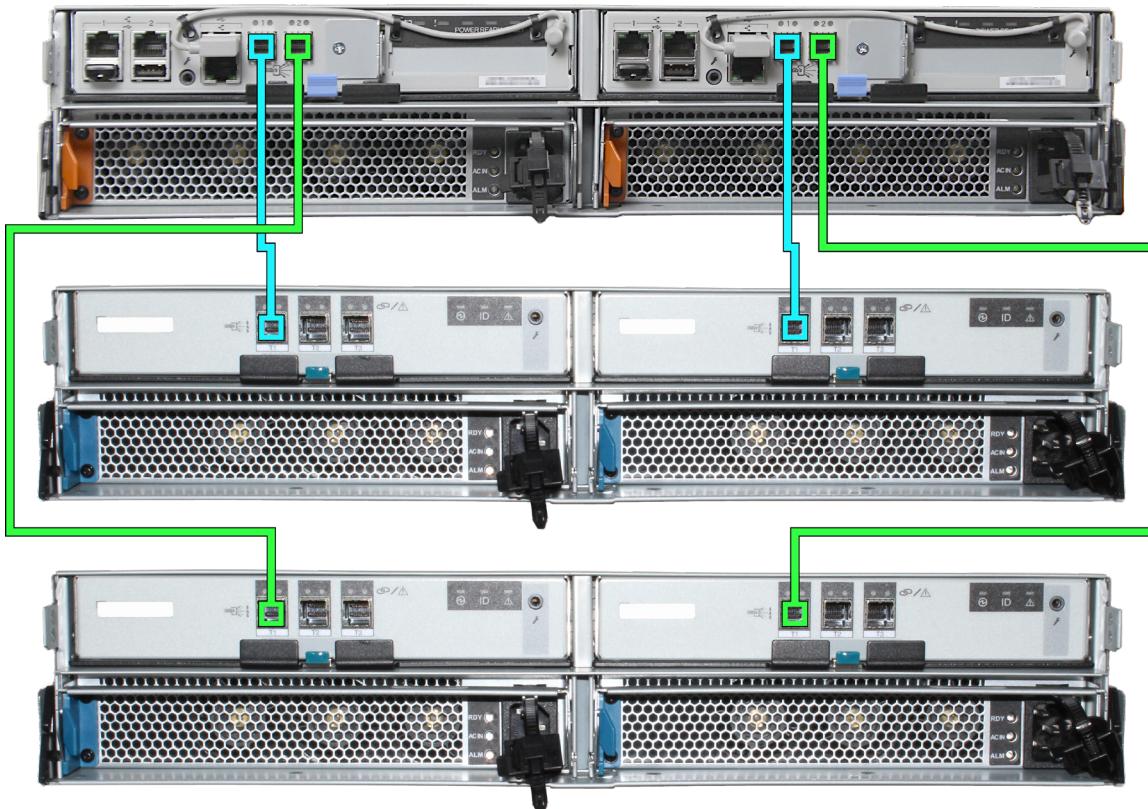
3 ES12 SAS Connections

3.1 X-Series Connections

X-Series with a single ES12 Expansion Shelf



X-Series with two ES12 Expansion Shelves

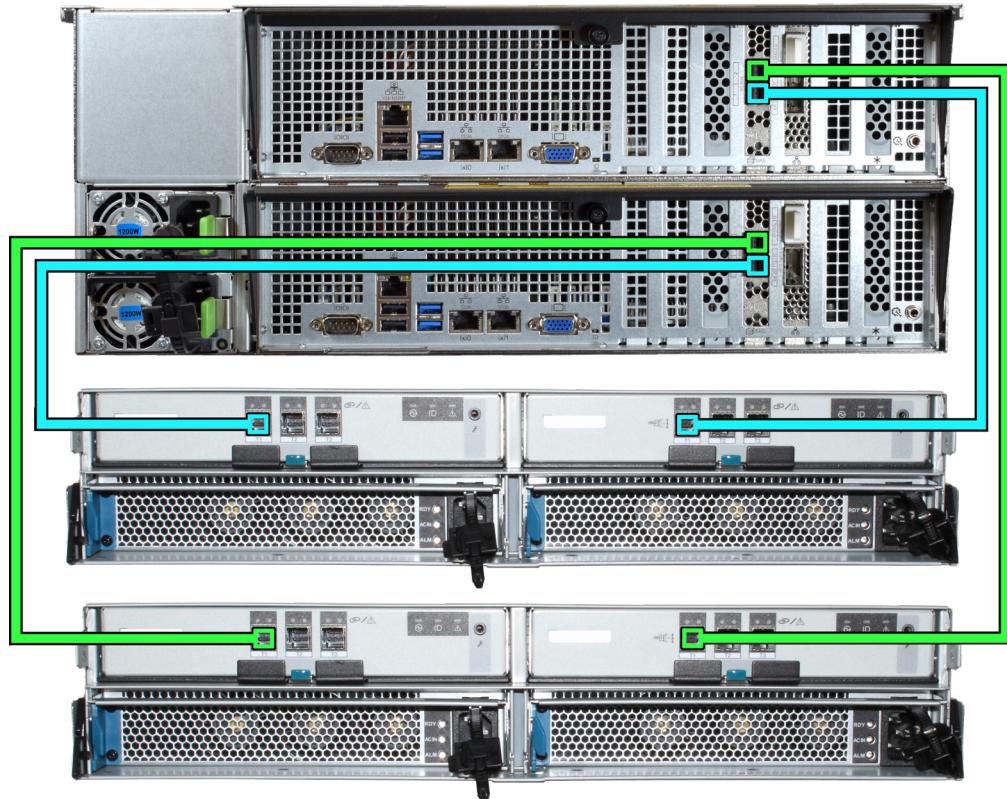


