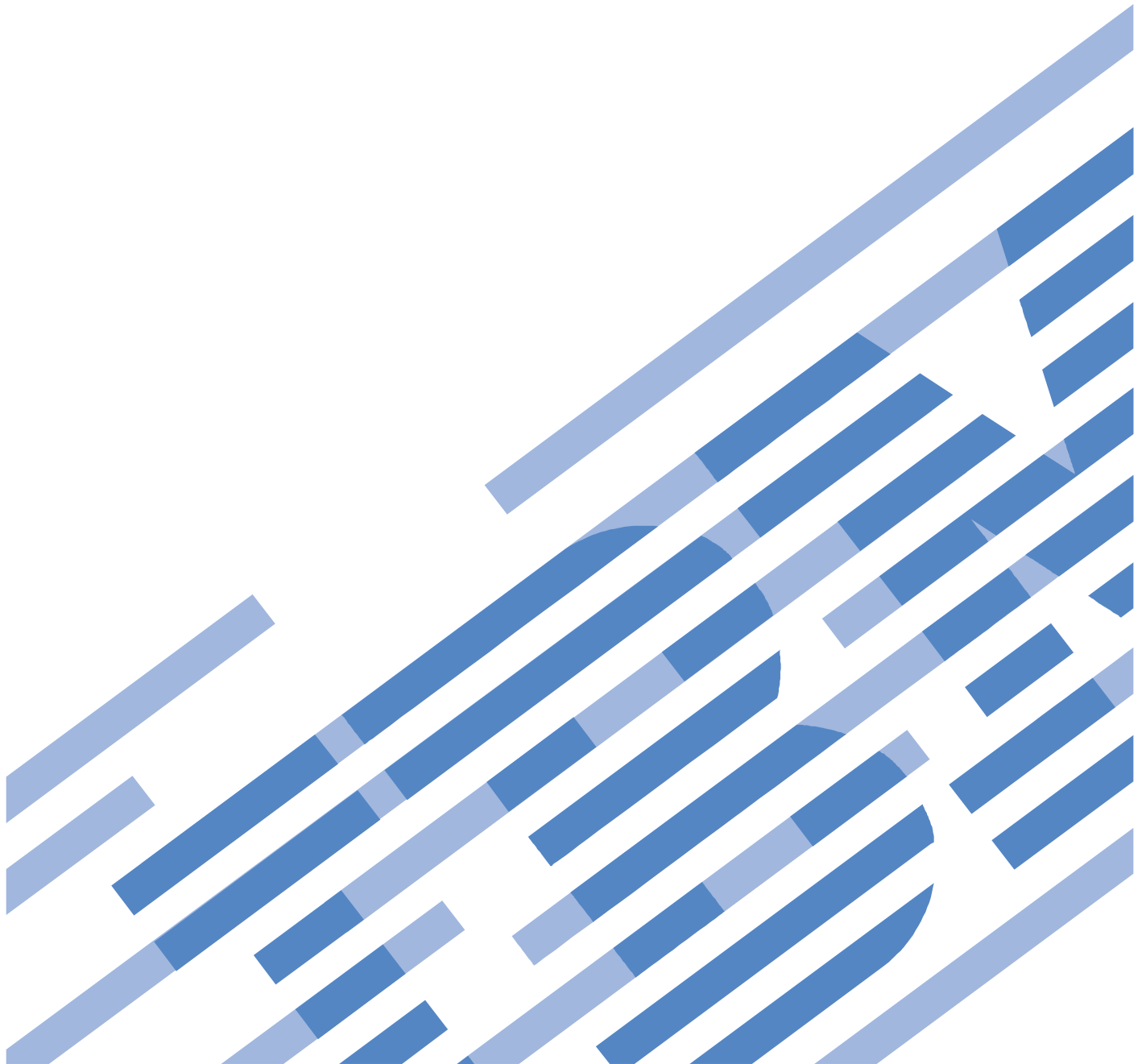


Power 775
D-Link Service Procedure
9/30/2011



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1 GENERAL

1.1 Release / Revision History

| File Name | Date | Description |
|--------------------------|-----------|-----------------|
| "p775_d_link_cables.pdf" | 9/30/2011 | Initial Release |

Table 1 Release / Revision History

1.2 Where to find this document

The current Power775 D-Link Service Procedure document is "p775_d_link_cables.pdf" which is to be downloaded from:
InfoCenter Website: <http://publib.boulder.ibm.com/infocenter/powersys/v3r1m5/topic/p7ee2/p7ee2kickoff.htm>
Click "PDF files for the IBM Power 775 (9125-F2C) removing and replacing parts"
Under "CEC Drawer", click "D-Link Optical cables" to download PDF "p775_d_link_cables.pdf"

This is the only valid source for the latest Power775 D-Link Cables Service Procedure.pdf.

1.3 Required Documents

| Document | Doc Number | Location |
|---|----------------|--------------|
| Safety Notices http://publib.boulder.ibm.com/infocenter/powersys/v3r1m5/topic/p7hdx/G229-9054.pdf | Doc# G229-9054 | InfoCenter * |

Table 2 Required Documents

*InfoCenter Website: <http://publib.boulder.ibm.com/infocenter/powersys/v3r1m5/topic/p7ee2/p7ee2kickoff.htm>

1.4 Related Documents

| Document | Doc # | Location |
|------------------------------------|-------|-------------|
| Power 775 L-Link Service Procedure | | Infocenter* |

Table 3 Related Documents

*InfoCenter Website: <http://publib.boulder.ibm.com/infocenter/powersys/v3r1m5/topic/p7ee2/p7ee2kickoff.htm>

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1.5 Abbreviations

| Abbreviation | Definition | Details |
|--------------|---|--|
| CEC | Central Electronic Complex | Also referred to as the node or node drawer. |
| DCCA | Distributed Conversion and Control Assembly | The power supplies for the CEC and DE are called the CEC DCCA and DE DCCA respectively. |
| DE | Disk Enclosure | |
| D-Link | Distant Link | Optical Cables that connect SuperNodes to other SuperNodes. |
| FRU | Field Replaceable Unit | |
| L-Link | Local Link | L-Links are optical (fiber) or electrical (copper) links connect all Hub modules to all other Hub modules within the same supernode. L-Links are distinguished as being either “LL-Links”, which are electrical links that interconnect all Hubs within a CEC, or “LR-Links”, which are optical links, enclosed within an OBE, that interconnect each Hub with all 24 Hubs in the other 3 drawers of the SuperNode. |
| MPO | Multi-Fiber Push-on/Pull-off | Type of multi-fiber optical connector |
| MTP | | Branded version of the MPO optical fiber connector |
| PVC | PolyVinyl Chloride | Jacketing material for D-Link Cables |
| SN | SuperNode | Array of 32 Octants or Nodes, in 4 CEC Drawers, that are interconnected in an all-to-all full mesh topology using LL-Links or LR-Links. |
| SSR | Systems Services Representative | IBM Service personnel |
| VCSEL | Vertical Cavity Surface Emitting Laser | |

2 OVERVIEW

You should be performing this procedure if you have determined a D-Link optical cable or port has poor signal quality or has failed and may need replacement.

This procedure describes how to isolate a problem in optical data transmission over an D-Link to either (a) a problem in the transmitting node, (b) a problem in the receiving node, or (c) a problem in the D-Link optical cable which interconnects them, or in the associated optical connectors.

This procedure also instructs how to test, remove, clean, reinstall, and re-test the D-Link optical cables, if cleaning or replacement is required.

This section, Section 2, is an overview. Do not start the service procedure until Section 3, which contains the detailed steps.

2.1 Safety Notices

Read “Safety_Notices “ available from InfoCenter – see Section 1.3.
<http://publib.boulder.ibm.com/infocenter/powersys/v3r1m5/topic/p7hdx/G229-9054.pdf>

The following cautions apply to all Power775 service procedures:

CAUTION:

Energy hazard present. Shorting might result in system outage and possible physical injury. Remove all metallic jewelry before servicing. (C001)

CAUTION:

The doors and covers to the product are to be closed at all times except for service by trained service personnel. All covers must be replaced and doors locked at the conclusion of the service operation. (C013)

CAUTION:

Service of this product or unit is to be performed by trained service personnel only. (C032)

The following caution specifically pertains to this Power775 service procedure.

