



FlexMaster for Release 9.13.1

Release Notes

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Contents

Copyright Notice and Proprietary Information
About This Release
Supported AP and ZoneDirector Platforms
Caveats, Limitations, and Known Issues
Enhancements and Resolved Issues
Upgrading to This Release
Upgrading ZoneDirector and FlexMaster to version 9.13
Interoperability Information

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About This Release

This document provides release information on FlexMaster version 9.13.1, including new features, enhancements, known issues, caveats, workarounds, upgrade details and interoperability information.

NOTE: Beginning with the 9.9.0 release, the ZoneFlex Release Notes (which previously included ZoneDirector, FlexMaster and ZoneFlex access points) are now divided into three separate Release Notes documents. This document covers FlexMaster only. For ZoneDirector and Ruckus Wireless access point release information, please refer to their respective Release Notes documents.

NOTE: By downloading this software and subsequently upgrading FlexMaster and/or Ruckus Wireless controllers to version 9.9.0 or later, and/or Ruckus Wireless APs to base image 100.0.0 or later, please be advised that:

- The ZoneDirector periodically connects to Ruckus and Ruckus collects the ZoneDirector serial number, software version and build number. Ruckus transmits a file back to the ZoneDirector and this is used to display the current status of the ZoneDirector Support Contract.
- The AP may send a query to Ruckus containing the AP's serial number. This allows your AP to autonomously connect with a wireless LAN controller operated by your choice of cloud service provider. Ruckus may transmit the Fully Qualified Domain Name (FQDN) or IP address of the controller that the AP will subsequently attempt to join back to the AP.
- Please be advised that this information may be transferred and stored outside of your country of residence where data protection standards may be different.

Minimum Recommended RAM and CPU

The amount of memory and CPU power required on the FlexMaster server depends on the number of ZoneDirector devices and standalone APs that FlexMaster is to manage, and on the FM system configuration.

Three-Tier Model

Refer to the following table for the minimum recommended RAM and CPU for managing ZoneDirector devices using the FM 3-tier model.

Table 1: Minimum recommended RAM and CPU for the FM 3-tier model

Managed Population	Minimum RAM	Minimum CPU
Up to 500 ZD-managed APs (with up to two UE sessions per hour, NOTE)	8GB	2.0GHz Quad Core Intel® Xeon® E5606 or equivalent

Managed Population	Minimum RAM	Minimum CPU
Up to 10,000 ZoneDirectormanaged APs	48GB	2* 2.5GHz Six Core Intel® Xeon® E5670 or equivalent

NOTE: User Equipment session services provide more accurate client traffic reports. However, if the FlexMaster manager is managing many ZoneDirector controllers, then the FM database may become overloaded with inputs. Enable User Equipment sessions in Administer > System Settings.

Purge Policy

Since release 9.5, FM can store up to 31 days of AP history data. In addition to the recommended RAM listed above, the number of APs that the FlexMaster server can support is determined by the amount of available RAM and the number of days of historical data defined in the Purge Policy setting. Refer to the following table for additional RAM requirements.

Table 2: Minimum RAM and CPU for various Purge Policies

Purge Policy	Max Capacity	Recommended Capacity
2 days	12k APs//120k Clients	10k APs/100k Clients
7 days	10k APs/100k Clients	6k APs/60k Clients
31 days	1.5k APs/15k Clients	1k APs/10k Clients

The capacity decreases when FM is hosted on a VMware Virtual Machine.

Table 3: Sample FM Capacity Decreases on a VMware Virtual Machine

Purge Policy	FM Max Capacity	Recommended Capacity	Hardware Notes (RAM/Disk RPM)
7 days	1k APs + 10k clients + 10M events	600 APs	8G/10000 RPM
	1k APs + 50k clients + 14M events		16G/10000 RPM
	1k APs + 10k clients + 6M events		8G/7200 RPM
	1k APs + 50k clients + 9M events		16G/7200 RPM

Too many SSIDs on the ZDs impacts the FM capacity. So when the FM is fully loaded, Ruckus Wireless recommends that the operator not implement the 64 SSID feature for the ZDs.

