

FortiGate-RTM-XD2

System Guide



A detailed guide to the FortiGate-RTM-XD2 System. This *FortiGate-RTM-XD2 System Guide* describes FortiGate-RTM-XD2 hardware features and how to install the FortiGate-RTM-XD2 module in a FortiGate-5000 series chassis.

The most recent versions of this and all FortiGate-5000 series documents are available from the [FortiGate-5000](http://docs.forticare.com) page of the [Fortinet Technical Documentation](http://docs.forticare.com) web site (<http://docs.forticare.com>).

Visit <http://support.fortinet.com> to register your FortiGate-RTM-XD2 system. By registering you can receive product updates, technical support, and FortiGuard services.



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.



CAUTION: Risk of Explosion if Battery is replaced by an Incorrect Type. Dispose of Used Batteries According to the Instructions.



Caution: You should be aware of the following cautions and warnings before installing FortiGate-5000 series hardware

- 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.
- 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.

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FortiGate-RTM-XD2 system

The FortiGate-RTM-XD2 system provides two 10-gigabit fabric backplane interfaces and NP4 processor acceleration for FortiGate-5001A boards installed in an ATCA chassis. The FortiGate-RTM-XD2 installs into the FortiGate-5001A and FortiGate-5003A blades via the Zone 3 interface.

The FortiGate-RTM-XD2 is an ATCA rear transition module (RTM) that installs into an RTM slot at the back of a ACTA chassis. You must install one FortiGate-RTM-XD2 module for each FortiGate-5001A board. Each chassis front panel slot has a corresponding RTM slot. The FortiGate-RTM-XD2 module must be installed in the RTM slot that corresponds to the front panel slot in which you will install a FortiGate-5001A board. For example, if the FortiGate-5001A board will be installed in front panel slot 3, install the FortiGate-RTM-XB2 module for this board in RTM slot 3.



Caution: To avoid damaging components, you should install the FortiGate-RTM-XD2 module first before you install the corresponding FortiGate-5001A board. If you have already installed the FortiGate-5001A board, you should remove it before installing the FortiGate-RTM-XD2 module. Except for this limitation, FortiGate-RTM-XD2 modules are hot swappable.

The FortiGate-RTM-XD2 NP4 processor provides hardware accelerated network processing for eligible traffic passing through the FortiGate-RTM-XD2 interfaces. Each FortiGate-RTM-XD2 interface is connected to an NP4 processor and the NP4 processors are connected by an Enhanced Extension Interface (EEI). The FortiGate-RTM-XD2 can accelerate eligible traffic that enters and exits the same FortiGate-RTM-XD2 interface or that enters one FortiGate-RTM-XD2 interface and exits the other.

Figure 1: FortiGate-RTM-XD2 front panel



The FortiGate-RTM-XD2 module includes the following features:

- Two fabric backplane 10-gigabit interfaces for 10-gigabit data communications across a FortiGate-5000 chassis backplane.
- One NP4 processor connected by an Enhanced Extension Interface (EEI) that provides hardware accelerated network processing.
- Mounting hardware.
- Power LED.



Note: On some versions of the FortiGate-5001A firmware, when a FortiGate-5001A board starts up with a FortiGate-RTM-XD2 module installed, the fabric1 and fabric2 interfaces are replaced with interfaces that are named RTM/1 and RTM/2 to indicate the presence of the FortiGate-RTM-XD2 module. Configuration settings that include the fabric1 and fabric2 interface names will have to be changed to use the RTM/1 and RTM/2 interface names.

Front panel LED

From the FortiGate-RTM-XD2 font panel includes a power LED.

