Type 7198 and 7199

Problem Determination and Services Guide



IBM Confidential

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IBM Confidential

Note

Before using this information and the product it supports, read the information in "Safety" on page v and, if necessary, the language-specific information for your locale in *IBM Systems Safety Notices*, G229-9054.

Before using this information and the product it supports, read the information in "Notices" on page 53.

Second Edition (May 2013)

This edition applies to Type 7198 and 7199 and to Type 2426 appliances until otherwise indicated in new editions.

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Contents

Guidelines for servicing electrical equipment vi	1
0 1 1	i
Inspecting for unsafe conditions	i
Safety statements	i
Danger notices	i
Caution notices in the test of tes	
Labels	i
Chapter 1. Learning the appliance 1	
Identifying components	
Front view 1	
Rear view)
Parts lists	3
Part numbers for CRU and FRU parts in the	
appliance	ŀ
Part numbers for appliances	;
Part numbers for power cords and cables 5	;
Tools needed	5
Chapter 2. Diagnostic tools 7	,
Diagnostics for DataPower appliances	7
Using the diagnostic self-test	7
Testing the hardware from the command line 8	3
Diagnostics for DataPower XC10 and Workload	
Devilence	
	1
Viewing status providers for sensors)
Viewing status providers for sensors)
Deproyer)
Deprover))
Deprover))
Deprover	· · · ·
Deprover	<i></i>
Deproyer	

Chapter 5. Replacing FRU parts	29
Replacing batteries	. 29
High-level procedure	. 29
Replacing the CMOS coin cell battery	. 29
Replacing the RAID backup battery	. 30
Replacing expansion cards	. 31
High-level procedure	. 31
Replacing an expansion card on Type 7198	
appliances.	. 32
Replacing an expansion card on Type 7199	
appliances	34
Replacing the RAID controller and battery	41
High-level procedure	. 11
Replacing the RAID controller or the RAID	. 11
hackup battory	/11
	. 41
Chanter C. Deplesing on emplicate	45
Chapter 6. Replacing an appliance	43
High-level procedure	. 45
Removing the detective appliance from the rack .	. 46
Moving the HSM card	. 47
Moving the hard disk drive modules	. 48
Applying the repair identification tag	. 48
Installing the appliance on the slide rails	. 49
Validating the replacement appliance	. 50
Validation on DataPower appliances	. 50
Validation on the WebSphere DataPower XC10	
Appliance and IBM Workload Deployer	. 51
Notices	53
Important notes	. 53
Electronic emission notices	. 53
Federal Communications Commission (FCC)	
statement	. 53
Industry Canada Compliance Statement	. 54
Avis de conformité à la réglementation	
d'Industrie Canada	. 54
United Kingdom telecommunications safety	
requirement	. 54
Furopean Union FMC Directive conformance	. 01
statement	54
Japanese Voluntary Control Council for	. 51
Interforance (VCCI) statement	55
Taiwanasa Class A warning statement	. 55
Chinese Class A warning statement	. 00
Voroan Class A warning statement	. 33
Rotean Class A warning statement	. 55
Russian Class A warning statement	. 30
	. 30

Safety

Before installing this product, read the Safety Information.

Arabic

قبل تركيب هذا المنتج، يجب قراءة الملاحظات الأمنية

Brazilian Portuguese

Antes de instalar este produto, leia as Informações de Segurança.

Chinese (simplified)

在安装本产品之前,请仔细阅读 Safety Information (安全信息)。

Chinese (traditional)

安裝本產品之前,請先閱讀「安全資訊」。

Croatian

Prije instalacije ovog produkta obavezno pročitajte Sigurnosne Upute.

Czech

Před instalací tohoto produktu si přečtěte příručku bezpečnostních instrukcí.

Danish

Læs sikkerhedsforskrifterne, før du installerer dette produkt.

Dutch

Lees voordat u dit product installeert eerst de veiligheidsvoorschriften.

Finnish

Ennen kuin asennat tämän tuotten, lue turvaohjeet kohdasta Safety Information.

French

Avant d'installer ce produit, lisez les consignes de sécurité.

German

Vor der Installation dieses Produkts die Sicherheitshinweise lesen.

Greek

Πριν εγκαταστήσετε το προϊόν αυτό, διαβάστε τις πληροφορίες ασφάλειας (safety information).

Hebrew

לפני שתתקינו מוצר זה, קראו את הוראות הבטיחות.

Hungarian

A termék telepítése előtt olvassa el a Biztonsági előírásokat!

Italian

Prima di installare questo prodotto, leggere le Informazioni sulla Sicurezza.

Japanese

製品の設置の前に、安全情報をお読みください。

Korean

본 제품을 설치하기 전에 안전 정보를 읽으십시오.

Macedonian

Пред да се инсталира овој продукт, прочитајте информацијата за безбедност.

Norwegian

Les sikkerhetsinformasjonen (Safety Information) før du installerer dette produktet.

Polish

Przed zainstalowaniem tego produktu, należy zapoznać się z książką "Informacje dotyczące bezpieczeństwa" (Safety Information).

Portuguese

Antes de instalar este produto, leia as Informações sobre Segurança.

Russian

Перед установкой продукта прочтите инструкции по технике безопасности.

Slovak

Pred inštaláciou tohto zariadenia si pečítaje Bezpečnostné predpisy.

Slovenian

Pred namestitvijo tega proizvoda preberite Varnostne informacije.

Spanish

Antes de instalar este producto, lea la información seguridad.

Swedish

Läs säkerhetsinformationen innan du installerar den här produkten.

Guidelines for servicing electrical equipment

Observe the following guidelines when servicing electrical equipment:

- Check the area for electrical hazards, such as moist floors, non-grounded power extension cords, and missing safety grounds.
- Use only approved tools and test equipment. Some hand tools have handles that are covered with a soft material that does not provide insulation from live electrical current.
- Regularly inspect and maintain your electrical hand tools for safe operational condition. Do not use worn or broken tools or testers.
- Do not touch the reflective surface of a dental mirror to a live electrical circuit. The surface is conductive and can cause personal injury or equipment damage if it touches a live electrical circuit.
- Some rubber floor mats contain small conductive fibers to decrease electrostatic discharge. Do not use this type of mat to protect yourself from electrical shock.
- Do not work alone under hazardous conditions or near equipment that has hazardous voltages.
- Locate the emergency power-off (EPO) switch, disconnecting switch, or electrical outlet so that you can turn off the power quickly in the event of an electrical accident.
- Disconnect all power before you perform a mechanical inspection, work near power supplies, or remove or install main units.
- Before you work on the equipment, disconnect the power cord. If you cannot disconnect the power cord, have the customer power off the wall box that supplies power to the equipment and lock the wall box in the off position.
- Never assume that power has been disconnected from a circuit. Check it to make sure that it has been disconnected.
- If you have to work on equipment that has exposed electrical circuits, observe the following precautions:

- Make sure that another person who is familiar with the power-off controls is near you and is available to turn off the power if necessary.
- When you are working with powered-on electrical equipment, use only one hand. Keep the other hand in your pocket or behind your back to avoid creating a complete circuit that could cause an electrical shock.
- When using a tester, set the controls correctly and use the approved probe leads and accessories for that tester.
- Stand on a suitable rubber mat to insulate you from grounds such as metal floor strips and equipment frames.
- Use extreme care when measuring high voltages.
- To ensure proper grounding of components, such as power supplies, pumps, blowers, fans, and motor generators, do not service these components outside of their normal operating locations.
- If an electrical accident occurs, use caution, turn off the power, and send another person to get medical aid.

Inspecting for unsafe conditions

Note: Use this information to help you identify potential unsafe conditions in an IBM[®] product that you are working on.

Each IBM product, as it was designed and manufactured, has required safety requirements to protect users and service technicians from injury. Use good judgment to identify potential unsafe conditions that might be caused by attachment of non-IBM features or options that are not addressed in this section. If you identify an unsafe condition, you must determine how serious the hazard is and whether you must correct the problem before you work on the product.

Consider the following conditions, and the safety hazards that they present:

- Electrical hazards (especially primary power). Primary voltage on the frame can cause serious or fatal electrical shock.
- Explosive hazards, such as a damaged CRT face or a bulging capacitor.
- Mechanical hazards, such as loose or missing hardware.

To inspect the product for potential unsafe conditions, complete the following steps:

- 1. Make sure that the power is off and the power cords are disconnected.
- 2. Make sure that the exterior cover is not damaged or broken, and observe any sharp edges.
- **3**. Check the power cords:
 - Make sure that the third-wire ground connector is in good condition. Use a meter to measure third-wire ground continuity for 0.1 ohm or less between the external ground pin and the frame ground.
 - Make sure that the power cords are the correct type.
 - Make sure that the insulation is not frayed or worn.
- 4. Check for pinched cables.