3.2 M40 Connections

M40 with a single ES12 Expansion Shelf

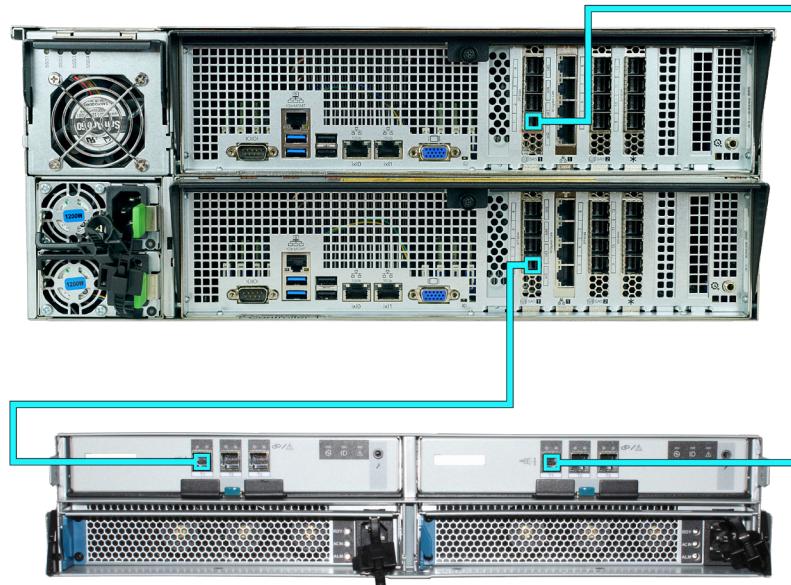


M40 with a two ES12 Expansion Shelves

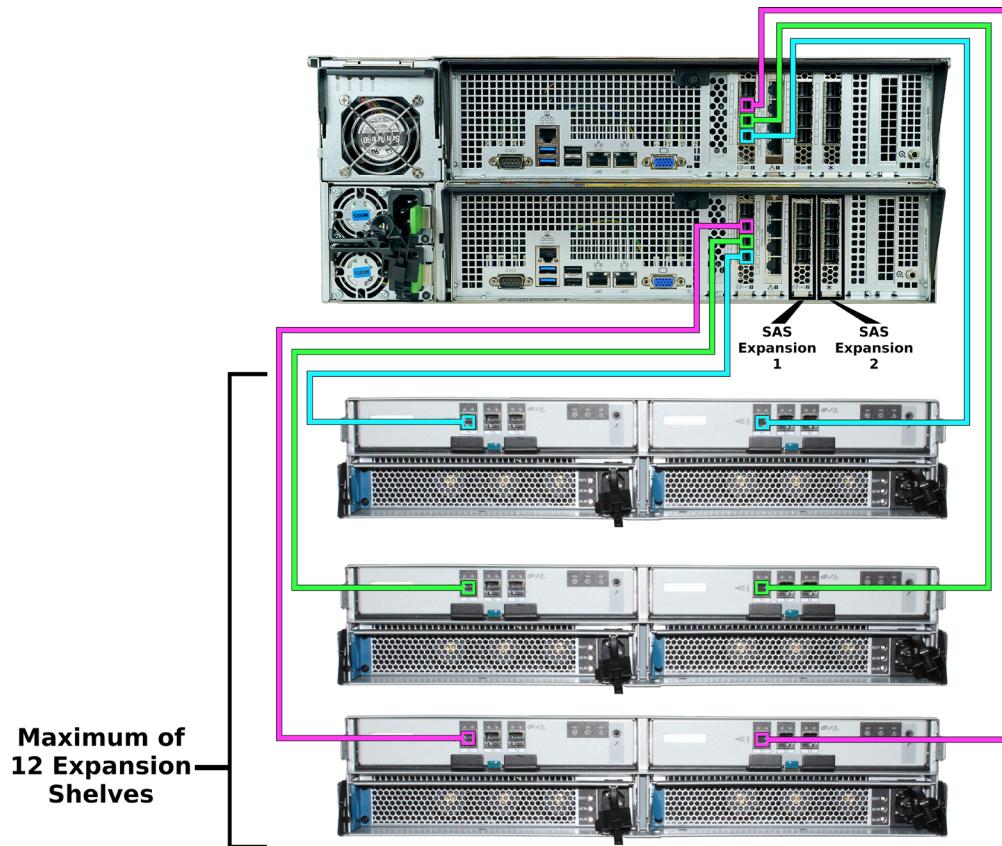


3.3 M50 Connections

M50 with a single ES12 Expansion Shelf



M50 with a three ES12 Expansion Shelves. The M50 can support up to 12 total Expansion Shelves with the use of additional SAS cards.