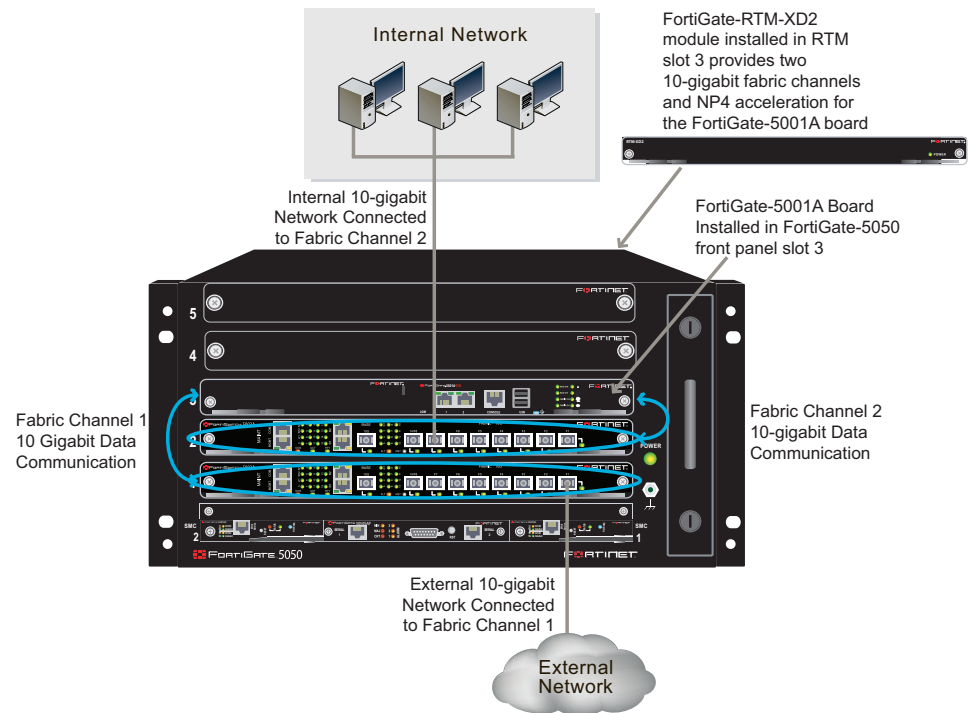
Table 1: FortiGate-RTM-XD2 power LED

LED	State	Description
Power	Green	The FortiGate-RTM-XD2 module is powered on and properly connected to a FortiGate-5001A board.

Fabric backplane 10-gigabit communication

The FortiGate-RTM-XD2 module is used for fabric backplane 10-gigabit data communication. To support fabric backplane communications, your ACTA chassis must include one or more FortiGate-5001A and a FortiGate-5003A via a Zone 3 connector.

Figure 2: Example FortiGate-RTM-XD2 configuration



Hardware installation

Before use, the FortiGate-RTM-XD2 module must be correctly inserted into a rear transition module (RTM) slot in the back of an Advanced Telecommunications Computing Architecture (ACTA) chassis such as the FortiGate-5140 or FortiGate-5050 chassis. FortiGate-RTM-XD2 modules are used to supply two 10-Gigabit fabric backplane interfaces for a FortiGate-5001A board. You must install one FortiGate-RTM-XD2 module for each FortiGate-5001A board.

Each chassis front panel slot has a corresponding RTM slot. The FortiGate-RTM-XD2 module must be installed in the RTM slot that corresponds to the front panel slot in which you will install a FortiGate-5001A board. For example, if the FortiGate-5001A board will be installed in front panel slot 3, install the FortiGate-RTM-XB2 module for this board in RTM slot 3.



Caution: To avoid damaging components, you should install the FortiGate-RTM-XD2 module first before you install the corresponding FortiGate-5001A board. If you have already installed the FortiGate-5001A board, you should remove it before installing the FortiGate-RTM-XD2 module. Except for this limitation, FortiGate-RTM-XD2 modules are hot swappable.



Caution: Only install FortiGate-RTM-XD2 modules with compatible FortiGate-5000 boards such as the FortiGate-5001A board. Installing a FortiGate-RTM-XD2 module with an unsupported board (such as the FortiGate-5005FA2 board) may damage the FortiGate-RTM-XD2 module and the unsupported board.

If your chassis RTM slots are covered by a rear panel cover, you must remove the cover before installing FortiGate-RTM-XD2 modules. After installing the FortiGate-RTM-XD2 modules you must install slot fillers in any open slots. The FortiGate-5050 chassis requires the removal of an internal partition to install RTM modules.