CAUTION:

This product contains Class 1M lasers. Do not view directly with optical instruments. (C028)



DANGER: Hazardous voltage present. Voltages present constitute a shock hazard, which can cause severe injury or death. (L004)



CAUTION: Sharp edges, corners, or joints nearby. (L006)

2.2 Confirm how you got to this Power 775 D Link Service Procedure

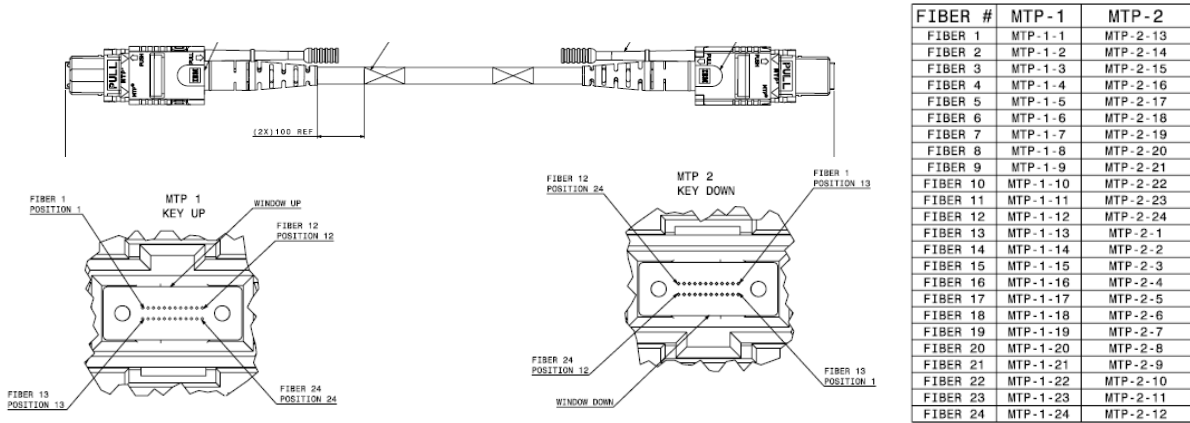
You should have downloaded this procedure from:

InfoCenter Website: <http://publib.boulder.ibm.com/infocenter/powersys/v3r1m5/topic/p7ee2/p7ee2kickoff.htm>

This is the only valid source for the latest Power775 D-Link Service Procedure document.

2.3 D-Link Description

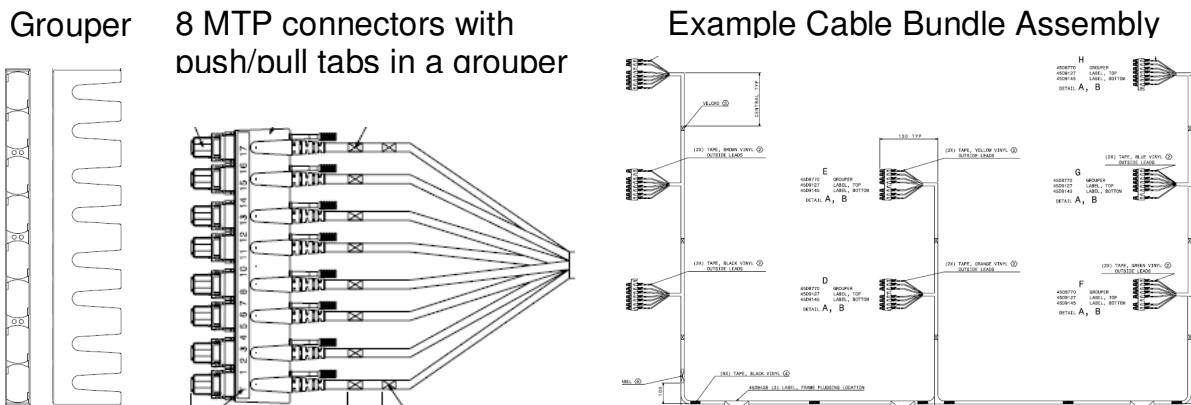
The D-Links that interconnect SuperNodes to each other consist of 24-fiber cables, with an orange PVC jacket. Each cable is 3.8mm in diameter. Each end of the cable has an MTP-brand 24-fiber MPO connector, with an attached push/pull tab that allows actuation of connectors in tightly-packed arrays.



The fibers in the top row of the left-hand, key-up connector of this figure are connected directly across to the top row of fibers in the right-hand, key-down connector, and vice versa. When cables are plugged into system adapter ports, they are always oriented with keys up on both ends, so the cable does a half-circle turn or helix half-twist, and the top row in each adapter port is wired to the bottom row at the other end of the cable.¹

Removing or inserting an individual D-Link from the CEC drawer can be done by pulling or pushing, respectively, on its push/pull tab. Insertion can also be done by pushing on the connector’s strain relief boot.

In most system installations, D-Links are gathered into Cable Assemblies, or “wiring harness” bundles, which consist of a reasonably large number of cables (14-150 or more), with vinyl tape or hook-and-loop tape wrapped around them, and connector groupers used to gather together a row of up to 8 connectors. The specific design of each assembly (number of D-Link cables, organization of connectors into groupers, etc.) depends on the size and scale of the system, and on the number of CEC drawers that are interconnected and is described in the system-specific System Installation Guide.



¹ Note that this over-and-under orientation of transmitting and receiving rows is different than many one-row connectors (e.g., RJ-45, or QSFP), where transmitting and receiving lanes are left-and-right of each other. With a two-row connector,

Power 775 D-Link Service Procedure

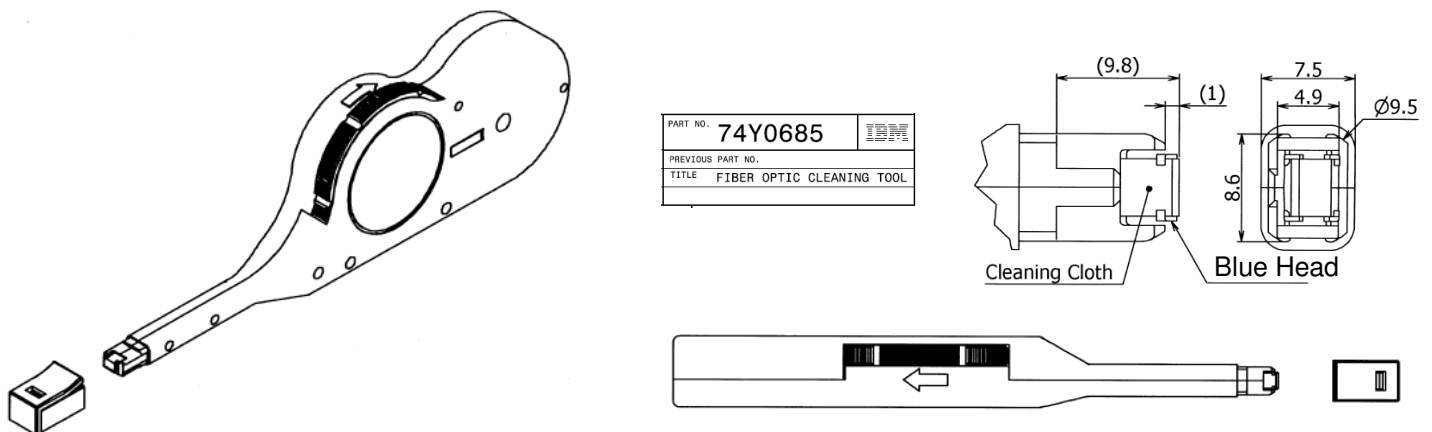
PN: 41U8487, EC N44172

2.3.1 General Discussion of MTP Optical Connector Handling

The MTP implementation of the MPO (Multi-Fiber Push-on/Pull-off) optical connector is a robust, rugged optical connector with a long record of service worldwide over nearly two decades. However, there are several factors that will greatly improve the effectiveness in using this optical connector.

