BSP Upgrade using CLI

Introduction

- Reference guide to upgrade BSP on **Kona Gateways (Enterprise, Micro, Macro and Mega)** using **CLI.**

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Prerequisites

This guide will assume that you are familiar with operating and navigating through a Linux environment. For a guide with ease of access, please see the [BSP upgrade guide using KonaFT.](#)

Programs recommended:
- FTP Program (such as FileZilla or WinSCP)
- Terminal program (such as TeraTerm or PuTTY)

Prerequisites:
- Kona Gateway
- Access via SSH

While there are various ways of accomplishing some of the goals of this guide, this guide will provide a simple overview using following tools:
- FileZilla
- TeraTerm

Prerequisites (Continued)

To determine the current BSP version on the gateway manually, there is only one method.

1. Access the gateway via **SSH** with the appropriate credentials. See the table below for details.
2. Enter the command: ***system_version***

| Username	Password	Notes
root	9-Digit Serial number of the Gateway (i.e. 1618B0052)	• Applies to gateways with serial numbers that start with 21 and below.
admin	9-Digit Serial number of the Gateway (i.e. 1618B0052)	• Commonly found on **older ENTERPRISE gateways.**
admin	Random string of characters provided on the test report.	• Applies to gateways with serial numbers that start with 22 and above. • **Some units in this category may still have root as the user and the serial number as the default password.**

Table-1 Username and Password

NOTE: If the password is not on the test report, contact Tektelic Support and provide the following:
- T-code (i.e. **T000XXYY**) and serial number (i.e. **1212A3434**)

Intermediate Upgrades

- Depending on the BSP version, you may have to upgrade your Kona Gateway multiple times. You would upgrade to the **Intermediate BSP versions**, then to the Final BSP version.
- Intermediate upgrades are ***always*** between each **Major Version** released.

BSP v5.1.2

Major Version   Minor Version   Patch Version
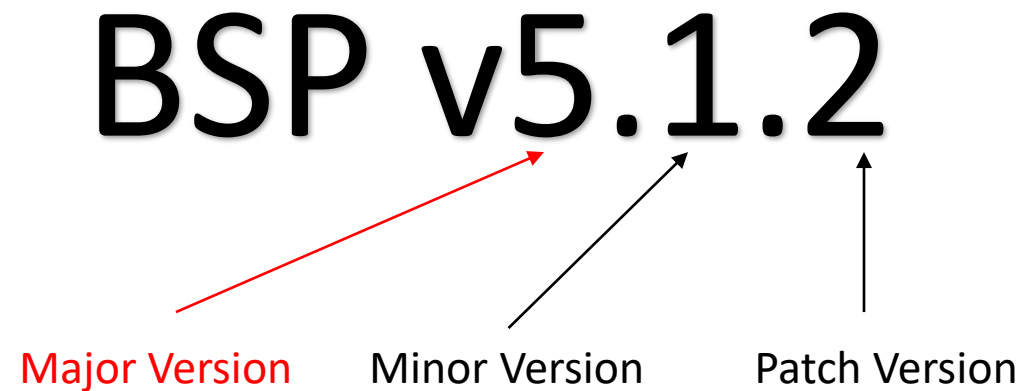
Intermediate Upgrades (Continued)

- This slide outlines the process for **determining intermediate BSP upgrades.**
- Each intermediate upgrade **should be in-between Major BSP versions.**
- For a baseline reference, please see the next slide.
- You may choose to upgrade to the latest Major version and Minor version. (i.e. BSP v2.1.3 -> v3.3.7 on Micro)

BSP v4.X.X   BSP v5.X.X   BSP v6.X.X

The above graphic outlines the intermediate upgrade process:

1. BSP upgrade from v4.X.X to v5.X.X

2. BSP upgrade from v5.X.X to v6.X.X

NOTE: When performing multiple BSP upgrades, **the upgrade files and package will need to be removed before each upgrade.** This will ensure the gateway will have enough space for each upgrade.

Intermediate Upgrades (Continued)

- This slide shows the intermediate BSP upgrades as a baseline reference.

