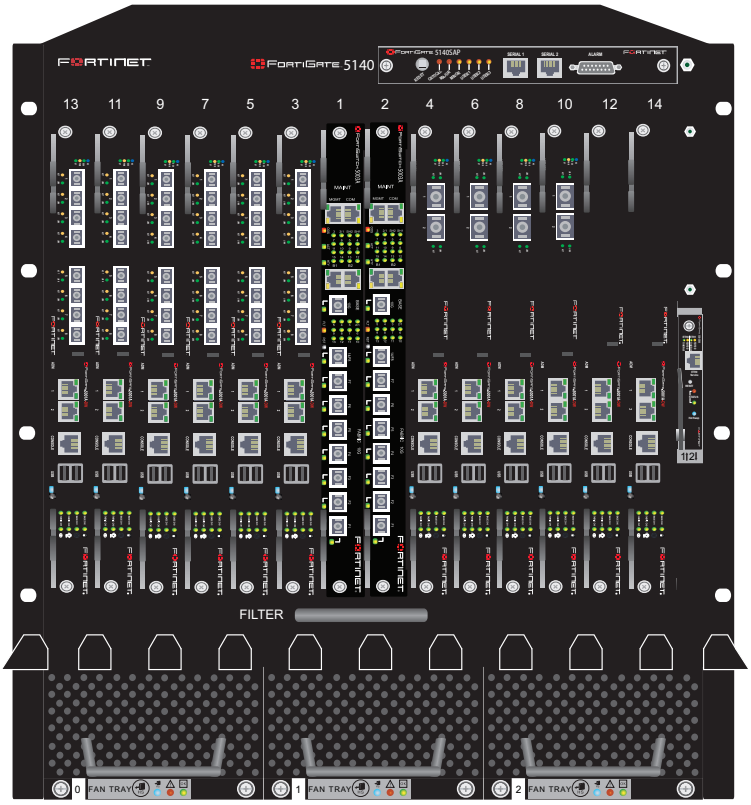
FortiGate-5140-R

Power and cooling enhancements to support the FortiSwitch-5203B

Technical Note



This technical note describes how to change the configuration of the FortiGate-5140-R chassis to support operating FortiSwitch-5203B boards in chassis slots 1 and 2.

The most recent versions of all FortiGate-5000 series documents are available from the FortiGate-5000 page of the Fortinet Technical Documentation web site (http://docs.fortinet.com).

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FortiGate-5140-R Power and cooling enhancements to support the FortiSwitch-5203B

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Warnings and cautions

Only trained and qualified personnel should be allowed to install or maintain FortiGate-5000 series equipment. Read and comply with all warnings, cautions and notices in this document.

- Risk of Explosion if Battery is replaced by an Incorrect Type. Dispose of Used Batteries According to the Instructions.
- Turning off all power switches may not turn off all power to the FortiGate-5000 series equipment. Some circuitry in the FortiGate-5000 series equipment may continue to operate even though all power switches are off.
- FortiGate-5000 equipment must be protected by a readily accessible disconnect device or circuit breaker that can be used for product power down emergencies.
- Many FortiGate-5000 components are hot swappable and can be installed or removed while the power is on. But some of the procedures in this document may require power to be turned off and completely disconnected. Follow all instructions in the procedures in this document that describe disconnecting FortiGate-5000 series equipment from power sources, telecommunications links and networks before installing, or removing FortiGate-5000 series components, or performing other maintenance tasks. Failure to follow the instructions in this document can result in personal injury or equipment damage.
- Install FortiGate-5000 series chassis at the lower positions of a rack to avoid making the rack top-heavy and unstable.
- Do not insert metal objects or tools into open chassis slots.
- Electrostatic discharge (ESD) can damage FortiGate-5000 series equipment. Only perform the procedures described in this document from an ESD workstation. If no such station is available, you can provide some ESD protection by wearing an anti-static wrist strap and attaching it to an available ESD connector such as the ESD sockets provided on FortiGate-5000 series chassis.
- Make sure all FortiGate-5000 series components have reliable grounding. Fortinet recommends direct connections to the building ground.
- If you install a FortiGate-5000 series component in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Make sure the operating ambient temperature does not exceed Fortinet's maximum rated ambient temperature.
- Installing FortiGate-5000 series equipment in a rack should be such that the amount of airflow required for safe operation of the equipment is not compromised.
- FortiGate-5000 series chassis should be installed by a qualified electrician.
- FortiGate-5000 series equipment shall be installed and connected to an electrical supply source in accordance with the applicable codes and regulations for the location in which it is installed. Particular attention shall be paid to use of correct wire type and size to comply with the applicable codes and regulations for the installation / location. Connection of the supply wiring to the terminal block on the equipment may be accomplished using Listed wire compression lugs, for example, Pressure Terminal Connector made by Ideal Industries Inc. or equivalent which is suitable for AWG-10. Particular attention shall be given to use of the appropriate compression tool specified by the compression lug manufacturer, if one is specified.
- This product is only intended for use in a Restricted Access Location.