CLEANLINESS IS CRITICAL. Operation of an optical connector requires precise end-to-end alignment of the two optical fibers, with little or no air gap in between. Fiber ends are pushed together with force of about 2 pounds, to minimize likelihood of air gaps. If dust or hair gets on the ends of the connectors, where the optical fibers exit, it may block the light passing between fibers, or may push ferrules apart, causing larger gaps between fibers. Therefore, it is important that the ends of the connectors are either kept clean, or are actively cleaned before each connection. The following steps will help assure cleanliness, and will help ensure proper signal integrity on all fiber lanes.

- Leave dust caps and dust covers on connectors and ports as much as possible,
- Ensure to never touch the end surfaces of the connectors, and
- Regularly use approved cleaning tools, such as the Fiber Optic Cleaning Tool shown below, preferably before each and every connector insertion.



DON'T FORCE IT. The Groupers, Push/Pull Tabs, and MTP Connector housings are made of plastic. The plastic is high-quality, robust, and non-brittle, but parts may break if pushed or pulled too hard. Also, the PVC cable jacket may separate from the connector housing, if it is pulled too hard. No operation in the insertion or removal of an individual connector should require more than about 1 kilogram (9.8 Newtons / 2 pound) of force – roughly equivalent to turning a doorknob. Always use the blue purple colored Push/Pull tabs for doing the final actuation of connectors, both on insertion and removal.

LISTEN & FEEL FOR THE CLICKS. MTP optical connectors operate in two steps: 1. Initial actuation, where the connector is aligned with the LR-Port receptacle and pushed partway in, and 2. Final actuation, where the latching fingers push the spring-loaded latching sleeve back, then ride over two latching nubs, and, when past the latching nubs, release the spring-loaded latching sleeve so that it can slide over the latching fingers. When this happens, there is an audible “click” as the latching sleeve hits its end of travel. If there is not a “click”, the connector is not fully connected, the fiber ends are not pressed together, and the connector will not pass light well. Similarly, on removal, there is another “click”, as the spring-loaded latching sleeve is pulled back, releasing the latching fingers, and they snap over the latching nubs. On insertion of a LR-Link 8-connector grouper, all connectors go through the initial actuation as a group. The final actuation is done individually -- 8 push/pull tabs must be pushed separately, yielding 8 separate audible “clicks”, for the whole grouper to be fully connected. On removal, all 8 push/pull tabs must be pulled, yielding 8 separate audible “clicks”, before the grouper can be removed from the row of ports.

2.4 Concurrency

This procedure requires removal of all of the D-Link connectors in a grouper, which may include up to 8 D-Link connectors at a time. Connectivity between supernodes is preserved by indirect links. However, depending on network traffic patterns, **D-Link connector removal may have significant impact on system-level performance.**

2.5 D-Link Weight

The Field Replaceable Unit is a single D-Link Cable. Each D-Link cable weighs 0.15 kg (0.33 lb) per 10 meters of length. The weight of each D-Cable Assembly Bundle is dependent on the number of cables in the bundle and the length of each cable.

2.6 Required SSRs and Roles

This service procedure contains steps to be performed by a system administrator and an IBM Systems Services Representative (SSR). The system administrator tasks and SSR tasks are separately called out in the procedure.

2.7 Estimated Service Time

Removal of a D-Link cable requires from 1 to 15 minutes, depending on cable length and on whether or not it is included in a cable bundle assembly. Installation of a D-Link cable requires from 1 to 20 minutes, depending on the length and complexity of the routing path.

2.8 P7IH Hand Tool Kit Required Tools

Installation of optical connectors requires a cleaning tool (IBM PN: 74Y0685, FIBER OPTICAL CLEANING TOOL), to clean the front surface of the optical connectors before connecting.

Testing of D-Ports requires the D-Link Wrap Plug (IBM PN: 74Y0792, WRAP PLUG, 24 POS STRAIGHT, WITH SLEEVE, WITH BACK), to wrap a D-Port transmitter back to its own receiver. Testing of both end-ports of a link will be faster if 2 wrap plugs are used.

Optionally, a bright flashlight (6-LED or 9-LED or equivalent) may be useful to inspect adapter ports for debris or contamination. Also, optionally, a 5x eye loupe-style magnifier is useful for inspecting the OBE connector front surfaces for dust contamination. For eye safety, this is absolutely not to be used for inspecting the adapter ports in the CEC drawers while the system is turned on – the system's laser transmitters are rated Class 1M, Eye safe *without* magnifying optics.

2.9 Prerequisites for this Procedure

In order to perform this procedure, you will need the following information:

For each end of the faulty D-Link

- 1) The frame number and frame serial number of the frame connected to the faulty D-Link Cable
- 2) The cage location
- 3) The location code of the D-Link port (Note the CEC serial#)
- 4) The HUB and link id (from the customer running the lsnwlinkinfo command).

2.10 Overview of Procedure

This is an overview of the tasks to be performed. Read this overview but do not perform any of the tasks yet.

| | | |
|----------------------|---|----|
| 3.1 | ASSESS IMPACT ON CLUSTER PERFORMANCE <= CUSTOMER TASK | 11 |
| 3.2 | IDENTIFY THE FRAME, CEC, AND D-PORT <= SSR TASK | 11 |
| 3.3 | CLEAN THE INDIVIDUAL D-LINK CONNECTORS <= SSR TASK | 15 |
| 3.4 | CLEAN THE D-LINK CONNECTORS IN THE GROUPER <= SSR TASK | 16 |
| 3.5 | RETEST THE LINK <= CUSTOMER TASK | 17 |
| 3.6 | INSTALL WRAP PLUG <= SSR TASK | 17 |
| 3.7 | RUN WRAP PLUG TEST (NWLINKDIAG) <= CUSTOMER TASK | 17 |
| 3.8 | EVALUATE WRAP PLUG TEST RESULTS <= SSR TASK | 18 |
| 3.9 | REPLACE AN INDIVIDUAL D-LINK OPTICAL CABLE <= SSR TASK | 19 |
| 3.10 | REPLACE A D-LINK CABLE IN D-LINK GROUPERS <= SSR TASK | 20 |
| 3.11 | RETEST THE LINK <= CUSTOMER TASK | 21 |
| 3.12 | CONFIRM THAT THE PROBLEM IS RESOLVED <= SSR TASK | 21 |
| 3.13 | END OF D-LINK SERVICE PROCEDURE | 21 |

3 SERVICE PROCEDURE

STOP – Do not proceed unless you have read “Safety_Notices_G229-9054.pdf” which is available from InfoCenter; see Section 1.3.

Unless otherwise indicated, each step below is to be performed by the SSR (System Services Representative).

3.1 Assess Impact on Cluster Performance <= Customer Task

STEP 1 Assess whether the expected performance impact due to removing multiple D-Link cables can be tolerated at this time. If only discrete D-Link cables, without groupers, have been used in this installation, it may be possible to clean or replace a cable without disturbing any other links. If groupers have been used in this installation, there will be 16 total supernode-to-supernode D-links unidirectional half-links removed during this procedure, and there may be significant system performance impact due to relying on indirect links.

If this procedure can be tolerated at this time, proceed to STEP 10.

If the procedure cannot be tolerated at this time, the system will continue to operate on the indirect paths until the single link failure can be repaired.

STEP 2 Note carefully, using the `lsnwlinkinfo` command on the EMS, and cluster topology information, which D-Port at each end of the cable is to be tested. If groupers are used, note particularly which groupers, and the positions of the cable within the groupers at each end. Notify the SSR which two D-Ports are involved.

3.2 Identify the frame, CEC, and D-Port<= SSR Task

For each end of the suspect D-Link Cable do the steps in section 3.2.

STEP 3 Access the HMC via the keyboard/display that resides in the management rack.

STEP 4 Place a checkmark in the Select column of the CEC Drawer connected to the D-Link Cable needing service.

STEP 5 Click the Tasks Menu button (right-arrow) and *select* **Operations -> LED Status -> Identify LED**. See Figure 1.