Caution: Do not operate the FortiGate-5000 chassis with open slots on the front panel or RTM panel. For optimum cooling performance and safety, front panel slots must contain a FortiGate-5000 series module or an air baffle slot filler and RTM panel slots must either be covered or must contain a rear transition module or slot filler. If you need additional slot fillers, contact your reseller or Fortinet Customer Support.

This section describes:

- [FortiGate-RTM-XD2 mounting components](#)
- [Inserting a FortiGate-RTM-XD2 module](#)
- [Removing a FortiGate-RTM-XD2 module](#)
- [Troubleshooting](#)

FortiGate-RTM-XD2 mounting components

To install a FortiGate-RTM-XD2 module you slide the module into the required RTM slot in the back of an ATCA chassis and then use the mounting components to lock the module into place in the slot. When locked into place and positioned correctly the module front panel is flush with the chassis back panel.

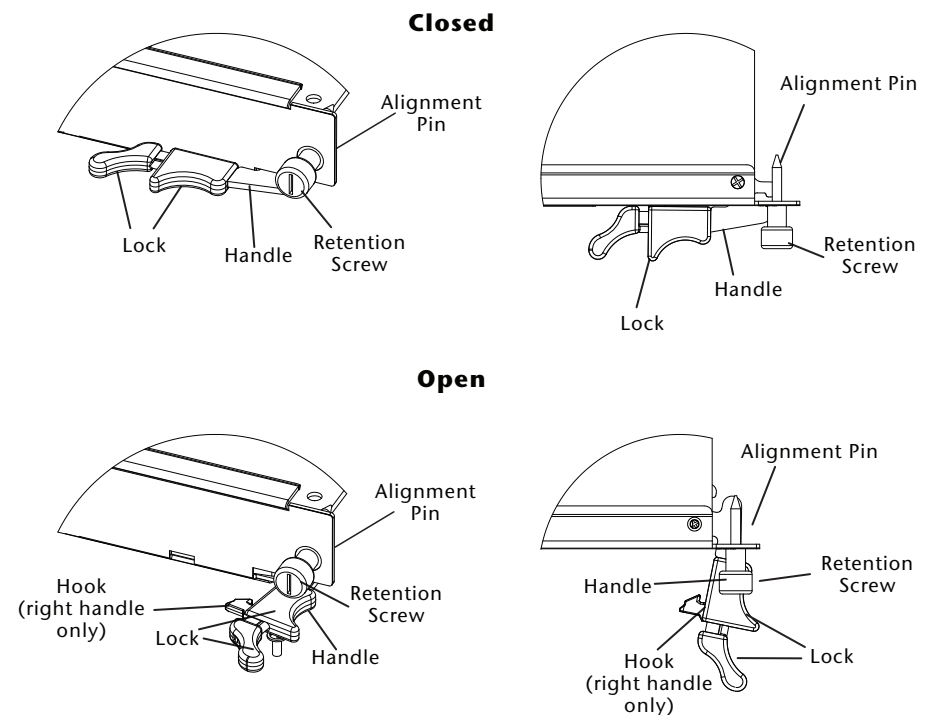


Note: FortiGate-RTM-XD2 modules are horizontal when inserted into a FortiGate-5050 chassis and vertical when inserted into a FortiGate-5140 chassis. The inserting and removing procedures are the same in either case. For clarity the descriptions in this document refer to the left (top) and right (bottom) mounting components.

It is important to carefully seat the FortiGate-RTM-XD2 module all the way into the chassis, to not use too much force on the handles, to make sure that the handles are properly locked, and to tighten the retention screws.

To position the module correctly you must use the mounting components shown in [Figure 3](#) for the right (bottom) side of the FortiGate-RTM-XD2 front panel. The mounting components on the left (top) side of the front panel are the same but reversed. The FortiGate-RTM-XD2 mounting components align the module in the RTM slot and are used to insert and eject the module from the slot.

