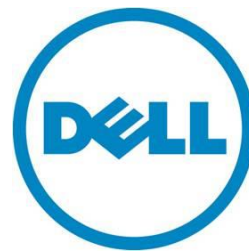

Cable Routing Procedures for Dell™ PowerEdge™ FX2/FX2s Systems

This Dell Technical White Paper explains the best practices for routing and securing the cables exiting the back of the FX2/FX2s systems.

Rail Solutions Engineering

April 2015



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April 2015 | Rev 1.2

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Introduction

This white paper covers recommended cable routing procedures for the Dell™ PowerEdge™ FX2/FX2s systems in the following racks:

- PowerEdge 2410, 4210
- PowerEdge 2420, 4220, 4820 (including wide and deep versions)
- PowerEdge Energy Smart 4020S, 4620S
- AR3100X717, AR3104X717 (Dell branded APC racks)

If you are using the sliding rails with the included strain relief bar (SRB), following these procedures will allow you to extend the system from the rack for service without powering down or disconnecting the cables. If you are not using the SRB, or are using the static rails, following these procedures will ensure secure attachment and strain relief of the cables behind the system.

This white paper will cover basic guidelines on how to route cables within the rack. For additional guidelines on how to route cables within the rack, refer to the Dell *Best Practices Guide for Rack Enclosure* white paper.

Section 1: Cabling a PowerEdge FX2/FX2s on sliding rails with a SRB (Strain Relief Bar)

This section details how to cable the PowerEdge FX2/FX2s systems on sliding rails using a SRB. If you are cabling the system on static rails, refer to Section 3.

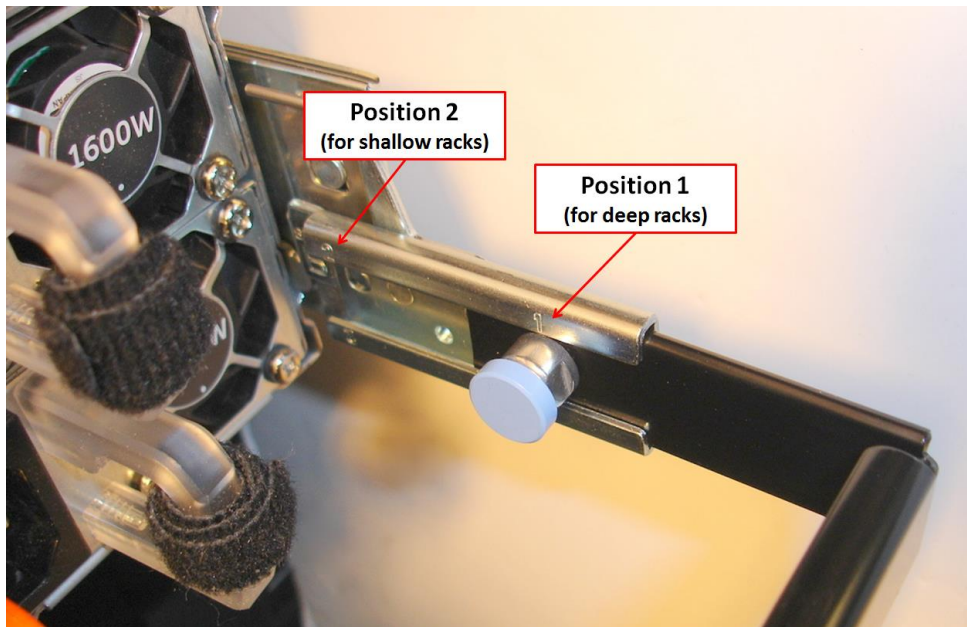
Follow the instructions contained in the *Rack Installation Instructions* in the sliding rail kit to install the server into the rack. Once installed, use these instructions to install the cables. All illustrations in this document were created using a PowerEdge FX2 system.

NOTE: PowerEdge FX2/FX2s systems are not compatible with any other Dell rails or SRBs including previous generation rails and SRBs.

1.1. Installing the SRB to the rails

Attach the SRB to the back of the rails as described in the *Rack Installation Instructions* provided in the sliding rail kit. The SRB has two depth positions: Position 1 for deep racks and Position 2 for shallow racks. It is easier to attach cables to the back of the system with the SRB in position 1 as shown in Fig. 1. The SRB can be moved to position 2, if required, after cables have been attached to the system.