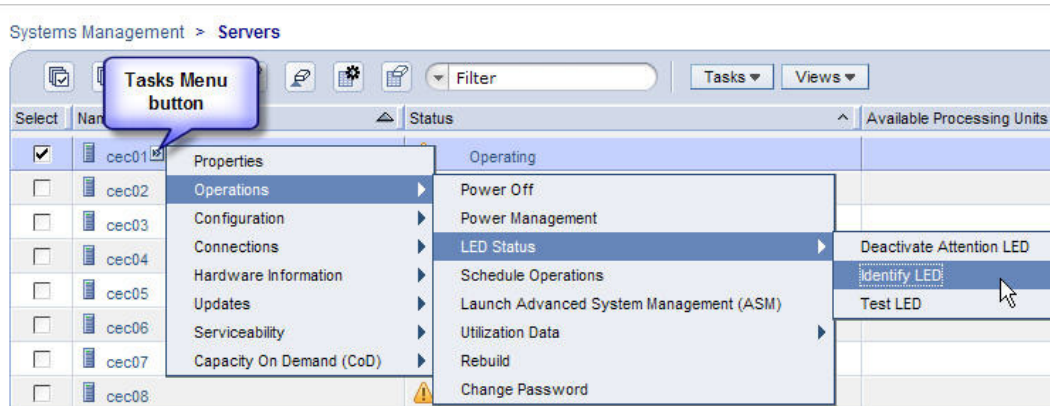


Figure 1 Identify LED Selection

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STEP 6 In the window titled **Identify LED, Select Enclosure** select **System Unit, Model F2C** then *click* the **Activate LED** button (see Figure 2). This will cause the CEC ID LED to flash, as well as the UEPO Panel of the frame.

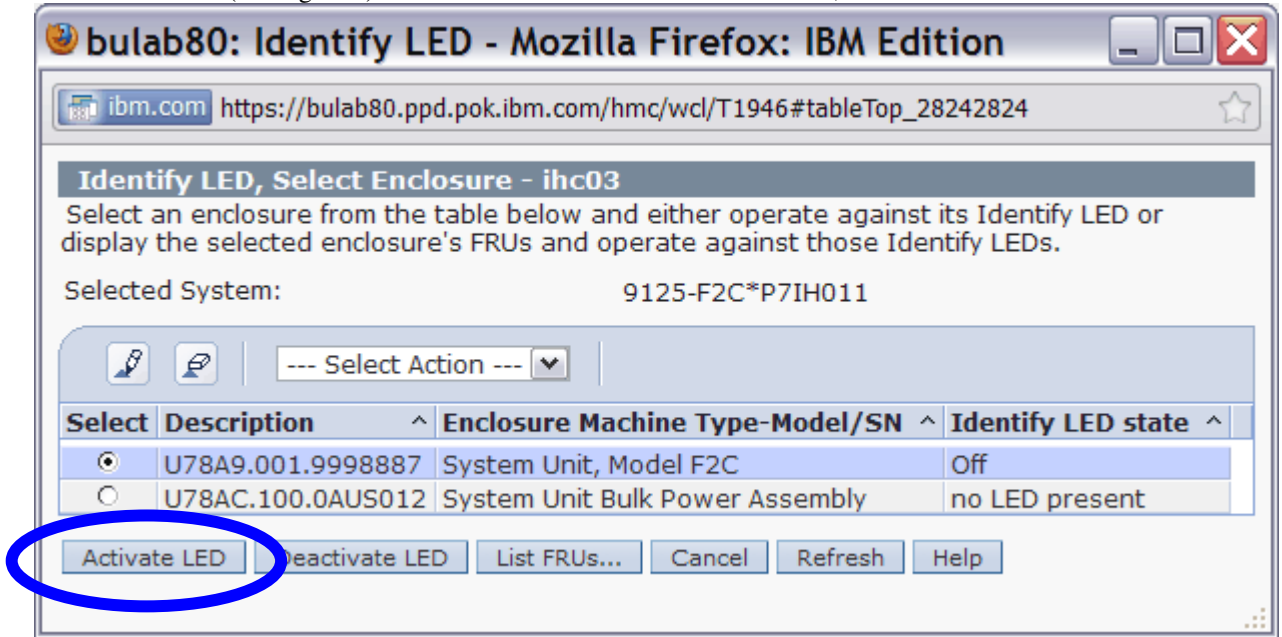


Figure 2 System Unit, Model F2C Selection – Activate LED

STEP 7 Locate the frame. The UEPO Identify Amber Led (see Figure 3) should be flashing. If the LEDs are not flashing, verify the FRU via MTMS (machine type model serial number). The rack level MTMS is located on the face of the UEPO (see Figure 3). Open the front and rear door of the frame.

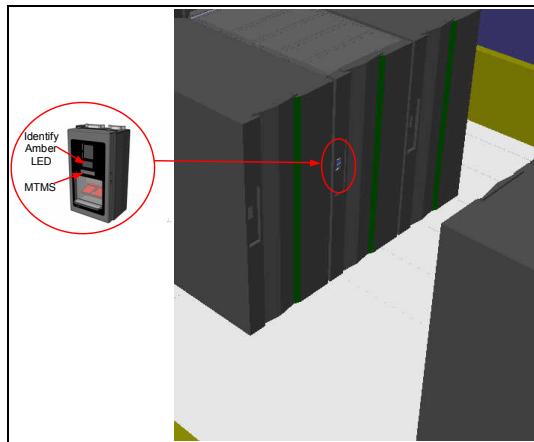


Figure 3 UEPO Identify LED location

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STEP 8 Locate the CEC with the D-Link Cable requiring service. The CEC Drawer Identify LEDs (see Figure 4 and Figure 5) will be flashing. If the LEDs are not flashing, verify the FRU via MTMS (machine type model serial number).

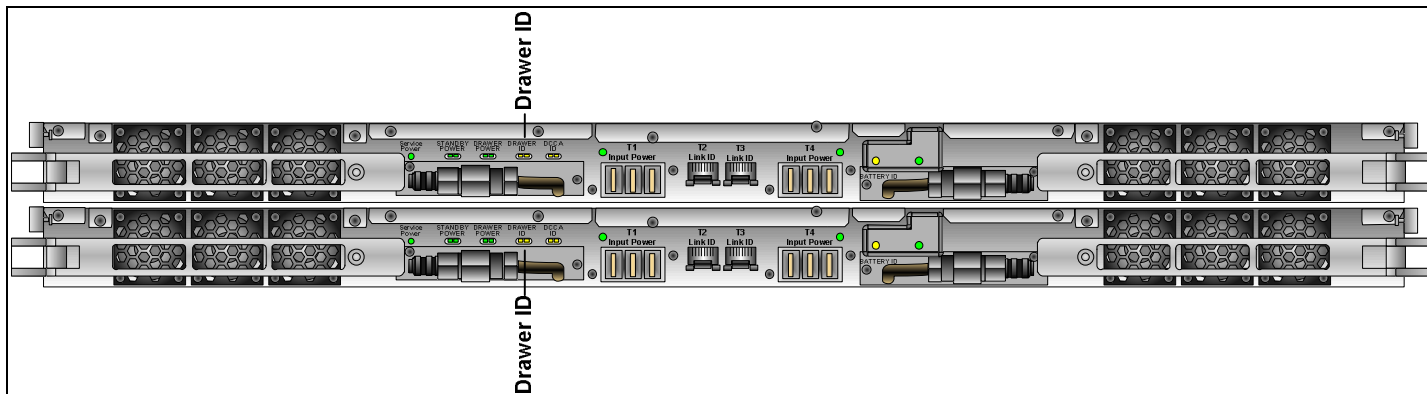


Figure 4 CEC Drawer ID – Front

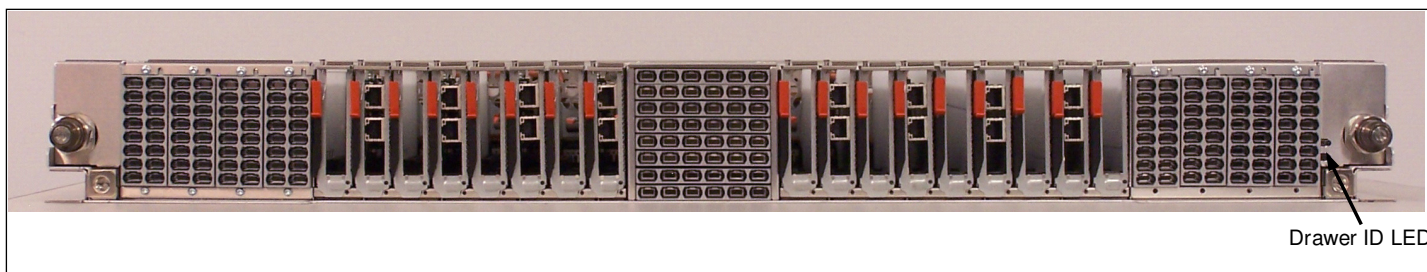


Figure 5 CEC Drawer ID - Rear

STEP 9 Verify that the serial number on the CEC Enclosure VPD label (CEC Node serial # label) matches the location code of the D-Link Cable / D-Link Port requiring service (see Figure 6). This is the 7 digit serial number in the location code, show in bold below for example:
U78A9.001.**312N003**-P1-C15-T1-L3