Safety statements

The safety statements in this section apply to the Type 7198 and 7199 appliances. These statements are duplicate statements from the *IBM Systems Safety Notices* document. However, the *IBM Systems Safety Notices* document provides the complete list of all the safety notices for IBM Systems Software.

Danger notices

DANGER

When working on or around the system, observe the following precautions:

Electrical voltage and current from power, telephone, and communication cables are hazardous. To avoid a shock hazard:

- Connect power to this unit only with the IBM provided power cord. Do not use the IBM provided power cord for any other product.
- Do not open or service any power supply assembly.
- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- The product might be equipped with multiple power cords. To remove all hazardous voltages, disconnect all power cords.
- Connect all power cords to a properly wired and grounded electrical outlet. Ensure that the outlet supplies proper voltage and phase rotation according to the system rating plate.
- Connect any equipment that will be attached to this product to properly wired outlets.
- When possible, use one hand only to connect or disconnect signal cables.
- Never turn on any equipment when there is evidence of fire, water, or structural damage.
- Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.
- Connect and disconnect cables as described in the following procedures when installing, moving, or opening covers on this product or attached devices.

To disconnect:

- 1. Turn off everything (unless instructed otherwise).
- 2. Remove the power cords from the outlets.
- **3.** Remove the cables from the connectors.
- 4. Remove all cables from the devices.

To connect:

- 1. Turn off everything (unless instructed otherwise).
- **2.** Attach all cables to the devices.
- **3.** Attach the cables to the connectors.
- 4. Attach the power cords to the outlets.
- 5. Turn on the devices.
- Sharp edges, corners, and joints may be present in and around the system. Use care when handling equipment to avoid cuts, scrapes, and pinching.

(D005)

Caution notices

CAUTION:

The battery contains lithium. To avoid possible explosion, do not burn or charge the battery.

- Do not throw or immerse into water.
- Do not heat to more than 100° C (212° F).
- Do not repair or disassemble.

Exchange only with the IBM-approved part. Recycle or discard the battery as instructed by local regulations. In the United States, IBM has a process for the collection of this battery. For information, call 1-800-426-4333. Have the IBM part number for the battery unit available when you call. (C003)

CAUTION:

Type 7199: The weight of this part or unit is between 18 and 32 kg (39.7 and 70.5 lb.). It takes two persons to safely lift this part or unit. (C009)



Use the following general safety information for all rack-mounted devices.

DANGER

Observe the following precautions when working on or around your IT rack system:

- Heavy equipment personal injury or equipment damage might result if mishandled.
- Always lower the leveling pads on the rack cabinet.
- Always install stabilizer brackets on the rack cabinet.
- To avoid hazardous conditions due to uneven mechanical loading, always install the heaviest devices in the bottom of the rack cabinet. Always install servers and optional devices starting from the bottom of the rack cabinet.
- Rack-mounted devices are not to be used as shelves or work spaces. Do not place objects on top of rack-mounted devices.



- Each rack cabinet might have more than one power cord. Be sure to disconnect all power cords in the rack cabinet when directed to disconnect power during servicing.
- Connect all devices installed in a rack cabinet to power devices installed in the same rack cabinet. Do not plug a power cord from a device installed in one rack cabinet into a power device installed in a different rack cabinet.
- An electrical outlet that is not correctly wired could place hazardous voltage on the metal parts of the system or the devices that attach to the system. It is the responsibility of the customer to ensure that the outlet is correctly wired and grounded to prevent an electrical shock.

(R001 part 1 of 2)

CAUTION:

- Do not install a unit in a rack where the internal rack ambient temperatures will exceed the manufacturer's recommended ambient temperature for all your rack-mounted devices.
- Do not install a unit in a rack where the air flow is compromised. Ensure that air flow is not blocked or reduced on any side, front, or back of a unit used for air flow through the unit.
- Consideration should be given to the connection of the equipment to the supply circuit so that overloading of the circuits does not compromise the supply wiring or overcurrent protection. To provide the correct power connection to a rack, refer to the rating labels located on the equipment in the rack to determine the total power requirement of the supply circuit.
- (For sliding drawers) Do not pull out or install any drawer or feature if the rack stabilizer brackets are not attached to the rack. Do not pull out more than one drawer at a time. The rack might become unstable if you pull out more than one drawer at a time.
- (For fixed drawers) This drawer is a fixed drawer and must not be moved for servicing unless specified by the manufacturer. Attempting to move the drawer partially or completely out of the rack might cause the rack to become unstable or cause the drawer to fall out of the rack.

(R001 part 2 of 2)

CAUTION:

Removing components from the upper positions in the rack cabinet improves rack stability during relocation. Follow these general guidelines whenever you relocate a populated rack cabinet within a room or building:

- Reduce the weight of the rack cabinet by removing equipment starting at the top of the rack cabinet. When possible, restore the rack cabinet to the configuration of the rack cabinet as you received it. If this configuration is not known, you must observe the following precautions:
 - Remove all devices in the 32U position and above.
 - Ensure that the heaviest devices are installed in the bottom of the rack cabinet.
 - Ensure that there are no empty U-levels between devices installed in the rack cabinet below the 32U level.
- If the rack cabinet you are relocating is part of a suite of rack cabinets, detach the rack cabinet from the suite.
- Inspect the route that you plan to take to eliminate potential hazards.
- Verify that the route that you choose can support the weight of the loaded rack cabinet. Refer to the documentation that comes with your rack cabinet for the weight of a loaded rack cabinet.
- Verify that all door openings are at least 760 x 230 mm (30 x 80 in.).
- Ensure that all devices, shelves, drawers, doors, and cables are secure.
- Ensure that the four leveling pads are raised to their highest position.
- Ensure that there are no stabilizer brackets installed on the rack cabinet during movement.
- Do not use a ramp inclined at more than 10 degrees.
- When the rack cabinet is in the new location, complete the following steps:
 - Lower the four leveling pads.
 - Install stabilizer brackets on the rack cabinet.
 - If you removed any devices from the rack cabinet, repopulate the rack cabinet from the lowest position to the highest position.
- If a long-distance relocation is required, restore the rack cabinet to the configuration of the rack cabinet as you received it. Pack the rack cabinet in the original packaging material, or equivalent. Also lower the leveling pads to raise the casters off of the pallet and bolt the rack cabinet to the pallet.

(R002)

Labels

DANGER

Hazardous voltage, current, or energy levels are present inside any component that has this label attached. Do not open any cover or barrier that contains this label. (L001)



DANGER

Rack-mounted devices are not to be used as shelves or work spaces. (L002)



DANGER

Multiple power cords. The product might be equipped with multiple power cords. To remove all hazardous voltages, disconnect all power cords. (L003)



CAUTION: Hazardous moving parts nearby. (L008)



Chapter 1. Learning the appliance

Identifying components

The Type 7198 and 7199 appliance is available in the following models:

- IBM WebSphere[®] DataPower[®] Service Gateway XG45
- IBM WebSphere DataPower Cast Iron XH40
- IBM WebSphere DataPower Cast Iron XH40 Enterprise
- IBM WebSphere DataPower Integration Appliance XI52
- IBM WebSphere DataPower B2B Appliance XB62
- IBM Workload Deployer
- IBM WebSphere DataPower XC10

Front view

Figure 1 shows the controls, LEDs, and connectors. The Ethernet and hard disk drive modules are on the front of the Type 7198 appliance.

Figure 2 on page 2 shows the controls, LEDs, and connectors. The Ethernet and hard disk drive modules are on the front of the Type 7199 appliance.



Figure 1. Front view of Type 7198 appliances



Figure 2. Front view of Type 7199 appliances

The labels in Figure 2 correspond to the following components on the front of the appliance:

- A Console connector
- B USB port
- C LCM module
- D Hard disk drive module 2
- **E** Hard disk drive module 0
- **F** Hard disk drive module 3
- G Hard disk drive module 1
- H Fault LED
- I Locate LED
- J Power LED
- K Power button
- L MGT0 Ethernet connector
- M MGT1 Ethernet connector
- N Left Ethernet modules
- O Right Ethernet modules
- **P** The amber error LED indicator light for the cache. (XC10 only)
- **Q** The yellow writing LED indicator light for the cache. (XC10 only)
- **R** The green reading LED indicator light for the cache. (XC10 only)

Rear view

Figure 3 on page 3 shows the modules and LEDs. The fan and power modules are on rear of the Type 7198 appliance.

Figure 4 on page 3 shows the modules and LEDs. The fan and power modules are on rear of the Type 7199 appliance.