Because adding User Equipment sessions (refer to NOTE in Table 1) affects the XML memory in FM, the FM capacity is affected when there are more client sessions with different purge

policies. Ruckus Wireless recommends that customers install 48GB RAM in the FM server, and then observe the maximum and recommended capacity limitations for two-day, seven-day, and 31-day Purge Policies listed in Table 4.

Table 4: Sample FM Capacity Decreases on a VMware Virtual Machine

Purge Policy	FM Max Capacity	Recommended Capacity	Hardware Notes (RAM/Disk RPM)
2 days	12k APs/120k Clients	10k APs/100k Clients	48G/10000 RPM/ 7200RPM
7 days	10k APs/100k Clients	6k APs/60k Clients	48G/10000 RPM/ 7200RPM
31 days	1.5k APs/15k Clients	1k APs/10k Clients	48G/10000 RPM/ 7200RPM

ZD1200 Scaling Capacity without UE Sessions

Table 5: ZD1200 Scaling Capacity (no UE sessions)

Scenario	ZDs	APs for each ZD 1200	Total APs	Clients per AP (concurrent)	Total Clients	Status	Hardware Notes (CPU/RAM/Disk RPM)
1	300	15	4500	30 (100 clients for 1 hour, 2 times every day, and 30 clients on at other times; 10 clients at night)	141000	(300ZDs + 4.5k APs + 141k clients.) Reports can be generated, FM cannot generate Client Association Activity 7days reports on the Dashboard.	2* 2.5G Eight Core (Intel Xeon X5670 equivalent or above) 48G/10000 RPM/ 7200RPM
2	250	15	3750	50	187500	(250 ZDs + 3.75k APs + 187k	2* 2.5G Eight Core (Intel Xeon X5670

Scenario	ZDs	APs for each ZD 1200	Total APs	Clients per AP (concurrent)	Total Clients	Status	Hardware Notes (CPU/RAM/Disk/RPM)
						clients.) All reports can be generated.	equivalent or above) 48G/10000 RPM/7200RPM

Included ZD Firmware Loads

There are no ZD firmware images included with FlexMaster since the 9.5.0.0.11 build. However, the operator can upload any required ZD firmware image in the Configure -> Manage Firmware Files window.

Supported Country Codes

Refer to the Ruckus Wireless Price List for available country certifications.

Supported AP and ZoneDirector Platforms

Supported ZoneDirector Models

This release supports the following ZD models:

- ZD1200
- ZD3000
- ZD5000

Supported Access Point Models

This release supports the following AP models:

- H500
- H510
- R300
- R310
- R500
- R510
- R600
- R610
- R700
- R710
- T300
- T300E
- T301N
- T301S
- T710
- T710S
- P300
- ZF7055
- SC8800-S
- SC8800-S-AC
- T300
- ZF2741
- ZF2942
- ZF7025
- ZF7055
- ZF7321
- ZF7321-U
- ZF7341

- ZF7341-U
- ZF7343
- ZF7343-U
- ZF7351
- ZF7351-U
- ZF7352
- ZF7352-U
- ZF7363
- ZF7363-U
- ZF7372
- ZF7372-E
- ZF7372-U
- ZF7441
- ZF7731
- ZF7761CM
- ZF7762
- ZF7762-AC
- ZF7762-S
- ZF7762-S-AC
- ZF7762-T
- ZF7781-M
- ZF7781CM
- ZF7781CM-E
- ZF7781CM-S
- ZF7781FN
- ZF7781FN-E
- ZF7781FN-S
- ZF7782
- ZF7782-E
- ZF7782-N
- ZF7782-S
- ZF7962
- ZF7982

Caveats, Limitations, and Known Issues

This section lists the caveats, limitations, and known issues for FlexMaster in this release. Please also refer to previous (for example, 9.12.0, 9.10.0) Release Notes documents for previously documented caveats and limitations.