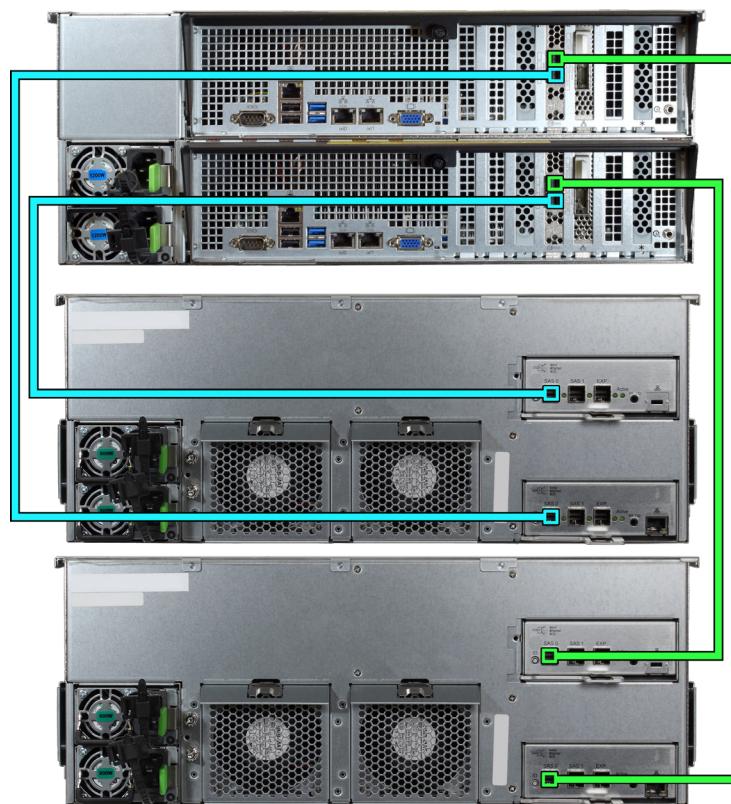
4 ES24 SAS Connections

4.1 M40 Connections

M40 with a single ES24 Expansion Shelf

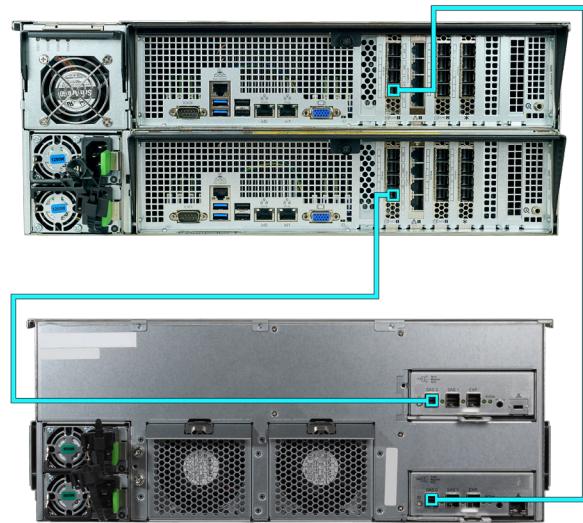


M40 with two ES24 Expansion Shelves

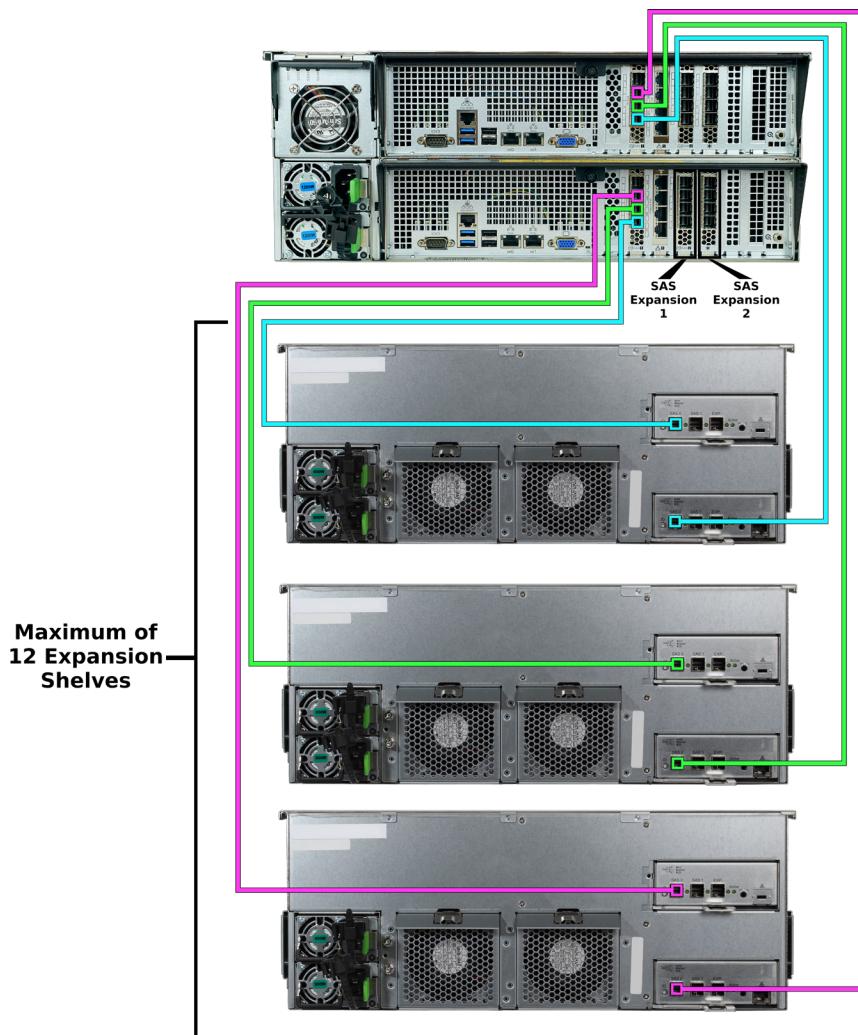