Figure 3. Rear view of Type 7198 appliances



Figure 4. Rear view of Type 7199 appliances

The labels in Figure 4 correspond to the following components on the rear of the appliance:

- A Fan module 1
- **B** Fan module 1 LED
- C Fan module 2
- **D** Fan module 2 LED
- E Fan module 3
- **F** Fan module 3 LED
- **G** Power supply module 1 LED
- H Power supply module 1
- I Power supply module 2 LED
- J Power supply module 2

Parts lists

The Type 7198 and 7199 appliance includes two of three types of replacement parts: Tier 1 customer replaceable unit (CRU) and field replaceable unit (FRU). However, replacement parts for other IBM machine types can be any of the following types:

Tier 1 CRU

Replacement of a Tier 1 CRU is your responsibility. If an IBM representative installs a Tier 1 CRU at your request, you *will* be charged for the installation.

Tier 2 CRU

Replacement of a Tier 2 CRU can be installed by you or can be installed at your request by an IBM representative for no charge if still under warranty. If installed by an IBM representative after your warranty has expired, you *will* be charged for the installation.

FRU FRUs must be installed by trained service technicians only.

For part numbers, descriptions, and classification, see the appropriate table:

- Part numbers for CRU and FRU parts in the appliance, see Table 1
- Part numbers for appliances, see Table 2 on page 5
- Part numbers for power cords and cables, see Table 3 on page 5

Part numbers for CRU and FRU parts in the appliance

Part number	Description	Туре
97Y0485	Hard disk drive modules - 300 GB	Tier 1 CRU
46N5587	Hard disk drive modules - 600 GB	Tier 1 CRU
46N5598	Hard disk drive modules - 1 TB	Tier 1 CRU
46N5530	Ethernet module four port 1 gigabit connector	Tier 1 CRU
46N5534	Ethernet module two port 10 gigabit connector (Type 7198)	Tier 1 CRU
97Y0446	Ethernet module eight port 1 gigabit connector	Tier 1 CRU
97Y0444	Ethernet module two port 10 gigabit connector (Type 7199)	Tier 1 CRU
46N5529	Fan module (Type 7198)	Tier 1 CRU
46N5599	Fan module (Type 7199)	Tier 1 CRU
46N5528	Power supply module, 650 watts	Tier 1 CRU
97Y0440	Power supply module, 720 watts	Tier 1 CRU
46N5656	Serial console cable	Tier 1 CRU
46N5592	SFP+ SR transceiver	Tier 1 CRU
46N5593	SFP+ LR transceiver	Tier 1 CRU
60Y0328	Rack-mounting kit	Tier 1 CRU
81Y4451	RAID backup battery	FRU
33F8354	CMOS coin cell battery	FRU
46N5644	Fusion I/O card	FRU
97Y0488	Cryptographic accelerator card (Type 7198)	FRU
97Y0443	Cryptographic accelerator card (Type 7199)	FRU
97Y0487	Hardware Security Module (HSM) card (Type 7198)	FRU
97Y0442	HSM card (Type 7199)	FRU
97Y0447	RAID controller	FRU

Table 1. Part numbers for CRU and FRU parts in the appliance

Part numbers for appliances

Table 2. Part numbers for appliances

Part number	Description	Туре
97Y1005	2426-32X (formerly 7198-32X) - Service Gateway XG45	FRU
97Y1008	2426-33X (formerly 7198-32X) - Service Gateway XG45 with HSM	FRU
97Y0434	7198-8CX - Cast Iron XH40	FRU
97Y0436	7198-8FX - Cast Iron XH40 Enterprise	FRU
97Y0993	2426-42X (formerly 7199-42X) - Integration Appliance XI52	FRU
97Y0996	2426-43X (formerly 7199-42X) - Integration Appliance XI52 with HSM	FRU
97Y0999	2426-62X (formerly 7199-62X) - B2B Appliance XB62	FRU
97Y1002	2426-63X (formerly 7199-62X) - B2B Appliance XB62 with HSM	FRU
97Y0420	7199-72X - Workload Deployer	FRU
97Y0417	7199-92X - XC10	FRU

Part numbers for power cords and cables

Table 3. Part numbers for power cords and cables

Part number	Description	Туре
39M5068	Argentina - 2.8m, 10A/250V, C13 to IRAM 2073	Tier 1 CRU
39M5102	Australia / New Zealand - 2.8m, 10A/250V, C13 to AS/NZ 3112	Tier 1 CRU
39M5233	Brazil - 2.8m, 10A/125V, C13 to IEC 320	Tier 1 CRU
39M5165	Chile - 2.8m, 220 - 240V	Tier 1 CRU
39M5206	China - 2.8m, 10A/250V, C13 to gigabit 2099.1	Tier 1 CRU
39M5130	Denmark - 2.8m, 10A/250V, C13 to DK2-5a	Tier 1 CRU
39M5123	Europe - 2.8m, 10A/250V, C13 to IEC 309 Type 2P+Gnd	Tier 1 CRU
39M5179	Europe - 2.8m, 10A/250V, C13 to IEC 320 Inline	Tier 1 CRU
39M5226	India - 2.8m, 10A/250V, C13 (2P +Gnd)	Tier 1 CRU
39M5172	Israel - 2.8m, 10A/250V, C13 to SI 32	Tier 1 CRU
39M5165	Italy - 2.8m, 220 - 240V	Tier 1 CRU
39M5199	Japan - 2.8m, 12A/100V, C13 to JIS C-8303	Tier 1 CRU
39M5219	Korea - 2.8m, 12A/250V, C13 to KETI	Tier 1 CRU
39M5144	South Africa - 2.8m, 10A/250V, C13 to SABS 164	Tier 1 CRU
39M5158	Switzerland - 2.8m, 10A/250V, C13 to SEV 1011-S24507	Tier 1 CRU
39M5247	Taiwan - 2.8m, 10A/125V, C13 to CNS 10917-3	Tier 1 CRU
39M5151	United Kingdom - 2.8m, 10A/250V, C13 to BS 1363/A	Tier 1 CRU
39M5081	United States - 2.8m, 10A/250V, C13 to NEMA 6-15P	Tier 1 CRU
39M5377	United States - 2.8m, 10A/100-250V, C13 to IEC 320-C14 Rack Power Cable	Tier 1 CRU

Tools needed

To replace FRU parts, you will need the tools that Table 4 contains.

Table 4. Tools needed for replacing FRU p	oarts
---	-------

Screwdrivers	Batteries	Expansion card	RAID controller	Appliance
#0 Phillips	No	No	Yes	No
#1 Phillips	Yes	Yes	Yes	No
Metric 2 mm hex	Yes	Yes	Yes	No

You will use the #0 Phillips screwdriver for screws that connect the battery controller card to the RAID controller

You will use the #1 Phillips screwdriver for all other screws on components inside the appliance

You will use the metric 2 mm hex screwdriver for the screws that secure the cover of the appliance.

Chapter 2. Diagnostic tools

Depending on the model, there are different diagnostic tools available on the appliance.

Diagnostics for DataPower appliances

Depending on which shell you are in, there are the following diagnostic tools available on 32X, 33X, 42X, 43X, 62X, and 63X appliances:

- In the serial console shell after a diagnostics boot, you can use the stand-alone hardware diagnostics tool.
- In the shell after a system boot, you can use the test hardware command.

These tools are available on the appliances in Table 5.

Machine type, model type		Description
7198-32X	2426-32X	DataPower Service Gateway XG45
	2426-33X	DataPower Service Gateway XG45 with HSM
7199-42X	2426-42X	DataPower Integration Appliance XI52
	2426-43X	DataPower Integration Appliance XI52 with HSM
7199–62X	2426-62X	DataPower B2B Appliance XB62
	2426-63X	DataPower B2B Appliance XB62 with HSM

Table 5. DataPower appliances machine type, model type

Using the diagnostic self-test

The Type 7198 and 7199 appliances provides a boot-time diagnostic self-test to help you test hardware components.

Note: Only use the diagnostic self-test when directed by IBM Support to help confirm a potential hardware problem with the appliance.

To initialize the diagnostic self-test:

- 1. Connect the serial cable.
- 2. If the appliance is not turned on, press the power button to turn on the appliance. The green power LED will illuminate. You should hear the fans start up.
- 3. When you see DPOS boot press <ESC> within 7 seconds for boot options, press ESC with seven seconds. You should see the DPOS prompt followed by the boot options menu.

4. At the DPOS prompt, enter diagnostics to start the appliance and display the diagnostics main menu.

```
DataPower Hardware Diagnostics Tool Version 1.0

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Main Menu:

1. Inventory n/a

2. BMC/Sensors n/a

3. Network n/a

4. Memory n/a

5. Disks n/a

0. Exit Diagnostics

Select action>
```

5. To select a test to run, enter its number at the Select action prompt.

Note: The diagnostics user interface can differ depending on your firmware release.

After completing a test, the diagnostic self-test produces one of the following results:

- PASS
- FAIL
- SKIP
- RUNNING
- SKIP
- n/a

Testing the hardware from the command line

You can use the Global **test hardware** command to test the hardware from the command line. To use this command:

- You need to be able to establish a connection to the appliance.
- You need to be in Global configuration mode by invoking the **configure terminal** command.