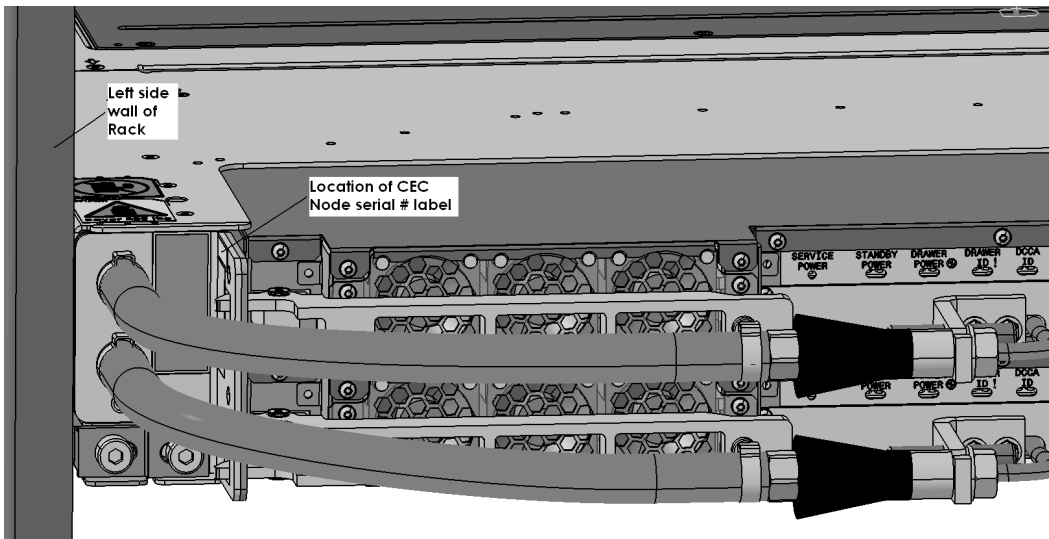


Figure 6 FRU Serial number location

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STEP 10 Find the D-Port location with the location code or HUB and link-id from the customer, referencing Figure 7.

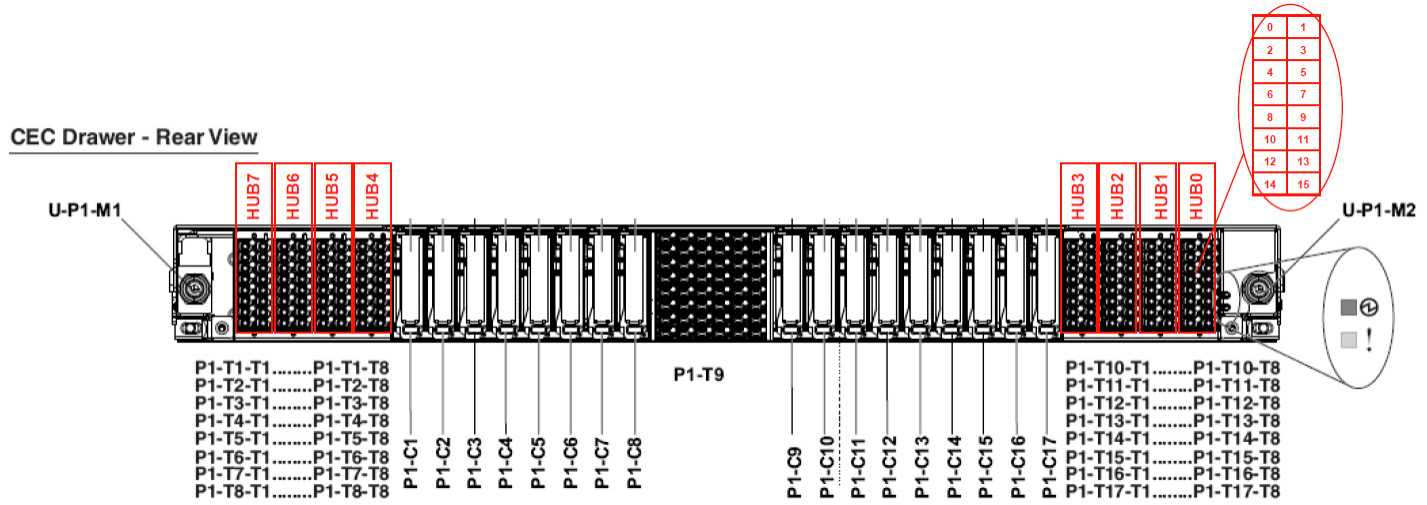


Figure 7 D-Link Port numbering and location codes

If the D-Link cables are individual, proceed to STEP 11.

If the D-Link cables are aggregated into cable assembly groupers (see Figure 10), proceed to STEP 15.

3.3 Clean the Individual D-Link Connectors <= SSR Task



CAUTION: Sharp edges, corners, or joints nearby. (L006)

CAUTION: This product contains Class 1M lasers. Do not view directly with optical instruments. (C028)

- STEP 11 Verify the correct identification of the connectors at each end of the cable. Typically, the easiest method of verification will be with use of a white LED flashlight. Light shown into one end of a D-Link cable will clearly appear at the other end of the cable. Alternatively, on smaller system configurations, label-matching, or manual cable-tracing can be used to verify correct connector identification.
- STEP 12 Remove the D-Link Optical connector at each end of the cable from the D-Port in the CEC drawer by pulling on the blue-purple colored push/pull tabs on the connector (see Figures 1 and 2).

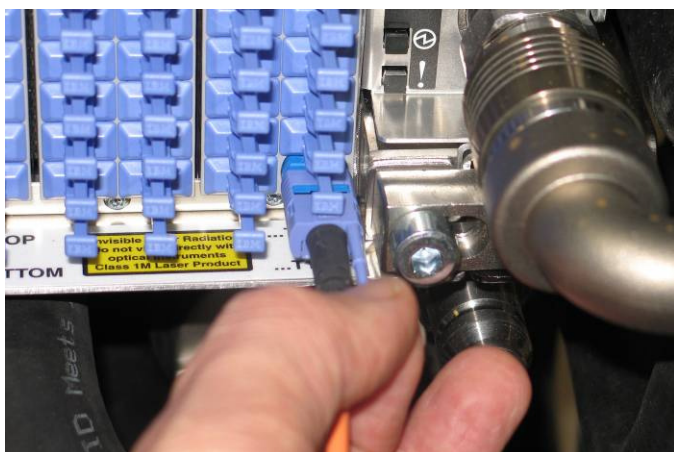


Figure 8 Grasping push/pull tab

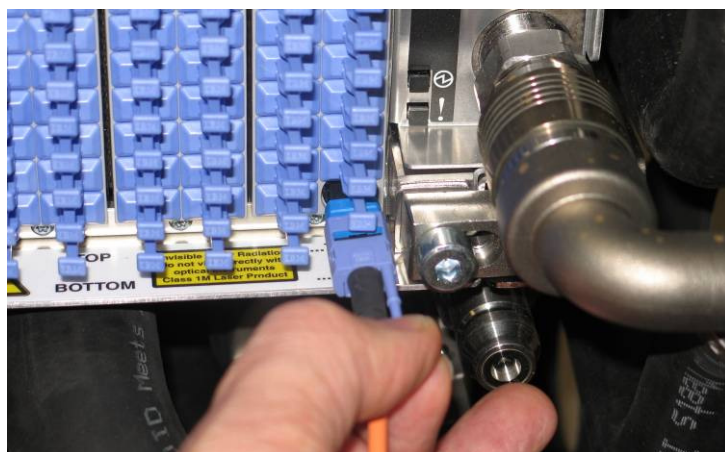


Figure 9 Removing D-Link Connector

- STEP 13 Ensure that the problem is not due to dirt, dust, or hair on one of the four connector surfaces in the link. Carefully clean the connectors at both ends of the cable, and the D-Port connector surfaces inside the adapters in the CEC drawers at each end of the D-Link, using the tools and procedures described in [Section 2.3.1](#).
- STEP 14 Plug the individual D-Link cable connectors back into the ports.