Caveats and Limitations

The original FlexMaster certification expires on March 26th, 2017. After certification expires, the HTTPS connection between ZoneDirector/Solo AP and FlexMaster will be disconnected, and FlexMaster will not be able to receive data from ZoneDirector/Solo AP.

To resolve this issue, Ruckus Wireless introduces a new SSL certification in the FlexMaster 9.13 release, and also introduces a new CA certification for ZoneDirector from release 9.10.2/9.12.2/9.13 and for Solo AP from release 104.0.0.0

- FlexMaster release 9.13 introduces SSL certification (default) for devices. All ZoneDirector devices must be upgraded to release 9.10.2, 9.12.2, or 9.13 to support this certification. In addition, solo APs must be upgraded to version 104.0.0.0.x, or you must change the TR069 URL to HTTP, else the AP will fail to register in FlexMaster through the HTTPS connection.

Enhancements and Resolved Issues

This section lists the enhancements that have been added in this release and resolved issues/bug fixes identified in previous releases.

Enhancements

- Support is extended to the following Solo APs:
 - H510
 - R610
- Tomcat version is upgraded to 7.0.55
- Security improvements relevant to application vulnerability, SSL protocols and encrypting data traffic are included.

Resolved Issues

The following FlexMaster issues are resolved in this release of the product:

- The FlexMaster Administrative page is populated with default access credentials (ZF-15774).
- User credentials entered in the FlexMaster login page are encrypted in order to protect user data (ZF-15775).
- To enhance security and reduce application vulnerability, users are allowed to login to the FlexMaster login page only thrice after which the user is blocked from accessing the page. (ZF-15776).
- The Tomcat server is configured to provide a secure network as it only responds to requests from the TLSv1.2 protocol (ZF-15777).
- FlexMaster security is enhanced to detect and prevent *cross-site scripting* or code changes done at the client side such as the FlexMaster login page thereby hijacking the users screen. This attempt reportedly redirects the user to malicious websites (ZF-15828).
- FlexMaster security is enhanced to detect and prevent *clickjacking* or an attempt by hijackers to create an invisible frame on the web page where users are requested to provide inputs or perform an activity thereby exposing information. The frame busting technique is used to prevent this security threat (ZF-15827).

Upgrading to This Release

This section lists important notes on installing and upgrading FlexMaster, ZoneDirector, and Ruckus Wireless Access Points to this version.

FlexMaster Upgrade

For better upgrade process control, FM is delivered in tar format as a patch since release 9.4. There are new upgrade scripts and patch files in this tarball.

Please refer to following steps as an upgrade example:

1. Upload the patch file (e.g. 9.13.0.0.12-9.13.1.0.9_patch.tar) to the FM server.
2. Copy the patch file (e.g. 9.13.0.0.12-9.13.1.0.9_patch.tar) to the FM folder (for example, /opt/FlexMaster/) using the following command:

```
# cp cp /home/9.13.0.0.12-9.13.1.0.9_patch.tar/opt/FlexMaster/
```

3. Extract the patch file using the following command:

```
# tar -vxf 9.13.0.0.12-9.13.1.0.9_patch.tar
```

4. Upgrade FlexMaster with following command:

NOTE: Before you upgrade, ensure that the *.patch (9.13.1.0.9.patch) file is extracted from the tar file.

```
# ./upgrade.sh 9.13.1.0.9
```

FlexMaster Environment Notes

NOTE: Also refer to Caveats, Limitations, and Known Issues for further information.

FlexMaster requires the following:

- RedHat Enterprise 5.5 (64 bit) or RedHat Enterprise 6.5 (64 bit).
- OR --
- CentOS release 6.3 (64 bit) or CentOS release 6.5 (64 bit).
- Ruckus Wireless recommends that you use the 'Web Server' option during RedHat Enterprise or CentOS installation. Do not use the 'Minimal' option, since that causes FM startup failure (ZF-6874).
- The FM installation requires several MySQL packages that are not included in a Minimal CentOS (or RHEL) install.
 1. When installing or upgrading to 9.13 install.sh or upgrade.sh will check that the following packages are installed on your system:
 - PERL

- UNZIP
- Libiao

If the check is successful, you can install or upgrade FlexMaster 9.13 successfully.