To test the hardware from the configuration, enter the following commands:

```
# configure terminal
(config)# test hardware
```

Depending on the state of the hardware, the command produces output that shows the status of each component:

- success
- warning
- failure

The components are broken down into the following categories:

- Backtrace availability
- Interface diagnostics
- Fan diagnostics
- Cryptographic card diagnostics
- RAID volume diagnostics
- · Sensors diagnostics
- CPU/memory diagnostics

Samples of success statements are as follows:

- [success] Backtrace file does not exist
- [success] Reuwinterface expected 4 interfaces found
- [success] MAC address of interface 'eth10' is 00:11:25:27:bf:e7
- [success] Statistics for interface 'eth10' show no errors
- [success] 6 fans expected 6 fans found
- [success] fan 1 operating within expected range
- [success] Status of the crypto 'standard' is fully operational

Samples of warning statements are as follows:

- [warning] Backtrace file exists.
- [warning] Physical link on interface 'eth10' is down.
- [warning] eth10 has invalid MAC (ff:ff:ff:ff:ff)

Samples of failure statements are as follows:

- [failure] Expected number of interfaces: 4 Found: 1
- [failure] fan 2 operating outside expected range (rpm too low)
- [failure] Status of crypto 'not detected' is unknown.

The output of the test hardware command is part of any generated error report.

Diagnostics for DataPower XC10 and Workload Deployer

Depending on which interface you are in, there are the following diagnostic tools available on 72X and 92X appliances:

- From the user interface, select the sensor-specific status provider.
- From the command line, enter the sensor-specific command.

These tools are available on the appliances in Table 6.

Table 6. XC10 and Workle	ad Deployer appliances	s machine type,	model type
--------------------------	------------------------	-----------------	------------

Machine type, model type	Description
7199-72X	IBM Workload Deployer
7199–92X	DataPower XC10

Viewing status providers for sensors

The DataPower appliance provides the following sensors status providers:

Fan speed sensors

Provides the measured speed in revolutions per minute (RPM) for each of the fans in each fan module.

From the command line, enter status fan.

Temperature sensors

Provides the measured temperature for internal components:

- Temperature of each of the two internal CPU components
- Temperature of each of the two internal inlet air temperatures
- Temperature of each of the two outlet air temperatures
- System ambient temperature

From the user interface, click **Appliance** → **Troubleshooting** → **Hardware Temperatures**.

From the command line, enter status temperature.

Voltage sensors

Provides the measured voltage for the internal components.

From the command line, enter status voltage.

RAID battery backup status

Monitors the battery backup unit on the RAID controller.

From the command line, enter status raidphystatus.

Intrusion status

Provides truth values for the intrusion switch.

From the command line, enter status intrusion.

Battery status

Provides information on the batteries.

From the command line, enter status battery.

Chapter 3. Common tasks

Controlling power

DANGER

When working on or around the system, observe the following precautions:

Electrical voltage and current from power, telephone, and communication cables are hazardous. To avoid a shock hazard:

- Connect power to this unit only with the IBM provided power cord. Do not use the IBM provided power cord for any other product.
- Do not open or service any power supply assembly.
- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- The product might be equipped with multiple power cords. To remove all hazardous voltages, disconnect all power cords.
- Connect all power cords to a properly wired and grounded electrical outlet. Ensure that the outlet supplies proper voltage and phase rotation according to the system rating plate.
- Connect any equipment that will be attached to this product to properly wired outlets.
- When possible, use one hand only to connect or disconnect signal cables.
- Never turn on any equipment when there is evidence of fire, water, or structural damage.
- Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.
- Connect and disconnect cables as described in the following procedures when installing, moving, or opening covers on this product or attached devices.

To disconnect:

- 1. Turn off everything (unless instructed otherwise).
- 2. Remove the power cords from the outlets.
- **3.** Remove the cables from the connectors.
- 4. Remove all cables from the devices.

To connect:

- 1. Turn off everything (unless instructed otherwise).
- **2.** Attach all cables to the devices.
- **3.** Attach the cables to the connectors.
- 4. Attach the power cords to the outlets.
- 5. Turn on the devices.
- Sharp edges, corners, and joints may be present in and around the system. Use care when handling equipment to avoid cuts, scrapes, and pinching.

(D005)

Turning off the appliance

To turn off the appliance:

- 1. Optional for DataPower appliances (see Table 5 on page 7): To persist the running configuration:
 - a. Log on to the command line as an administrator.
 - b. Enter the **write memory** command.
- 2. Turn off the appliance by performing a graceful shutdown. To start a graceful shutdown, press the power button on the front of the chassis. Because the appliance does not provide feedback of a graceful shutdown, wait until the power LED is no longer illuminated.
- 3. Verify that the power LED is not illuminated.
- 4. Unplug all power cords.

Turning on the appliance

To turn on the appliance:

- 1. If you unplugged the power cords, plug in all power cords to an AC power source.
- 2. Press the power button on the front of the chassis.
- 3. Verify that the power LED is illuminated.

Managing intrusion detection

The intrusion switch is enabled by default. Depending on the model type, the customer can configure the appliance to ignore the intrusion detection.

Intrusion detection on DataPower appliances

If intrusion detection is enabled and the appliance detects an intrusion during normal operation, the appliance will:

- Go into Fail-Safe mode if the intrusion is during startup. An administrator can reset the intrusion detection with the **clear intrusion-detected** command.
- Display a warning message on the WebGUI and on a newly connected session to the appliance. If the intrusion is during normal operation, an administrator can clear the setting with the **clear intrusion-detected** command.

Disabling intrusion detection

To prevent going into Fail Safe mode during maintenance, the customer can disable intrusion detection, if enabled, before the IBM service representative opens the chassis. If intrusion detection is enabled and customer does not disable it:

- The appliance boots in Fail Safe mode.
- The IBM service representative must work with the customer to clear intrusion detection and reboot the appliance. The IBM service representative cannot log in to the appliance.

To disable intrusion detection, the customer needs to log in to the appliance as an administrator and enter the following commands:

```
# configure terminal
Global configuration mode
(config)# system
Modify System Settings configuration
(config system)# detect-intrusion disable
```

Enabling intrusion detection

If the customer enabled intrusion detection and did not disable it before the IBM service representative opens the chassis, the appliance boots in Fail Safe mode. The

IBM service representative must work with the customer to clear intrusion detection and reboot the appliance. The IBM service representative cannot log in to the appliance.

To clear intrusion detection, the customer needs to log in to the appliance as an administrator and enter the following commands:

```
(fail-safe)# clear intrusion-detected
Resetting chassis intrusion flag(s)
(fail-safe)# shutdown reboot
```

After the IBM service representative performs maintenance and the customer disabled intrusion detection, the customer needs to re-enable intrusion detection. To re-enable, the customer needs to log in to the appliance as an administrator and enter the following commands:

configure terminal Global configuration mode (config)# system Modify System Settings configuration (config system)# detect-intrusion enable

Intrusion detection on the DataPower XC10 and Workload Deployer appliances

If intrusion detection is enabled and the appliance detects an intrusion during normal operation, the appliance will:

- Go into Fail-Safe mode if the intrusion is during startup.
- Display a warning message on the user interface and on a newly connected session to the appliance.

You can check the status of the intrusion switch with the **status intrusion** command.

DataPower XC10

If the intrusion is during normal operation, an administrator can clear the setting with the **device clear-intrusion** command.

Workload Deployer

If an intrusion is detected, the appliance does not start and must be returned to IBM for remanufacturing.

Removing and replacing the cover

Depending on the machine type, there is a different number of hex screws that secure the cover to the appliance.

- Type 7198 appliances have 4 hex screws: 2 at the rear, and 2 at the front.
- Type 7199 appliances have 2 hex screws: 2 at the rear.

You need to remove and replace all the hex screws.

Removing the cover

You do not need to remove the appliance from the rack to replace FRU parts inside the appliance.

To remove the cover:

1. If the appliance is not turned off, see "Turning off the appliance" on page 11.

- 2. Press the blue locking levers on either side of the appliance, and slide the appliance forward until the rails are in the fully extended position.
- **3**. With a metric 2 mm hex-head screwdriver, remove the hex screws that secure the top metal cover of the appliance. See Figure 5.



Figure 5. Hex screws on the cover

4. Slide the cover toward the back of the appliance, and lift it off. See Figure 6.



Figure 6. Lift the cover

5. Set the cover aside.

Replacing the cover

To replace the cover:

- 1. Place the cover on the appliance.
- 2. Slide the cover toward the front of the appliance into position.
- **3**. Secure the cover with hex screws.
- 4. Slide the appliance back into the rack.

Returning parts

To return an appliance or component:

- 1. Pack carefully using the packaging materials from the replacement part.
- 2. Return the part to IBM.

Chapter 4. Removing and replacing CRU parts

Replacement of Tier 1 CRU parts is your responsibility. If an IBM representative installs a Tier 1 CRU part at your request, you will be charged for the installation.