4.2 M50 Connections

M50 with a single ES24 Expansion Shelf



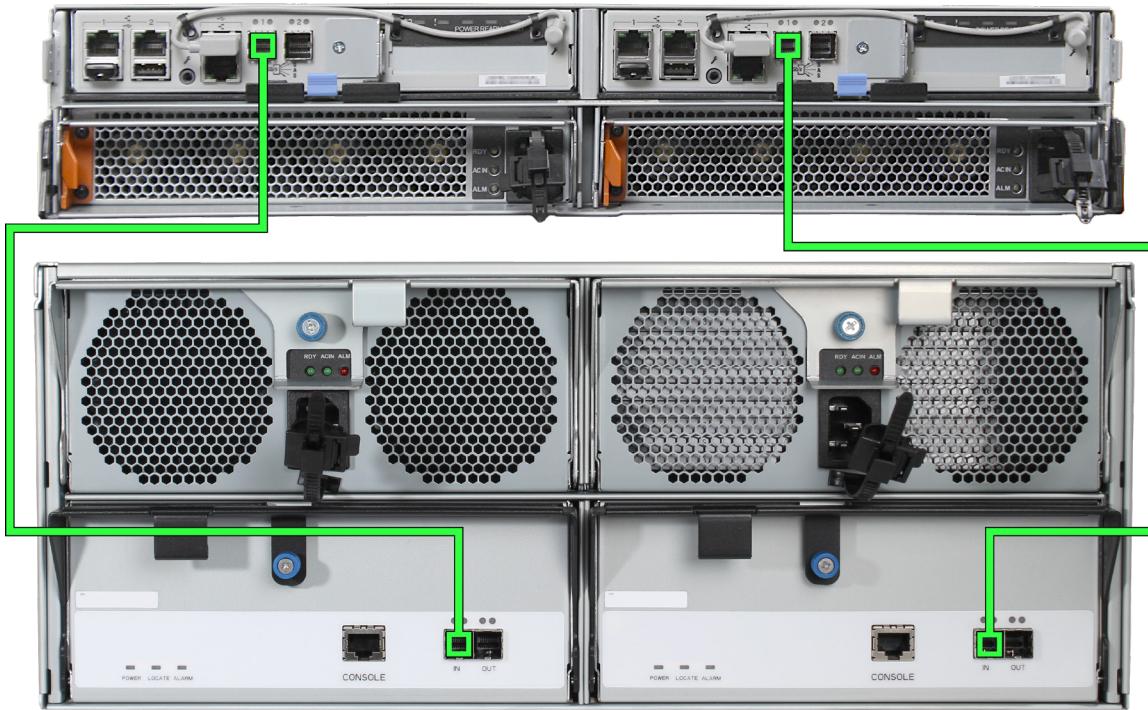
M50 with a three ES24 Expansion Shelves. The M50 can support up to 12 total Expansion Shelves with the use of additional SAS cards.