If the check is unsuccessful, you will need to install the Perl, Unzip and/or libiao packages before installing or upgrading FlexMaster 9.13:

- `yum -y install unzip`
- `yum -y install perl`
- `yum -y install libaio`

2. Once the packages are installed, you can install or upgrade FM normally.

Other Notes

- When FM is installed on RedHat or CentOS, FM may have port conflicts with the following. Modify those port numbers as required.
 - DB (3306)
 - apache (80)
 - tomcat (80)
 - or the default port on RedHat or CentOS.
- Because of compatibility issues between MySQL and the ext4 partition (for details, refer to <http://bugs.mysql.com/bug.php?id=46959>), Ruckus Wireless recommends that you install FM with an ext3 partition.
- If the operator has to use an ext4 partition, for better system performance, Ruckus Wireless recommends that you disable the barrier option on the partition where FM is installed. Following is an example of how to disable the barrier option:

```
# umount /opt
# mount -o barrier=0 /dev/sda1 /opt
```

- FM 9.13, introduces MariaDB so operators must install *jemalloc* before they can install/upgrade FM 9.13. Sample steps to install jemalloc:

1. Download jemalloc based on your linux version from [http://pkgs.org/download/libjemalloc.so.1\(\)\(64bit\)](http://pkgs.org/download/libjemalloc.so.1()(64bit))
2. Upload jemalloc to the FM server and install it with command

```
rpm -Uvh jemalloc-3.6.0-1.e16.x86_64.rpm
```

3. Install and upgrade FlexMaster.

For more information about jemalloc, see <http://www.canonware.com/jemalloc/>

Editing the Hosts File

FlexMaster stores some of its configuration settings in a MySQL server database that is installed with the FM software. To make sure that FM can connect to this MySQL database after installation, you need to edit your Linux server's hosts file to include its DNS-related information (ER-1631).

1. Go to the /etc directory, and then open the hosts file.
2. Add the following line to the hosts file:

```
127.0.0.1 hostname hostname.domainname
```

3. Save the hosts file.

NOTE: If you use a full stop (.) in the hostname, then you are not allowed to use only digits after the full stop. If you use a domain in the hosts file, then the domainname is also not allowed to consist of a digit or only digits.

- Valid hostname/hostname.domainname combinations:

```
FlexMaster/FlexMaster.ruckus
FlexMaster.98ABC/FlexMaster.98ABC
FlexMaster.com/FlexMaster.orange
```

- Invalid hostname/hostname.domainname combinations:

```
FlexMaster.98/FlexMaster.98
FlexMaster.126/FlexMaster.126
Localhost.12345/Localhost.12345
```

FlexMaster Upgrade Paths

Official FM 9.13.1.0.9 upgrade paths supported:

- FM 9.13.0.0.12 > FM 9.13.1.0.9

If you are running an earlier version, then you must first upgrade to FM 9.12.2.0.6 or FM 9.10.2.0.1, before upgrading to FM 9.13.1.0.9.

NOTE: The FM manager and ZD controllers are generally updated in the following order:

- Operator upgrades the FM first and then upgrades the ZDs.
- Operator upgrades the FM and ZDs release by release; please refer to Table 6 for details.
- For multi-release upgrades, the operator should align the ZD version with FM first, and then continue with the FM upgrade. For instance, FM/ZD 9.12.0 -> 9.13 upgrade:

1. Step 1, upgrade FM 9.10 -> 9.12
2. Step 2, upgrade ZD 9.10 -> 9.12
3. Step 3, upgrade FM 9.12 -> 9.12.1

4. Step 4, upgrade ZD 9.12 -> 9.12.1
5. Step 3, upgrade FM 9.12.1 -> 9.12.2
6. Step 4, upgrade ZD 9.12.1 -> 9.13

Table 6 contains a comprehensive list of FM upgrade paths and corresponding ZD alignments.