Proceed to STEP 21.

3.4 Clean the D-Link Connectors in the grouper <= SSR Task



CAUTION: Sharp edges, corners, or joints nearby. (L006)

CAUTION: This product contains Class 1M lasers. Do not view directly with optical instruments. (C028)

STEP 15 Verify the correct identification of the connectors at each end of the cable. Typically, the easiest method of verification will be with use of a white LED flashlight. Light shown into one end of a D-Link cable will clearly appear at the other end of the cable. Alternatively, on smaller system configurations, label-matching, or manual cable-tracing can be used to verify correct connector identification.

STEP 16 Unlatch all of the D-Link Optical connectors in the grouper at one end of the cable bundle assembly from the D-Ports in the CEC drawer by pulling on the blue purple colored push/pull tab on each connector. Remove the grouper from the CEC drawer (see Figure 10 to Figure 12)

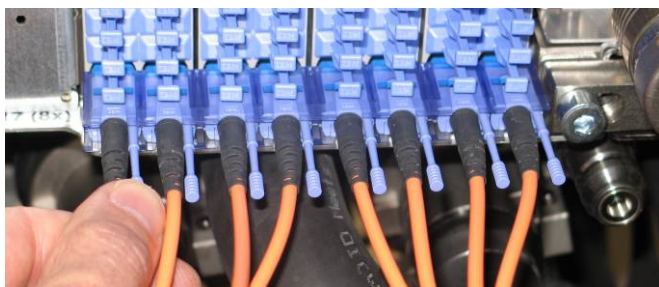


Figure 10 Unlatching connector with push/pull tab

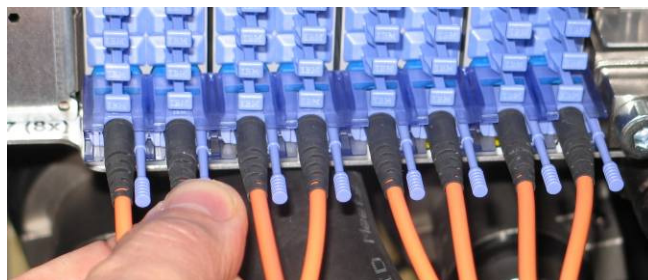


Figure 11 Unlatching next connector in grouper

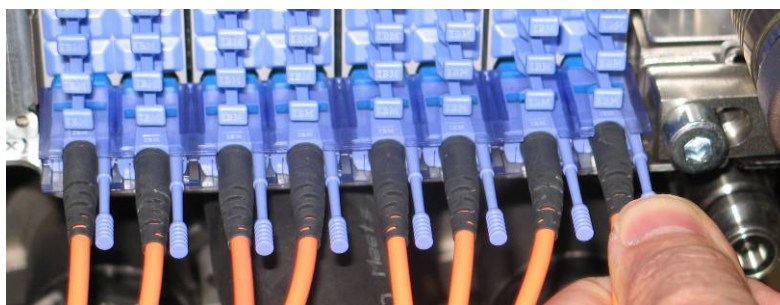


Figure 12 Unlatching last connector in grouper

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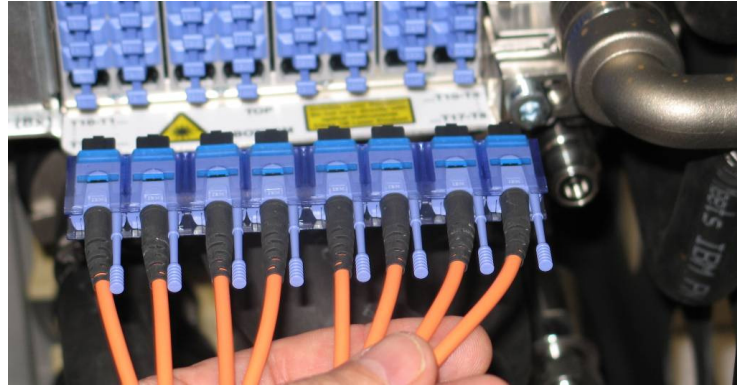


Figure 13 Grouper removed

- STEP 17 Do the same for the connectors in the grouper at the other end of the suspect D-Link cable..
- STEP 18 Ensure that the problem is not due to dirt, dust, or hair on one of the four connector surfaces in the link. Carefully clean all connectors in the groupers at both ends of the suspect D-Link cable. See [Section 2.3.1](#).

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- STEP 19 Plug the grouper in by positioning the grouper for the D-Link optical connectors at the proper row, inserting all connectors in the grouper into their respective D-Port adapter receptacles (see Figure 11), and clicking them all into place. Do this at both ends of the suspect D-Link cable.



Figure 14 Grouper installation

- STEP 20 For each connector, do the final actuation of the connector into the port by pushing on the strain relief boot at the rear of the connector, or by pushing on the push/pull tab. Proceed to STEP 43.

3.5 Retest the link <= Customer Task

- STEP 21 Retest the link status using the `/usr/bin/lswlinkinfo` command from the EMS, to determine if connector cleaning has resolved the problem. The state of the links should be “UP_OPERATIONAL”.

NOTE: If the suspect cable was part of a grouper, make sure all the links in the groupers at both ends of the cable are operational.

If cleaning the connectors resolved the problem, **proceed to STEP 44**

If cleaning the connectors did not resolved the problem, **proceed to STEP 22.**

3.6 Install Wrap Plug <= SSR Task

- STEP 22 If the D-Link is individual, remove the D-Link Optical connector at each end of the cable from the D-Port in the CEC drawer by pulling on the blue-purple colored push/pull tabs on the connector (see Figures 1 and 2).
If the D-Link cable is in a grouper, unlatch all of the D-Link Optical connectors in the grouper at one end of the cable bundle assembly from the D-Ports in the CEC drawer by pulling on the blue purple colored push/pull tab on each connector. Remove the grouper from the CEC drawer (see Figure 10 to Figure 12).

- STEP 23 Find two 24-position Straight Wrap Plugs (IBM PN: 74Y0792; WRAP PLUG, 24 POSITION, STRAIGHT, WITH SLEEVE, WITH BACK) available in P7IH Hand Tool Kit.

Clean both wrap plugs before installing.

NOTE: If only one 24-position Straight Wrap Plug is available, the wrap test can be executed sequentially on each D-Port.

- STEP 24 On both suspect D-Ports, install 24-position Straight Wrap Plugs (IBM PN: 74Y0792).

3.7 Run Wrap Plug Test (nwlkdiag) <= Customer Task

STEP 25 Run the nwlkdiag command on each of the two ports to determine if the ports can come up when wrapped back on themselves. The nwlkdiag command is documented in the “p775_management_guide.pdf”, in Section 3.1.17. Note that the syntax of the nwlkdiag command is:

```
nwlkdiag { -f <frame-id> -c cage-id -m <hub-module -l <link-id> } [-h]
nwlkdiag { -s <supernode-id> -d <drawer-id> -m <hub-module -l <link-id> } [-h]
```

where the CEC drawer can be identified either by frame-id and cage-id, or by supernode-id and drawer-id (in the range 0-3). The module-id specifies the hub module within the CEC drawer (in the range 0-7). The link-id specifies the link to diagnose.

Link-id values 7-31 map to L-Links LR0-LR23
Link-id values 32-47 map to D-Links D0—D15.

Sample command, with successful output, of the nwlkdiag command for D-Link 3 supernode 3 drawer 1 hub 4:
\$ nwlkdiag -s 3 -d 1 -m 4 -l 35

This link is operational.