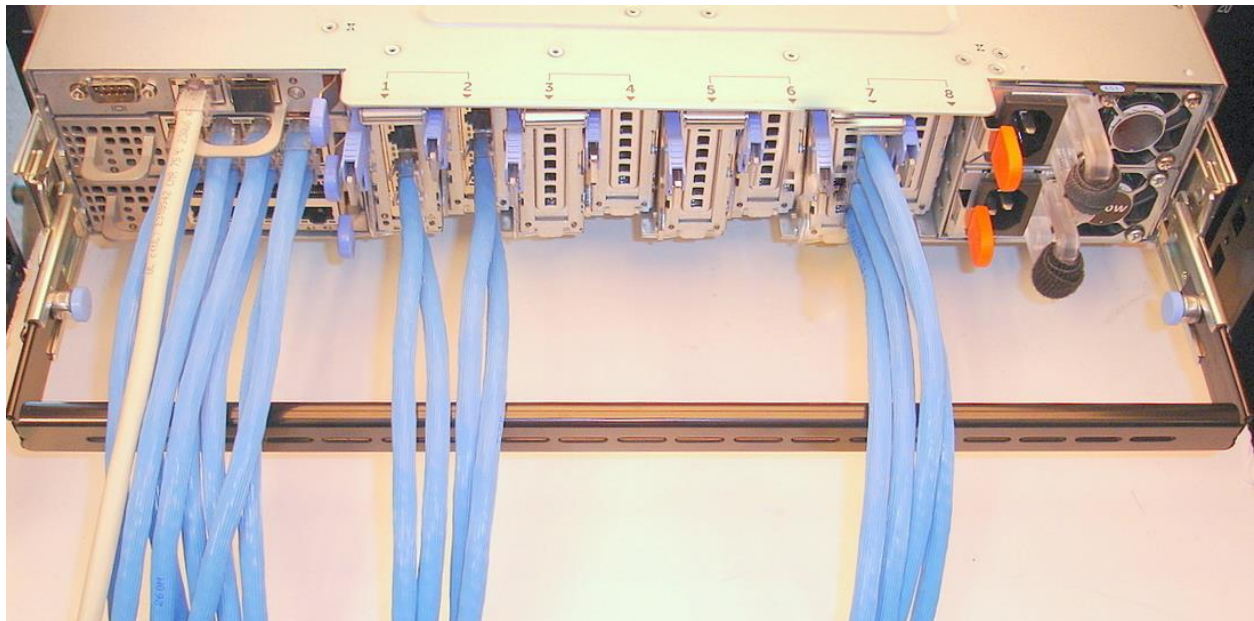
Figure 1. Adjustable depth SRB



1.2. Connecting the cables to the system

Connect all applicable cables to the rear of the system and verify that all connections are secure. Place cables across the top of the SRB. See Figure 2.

Figure 2. System with cables installed



1.3. Routing the power cables through the strain reliefs

After you have installed the SRB and cables, route the power cables through the strain reliefs located on the power supply handles as shown in Figure 3. Note: only one power cable is shown. Repeat the cable routing for the lower power cable.