Table 6: FM Upgrade Path and ZD Alignments

FM version	Official FM Upgrade Path	ZD Alignment
FM 9.2	N/A	ZD 9.2
FM 9.3	9.2 -> 9.3	ZD 9.3
FM 9.3.2	9.3 -> 9.3.2	ZD 9.3.2
FM 9.4	9.3 -> 9.4	ZD 9.4
FM 9.5	9.3 -> 9.5	ZD 9.5
	9.3.2 -> 9.5	
	9.4 -> 9.5	
FM 9.5.1	9.5 -> 9.5.1	ZD 9.5.1
FM 9.5.2	9.5.1 -> 9.5.2	ZD 9.5.2
FM 9.6	9.5 -> 9.6	ZD 9.6
	9.5.1 -> 9.6	
FM 9.7	9.6 -> 9.7	ZD 9.7 (or ZD9.5.1)
FM 9.8	9.7 -> 9.8	ZD 9.8
FM 9.8.1	9.8 -> 9.8.1	ZD 9.8.1
		ZD 9.8
FM 9.9	9.8 -> 9.9	ZD 9.9
	9.8.1->9.9	
FM 9.10	9.9 -> 9.10	ZD 9.10
FM 9.12	9.10 -> 9.12	ZD 9.12
FM 9.12.1	9.12 -> 9.12.1	ZD 9.12.1
FM 9.12.2	9.12.1 -> 9.12.2	ZD 9.12.2
FM 9.13	9.10.2 > 9.13	ZD 9.10.2
	9.12.2 > 9.13	ZD 9.12.2
		ZD 9.13

FM version	Official FM Upgrade Path	ZD Alignment
FM 9.13.1	9.13 > 9.13.1	ZD 9.13 ZD 9.13.1 ZD 9.13.2

Upgrading ZoneDirector and FlexMaster to version 9.13

When you upgrade FM or ZD to version 9.13, you must also upgrade Solo APs to 104.0.0.0 and FM or ZD to version 9.10.2 or 9.12.2, and then upgrade to 9.13.

Follow these steps to upgrade:

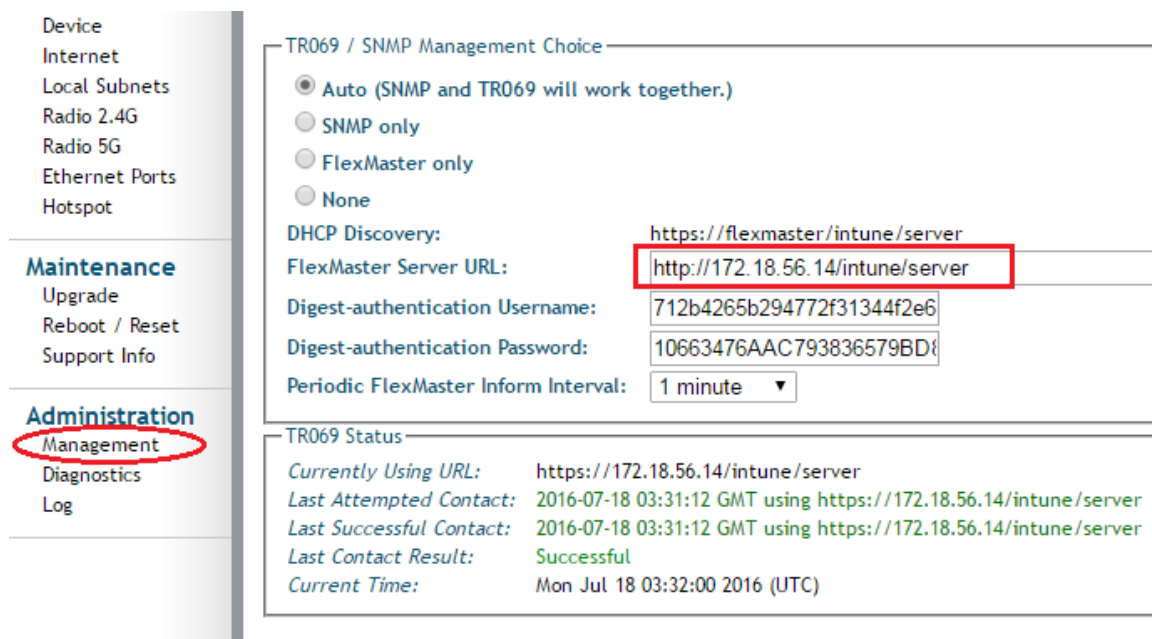
1. Upgrade FM to version 9.10.2 or 9.12.2.
2. Upgrade ZD to version 9.10.2 or 9.12.2.
3. Upgrade Solo AP to version 104.0.0.0.x, or change the TR069 URL to HTTP.