Gateway	Initial BSP Version	Intermediate BSP versions	Final BSP Version
Kona Micro	Older than v2.1.x	v2.1.3	v3.x.x and newer
Kona Micro PoE	v2.x.x	v2.5.1	v5.x.x and newer
Kona Macro	Older than v3.1.x	v3.1.5	v4.x.x and newer
Kona Mega	Older than v3.1.x	v3.1.4	v4.x.x and newer
Kona Enterprise	v1.x.x	v2.0.1	v3.x.x and newer

Table-1 Intermediate upgrades for Older BSPs

For example, if your Kona Macro has BSP v1.6.5 and you wish to upgrade it to a later version i.e. v5.X.X, the upgrade process must follow the below steps:

1. BSP Upgrade from v1.6.5 to v3.1.5

2. BSP Upgrade from v3.1.5 to v4.0.3

3. BSP Upgrade from v4.0.3 to v5.X.X

Download Upgrade Package

All BSP upgrade packages can be found on the TEKTELIC FTP server. You can find out the latest releases here. Instructions to access the FTP are as follows:

1. Configure your FTP client to **"Use explicit FTP over TLS if available".**

| Protocol: | FTP - File Transfer Protocol |
| Encryption: | Use explicit FTP over TLS if available |
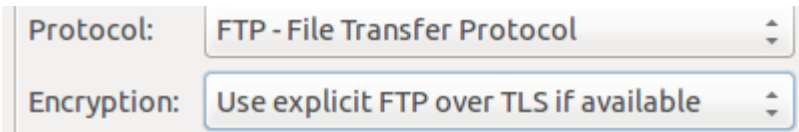
Figure-1 FTP client settings

2. Use the following credentials to access the server.
   - Site: **74.3.134.34**
   - Username: **customer**
   - Password: **vU6_ATR3**
3. Navigate to the correct directory and download two items.
   - **snmpManaged-feed.conf** found in the gateway folder
   - BSP package of your choice

Upload Upgrade Package

There are various ways of uploading the BSP Upgrade Package to the gateway. This guide will use FileZilla to upload files to the gateway.

Use the following site settings to connect to the gateway:
- Site: **<IP of your gateway>**
- Username and password: Credentials of the gateway

Upload the files according to your credentials:
- root:
  - Upload upgrade package to wherever you like.
- admin:
  - Upload everything to **/home/admin/**

Edit Configuration File - Preface

Gateways upgrading to intermediary versions (i.e. Micro 3.0.4 or Macro 4.0.3) will need to have the **snmpManaged-feed.conf** file edited **PRIOR to being uploaded to the gateway.** This file can be edited with a text editor of your choice. Please double check the contents of the file before proceeding.

Edit Configuration File (for Micro)

On the latest BSPs offered for **Micro**, the **snmpManaged-feed.conf** file will appear as follows:

```
1  src/gz bsp file:///lib/firmware/bsp/bsp
2  src/gz gpio-fpga file:///lib/firmware/bsp/gpio-fpga
3  src/gz tektelic-networking-extra file:///lib/firmware/bsp/networking-extra
4  src/gz tektelic-python-extra file:///lib/firmware/bsp/python-extra
5  src/gz tektelic-utils file:///lib/firmware/bsp/utils
6  src/gz tektelic-webserver file:///lib/firmware/bsp/webserver
```

Figure-2 Sample Configuration File for Micro BSP 3.3.7 and newer

For ease of use, please save a separate copy of this file for when you upgrade to the latest BSP version. Then, for gateways upgrading to an intermediary version, please edit the files accordingly:

```
1  src/gz bsp file:///lib/firmware/bsp/bsp
2  src/gz gpio-fpga file:///lib/firmware/bsp/gpio-fpga
3  #src/gz tektelic-networking-extra file:///lib/firmware/bsp/networking-extra
4  #src/gz tektelic-python-extra file:///lib/firmware/bsp/python-extra
5  #src/gz tektelic-utils file:///lib/firmware/bsp/utils
6  #src/gz tektelic-webserver file:///lib/firmware/bsp/webserver
```

Figure-3 Edited Configuration File for Micro BSP older than 3.3.7

Once done, save the file and upload the file to **/etc/opkg** or **/home/admin/** as **snmpManaged-feed.conf**
Then, when it is time to upgrade to the latest BSP, upload the unedited file seen in figure 2.

Edit Configuration File (for Macro/Mega)

On the latest BSPs offered for **Macro/Mega**, the **snmpManaged-feed.conf** file will appear as follows:

```
1  src/gz bsp file:///lib/firmware/bsp/bsp
2  src/gz gpio-fpga file:///lib/firmware/bsp/gpio-fpga
3  src/gz fe-fpga file:///lib/firmware/bsp/fe-fpga
4  src/gz tektelic-networking-extra file:///lib/firmware/bsp/networking-extra
5  src/gz tektelic-python-extra file:///lib/firmware/bsp/python-extra
6  src/gz tektelic-utils file:///lib/firmware/bsp/utils
7  src/gz tektelic-webserver file:///lib/firmware/bsp/webserver
```