Figure 3: FortiGate-RTM-XD2 right (bottom) mounting components



Inserting a FortiGate-RTM-XD2 module

The FortiGate-RTM-XD2 module must be fully inserted in an RTM slot, with the handles closed and locked and retention screws fully tightened. Then, you must install a FortiGate-5001A board for the FortiGate-RTM-XD2 module to receive power and operate normally. The FortiGate-RTM-XD2 module gets its power from the corresponding FortiGate-5001A board so the FortiGate-RTM-XD2 will not power up until the FortiGate-5001A board is inserted. If the FortiGate-RTM-XD2 module is not receiving power the power LED remains off.

It is important to carefully seat the FortiGate-RTM-XD2 module all the way into the chassis, to not use too much force on the handles, and to make sure that the handles are properly locked and retention screws fully tightened.

FortiGate-RTM-XD2 modules are hot swappable. The procedure for inserting a FortiGate-RTM-XD2 module in an RTM slot is the same whether or not the chassis is powered on.

To insert a FortiGate-RTM-XD2 module into an RTM slot



Caution: Do not carry the FortiGate-RTM-XD2 module by holding the handles or retention screws. When inserting or removing the FortiGate-RTM-XD2 module, handle the module by the front panel. The handles are not designed for carrying the module. If the handles become bent or damaged the FortiGate-RTM-XD2 module may not align correctly in the RTM slot.

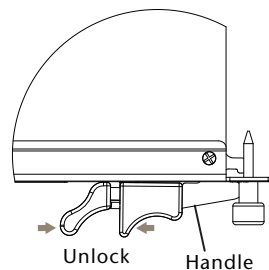
To complete this procedure, you need:

- A FortiGate-RTM-XD2 module
- A FortiGate-5001A board
- An ATCA chassis with an empty RTM slot and corresponding front panel slot
- An electrostatic discharge (ESD) preventive wrist strap with connection cord



Caution: FortiGate-RTM-XD2 modules must be protected from static discharge and physical shock. Only handle or work with FortiGate-RTM-XD2 modules at a static-free workstation. Always wear a grounded electrostatic discharge (ESD) preventive wrist strap when handling FortiGate-RTM-XD2 modules.

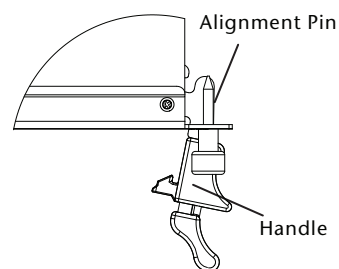
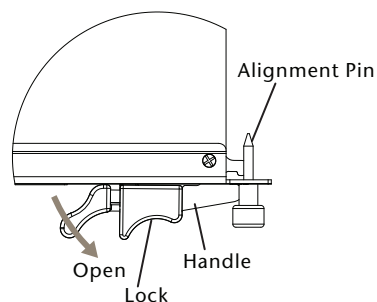
- 1 Attach the ESD wrist strap to your wrist and to an available ESD socket or wrist strap terminal.
- 2 Make sure that the corresponding chassis front panel slot does not contain a board.
- 3 Unlock the handles by squeezing the handle locks.



- 4 Open the handles to their fully open positions.



Caution: To avoid damaging the lock, make sure you squeeze the handles fully to unlock them before opening. The handles should pop easily out of the board front panel.



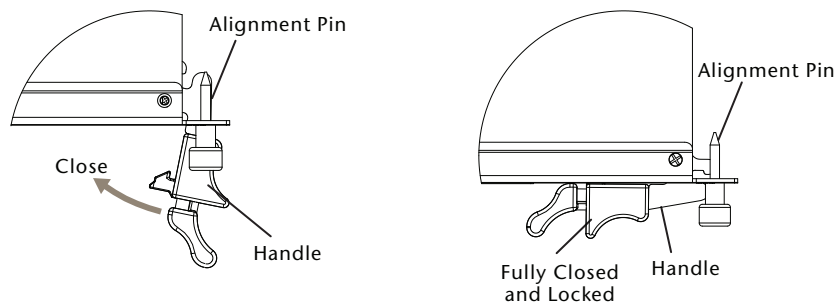
- 5 Insert the FortiGate-RTM-XD2 module into an empty RTM slot in the chassis.
Insert the module by applying moderate force to the front faceplate (not the handles) to slide the module into the slot. The module should glide smoothly into the RTM slot. If you encounter any resistance while sliding the module in, the module could be aligned incorrectly. Pull the module back out and try inserting it again.