You can upgrade Solo APs to version 104.0.0.0.x if the AP supports that release.

If the Solo APs does not support 104.0.0.0.x, or if you do not want to upgrade the Solo AP, you can change the TR069 URL to HTTP. Following is an example you can refer, to change the TR069 URL:

- a) **Method 1:** Login to the Solo AP Web UI and change the TR069 URL to HTTP as shown:

Figure 1: Login to Solo AP Web UI



- a) **Method 2:** Change TR069 URL via FlexMaster template
- b) Login to FlexMaster and go to **Configure > Standalone AP > Config Templates**. Create a template with HTTP TR069 URL.

Figure 2: Creating a template

CREATE A TEMPLATE

Template Name: R7982


Product Type: ZF7982

Device Registration Settings

Parameter	Value
<input checked="" type="checkbox"/> Server URL:	http://172.18.56.14/intune/server <small>Warning: If this value is incorrect, the device will not be able to contact the FlexMaster server.</small>
<input type="checkbox"/> Server Registration User Name:	
<input type="checkbox"/> Server Registration Password:	
<input type="checkbox"/> Periodic Inform Interval:	5 Minutes

- c) Go to **Configure > Standalone AP > Config Task**, and create a task to apply the template to the Solo AP.
- a) **Method 2:** Change TR069 URL via FlexMaster Solo AP Device View
- b) Login to FlexMaster and go to **Inventory > Standalone**.
- c) Click the Serial Number of the Solo AP to pop up the Solo AP Device View.
- d) Go to the Solo AP and click **Device View > Detail**.
- e) Click **Edit Setting** and change the TR069 URL to HTTP.

Figure 3: Device details



Summary | **Details** | Diagnostics

Device

- Internet/WAN
- Local Subnets
- Radio 2.4G
- Radio 5G
- Rate Limiting
- Associated Devices
- Device Events
- Ethernet Ports
- 802.1x
- Management
- Hotspot

Find Another Device

Device

Device Name: 7982

Periodic Inform Interval: 1 minute

Server URL: http://172.18.56.14/intune/server

Service Provider Login Name: super

Service Provider Login Password:

Service Provider Password Confirmation:

LED Control: Disable Status LED(s)

TACACS+ State:

Back Submit Reset

4. Upgrade the FM to version 9.13. For more information, see the *FlexMaster Upgrade* section in [Upgrading to This Release](#) on page 12.
5. Upgrade the ZD to version 9.13.
Though FlexMaster 9.13 supports ZoneFlex 9.10.2 and 9.12.2, it is recommended that you upgrade ZoneFlex to version 9.13.

Interoperability Information

The following client web browsers have been tested for compatibility with this release:

NOTE: Ruckus Wireless strongly recommends that you use the latest release of an officially-supported browser with FlexMaster.

- Officially Supported Browsers:
 - Internet Explorer 8.0 and later (refer to Caveats, Limitations, and Known Issues)
 - Firefox 3.0 and later
 - Safari 5.1.7 and later
 - Chrome 5.0 and later
- Not officially supported browsers:
 - Dolphin, Opera Mini, Android Default, BlackBerry Default, and others.