This document describes how to change the configuration of the FortiGate-5140-R chassis to support FortiSwitch-5203B. board. By default, the FortiGate-5140-R does not provide adequate cooling or power for the FortiSwitch-5203B board. This technical note describes how to:

- Increase cooling by setting the minimum fan level to 8
- Increase the power capacity for chassis slots 1 and 2 to 220 watts

To increase cooling capacity and power capacity

To complete this procedure, you need:

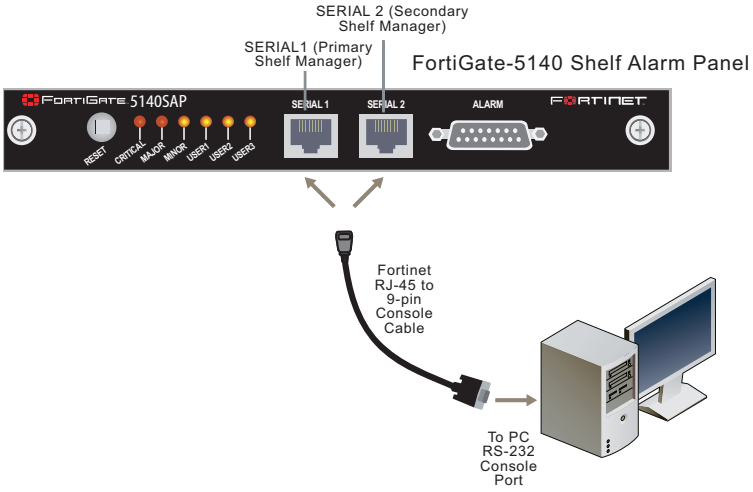
- An electrostatic discharge (ESD) preventive wrist strap with connection cord

FortiGate-5000 series boards and chassis must be protected from static discharge and physical shock. Only handle or work with FortiGate-5000 equipment at a static-free workstation. Always wear a grounded electrostatic discharge (ESD) preventive wrist strap when handling FortiGate-5000 equipment.

1. Attach the ESD wrist strap to your wrist and to an available ESD socket or wrist strap terminal.
2. Connect to the FortiGate-5140-R shelf manager CLI.

   You can connect to the shelf manager CLI by connecting the console cable supplied with your chassis to a management PC console port and to the appropriate shelf alarm panel serial port. To connect to the primary shelf manager use Serial 1. To connect to the secondary shelf manager use Serial 2.

Figure 1: Connecting to a shelf manager serial port



3. Connect the console cable supplied with your chassis to your PC or other device RS-232 console port.
4. Start a terminal emulation program (for example, HyperTerminal) on the management computer. Use these settings:

Baud Rate (bps)	9600
Data bits	8
Parity	None
Stop bits	1
Flow Control	None

5 Press enter to connect to the CLI.

6 At the `login` prompt enter the shelf manager user name and password.

7 Use the following command to start the vi editor and edit the shelf manager configuration file and change mini-fan level to 8.

```
# vi /etc/shelfman.conf.ACB-IV
```

The contents of the shelfman.conf file are displayed. Note that the `MIN_FAN_LEVEL` is 3:

```
FAN_LEVEL_STEP_DOWN = 1

NORMAL_STABLE_TIME = 1800

IPMB_LINK_ISOLATION_TIMEOUT = 60

INITIAL_FAN_LEVEL = 8

MIN_FAN_LEVEL = 3

REDUNDANCY_NET_ADAPTER = "usb0"
```

8 Enter `I` to edit, move cursor and change `MIN_FAN_LEVEL=3` to `MIN_FAN_LEVEL=8`.

9 Press `Esc`.

10 Enter `:w` to save.

11 Enter `:q` to quit.

12 Enter the following commands to change the power setting of slot1 and slot2

```
clia shelf pwrcapability 41 0xfe 220
clia shelf pwrcapability 42 0xfe 220
```

13 Power cycle the chassis to make sure the changes take effect.

Verifying the changes

1 When the chassis has started back up enter the following command to check the minimum fan level:

```
# clia minfanlevel

Pigeon Point Shelf Manager Command Line Interpreter

Minimal Fan Level is 8
Dynamic Minimum Fan Level is 8
```