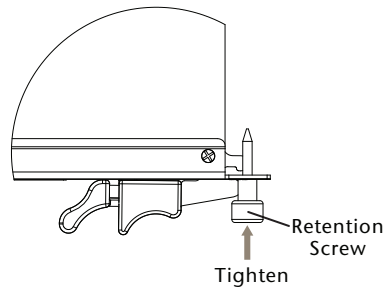
Caution: You will also encounter resistance if a board is still installed in the corresponding front panel slot. Double-check to make sure the front panel slot is empty.

- 6 Slide the module in until the alignment pins are inserted half way into their sockets in the chassis.
- 7 Turn both handles to their fully-closed positions.

The handles should hook into the sides of the chassis slot. Closing the handles draws the FortiGate-RTM-XD2 module into place in the RTM slot and into full contact with the chassis. The FortiGate-RTM-XD2 front panel should be in contact with the chassis back panel. When the handles are fully-closed they lock into place.



- 8 Once the module is inserted correctly, fully tighten the retention screws to lock the FortiGate-RTM-XD2 module into position in the RTM slot.



- 9 Use the correct procedure to insert a FortiGate-5001A board into the corresponding front panel slot.

See the [FortiGate-5001A Security System Guide](#) for instructions.

If the chassis is powered on and the FortiGate-5001A board and FortiGate-RTM-XD2 module are operating correctly, the FortiGate-RTM-XD2 front panel power LED should be on and green.

Removing a FortiGate-RTM-XD2 module

The following procedure describes how to correctly use the FortiGate-RTM-XD2 mounting components described in “[FortiGate-RTM-XD2 mounting components](#)” on page 6 to remove a FortiGate-RTM-XD2 module from an ATCA RTM slot.

To remove a FortiGate-RTM-XD2 module from an RTM slot

FortiGate-RTM-XD2 modules are hot swappable. The procedure for removing a FortiGate-RTM-XD2 module from an RTM slot is the same whether or not the chassis is powered on.



Caution: Do not carry the FortiGate-RTM-XD2 module by holding the handles or retention screws. When inserting or removing the FortiGate-RTM-XD2 module from a chassis slot, handle the module by the front panel. The handles are not designed for carrying the module. If the handles become bent or damaged the FortiGate-RTM-XD2 module may not align correctly in the chassis slot.

To complete this procedure, you need:

- An ATCA chassis with a FortiGate-RTM-XD2 module installed
- An electrostatic discharge (ESD) preventive wrist trap with connection cord



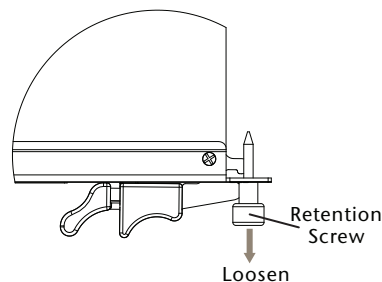
Caution: FortiGate-RTM-XD2 modules must be protected from static discharge and physical shock. Only handle or work with FortiGate-RTM-XD2 modules at a static-free workstation. Always wear a grounded electrostatic discharge (ESD) preventive wrist strap when handling FortiGate-RTM-XD2 modules.

- 1 Attach the ESD wrist strap to your wrist and to an available ESD socket or wrist strap terminal.
- 2 Remove the corresponding FortiGate-5001A board from the chassis front panel slot.

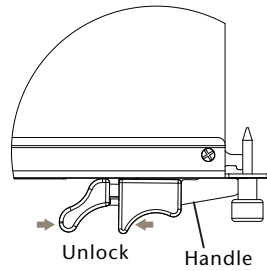
See the [FortiGate-5001A Security System Guide](#) for instructions.

The FortiGate-RTM-XD2 front panel power LED turns off.