Figure-4 Sample Configuration File for Macro/Mega BSP newer than 4.3.6 / 4.3.8

For ease of use, please save a separate copy of this file for when you upgrade to the latest BSP version. Then, for gateways upgrading to an intermediary version, please edit the files accordingly:

```
1  src/gz bsp file:///lib/firmware/bsp/bsp
2  src/gz gpio-fpga file:///lib/firmware/bsp/gpio-fpga
3  src/gz fe-fpga file:///lib/firmware/bsp/fe-fpga
4  #src/gz tektelic-networking-extra file:///lib/firmware/bsp/networking-extra
5  #src/gz tektelic-python-extra file:///lib/firmware/bsp/python-extra
6  #src/gz tektelic-utils file:///lib/firmware/bsp/utils
7  #src/gz tektelic-webserver file:///lib/firmware/bsp/webserver
```

Figure-5 Edited Configuration File for Macro/Mega BSP 4.3.6 / 4.3.8 and older

Once done, save the file and upload the file to **/etc/opkg** or **/home/admin/** as **snmpManaged-feed.conf**
Then, when it is time to upgrade to the latest BSP, upload the unedited file seen in figure 4.

Configure and Initiate Upgrade (Legacy)

This slide is intended for upgrading gateways v2.x.x to v3.y.y (on Kona Macro and Mega) and v1.x.x to v2.y.y (on Kona Micro). **For upgrading gateways in _any other case_, proceed to the next slide for the standard method.**

1. Create the upgrade folder: **mkdir /lib/firmware/bsp**
2. Unzip files to the newly created folder:
   - **unzip <location and name of upgrade package> -d /lib/firmware/bsp/**
3. Configure gateway upgrade location paths with the following command: **opkg update**
4. Install the following packages _**BEFORE**_ upgrading the gateway:
   - **opkg install opkg-arch-config**
   - **opkg install tektelic-upgrade**
5. Initiate BSP upgrade with the following command: **tektelic-dist-upgrade -Du**

Configure and Initiate Upgrade (Standard)

To set up the upgrade package, please use the following steps:

1. Create the upgrade folder: **mkdir /lib/firmware/bsp**
2. Unzip files to the newly created folder:
   - **unzip <location and name of upgrade package> -d /lib/firmware/bsp/**
3. Configure gateway upgrade location paths with the following command: **opkg update**
4. Initiate BSP upgrade with the following command: **tektelic-dist-upgrade -Du**

Users that use ***admin*** as their login credentials have insufficient permissions to perform the above steps. They will have to perform additional steps:

1. Move **snmpManaged-feed.conf** to **/etc/opkg/** with command:
   - **sudo mv snmpManaged-feed.conf /etc/opkg**
2. Perform the above steps, but prefix each command with **sudo**

Configure and Initiate Upgrade (cont.)

The gateway will reboot several times in the BSP upgrade process, severing all SSH connections. **There is no way to keep track of its progress aside from logging into the gateway and manually checking.** The upgrade process will take around 15-30 minutes.

To check the upgrade progress, login to the gateway and enter the following command:
- **tektelic-dist-upgrade -p**

```
Distributor ID:        Tektelic
Description:           Tektelic Kona Micro GNU/Linux 4.0.2
Release:               4.0.2 upgrade-in-progress
```

Figure-6 *system_version* command during upgrade

Configure and Initiate Upgrade (cont.)

You can verify the completion of the BSP upgrade with the following two commands:
- **system_version**
  - Output should contain the desired version without **upgrade-in-progress**
- **tektelic-dist-upgrade -s**
  - Output should be: **ok**

If an error occurred during the upgrade process, please raise a support ticket with the upgrade logs.
You can find the upgrade logs in **/var/log/** or **/var/lib/logs/**

Automation Tip

For users that wish to host upgrade servers of their own, we do not recommend hosting individual upgrade files. What could happen is that one of the upgrade files may become corrupted during the file transfer and heavily disrupt the upgrade process.

We recommend developing a solution where zipped upgrade packages are distributed to the gateway and then configuring it from there. That way, the margin of error is significantly reduced from hundreds of transfers to a single file transfer per gateway.

Conserving Gateway Space

When a gateway requires multiple BSP upgrades, you will need to remove the upgrade files and backup created. This will ensure that the gateway will have enough space to create a backup and perform the upgrade. **If the gateway does not have enough space to perform an upgrade, the upgrade will throw an error and will not proceed.**

Because each new BSP release may contain new versions of the packages, they will not overwrite existing upgrade files. Hence, we will always recommend removing upgrade package and associated files.

This section will cover how to remove the following:
• Gateway upgrade files
• Gateway backups

Conserving Gateway Space (Files)

The files and upgrade package can _only_ be removed through SSH.

