Title

Description and operational principles

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To the certification exam

InfiMONITOR NEXT includes the following features:

- Real-time monitoring of the wireless links.
- Automatic network nodes discovery.
- Event creation.

NOTE

The monitoring system system is intended only for monitoring Infinet Wireless devices. Devices from other manufacturers are not supported.

Architecture

InfiMONITOR NEXT monitoring system consists of several subsystems, each performing a specific function:

- Polling subsystem - periodically polls the network nodes to obtain their parameters's values.
- Incident management subsystem - monitors the change in the parameter values provided by the polling subsystem, and creates the events according to a certain set of rules.
- Discovery subsystem - performs automatic detection and addition of the network nodes.
- Device management subsystem - performs automatic detection and addition of the network nodes.
- Web GUI - graphical interface that allows the NEXT operating engineer to manage the monitoring system.
- Storage subsystem - the database.

Polling subsystem

The main **InfiMONITOR NEXT** subsystem periodically polling the network nodes and obtaining their parameters values.

The subsystem is working constantly. It distributes all the necessary polling in order to perform the entire network polling during a 5 minutes interval, so it prevents peak loads on the wireless network:

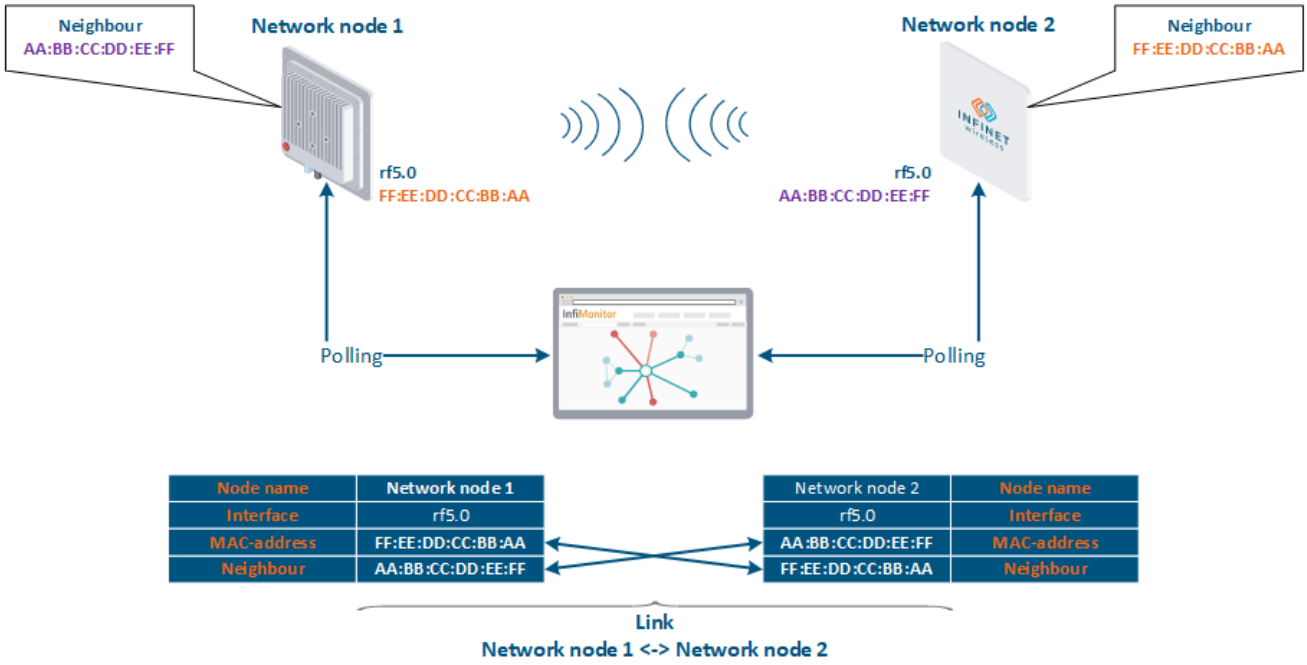
- The time required for sequential polling of all the network nodes is determined based on the number of network nodes. If there are too many devices, a situation may occur when the time available to poll each node is less than the minimum required time. In this case, the network nodes will be grouped, and the survey will be conducted in parallel for all the network nodes of each group.
- Checks if network nodes are ready for the polling. Nodes that have the polling completed in a previous cycle will be polled first. The nodes with incomplete polling in the previous cycle will be polled last.
- If there are network nodes for which the polling began in the previous cycle and did not complete during the current 5 minutes period, then these nodes will be queued for polling in the next cycle.
- All the data received during the polling is placed in the storage subsystem.

Determining the link between devices

After the polling is complete, the monitoring system analyzes data received from the devices in order to determine the link presence between them.

Each device provides information about the neighbor device MAC address. The monitoring system checks the presence of a device with the obtained MAC address among the added devices and, if such a device is found, makes a conclusion that the link was established between these two devices. Thus, the devices lists of neighbors, connected by a link, will contain entries with each other's MAC addresses.