5 ES60 SAS Connections

5.1 X-Series Connections

X-Series with a single ES60

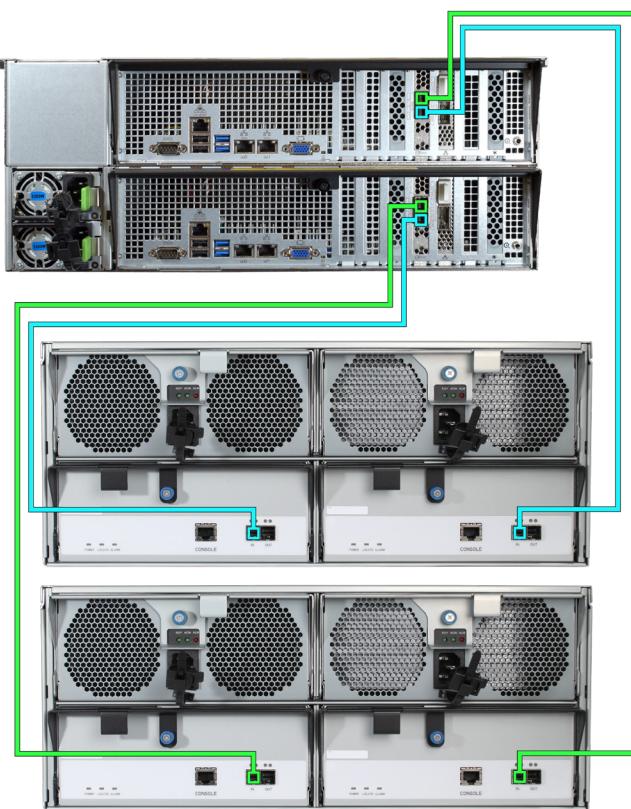


5.2 M40 Connections

M40 with a single ES60 Expansion Shelf

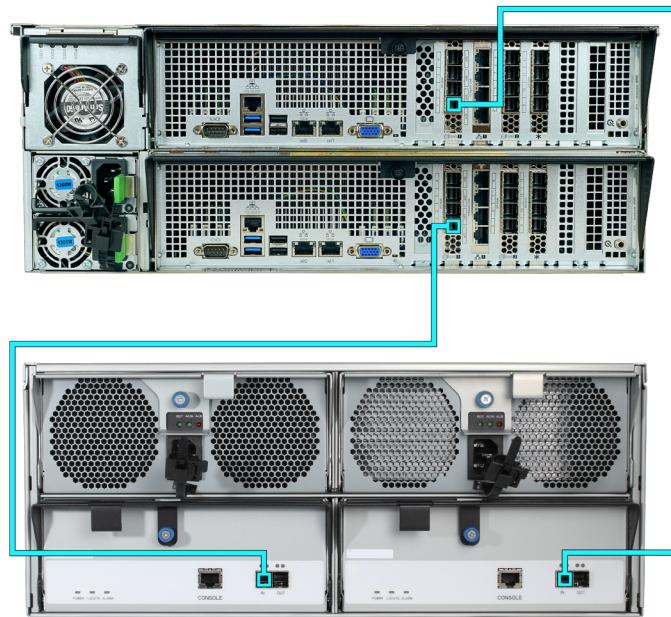


M40 with two ES60 Expansion Shelves

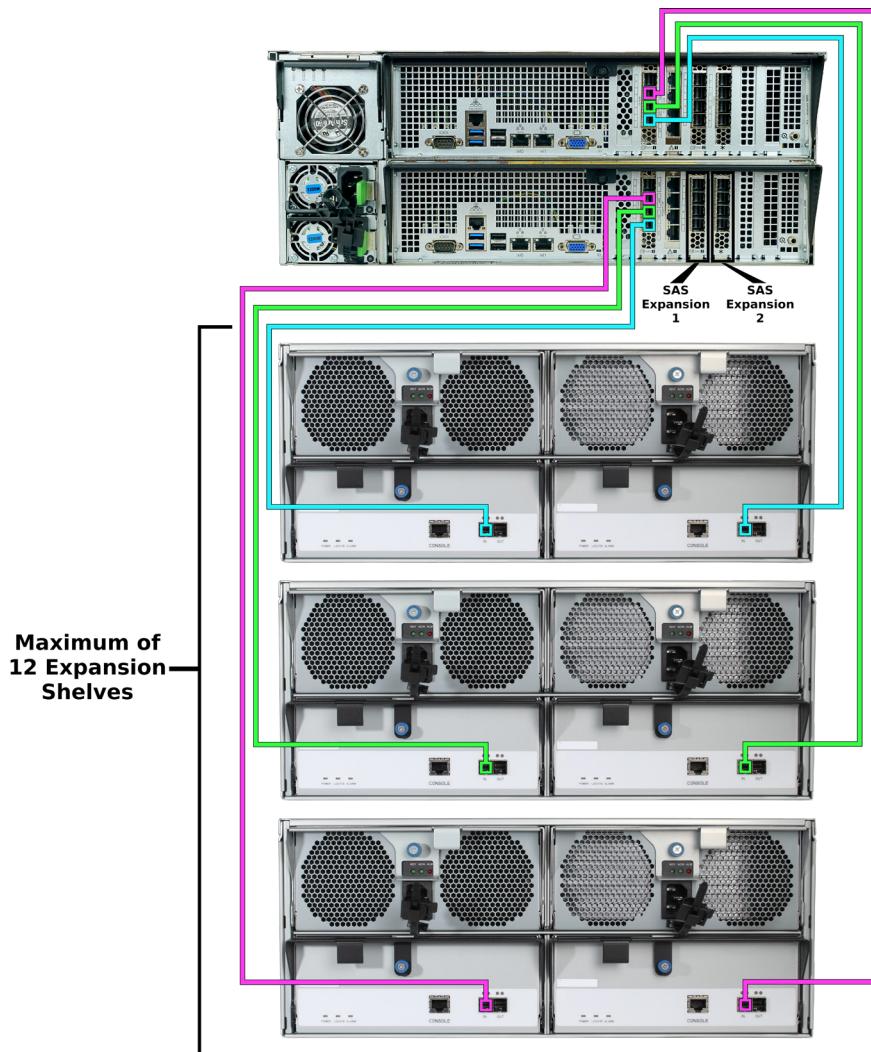


5.3 M50 Connections

M50 with a single ES60 Expansion Shelf



M50 with a three ES60 Expansion Shelves. The M50 can support up to 12 total Expansion Shelves with the use of additional SAS cards.



6 M50 SAS Expansions

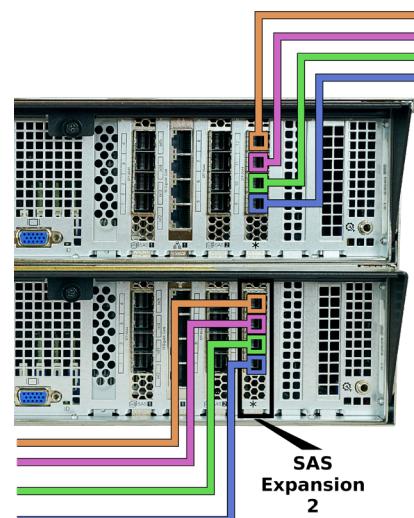
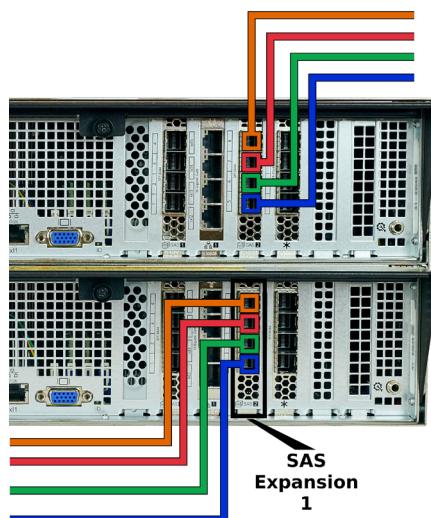
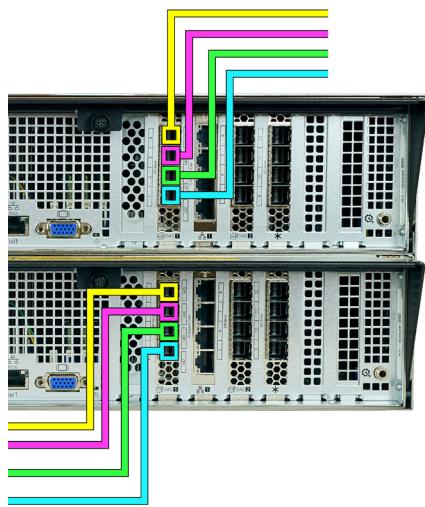
The M50 can support up to 12 total Expansion Shelves with the use of additional SAS cards. Wiring for additional cards is completed in the same way as the primary card. Shelves are connected four per SAS card starting from the bottom port on each card until it is full.



Primary SAS Ports

First SAS Expansion Card

Second SAS Expansion Card



7 Contacting iXsystems

For assistance, please contact iXSupport:

Contact Method	Contact Options
Web	https://support.ixsystems.com
Email	support@ixsystems.com
Telephone	Monday-Friday, 6:00AM to 6:00PM Pacific Standard Time: • US-only toll-free: 855-473-7449 option 2 • Local and international: 408-943-4100 option 2
Telephone	Telephone After Hours (24x7 Gold Level Support only): • US-only toll-free: 855-499-5131 • International: 408-878-3140 (International calling rates will apply)