When a package is uploaded through KonaFT, the package is uploaded to the directory **/dev/shm**
- **If the Decompress option is ticked,** the gateway will automatically remove the upgrade package.
- To remove the upgrade package, run the following command: **sudo rm /dev/shm/<upgrade-package-name>.zip**

All BSP upgrade files can be found in the following folder: **/lib/firmware/bsp**
- To remove the upgrade files, run the following command: **sudo rm -rf /lib/firmware/bsp**

Conserving Gateway Space (Backups)

Backups are always created as part of the BSP upgrade process. When doing multiple intermediate upgrades, backups should also be removed to conserve space.
Backups can be removed through 2 methods: SSH or KonaFT.

SSH:
1. Log into the gateway via SSH.
2. See the list of available backups: **ls /backup**
3. Remove backups as desired: **sudo rm -rf /backup/<Three digit backup index>**

KonaFT:
1. Connect to the gateway.
2. In the top row of tabs, select **Board Details.**
3. In the row of tabs slightly below, select **Backup and Restore.**
4. Under Restore, select **Update Table.**
5. A list of backups will now appear. Click one and then select **Delete Selected** to delete the backup.
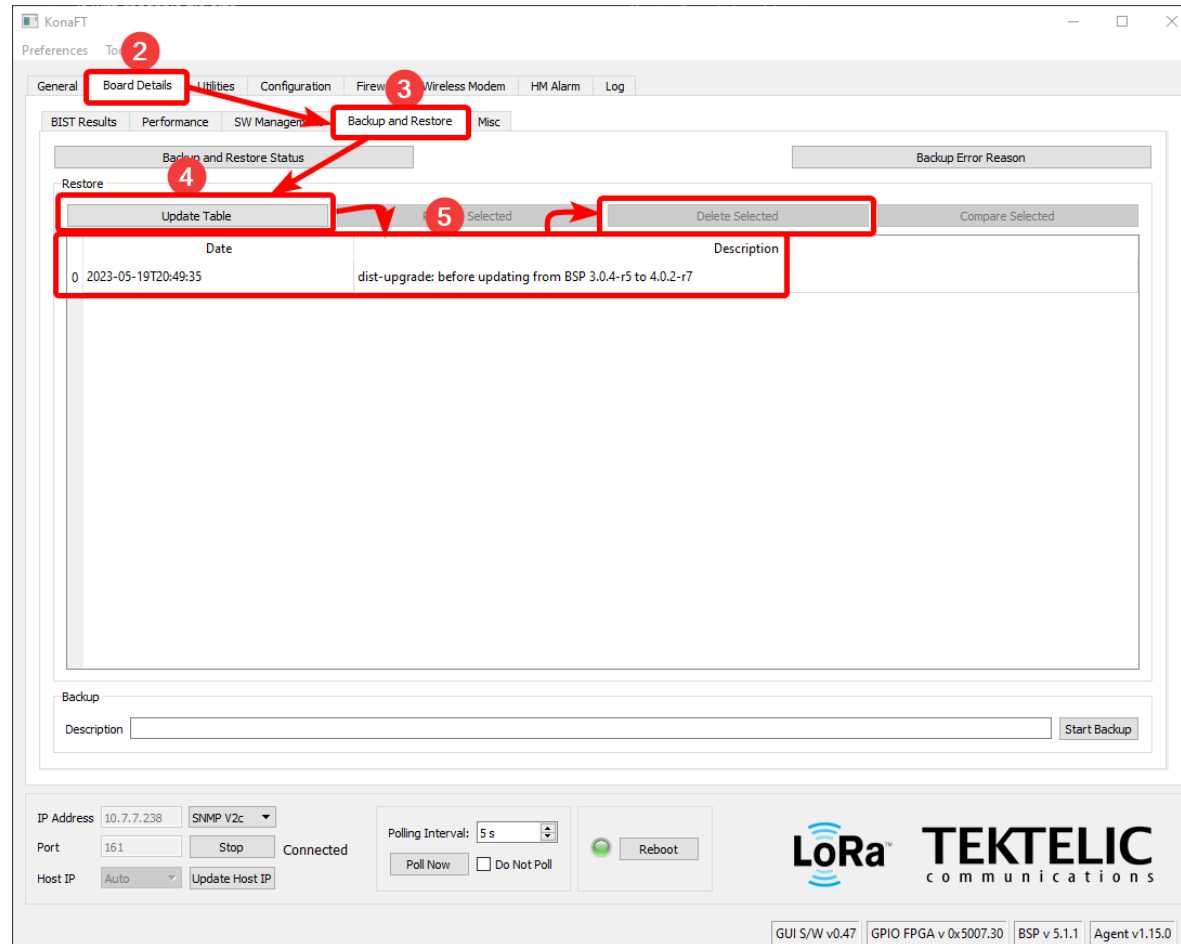
Conserving Gateway Space (Backups)

Figure-7 Deleting Backups

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