Use the following hardware maintenance procedures to remove and replace a CRU part when directed by IBM Support:

- "Replacing a fan module" on page 16
- "Replacing a power supply module" on page 18
- "Replacing a hard disk drive module" on page 20
- "Replacing an Ethernet module" on page 23
- "Removing an SFP transceiver" on page 26

Replacing a fan module

DANGER

When working on or around the system, observe the following precautions:

Electrical voltage and current from power, telephone, and communication cables are hazardous. To avoid a shock hazard:

- Connect power to this unit only with the IBM provided power cord. Do not use the IBM provided power cord for any other product.
- Do not open or service any power supply assembly.
- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- The product might be equipped with multiple power cords. To remove all hazardous voltages, disconnect all power cords.
- Connect all power cords to a properly wired and grounded electrical outlet. Ensure that the outlet supplies proper voltage and phase rotation according to the system rating plate.
- Connect any equipment that will be attached to this product to properly wired outlets.
- When possible, use one hand only to connect or disconnect signal cables.
- Never turn on any equipment when there is evidence of fire, water, or structural damage.
- Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.
- Connect and disconnect cables as described in the following procedures when installing, moving, or opening covers on this product or attached devices.

To disconnect:

- 1. Turn off everything (unless instructed otherwise).
- **2.** Remove the power cords from the outlets.
- **3.** Remove the cables from the connectors.
- 4. Remove all cables from the devices.

To connect:

- 1. Turn off everything (unless instructed otherwise).
- 2. Attach all cables to the devices.
- **3.** Attach the cables to the connectors.
- 4. Attach the power cords to the outlets.
- 5. Turn on the devices.
- Sharp edges, corners, and joints may be present in and around the system. Use care when handling equipment to avoid cuts, scrapes, and pinching.

(D005)

You might need to turn off the appliance and replace a fan module when directed by IBM Support if the following situation occurs:

- After the appliance generates a critical message that indicates a fan failure. The message identifies which fan module to replace.
- When the LED on one of the fan modules and the fault LED are illuminated.

Best Practice: Turn off the appliance as soon as possible to avoid overheating. The remaining fans might not be able to maintain the appropriate environmental temperature.

To replace a failed fan module:

- 1. If the appliance is not turned off, perform a graceful shutdown by pressing the power button on the front of the chassis. Because the appliance does not provide feedback of a graceful shutdown, wait until the power LED is no longer illuminated.
- 2. Unplug all power cords.
- **3**. Unscrew the thumbscrews on the fan module.
- 4. Remove the fan module, as illustrated in Figure 7 (Type 7198) or Figure 8 (Type 7199).



Figure 7. Removing a Type 7198 fan module



Figure 8. Removing a Type 7199 fan module

Attention: Ensure that the gold connectors at the rear of the module do not come into contact with your hands or with the packing material as you unpack the replacement module. Avoid damaging the gold connectors against the chassis as you insert the replacement module.

- 5. Unpack the replacement module.
- 6. Carefully align the replacement module, and insert until flush with the chassis.
- 7. Secure the thumbscrews on the fan module.
- 8. Plug in all power cords.
- 9. Turn on the appliance by pressing the power button.

After replacing the fan module, confirm that the new module is working by verifying that neither of the following LEDs are illuminated:

- The LED for the fan module is not illuminated.
- The fault LED is not illuminated.

After verifying that the replacement module is working, return the part to IBM. For details, see "Returning parts" on page 14.

Replacing a power supply module

There are two hot-swap power supplies in the rear of the appliance. You need to replace a power supply module when directed by IBM Support if the following situation occurs:

- After the appliance generates a critical or warning message that indicates a power supply failure. The message identifies which power supply module to replace.
- When the LED on one of the power supply modules is red and blinking three times per second and the fault LED is illuminated.

Best Practice: Replace a failed power supply module as soon as possible.

To replace a power supply module:

- 1. Unplug the power cord of the failed module.
- 2. Remove the power supply module.
 - a. Firmly grip the handle A of the failed module while pressing the orange release latch B toward the handle, and hold the release latch in this position, as shown in Figure 9 (Type 7198) or Figure 10 on page 19 (Type 7199).



Figure 9. Removing a Type 7198 power supply module



Figure 10. Removing a Type 7199 power supply module

b. Pull the failed module from the back of the appliance.

3. When fully removed from the back of the appliance, set aside the failed module.

Attention: Ensure that the gold connectors at the rear of the module do not come into contact with your hands or with the packing material as you unpack the replacement module. Avoid damaging the gold connectors against the chassis as you insert the replacement module.

- 4. Unpack the replacement module.
- 5. Replace the module.
 - a. Carefully align the replacement module with the space in the chassis.
 - b. Insert the module until flush with the chassis.
 - c. Pull the handle to ensure that the module is secure.
- 6. Plug in the power cord to the replaced module.

After replacing the module, verify that the new module is working:

- The power supply LED is illuminated in green.
- The fault LED is not illuminated.

After verifying that the replacement module is working, return the part to IBM. For details, see "Returning parts" on page 14.

Replacing a hard disk drive module

DANGER

When working on or around the system, observe the following precautions:

Electrical voltage and current from power, telephone, and communication cables are hazardous. To avoid a shock hazard:

- Connect power to this unit only with the IBM provided power cord. Do not use the IBM provided power cord for any other product.
- Do not open or service any power supply assembly.
- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- The product might be equipped with multiple power cords. To remove all hazardous voltages, disconnect all power cords.
- Connect all power cords to a properly wired and grounded electrical outlet. Ensure that the outlet supplies proper voltage and phase rotation according to the system rating plate.
- Connect any equipment that will be attached to this product to properly wired outlets.
- When possible, use one hand only to connect or disconnect signal cables.
- Never turn on any equipment when there is evidence of fire, water, or structural damage.
- Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.
- Connect and disconnect cables as described in the following procedures when installing, moving, or opening covers on this product or attached devices.

To disconnect:

- 1. Turn off everything (unless instructed otherwise).
- **2.** Remove the power cords from the outlets.
- **3.** Remove the cables from the connectors.
- 4. Remove all cables from the devices.

To connect:

- 1. Turn off everything (unless instructed otherwise).
- 2. Attach all cables to the devices.
- **3.** Attach the cables to the connectors.
- **4.** Attach the power cords to the outlets.
- 5. Turn on the devices.
- Sharp edges, corners, and joints may be present in and around the system. Use care when handling equipment to avoid cuts, scrapes, and pinching.

(D005)

You need to replace a hard disk drive module when the hard disk state is Unconfigured Bad or if directed by IBM Support. You must turn off the appliance before replacing the hard disk drive module.

Figure 11 on page 21 illustrate the LEDs and controls on the hard disk drive module.



Figure 11. Controls and LEDs on the hard disk drive module

- A Release button. Press to open the lever to remove the module.
- **B** Locking control. To unlock, move left. To lock, move right.
- C Activity LED
- **D** Fault LED. Nonfunctional on Type 7198 appliances.

To replace the hard disk drive module:

- 1. If the appliance is not turned off, perform a graceful shutdown by pressing the power button on the front of the chassis. Because the appliance does not provide feedback of a graceful shutdown, wait until the power LED is no longer illuminated.
- 2. Move the locking control to the left to unlock.
- **3**. Press the blue button and the lever pops open. Figure 12 illustrates the following steps.



Figure 12. Removing a hard disk drive module

- a. Pull the lever toward you to pull out the hard disk drive module.
- b. Pull the failed module out of the chassis.
- 4. Set aside the failed module.

Attention: Ensure that the gold connectors at the rear of the module do not come into contact with your hands or with the packing material as you unpack the replacement module. Avoid damaging the gold connectors against the chassis as you insert the replacement module.

- 5. Unpack the replacement module.
- 6. Carefully align the module, and insert into the chassis.

- 7. Push the lever forward until you hear the release latch click in place.
- 8. Move the locking control to the right to lock.
- **9**. Turn on the appliance by pressing the power button located on the front of the chassis.
- 10. Verify that the power LED is illuminated.

After replacing the module, you can verify that the new module is working if:

- For the Type 7199, the amber LED on the hard disk drive module is not illuminated.
- The fault LED light on the front of the chassis is not illuminated.

After verifying that the replacement module is working, return the part to IBM. For details, see "Returning parts" on page 14.
Replacing an Ethernet module

DANGER

When working on or around the system, observe the following precautions:

Electrical voltage and current from power, telephone, and communication cables are hazardous. To avoid a shock hazard:

- Connect power to this unit only with the IBM provided power cord. Do not use the IBM provided power cord for any other product.
- Do not open or service any power supply assembly.
- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- The product might be equipped with multiple power cords. To remove all hazardous voltages, disconnect all power cords.
- Connect all power cords to a properly wired and grounded electrical outlet. Ensure that the outlet supplies proper voltage and phase rotation according to the system rating plate.
- Connect any equipment that will be attached to this product to properly wired outlets.
- When possible, use one hand only to connect or disconnect signal cables.
- Never turn on any equipment when there is evidence of fire, water, or structural damage.
- Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.
- Connect and disconnect cables as described in the following procedures when installing, moving, or opening covers on this product or attached devices.