- 3 Fully loosen the FortiGate-RTM-XD2 retention screws.



- 4 Unlock the handles by squeezing the handle locks.

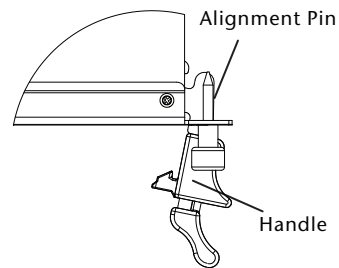
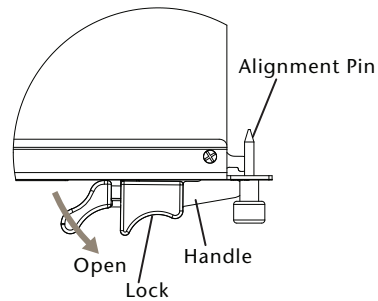


- 5 Open the handles to their fully open positions.



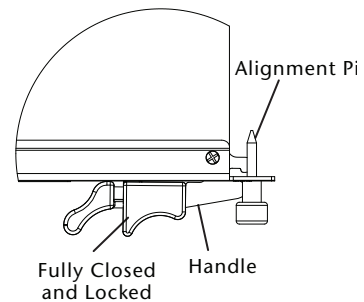
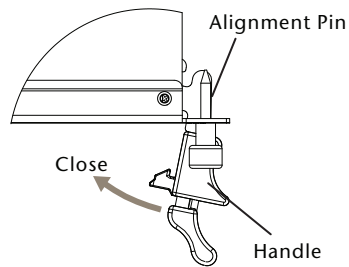
Caution: To avoid damaging the lock, make sure you squeeze the handles fully to unlock them before opening. The handles should pop easily out of the board front panel.

Pivoting the handles ejects the module from the RTM slot. You need to use moderate pressure to eject the board.



- 6 Pull the module out of the slot.
- 7 Turn both handles to their fully-closed positions.

When the handles are fully-closed they lock into place.



Troubleshooting

This section describes the following troubleshooting topics:

- [FortiGate-RTM-XD2 does not start up](#)

FortiGate-RTM-XD2 does not start up

Positioning of FortiGate-RTM-XD2 handles may prevent a FortiGate-RTM-XD2 module for starting up correctly. This section describes how to fix this problem.

All chassis: handles not fully closed

If the handles are damaged or positioned incorrectly the FortiGate-RTM-XD2 module will not start up. Make sure the handle are correctly aligned, fully inserted and locked.

If this does not solve the problem, contact Fortinet Technical Support.

All chassis: FortiGate-5001A board not inserted or not operating properly

The FortiGate-RTM-XD2 receives power from the corresponding FortiGate-5001A board. If the FortiGate-5001A board is not installed or is not operating properly the FortiGate-RTM-XD2 may not receive power. Either insert a FortiGate-5001A board or make sure the FortiGate-5001A board is operating properly. See the [FortiGate-5001A Security System Guide](#).

If this does not solve the problem, contact Fortinet Technical Support.

For more information

Support for your Fortinet product is available as online help from within the web-based manager, from the Tools and Documentation CD included with the product, on the Fortinet Technical Documentation web site, from the Fortinet Knowledge Center web site, as well as from Fortinet Technical Support.

Fortinet documentation

The most up-to-date publications and previous releases of Fortinet product documentation are available from the Fortinet Technical Documentation web site at <http://docs.fortinet.com>. FortiGate-5000 series documentation is located in its own section of the site at <http://docs.fortinet.com/fgt5k.html>.

Tools and Documentation CD

The documentation for your product is available on the Fortinet Tools and Documentation CD shipped with your product. The documents on this CD are current at shipping time. For current versions of Fortinet documentation, visit the Fortinet Technical Documentation web site, <http://docs.fortinet.com>.

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Register your product by visiting <http://support.fortinet.com> and selecting Product Registration.

To register, enter your contact information and the serial numbers of the Fortinet products that you or your organization have purchased. You can register multiple Fortinet products in a single session without re-entering your contact information.

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