Figure 3. Routing power cables through the strain reliefs

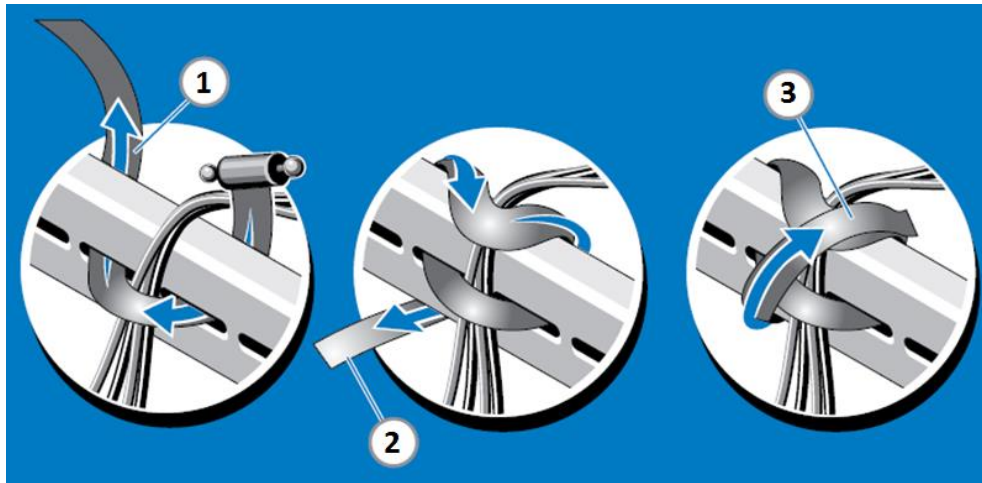


1.4. Securing the cables to the SRB

The SRB has two depth positions: Position 1 for deep racks (1070mm and above) and Position 2 for shallow racks (1000mm). Before securing the cables to the SRB, verify that the rear door can close. If necessary, adjust the SRB to Position 2.

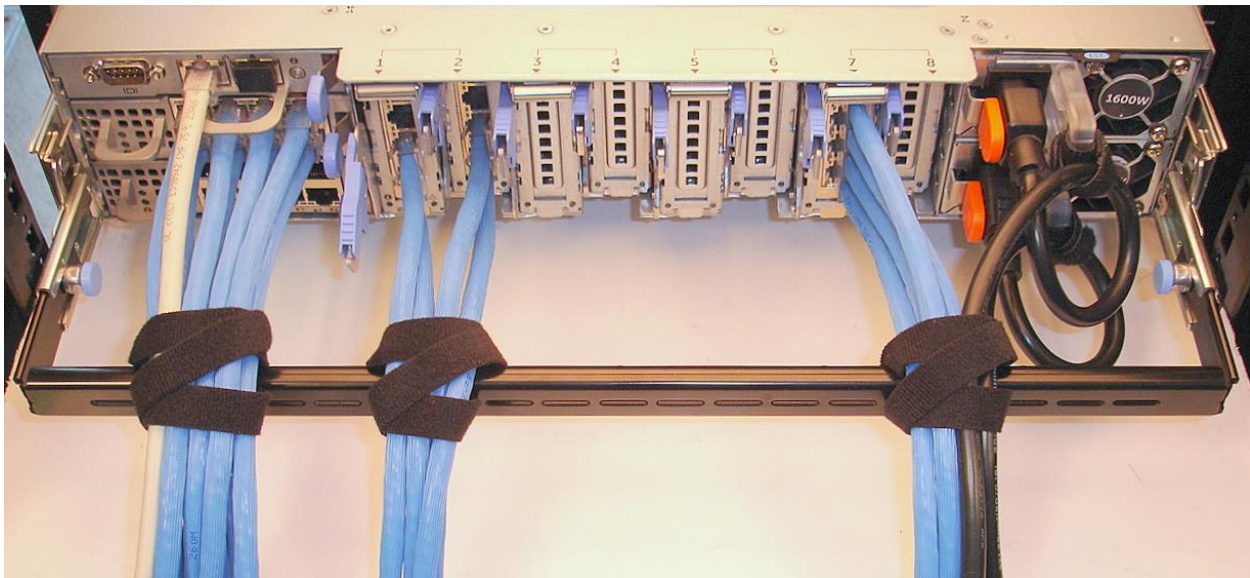
Secure the cables to the SRB with the hook-and-loop straps included with the sliding rail kit. Thread the straps through the holes on the SRB and around the cable bundles. A suggested method of routing the straps is shown in Figure 4.

Figure 4. Suggested hook and loop strap routing on SRB



A completed assembly is shown in Figure 5. Note that cables exiting multiple components can be combined into one bundle when securing to the SRB.

Figure 5. System with cables secured to SRB



NOTE: The SRB must be removed from the rails to enable replacement of any of the rear components of the system (power supply, PCIe, or Fab A modules)

Section 2: Creating cable service loops in the rack

NOTE: Cable service loops must be created if access to the hot plug fans is required while the system is in the rack. If hot plug access to the fans is not required, the system can be installed on static rails, or installed on sliding rails and cabled without the SRB. See Section 3 for details.