To disconnect:

- 1. Turn off everything (unless instructed otherwise).
- 2. Remove the power cords from the outlets.
- **3.** Remove the cables from the connectors.
- 4. Remove all cables from the devices.

To connect:

- 1. Turn off everything (unless instructed otherwise).
- 2. Attach all cables to the devices.
- **3.** Attach the cables to the connectors.
- 4. Attach the power cords to the outlets.
- **5.** Turn on the devices.
- Sharp edges, corners, and joints may be present in and around the system. Use care when handling equipment to avoid cuts, scrapes, and pinching.

(D005)

You can replace an Ethernet module if you have a problem with your module or if directed by IBM Support if the following situation occurs:

- You are unable to connect to the network even though the cable is plugged in.
- If the output from the **test hardware** command includes Expected number of interfaces: x found y.
- When you use listing, all the Ethernet ports in the module are not included in the list:

For DataPower appliances (see Table 5 on page 7):

- From the **show interface** command.
- From the WebGUI, click STATUS → IP Network → Ethernet Interfaces.
- For WebSphere DataPower XC10 Appliance and IBM Workload Deployer:
- From the **netif status** command.
- From the user interface, click **Appliance** → **Settings** → **Ethernet Interfaces**.

You must turn off the appliance before replacing the Ethernet module.

To replace an Ethernet module:

- If the appliance is not turned off, perform a graceful shutdown by pressing the power button on the front of the chassis. Because the appliance does not provide feedback of a graceful shutdown, wait until the power LED is no longer illuminated.
- Unplug all power cords.
- Grasp the blue latch and pull outward.
- Pull the lever toward you to pull out the Ethernet modules, as shown in Figure 13.



Figure 13. Removing an Ethernet module

• Set aside the Ethernet module.

Attention: Ensure that the gold connectors at the rear of the module do not come into contact with your hands or with the packing material as you unpack the replacement module. Avoid damaging the gold connectors against the chassis as you insert the replacement module.

- Unpack the replacement module.
- Carefully align the module, and insert into the appliance.
- Push the Ethernet module forward until the module is in place.
- Push the blue latch back in place
- Plug in all power cords.
- Turn on the appliance by pressing the power button located on the front of the appliance.
- Verify that the power LED is illuminated.

After replacing the module, you can verify that the new module is working if:

- You are able to connect to the network after you plug in the cable and the link status LED is illuminated.
- The fault LED light is not illuminated.

If you are replacing a failed Ethernet module, verify that the replacement module is working and return the failed part to IBM. See "Returning parts" on page 14 for details on returning parts to IBM.

Removing an SFP transceiver

DANGER

When working on or around the system, observe the following precautions:

Electrical voltage and current from power, telephone, and communication cables are hazardous. To avoid a shock hazard:

- Connect power to this unit only with the IBM provided power cord. Do not use the IBM provided power cord for any other product.
- Do not open or service any power supply assembly.
- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- The product might be equipped with multiple power cords. To remove all hazardous voltages, disconnect all power cords.
- Connect all power cords to a properly wired and grounded electrical outlet. Ensure that the outlet supplies proper voltage and phase rotation according to the system rating plate.
- Connect any equipment that will be attached to this product to properly wired outlets.
- When possible, use one hand only to connect or disconnect signal cables.
- Never turn on any equipment when there is evidence of fire, water, or structural damage.
- Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.
- Connect and disconnect cables as described in the following procedures when installing, moving, or opening covers on this product or attached devices.

To disconnect:

- 1. Turn off everything (unless instructed otherwise).
- **2.** Remove the power cords from the outlets.
- **3.** Remove the cables from the connectors.
- 4. Remove all cables from the devices.

To connect:

- 1. Turn off everything (unless instructed otherwise).
- 2. Attach all cables to the devices.
- **3.** Attach the cables to the connectors.
- 4. Attach the power cords to the outlets.
- 5. Turn on the devices.
- Sharp edges, corners, and joints may be present in and around the system. Use care when handling equipment to avoid cuts, scrapes, and pinching.

(D005)

To remove the 10 Gb SFP transceiver:

- If the appliance is not turned off, perform a graceful shutdown by pressing the power button on the front of the chassis. Because the appliance does not provide feedback of a graceful shutdown, wait until the power LED is no longer illuminated.
- Unplug all power cords.

- Pull downward on the blue latch on the front of the transceiver, as shown in Figure 14.
- Pull the transceiver out by pulling forward the blue latch.



Figure 14. Removing the SFP transceiver

Chapter 5. Replacing FRU parts

Replacement for FRU parts is the responsibility of an IBM representative. Use the following hardware maintenance procedures to replace a FRU part:

- "Replacing batteries"
- "Replacing expansion cards" on page 31
- "Replacing the RAID controller and battery" on page 41

Replacing batteries

Batteries must be replaced by a trained service technician. Replacement requires two FRU parts:

- CMOS coin cell battery
- RAID backup battery

Before starting, you need the following parts and tools:

- RAID backup battery: FRU part 81Y4451
- CMOS coin cell battery: FRU part 33F8354
- Metric 2 mm hex-head screwdriver

High-level procedure

Before performing maintenance, the *customer* might want to disable intrusion detection. For details, see "Disabling intrusion detection" on page 12.

To remove and replace the FRU batteries, the *IBM service representative* needs to perform the following tasks:

- 1. "Turning off the appliance" on page 11
- 2. "Removing the cover" on page 13
- 3. "Replacing the CMOS coin cell battery"
- 4. "Replacing the RAID backup battery" on page 30
- 5. "Replacing the cover" on page 14
- 6. "Turning on the appliance" on page 12
- 7. "Returning parts" on page 14

After performing maintenance and if the customer disabled intrusion detection, the *customer* needs to re-enable intrusion detection. For details, see "Enabling intrusion detection" on page 12.

Replacing the CMOS coin cell battery

To replace the CMOS coin cell battery:

1. Locate the CMOS coin cell battery. See Figure 15 on page 30.



Figure 15. Location of the coin cell battery

2. Using your finger, press on the tab holding the coin battery to release it. See Figure 16.



Figure 16. Coin battery tab release

- 3. Set the used battery aside.
- 4. Unpack the replacement CMOS coin cell battery.
- 5. Align the battery underneath the tab with the "+" side up.
- 6. Press down to make sure the battery is properly seated.

Next, replace the RAID backup battery.

Replacing the RAID backup battery

CAUTION:

The battery contains lithium. To avoid possible explosion, do not burn or charge the battery.

- Do not throw or immerse into water.
- Do not heat to more than 100° C (212° F).
- Do not repair or disassemble.

Exchange only with the IBM-approved part. Recycle or discard the battery as instructed by local regulations. In the United States, IBM has a process for the collection of this battery. For information, call 1-800-426-4333. Have the IBM part number for the battery unit available when you call. (C003)

To replace the RAID backup battery, see "Replacing the RAID controller or the RAID backup battery" on page 41.

Replacing expansion cards

Expansion cards must be replaced by a trained service technician. Before starting, you need the following parts and tools:

- The card to replace:
 - Cryptographic accelerator card (Type 7198) FRU part 97Y0488
 - Cryptographic accelerator card (Type 7199) FRU part 97Y0443
 - HSM card (Type 7198) FRU part 97Y0487
 - HSM card (Type 7199) FRU part 97Y0442
 - Fusion I/O card (Type 7199 only) FRU part 46N5644
- · Phillips head screwdriver
- Metric 2 mm hex-head screwdriver

The faceplates for the cards differ. You can tell which card the appliance contains from the faceplates. See Figure 17 for sample graphics.

Standard



HSM



Fusion I/O



Figure 17. Types of faceplates

- If the appliance contains no card or contains the cryptographic accelerator card, the faceplate has only ventilation holes.
- If the appliance contains the HSM card, the faceplate has a USB connector and ventilation holes.
- If the appliance contains the Fusion I/O card, the faceplate has LEDs and ventilation holes.

Note: The illustrations in the procedures show the cryptographic accelerator card. The procedure is the same, independent of card.

High-level procedure

Before performing maintenance, the *customer* might want to disable intrusion detection. For details, see "Disabling intrusion detection" on page 12.

To remove and replace a FRU expansion card, the *IBM service representative* needs to perform the following tasks:

- 1. "Turning off the appliance" on page 11
- 2. "Removing the cover" on page 13
- 3. Replace the expansion card. The procedure differs by machine type.
 - "Replacing an expansion card on Type 7198 appliances"
 - "Replacing an expansion card on Type 7199 appliances" on page 34
- 4. "Replacing the cover" on page 14
- 5. "Turning on the appliance" on page 12
- 6. "Returning parts" on page 14

After performing maintenance and if the customer disabled intrusion detection, the *customer* needs to re-enable intrusion detection. For details, see "Enabling intrusion detection" on page 12.