Title



Incident management subsystem

The subsystem is designed to create and manage incidents based on the rules set by **InfiMONITOR NEXT** users.

The incident management subsystem's operation begins after the polling results received through the polling subsystem. This subsystem verifies the match between the rules set and the received values. If the condition specified in a rule is met, an incident is created. The incident management subsystem performs maintenance of each active incident.

Discovery subsystem

The subsystem performs the automatic search and adding of devices. After a device is added manually, the discovery subsystem performs the following:

- Detects any neighboring device of the newly added device that is in the same MINT area and has a connection already established, but has not yet been added to the monitoring system.
- Generates a polling task for neighboring devices.
- The polling subsystem performs an unscheduled polling of the neighboring device. If the specified authentication data is correct, then the neighboring device will be added automatically. If the data does not match, a new request will be generated to the polling subsystem with the authentication data that was specified for other devices previously added to **InfiMONITOR NEXT**. The requests will be repeated until any authentication data matches or it runs out of available authentication data.
- After adding the detected device, a search for neighboring devices will be also carried out. This process ends when neighbors of all the previously added devices have been discovered and polled. The network nodes without authentication data matching will not be added and attempts to add them will carried out in the future.

An important feature of the subsystem is that it performs the search only within a single MINT area. If there are several MINT areas in a wireless network, then at least one device from each area must be added in order to detect the other devices.

Device management subsystem

The subsystem performs the following functions:

1. Provisioning - automatically enables remote access for monitoring system to devices via SSH, that is required for configuration management functions.
2. Configuration update - safely applies configuration changes made by monitoring system users. This function is available only for provisioned devices.
3. Firmware update - uploads and applies the specified firmware version.

Provisioning

One of the key stage in the process of preparing a device for managing its configurations from **InfiMONITOR NEXT**. During provisioning unique SSH requisites will be installed to each device, After that the monitoring system will be able to connect to each provisioned device to perform configuration management operations. Provisioning may be done manually or automatically at the device adding stage.

Provisioning is performed via SSH, but you can enable using of Telnet.

Configuration update

This function is available only for provisioned devices.

The monitoring system applies configuration changes made by users. The main advantage of this feature is protection against logical errors in configuration, that may cause connection loss. If applied changes lead to a loss of connection between device and **InfiMONITOR NEXT**, then the previous configuration version will be restored.

Changing the device configuration includes the following stages:

1. The monitoring system connects to device and uploads the new configuration, but not applies it.
2. The new uploaded configuration is set as prospective, the current is set as main one.
3. The device is being rebooted.
4. The device will be booted with the new configuration and delayed reboot is set. If delayed reboot is done then the device will be rebooted with its previous configuration.
5. The monitoring system compares current device configuration with configuration that should have been applied.
    a. If both of configurations are equal then delayed reboot will be cancelled. New configuration is applied successfully.
    b. If configurations are differ or monitoring system lost connection to wireless device, the delayed reboot timer will trigger and the previous configuration will be restored.

Notification subsystem

The subsystem is designed to send notifications to the users of the monitoring system.

Web GUI

A graphical web interface is used for **InfiMONITOR NEXT** monitoring system management. The Web GUI interacts with all the subsystems.

The Web GUI works properly with the latest versions of the following web browsers:

- Google Chrome;
- Firefox;
- Microsoft Edge;
- Safari.

The recommended minimum screen resolution is 1600×900.

Storage subsystem

The subsystem provides data storage and quick access to the information for the web GUI and subsequently for the engineers operating **InfiMONTOR NEXT**.

Licensing

The license permits using **InfiMONITOR NEXT**. There are three license types, differ in the validity period and the maximum number of devices for which monitoring will be performed. One license may be installed to only the one monitoring system instance.

License type	Device number	Validity period	Description
Free	30	unlimited	Free license for full-featured use of **InfiMONITOR NEXT** for small wireless networks.
Trial	unlimited	1 month	A temporary license for the evaluation use of monitoring system.
Enterprise	defined at ordering	defined at ordering	License for full-featured use of monitoring system for wireless networks of any size.

All added to **InfiMONITOR NEXT** devices are divided into the following categories:

- **Licensed device** - license permits are granted to such devices, so monitoring/management functions will be available. Each licensed device decrease by one the total allowed number of devices, set by the license.
- **Unlicensed device** - a device for which no license permits are granted. Unlicensed devices appears when the number of added devices exceed the total allowed number of devices set by the license.

In fact **InfiMONITOR NEXT** performs monitoring of any devices, whether licensed or unlicensed. However, users are provided with monitoring data and management function only for licensed devices.

If license limitations on device number will be extended unlicensed devices become licensed and monitoring data for the past period will be available.

If the maximum device number permitted by license is less than number of being added devices, licenses will be assigned on each device sequentially until license limitation is reached - the rest will be added as unlicensed.

License management

The license must be installed to use InfiMONITOR NEXT, it may be done at installation stage or in the "System configuration" section. Internet access must be provided to workstation used for license installation.

License management is performing in the licensing center.