2 Enter the following command to check the power setting for each chassis slot:

```
# clia shelf -v pm
```

The following command output shows slots 1 and 2 supplying 220 Watts of power and all other slots supplying 200 Watts.

```
Pigeon Point Shelf Manager Command Line Interpreter

    PICMG Shelf Activation And Power Management Record (ID=0x12)
        Version = 1
    Allowance for FRU Activation Readiness: 20 seconds
    FRU Activation and Power Description Count: 17
    Hw Address: 41 (82), FRU ID: 0xfe, Maximum FRU Power
   Capabilities: 220 Watts
        Shelf Manager Controlled Activation: Enabled
        Shelf Manager Controlled Deactivation: Enabled
        Delay Before Next Power On: 0.0 seconds
        Currently Assigned Power: 150.0 Watts

    Hw Address: 42 (84), FRU ID: 0xfe, Maximum FRU Power
   Capabilities: 220 Watts
        Shelf Manager Controlled Activation: Enabled
        Shelf Manager Controlled Deactivation: Enabled
        Delay Before Next Power On: 0.0 seconds
        Currently Assigned Power: 150.0 Watts

    Hw Address: 43 (86), FRU ID: 0xfe, Maximum FRU Power
   Capabilities: 200 Watts
        Shelf Manager Controlled Activation: Enabled
        Shelf Manager Controlled Deactivation: Enabled
        Delay Before Next Power On: 0.0 seconds
        Currently Assigned Power: 0.0 Watts

    Hw Address: 44 (88), FRU ID: 0xfe, Maximum FRU Power
   Capabilities: 200 Watts
        Shelf Manager Controlled Activation: Enabled
        Shelf Manager Controlled Deactivation: Enabled
        Delay Before Next Power On: 0.0 seconds
        Currently Assigned Power: 0.0 Watts

    Hw Address: 45 (8a), FRU ID: 0xfe, Maximum FRU Power
   Capabilities: 200 Watts
        Shelf Manager Controlled Activation: Enabled
        Shelf Manager Controlled Deactivation: Enabled
        Delay Before Next Power On: 0.0 seconds
        Currently Assigned Power: 0.0 Watts

    Hw Address: 46 (8c), FRU ID: 0xfe, Maximum FRU Power
   Capabilities: 200 Watts
        Shelf Manager Controlled Activation: Enabled
        Shelf Manager Controlled Deactivation: Enabled
        Delay Before Next Power On: 0.0 seconds
        Currently Assigned Power: 0.0 Watts
```

```
 Hw Address: 47 (8e), FRU ID: 0xfe, Maximum FRU Power
Capabilities: 200 Watts
     Shelf Manager Controlled Activation: Enabled
     Shelf Manager Controlled Deactivation: Enabled
     Delay Before Next Power On: 0.0 seconds
     Currently Assigned Power: 0.0 Watts

 Hw Address: 48 (90), FRU ID: 0xfe, Maximum FRU Power
Capabilities: 200 Watts
     Shelf Manager Controlled Activation: Enabled
     Shelf Manager Controlled Deactivation: Enabled
     Delay Before Next Power On: 0.0 seconds
     Currently Assigned Power: 0.0 Watts

 Hw Address: 49 (92), FRU ID: 0xfe, Maximum FRU Power
Capabilities: 200 Watts
     Shelf Manager Controlled Activation: Enabled
     Shelf Manager Controlled Deactivation: Enabled
     Delay Before Next Power On: 0.0 seconds
     Currently Assigned Power: 0.0 Watts

 Hw Address: 4a (94), FRU ID: 0xfe, Maximum FRU Power
Capabilities: 200 Watts
     Shelf Manager Controlled Activation: Enabled
     Shelf Manager Controlled Deactivation: Enabled
     Delay Before Next Power On: 0.0 seconds
     Currently Assigned Power: 0.0 Watts

 Hw Address: 4b (96), FRU ID: 0xfe, Maximum FRU Power
Capabilities: 200 Watts
     Shelf Manager Controlled Activation: Enabled
     Shelf Manager Controlled Deactivation: Enabled
     Delay Before Next Power On: 0.0 seconds
     Currently Assigned Power: 0.0 Watts

 Hw Address: 4c (98), FRU ID: 0xfe, Maximum FRU Power
Capabilities: 200 Watts
     Shelf Manager Controlled Activation: Enabled
     Shelf Manager Controlled Deactivation: Enabled
     Delay Before Next Power On: 0.0 seconds
     Currently Assigned Power: 0.0 Watts

 Hw Address: 4d (9a), FRU ID: 0xfe, Maximum FRU Power
Capabilities: 200 Watts
     Shelf Manager Controlled Activation: Enabled
     Shelf Manager Controlled Deactivation: Enabled
     Delay Before Next Power On: 0.0 seconds
     Currently Assigned Power: 0.0 Watts

 Hw Address: 4e (9c), FRU ID: 0xfe, Maximum FRU Power
Capabilities: 200 Watts
     Shelf Manager Controlled Activation: Enabled
     Shelf Manager Controlled Deactivation: Enabled
     Delay Before Next Power On: 0.0 seconds
```

```
     Currently Assigned Power: 0.0 Watts

 Hw Address: 08 (10), FRU ID: 0xfe, Maximum FRU Power
Capabilities: 24 Watts
     Shelf Manager Controlled Activation: Enabled
     Shelf Manager Controlled Deactivation: Enabled
     Delay Before Next Power On: 0.0 seconds
     Currently Assigned Power: 20.0 Watts

 Hw Address: 09 (12), FRU ID: 0xfe, Maximum FRU Power
Capabilities: 24 Watts
     Shelf Manager Controlled Activation: Enabled
     Shelf Manager Controlled Deactivation: Enabled
     Delay Before Next Power On: 0.0 seconds
     Currently Assigned Power: 0.0 Watts

 Hw Address: 10 (20), FRU ID: 0xfe, Maximum FRU Power
Capabilities: 400 Watts
     Shelf Manager Controlled Activation: Enabled
     Shelf Manager Controlled Deactivation: Enabled
     Delay Before Next Power On: 0.0 seconds
     Currently Assigned Power: 357.0 Watts
```

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