For appliances with the cryptographic accelerator or HSM card, the *customer* can use the **show crypto-engine** command to validate its status.

Replacing an expansion card on Type 7198 appliances

The expansion card is connected to a faceplate. See Figure 17 on page 31 to determine which expansion card the appliance currently contains. To locate, the expansion card, see Figure 18. The photograph is from the front of the appliance and shows a cryptographic accelerator card.



Figure 18. Location of expansion card

To remove and replace a FRU expansion card on Type 7198 appliances:

1. Remove the 3 screws that secure the black faceplate of the expansion card assembly to the front of the chassis, and set aside. See Figure 19 on page 33.



Figure 19. Location of screws for the faceplate

2. Loosen the 3 captive screws that secure the expansion card assembly in the chassis. See Figure 20.



Figure 20. Location of captive screws

- **3**. Remove the assembly.
 - a. Firmly grasp the faceplate and the back of the riser. See Figure 21 on page 34.



Figure 21. Location of grip the assembly to remove

b. Lift up.

- 4. Replace the expansion card.
 - a. Carefully grasp the card, and pull it out of the slot in the riser.
 - b. Set the used card aside.
 - c. Unpack the replacement card.
 - d. Position the card in the slot.
 - e. Gently press until the card is seated firmly in the riser.
- 5. Replace the assembly in the chassis.
- 6. Tighten the 3 captive screws.
- 7. Replace the 3 faceplate screws.

Replacing an expansion card on Type 7199 appliances

To remove and replace a FRU expansion card on Type 7199 appliances:

- 1. "Removing the card cage"
- 2. "Removing the cage cover" on page 37
- 3. "Replacing the card" on page 40
- 4. "Reassembling the cage" on page 40

Removing the card cage

To replace the expansion card, first take the card cage out of the appliance. There are 5 Phillips screws and 2 thumb screws.

1. Locate the card cage. See Figure 22 on page 35.



Figure 22. Location of the card cage

2. With a Phillips screwdriver, remove the screw holding the right slide rail ear. See Figure 23.



Figure 23. Screw that secures the slide rail ear

3. Remove the screw that is exposed now that the right slide rail ear is removed. See Figure 24 on page 36.



Figure 24. Screw that secures the card cage to the right side of the chassis

4. Unscrew to release the 2 screws at the back of the cage. See Figure 25.



Figure 25. Screws that secure the card cage to the bottom of the chassis

5. Remove the single top screw securing the card cage to the hard disk drive module. See Figure 26.



Figure 26. Screw that secures the card cage to the hard disk drive module

6. Loosen the 2 thumb screws on the handles. See Figure 27 on page 37.



Figure 27. Thumb screws

7. Holding the handles, pull the cage straight up to lift it out. See Figure 28.



Figure 28. The card cage

Removing the cage cover

The expansion card is in the card cage. To replace it, remove the cover from the cage. There are 7 Phillips screws that secure the cover.

- 2 screws secure the card bracket to the cage
- 5 screws secure the cage cover
 - 1 screw on black faceplate
 - 3 screws along top edge of the cage cover opposite the cage handles
 - 1 screw at the back of the cage cover

To remove the cage cover:

1. Identify which slot holds the expansion card inside the cage. See Figure 29 on page 38.



Figure 29. Inside the card cage

2. Remove the 2 screws from the top and bottom of the card bracket. See Figure 30.



Figure 30. Card bracket screws

3. Remove 1 screw that secures the cage cover to the black faceplate. See Figure 31 on page 39.



Figure 31. Cage cover front screw

4. Remove 3 screws along the top edge of the cage cover opposite the cage handles. See Figure 32.



Figure 32. Cage cover top screws

5. Remove 1 screw from the back of the cage cover. See Figure 33 on page 40.



Figure 33. Cage cover back screw

6. Lift off the cover of the card cage. See Figure 34.



Figure 34. Card cage cover

Replacing the card

Replace the expansion card.

- 1. Carefully grasp the card by the corners and pull it out of the slot.
- 2. Set the used card aside.
- 3. Unpack the replacement card.
- 4. Grasp the card by the corners and position it in the slot.
- 5. Gently press until the card is firmly seated.

Reassembling the cage

Reassemble the card cage.

- 1. Place the cage cover on the cage.
- 2. Secure the cover to the cage with 5 screws.
 - a. Secure 1 screw at the back of the cage cover.
 - b. Secure the 3 screws at the top edge of the cage cover opposite the cage handles.
 - c. Secure 1 screw that holds the cage cover to the black faceplate.
- 3. Secure the card front bracket with 2 screws.

- 4. Holding the cage handles, lower the card cage into the chassis.
- **5**. Secure the 2 thumb screws and the 5 Phillips screws to hold the card cage in the chassis.
 - a. Tighten the 2 thumb screws on the handles.
 - b. Secure the screw holding the card cage to the hard disk drive module.
 - c. Secure the 2 screws at the back of the cage.
 - d. Secure the screw under the right slide rail ear.
 - e. Replace the right slide rail ear and secure the screw holding it.

Replacing the RAID controller and battery

The RAID controller must be replaced by a trained service technician. The RAID controller FRU contains the following parts:

- RAID controller card
- RAID Battery Backup Unit (BBU), which includes the battery controller card and the backup battery

Before starting, you need the following parts and tools:

- RAID controller FRU part number 97Y0447
- #0 Phillips screwdriver
- #1 Phillips screwdriver
- · Metric 2 mm hex-head screwdriver

High-level procedure

Before performing maintenance, the *customer* might want to disable intrusion detection. For details, see "Disabling intrusion detection" on page 12.

To remove and replace the RAID controller FRU, the *IBM service representative* needs to perform the following tasks:

- 1. "Turning off the appliance" on page 11
- 2. "Removing the cover" on page 13
- 3. "Replacing the RAID controller or the RAID backup battery"
- 4. "Replacing the cover" on page 14
- 5. "Turning on the appliance" on page 12
- 6. "Returning parts" on page 14

After performing maintenance and if the customer disabled intrusion detection, the *customer* needs to re-enable intrusion detection. For details, see "Enabling intrusion detection" on page 12.

Replacing the RAID controller or the RAID backup battery

To remove the RAID controller and backup battery:

1. Locate the RAID controller. See Figure 35 on page 42.



Figure 35. Location of the RAID controller

2. Push down the silver latch on the SAS cable connector, carefully pull the cable free, and move it out of the way. There are two connectors on the RAID controller. Generally, the cable is attached to the connector that is closer to the RAID backup battery (beside the heat sink). However, pay attention to the connector to which the cable is attached. See Figure 36.



Figure 36. RAID internal SAS cable

3. With the #1 Phillips screwdriver, remove the 2 screws securing the RAID controller, and set the screws aside. See Figure 37 on page 43.



Figure 37. RAID controller screws

- 4. Carefully grasp the controller by the corners and pull it out of the slot.
- 5. With a #0 Phillips screwdriver, remove the 3 screws that secure the battery controller card to the RAID BBU.
- 6. Set the controller and BBU aside.

To assemble the RAID controller and the RAID BBU:

- 1. Unpack the replacement RAID controller.
- 2. With a #1 Phillips screwdriver, remove the 2 screws that attach the card bracket to the RAID controller. The card bracket is not used.
- 3. Place the RAID controller on an antistatic surface.
- 4. Unpack the RAID BBU.
- 5. Align the 3 pegs of the RAID BBU with the holes in the RAID controller.
- 6. Press down gently but firmly to seat the connector.
- 7. Turn the assembled controller over.
- 8. With a #0 Phillips screwdriver, secure the battery controller card to the RAID BBU with the 3 provided screws.

To replace the RAID controller:

- 1. Grasp the controller by the corners and position it in the slot.
- 2. Gently press until the controller is firmly seated.
- 3. Replace the 2 screws to secure the controller.
- 4. Carefully connect the SAS cable to the connector on the controller. Use the connector from which you removed the cable in step 2 on page 42. Generally, the cable is attached to the connector that is closer to the RAID backup battery (beside the heat sink). See Figure 38 on page 44.