Sample command, with failing output, for D-Link 15, in supernode 49, drawer 0, hub 3:

```
$ nwlkdiag -s 49 -d 0 -m 3 -l 47
```

```
FR007-CG12-SN049-DR0-HB3-LD15 LOCATION_CODE=U78A9.001.1122333-P1-T9
```

This link is not operational. If a cable is installed in the optical port, remove the cable and install an optical wrap device instead, then re-issue the nwlkdiag command. If a wrap device is already installed, then the problem lies behind the optical port.

3.8 Evaluate Wrap Plug Test Results <= SSR Task

If the nwlkdiag test fails on either of the D-Ports, notify next-level support that the D-Port in the CEC has failed, and the procedure is complete – no further steps are necessary (replacing the cable will not help if the D-Port has failed).

If the nwlkdiag test succeeds on both D-Ports, and if all 4 connector surfaces on the link (2 on the cable, plus 2 in the D-Ports at either end) have all been verified to be clean, then the problem has been isolated to be in the cable.

If the D-Link cables are individual, **proceed to STEP 26**

If the D-Link cables are aggregated into cable assembly groupers, **proceed to STEP 34**

3.9 Replace an Individual D-Link Optical Cable <= SSR Task

- STEP 26 If the system includes multiple frames, and the cable is confirmed defective after the wrap test, then pull the cable through the system's cable tray raceways to remove it completely from the system. If the system is a single frame, simply remove the cable from the system.
- STEP 27 Obtain a replacement cable that the same or longer length than the cable being replaced.
- STEP 28 Label the new cable, to match the cable being replaced.
- STEP 29 Clean one end of the cable. See [Section 2.3.1](#).
- STEP 30 Remove the wrap plug and insert the cleaned connector of the D-Link cable into the D-Port at that end. Do the final actuation of the connector into the port by pushing on the push/pull tab, or by pushing on the strain relief boot at the rear of the connector (see Figure 16 and Figure 10). When D-Link cables are installed, it is important that
- (a) the key of the MPO connector is oriented upward, to align with the Key-Up orientation of the MPO D-Port adapters (see Figure 15).
 - (b) the handle of the push/pull tab is on the upper-right side of the D-Link connector (see Figure 15).



Figure 15 Individual D-Link Connector with push/pull tab on upper right



Figure 16 Insert one connector

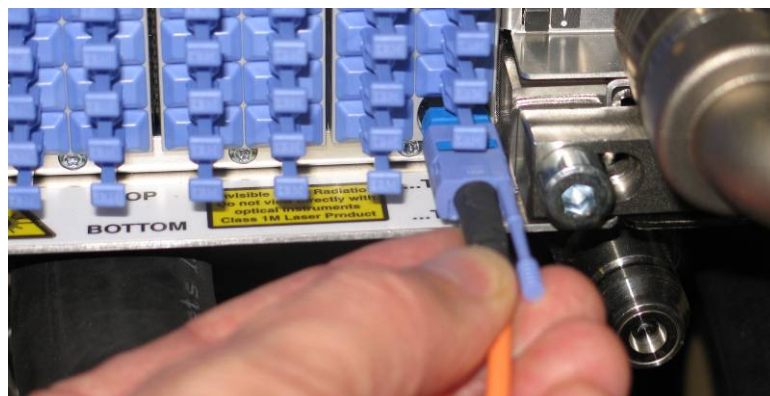


Figure 17 Perform final actuation

- STEP 31 Route the D-Link cable to the D-Port at the other end, routing the cable through the systems cable tray raceways, if necessary.

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STEP 32 Clean the other end of the cable. See [Section 2.3.1](#).

STEP 33 Repeat **STEP 30** for the D-Link Optical connector at the other end of the cable. Plug the connector into the port by pushing either on the strain relief boot at the rear of the connector, or by pushing on the push/pull tab.

Proceed to STEP 43.

3.10 Replace a D-Link cable in D-Link groupers <= SSR Task

- STEP 34 Remove a D-Link connector from the bundle assembly groupers at both ends of the cable. Pry apart the two tabs at the upper left and lower right. This can be done with fingers (see Figure 10 and Figure 11). Once the two tabs are pried apart, pull the cable connector out of the grouper.

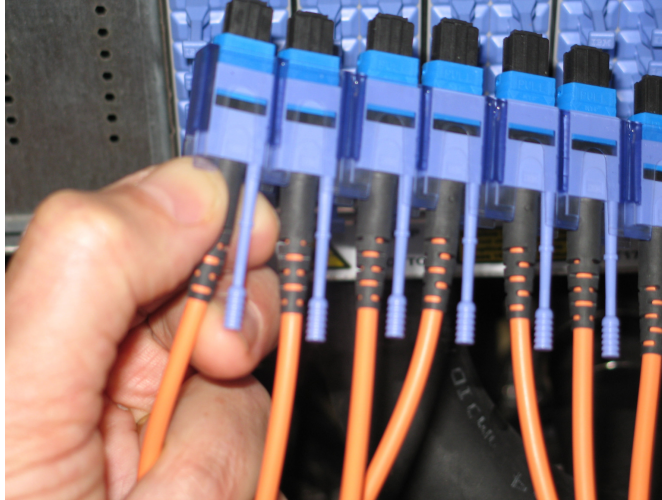


Figure 18 Top view of grouper

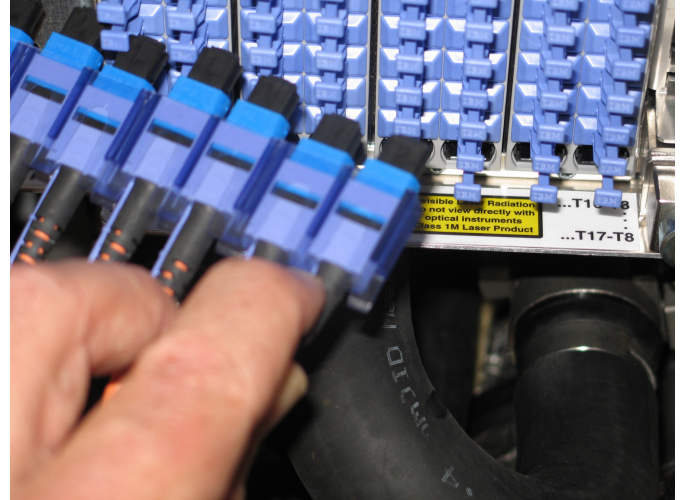


Figure 11 Bottom view of grouper

- STEP 35 Obtain a replacement cable that the same or longer length than the cable being replaced.
- STEP 36 Label the new cable, to match the cable being replaced.
- STEP 37 Plug the connector of the new cable into the grouper at one end.
- STEP 38 Clean all connectors in the grouper. See [Section 2.3.1](#).
- STEP 39 Remove the wrap plug and plug the grouper in by positioning the grouper for the D-Link optical connectors at the proper row, inserting all connectors in the grouper into their respective D-Port adapter receptacles (see Figure 11), and clicking them all into place.
- STEP 40 Route the new cable along the bundle alongside the cable being replaced, to the other end of the bundle, removing the old cable while re-doing hook-and-loop tape or vinyl tape along the way.
- STEP 41 Plug the new cable's 2nd connector into the grouper at the other end.
- STEP 42 Clean all connectors in the grouper. See [Section 2.3.1](#).

3.11 Retest the link <= Customer Task

STEP 43 From the EMS, run the lsnwlinkinfo link status test to determine that the ports correctly come up to the UP_OPERATIONAL status using the newly-installed optical cable.

3.12 Confirm that the problem is resolved <= SSR Task

STEP 44 Confirm with the customer whether replacing the cable resolved the problem.
If the problem is not resolved, contact next level of support.

STEP 45 In the window titled **Identify LED, Select Enclosure**, click the **Deactivate LED** button (see Figure 2) and then close this window.