1. After cables have been secured to the SRB, create a service loop with the cable bundle(s) behind the system with enough slack to allow the system to fully translate out to the service position. See Figure 6.

Multiple service loops can be created. For example: one service loop for power cables and one (or more) for data.

2. Cycle the system out of the rack to verify that enough slack is in the service loop. It is strongly recommended that one person, at the front of the rack, pull the system out of the rack with a second person, behind the rack, feeding the cables forward in order to avoid cables binding.

Figure 6. System with cables secured to SRB in rack



If multiple FX2/FX2s systems are being installed in a rack, the cable service loops will stack on top of one another and may prevent the rack rear door from closing. To remedy this, the following techniques may be applied:

- Install systems with sufficient rack U space between them.
- Vary the locations that cable bundles are secured to the crossbar on adjacent systems.
- Leave at least 2U of empty space between systems and tuck the cable bundles in the empty space.

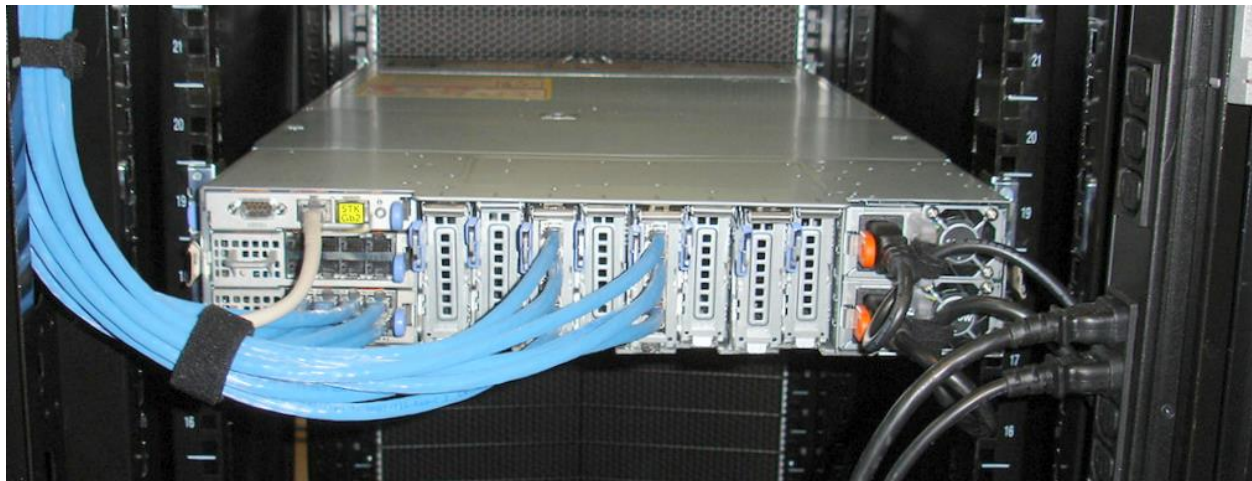
Section 3: Cabling a PowerEdge FX2/FX2s system on static rails

NOTE: If the system is installed on static rails, the system must be powered down and all cables disconnected before it can be extended out of the rack.

NOTE: The SRB is compatible only with the sliding rails, not the static rails.

1. Follow the instructions contained in the *Rack Installation Instructions* found in the static rail kit to install the server into a four-post rack.
2. Connect all applicable cables to the rear of the system and verify that all connections are secure.
3. While minimizing stress on the cable connectors, create cable bundles and secure them to the frame of the rack as shown in Figure 8.

Figure 7. Cabling a system installed in static rails



Section 4: Cabling Sleds with Front I/O.

NOTE: Some sleds offered with FX2/FX2s have data cables that connect to the front of the sled.

For most racks, the rack front door will need to be removed when front I/O cables are installed.

For Dell branded racks AR3100X717 and AR3104X717, the front mounting flanges can be adjusted rearward to allow the front door to remain installed. However the following trade-offs must be considered:

- Air recirculation internal to the rack is enabled if the front mounting flanges are moved rearward by any amount. APC recirculation prevention kit (AR7708) is recommended.
- Both rear PDU banks will be fully blocked.

Recommended cable routing for front I/O cables: route cables to the side of the rack using hook and loop fasteners, and then vertically to the switch.