Figure 38. RAID internal SAS cable

Chapter 6. Replacing an appliance

The appliance FRU includes a Type 7198 and 7199 appliance of the correct model type. The appliance FRU must be replaced by a trained service technician. Before starting, you need:

- A Type 7198 and 7199 appliance FRU part of the correct model type:
 - For 2426-32X (formerly 7198-32X), part 97Y1005
 - For 2426-33X (formerly 7198-32X), part 97Y1008
 - For 7198-8CX, part 97Y0434
 - For 7198-8FX, part 97Y0436
 - For 2426-42X (formerly 7199-42X), part 97Y0993
 - For 2426-43X (formerly 7199-42X), part 97Y0996
 - For 2426-62X (formerly 7199-62X), part 97Y0999
 - For 2426-63X (formerly 7199-62X), part 97Y1002
 - For 7199-72X, part 97Y0420
 - For 7199-92X, part 97Y0417
- #1 Phillips screwdriver
- A cleared work area to place the appliances
- The original serial number and current firmware level of the defective appliance

High-level procedure

The appliance replacement involves removing the defective appliance from the rack, moving components from the defective to the replacement appliance, installing the replacement appliance in the rack, and the installing and initializing the replacement appliance. Some of these tasks need to be preformed by the customer before or after the IBM service representative replaces the appliance.

Before replacing an appliance, the *customer* needs to perform the following task:

- 1. If customers want to restore the appliance configuration, they must have a good backup.
 - For a standard backup with supporting cryptographic materials and local user credentials, see the administrative information about backing up the appliance configuration in the information center.
 - For a secure backup, if the defective appliance was enabled for disaster recovery, see the administrative information about creating a secure backup in the information center.

To replace the appliance, the *IBM service representative* needs to perform the following tasks:

- 1. "Turning off the appliance" on page 11
- 2. "Removing the defective appliance from the rack" on page 46
- 3. For appliance with an HSM card: "Moving the HSM card" on page 47
- 4. Optional: "Moving the hard disk drive modules" on page 48
- 5. "Applying the repair identification tag" on page 48
- 6. "Installing the appliance on the slide rails" on page 49
- 7. "Validating the replacement appliance" on page 50

8. "Returning parts" on page 14

After replacing an appliance, the *customer* needs to perform the following tasks:

- 1. Initialize the appliance by accepting the license agreement and change the password for the admin account. For the IBM service representative to perform validation, the customer does not need to run the Installation Wizard. The customer will restore the full appliance configuration later. In other words, during the initialization process, the customer should answer n to the Do you want to run the Installation Wizard? prompt. For detailed information, see the information about setting up the initial firmware configuration in the *Type 7198 and 7199: Installation and User's Guide*.
- 2. If customers have a good backup and want to restore the appliance configuration. These procedures are in the DataPower information center. To access the information center specific to your appliance and firmware level, go to:

http://www.ibm.com/software/integration/datapower/library/ documentation

- For a standard backup with supporting cryptographic materials and local user credentials, import the exported configuration file. For information, see the administrative topic "Importing Configuration Data" in the information center.
- For a secure backup, if the defective appliance was enabled for disaster recovery, see the administrative topic "Restoring from a Secure Backup" in the information center.
- **3**. Set the entitlement serial number on the replacement appliance. For detailed information, see the topic "Updating the serial number after a replacement" in the DataPower information center.

Removing the defective appliance from the rack

CAUTION:

Type 7198: This part or unit is heavy but has a weight smaller than 18 kg (39.7 lb). Use care when lifting, removing, or installing this part or unit. (C008)

CAUTION:

Type 7199: The weight of this part or unit is between 18 and 32 kg (39.7 and 70.5 lb.). It takes two persons to safely lift this part or unit. (C009)



To remove the appliance from the rack, complete the following steps:

Note: Make sure two people lift the appliance, with hands positioned as illustrated by **2** in Figure 39 on page 47.

Unlatch and rotate the front of the appliance, as shown in Figure 39 on page 47.
 a. Disconnect the cables from the rear of the appliance.

b. Pull the locking levers 1 forward, then with two people supporting the front and the rear of the appliance 2, lift the front of the appliance up slightly 3 to clear the nailhead from the slot.



Figure 39. Unlatching and rotating the front of the appliance

- 2. Lift the appliance off of the slide rails, as shown in Figure 40.
 - a. After the front nailheads clear the latches, lift up on the rear **1** of the appliance to level the appliance.
 - b. Lift the server out of the rack **2** and place it on a sturdy surface.
 - c. Slide the rail back in the rack.



Figure 40. Lifting the appliance off the slide rails

Moving the HSM card

A replacement appliance does not contain the HSM card. During the replacement procedure, you must move the HSM card from the defective appliance to the replacement appliance. The following appliance can contain an HSM card:

- 7198-32X
- 7199-42X
- 7199-62X

• 7199-8EX

You can look at the faceplate to know whether the defective appliance contains an HSM card. See Figure 17 on page 31 for sample graphics.

If the defective appliance contains an HSM, move the HSM card to the replacement appliance. The procedure to move an HSM card is the same as replacing an expansion card. For details, see "Replacing expansion cards" on page 31.

Moving the hard disk drive modules

If the customer want to retain the data on the RAID volume, you must move the hard disk drive modules from the defective appliance to the replacement appliance.

The following high-level steps move the hard disk drive module from the existing appliance to the new appliance:

- 1. Remove the hard disk drive module from the defective appliance and set it aside.
- 2. Remove the hard disk drive module from the replacement appliance.
- **3**. Install the hard disk drive module from the defective appliance in the replacement appliance.
- 4. Install the hard disk drive module from the replacement appliance in the defective appliance for return to IBM.

For instructions about removing and replacing these modules, see "Replacing a hard disk drive module" on page 20.

Applying the repair identification tag

When you receive a replacement appliance, the box contains a repair identification (RID) tag. The RID tag is important for transferring the serial number of the defective appliance to the replacement appliance. The RID tag maintains the original serial number record of the appliance and allows IBM to entitle the appliance for future maintenance or warranty service. Replacement exchange requires the completion and securing of the RID tag to the replacement appliance.

When replacing your appliance:

- 1. Locate the defective appliance. The serial number of the defective appliance should match the serial number that you reported to IBM. The serial number is located:
 - On the front panel of the appliance in the upper-left corner beside the LCD display
 - On the bottom panel of the appliance close to the rear
- 2. With a ballpoint pen, transcribe the machine type, model, and serial number of the defective appliance to the RID tag.
- **3**. Secure the RID tag as close as possible, but not covering, the serial number of the replacement appliance. The original serial number of the replacement appliance must be visible.

Figure 41 on page 49 shows an example of the RID tag that is included in the box that contains the replacement appliance.



Figure 41. Example of the RID tag

Installing the appliance on the slide rails

CAUTION:

Type 7199: The weight of this part or unit is between 18 and 32 kg (39.7 and 70.5 lb.). It takes two persons to safely lift this part or unit. (C009)



To install the appliance on the slide rails, complete the following steps as shown in Figure 42 on page 50.

- **1**. Pull the slide rail forward **1**.
- 2. Use two people to carefully lift the appliance 2 and tilt it into position over the slide rails so that the rear nail heads 3 on the appliance line up with the rear slots 4 on the slide rails.
- 3. Slide the appliance down until the rear nail heads slip into the two rear slots, and then slowly lower the front of the appliance 5 until the other nail heads slip into the other slots on the slide rails.

4. Make sure that the front latch **6** slides over the nail heads.



Figure 42. Secure the appliance in the rack

- **5**. If the appliance is locked into place, slide the appliance toward you so that you can attach the brackets with the captive screws.
- 6. Slide the appliance into the rack, as shown in Figure 43.



Figure 43. Slide the appliance into the rack

Validating the replacement appliance

Depending on the model type, there might be additional validation steps beyond the state reported by the fault LED.

Validation on DataPower appliances

After completing the initial firmware configuration on a DataPower appliance, validate the replacement appliance by running the hardware inventory in the diagnostics self-test utility and with the **test hardware** command.

- For information about the diagnostics self-test utility, see "Using the diagnostic self-test" on page 7.
- For information about the **test hardware** command, see "Testing the hardware from the command line" on page 8.

Run a hardware inventory:

- 1. Press the power button to turn on the appliance.
- At the DPOS boot press <ESC> within 7 seconds for boot options prompt, press the ESC key.
- 3. At the DPOS prompt, enter diagnostics.
- 4. At the DataPower Hardware Diagnostics Tool main menu, enter 1 to run the inventory test.
- 5. Confirm that the serial number listed is the serial number of the defective appliance.
- 6. Confirm that all hardware components indicate PASS.
- 7. Enter 0 to exit diagnostics mode.

Reboot the appliance to run the hardware tests from Global configuration mode:

- 1. At the login prompt, enter the ID for an administrator.
- 2. At the password prompt, enter the password for this administrator.
- **3**. At the command prompt, enter Global configuration mode and run the **test hardware** command:

configure terminal
(config)# test hardware

4. Confirm that all components register SUCCESS.

If all hardware components during the inventory text do not indicate PASS or if the all components in the output from the **test hardware** command do not indicate SUCCESS, call the phone number on the work request and ask to speak with the 7199 Recovery Team.

Validation on the WebSphere DataPower XC10 Appliance and IBM Workload Deployer

To validate the replacement appliance, ensure that the fault LED is not amber. When this LED is illuminated, the appliance has detected a critical error condition.

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