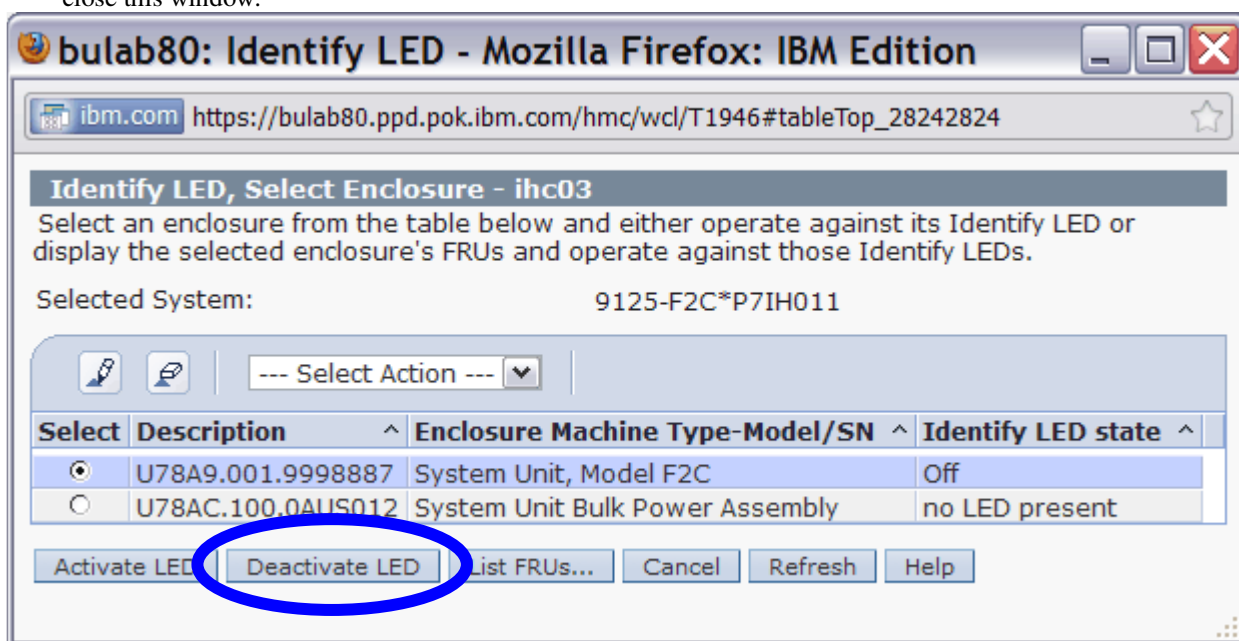


Figure 19 System Unit, Model F2C Selection

STEP 46 Close the front and rear doors.

3.13 End of D-Link Service Procedure

4 APPENDIX A: BACKGROUND INFORMATION ON FAILURE ISOLATION OF D-LINKS

The information in Section 2.11 is useful for diagnosing a link failure. This document, however, is written with the assumption that you have already diagnosed the failure and have determined that there is a D-Link cable needing replacement. Section 3 describes how to replace the cable.

The following procedure is used for isolating failures in D-Links, and for repairing them, if possible.

4.1.1 Likely Root Causes for Failure in D-Links

If a D-Link is found to be non-functional, there are several potential root causes. If, for example, the D-Link from D-Port A (e.g., Hub 0, D14 in CEC drawer 0 of SN 001) to D-Port B (e.g., Hub 0, D15, in CEC drawer 0 of the SN 002) is found to be non-functional, then the possible root causes are:

1. Failure in some part of the transmitting D-Port (e.g., connector, optical fiber ribbon, internal lenses, optical transmitters, electrical wiring in the Hub module, or circuitry on the D-Port A Hub chip)
2. Dirt, dust, or other contamination between the cable's optical connector and the D-Port A internal optical connector
3. Breakage or failure in the D-Link cable fibers or connectors
4. Dirt, dust, or other contamination between the cable's optical connector and the D-Port B internal optical connector
5. Failure in some part of the receiving D-Port (e.g., connector, optical fiber ribbon, internal lenses, optical receivers, electrical wiring in the Hub module, or receiver circuitry on the D-Port B Hub chip)

A failure in either the transmitting D-Port (root cause 1 above) or the receiving D-Port (root cause 5) is not field repairable – the full CEC drawer is the Field Replaceable Unit. The procedure below is designed to isolate whether the root cause of an D-Link failure results from failure in the transmitting or receiving CEC drawer (1 or 5), from contamination of the connector face(s) (2 or 4), or from breakage or failure of a fiber or a connector in the D-Link Cable (3).

In the case of a contaminated connector or connectors (case 2 or 4), the link can generally be repaired by cleaning the connector(s). In the case of cable failure (case 3), the cable should be replaced.

4.1.2 Failure Isolation and Repair for D-Links

The following procedure is used for isolating failures in D-Links, and repairing them, if possible.

1. Note which receiving port (D-Port B) is not receiving good signals, and which transmitting port (D-Port A) is connected to it through the D-Link Cable, using the mapping in the system-specific System Installation Guide. Use the following steps to determine which D-Link, and which D-Ports, are affected.
 - a. Record the System Reference Code (SRC) or refcode or alert_id of the failure notification.
 - b. Record the problem description or reason
 - c. Record the FRU list – particularly the HFI_CAB (cable connector location code) and CBLCONT (location code for the other end of the cable) FRUs.
 - d. Before proceeding, follow the Fail-in-place (FIP) procedures to determine if action is required, since no action is required if FIP resources are still available.

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- e. If action is required, Log onto the EMS and run `/usr/bin/lsnwlinfo` on the affected D-link to specifically diagnose any problems with the link before proceeding further.
2. Before proceeding further, ensure that the optical connectors on both ends of the affected D-Link cable are fully seated.
 - a. Pull out the push/pull tab on the connector end, and push it back in, to assure that the connector is fully 'clicked' into place.
 - b. Repeat on the other end of the D-Link.
 - c. Repeat the diagnostic procedure in Step 1 above, to ensure that the problem has not been remedied, before proceeding further.

Note that the following procedures will affect other D-Link Cables with connectors in the same groupers as the cable being diagnosed, and may have some impact on performance of neighboring D-Ports on the same Hub/Switch as the D-Ports being diagnosed. Verify that this will not detrimentally affect system operation before proceeding further.

3. Remove the D-Link Cable connectors from the node, using the procedure described in [Section Error! Reference source not found., Error! Reference source not found.](#). If the connectors are included in a grouper, the full grouper must be removed, as described in [Section 3.4, Clean the D-Link Connectors in the grouper](#) . This will impact operation of any other cables that have connectors inserted into the same grouper (i.e., in the same row of D-Ports).
4. On the D-Port A and D-Port B ports, install 24-position Straight Wrap Plugs (IBM PN: 74Y0792; WRAP PLUG, 24 POSITION, STRAIGHT, WITH SLEEVE, WITH BACK). If only one 24-position Straight Wrap Plug is available, Steps [4-6](#) can be executed sequentially on each D-Port.
5. Wait a few seconds.
6. From the EMS, run the `/usr/bin/nwlinkdiag` command on both ports to display information about whether the link is able to train with the wrap device installed, and whether the fault can be isolated to a cable.
 - Note: The `lnwlinkdiag` command is described in the specification "High performance clustering using the 9125-F2C – Management Guide".
7. If the `lsnwlinfo` command indicates D-Port failure on either D-Port A or D-Port B, then the link cannot be repaired without replacing the corresponding CEC drawer. If the link initialization tests succeed on both D-Ports, then the D-Ports in both CEC drawers are functional – proceed to the following step.
8. Clean all cable connectors and all D-Port connectors using the Fiber Optic Cleaning Tool (IBM PN: 74Y0685).
9. Install again the D-Link Cable using the procedure described in [Section 3.9, Replace an Individual D-Link Optical Cable](#) or [Section 3.10, Replace a D-Link cable in D-Link groupers](#) .
10. Run the `lsnwlinfo` link initialization test to determine if the ports can correctly come up to the `UP_OPERATIONAL` state using the cleaned optical cable installed
11. If the link diagnostic test fails, remove the original cable and install a replacement cable and repeat from Step [10](#). If the test succeeds, the link is repaired.

Summary: If a link failure is determined to be due to a failure within the D-Port A or D-Port B of the CEC drawers, and the failure can not be handled using Fail-in-Place resources, the drawer must be either replaced or repaired. Otherwise, cleaning of the connectors or replacement of the D-Link cable should repair the failure.

5 END OF DOCUMENT