

Unified BSP Upgrade using KonaFT

Introduction

- Reference guide to upgrade to and from the unified BSP on Kona Gateways (Enterprise, Micro, Macro and Mega) using the KonaFT.
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- 1. <u>Prerequisites</u>
- 2. Connecting to your Gateway
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- 6. Initiating BSP Upgrade
- 7. Installation of Geo-Location Features
- 8. Conserving Gateway Space

Prerequisites

This guide will assume that you are familiar with operating and navigating through a Linux environment.

Prerequisites:

- <u>The latest release of KonaFT</u>.
- FTP Program (such as <u>FileZilla</u> or <u>WinSCP</u>).
- Gateway (on which BSP needs to be upgraded) and KonaFT must be connected in the same computer sub-network.
- Terminal program (such as <u>TeraTerm</u> or <u>PuTTY</u>).
- SSH access to the gateway (if managing files).

Prerequisites (Continued)

- All Kona gateways will be using a **unified BSP upgrade package** moving forward starting with **BSP v7.X.X.**
- Kona gateways will need to be on a specified BSP (seen below) before upgrading to the unified BSP.
- To determine the BSP version of your gateway, <u>connect to the gateway (described in next section)</u> and look at the bottom right of KonaFT.
- If your gateway is not on the initial BSP version, use the legacy upgrade guide before proceeding.

Gateway	Initial BSP Version	Final BSP Version
Kona Micro	v4.0.5 or newer	v7.x.x
Kona Micro PoE	v5.1.1 or newer	v7.x.x
Kona Macro	v6.1.4 or newer	v7.x.x
Kona Mega	v5.0.6 or newer	v7.x.x
Kona Enterprise	v2.1.2 or newer	v7.x.x

Table-1 BSP Upgrade Path

GUI S/W v0.47 GPIO FPGA v 0x5007.30 BSP v 5.1.1 Agent v1.15.0

Figure-1 Gateway BSP version

Connecting to your Gateway

Ensure that the computer and gateway are on the same computer network. Then follow the steps below:

- 1. In the top left corner, click on Tools and select Find my Gateway
- 2. Then select the interface that corroborates to the gateway's network. When ready, click Scan.
- 3. When your gateway appears, click on the entry and finalize by clicking Select.
- 4. On newer versions of KonaFT, select SNMPv2 from the drop-down menu indicated.
- 5. Below the SNMP drop-down menu in step 4, click **Start** to connect to your gateway.

A pop-up with the title "AGENT MISMATCH DETECTED" may appear. This can be ignored.

Connecting to your Gateway (Cont.)

Gateway Info			Packet Forwarder A	pplication	Spectral Scan		
Module TCODE:			Stop	Start	Spectrum Analyzer		
Serial Number:	Find Tektelic Gateways	s	×	Switch	Sample Period	0.5.05	
Module Name:	Select interface to use			tektelic running	Antenna Selection	Antenna 0	T
Module Revision:	10.7.7.141 🔻	Scan		kata 1	Antenna Selection:	Antienna u	
Gateway ID:	MÂC	IP	^	tamp: 0	Avgerage count:	1	· ·
MAC Address:	64-7f-da-00-00-d9	10.7.7.196		tamp: 0 tkets: 6904	Start Frequency (kHz):	902299	¥
Gateway Temperature:	64-7f-da-00-40-71	10.7.7.86		ssed: 6646	Stop Frequency (kHz)	924600	¥
Operating Band:	64-7f-da-00-40-8e	10.7.7.156		C fail: 282 rate: 0.0405562	Bin Spacing (KHz):	200	Ŧ
Module Time:	64-7f-da-00-40-d3	10 7 7 101		natch 0	Start Spectrum Analyzer		
No of Lora Antennas:	64-7f-da-00-51-65	10.7.7.107		et Counters	No overlay 🔻	I	
	64-71-08-00-51-05	10.7.7.114					
Minimum -137 🖨 Maximum Auto 🖨	04-71-da-00-52-39	10.7.7.114			-		
	64- /f-da-00-54-12	10.7.7.163					
	64-7f-da-00-55-32	10.7.7.164					
	64-7f-da-00-57-60	10.7.7.191					
	64-7f-da-00-58-41	10.7.7.168					
	64-7f-da-00-59-be	10.7.7.182	3				
	64-7f-da-00-5b-c4	10 7 7 219					
	43 gateways found	Canc	el Select				
	L						
Address 10.7.7.216 SNMP V2c -				_			
	Polling Int	terval: 5 s				TCI	10

Figure-2 Find My Gateway

Connecting to your Gateway (Cont.)

Gateway In	Gateway Info Module TCODE:		Packet Forwarder An	plication	Countral Count			
batteries in						Spectral Scan		
MO	dule (CODE:			Stop	Start	Spectrum Analyzer		
56	Module Name: Module Revision: Gateway ID: MAC Address: teway Temperature: Operating Band:		Check	Switch	Sample Period:	0.5 µs	*	
M	lodule Name:			Current pkt fwd:	tektelic running	Antenna Selection:	Antenna 0	v
Mod	lule Revision:			# of transmitted pack	ets: 1	Avgerage count:	1	* *
	Gateway ID:			With fine timesta Without fine timesta	amp: 0 amp: 0	Start Frequency (kHz):	902299	4 ¥
м	IAC Address:			# of received pack	ets: 6904	Stop Frequency (kHz)	924600	*
Gateway T	emperature:			CRC pas	sed: 6646	Bin Spacing (kHz):	200	<u>*</u>
Ope	erating Band:			Rx packet error r	ate: 0.0405562	Start Spectrum Applurer		
1	Module Time:			No ma	atch 0	otare opecti uni Analyzer		
No of Lor	ra Antennas:			Rese	t Counters	No overlay 👻		

Figure-3 SNMP Drop-down menu

Download Upgrade Package

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

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



Figure-4 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 "Universal_Kona_SW" directory and download the BSP package of your choice.

Uploading Upgrade Files

- 1. Go to Tools → File Transfer
- 2. Click on Browse and select the upgrade package.
 - *a.* **<u>DESELECT</u>** the decompress checkbox if you access the gateway via admin account.
- 3. Upon selecting the file to be uploaded to the Gateway, click Upload
- 4. A prompt will ask for a username and password. See below for details.

Username	Password	Notes
root	9-Digit Serial number of the Gateway (i.e. 161880052)	• 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-2 Username and Password

NOTE: If the password is not on the test report, <u>contact Tektelic Support</u> and provide the following:

• T-code (i.e. **T000XXYY**) and serial number (i.e. **1212A3434**)

Uploading Upgrade Files (Continued)

- 5. As upgrade file will start uploading on the GW, you can monitor the status of upload shown in Figure-5.
- 6. After upload finishes, wait for 2-3 minutes as the uploaded zip file will be unzipped on the Gateway.

🖪 File Transfer		>
Upload files to target	Download logs from target	
Select file to upload		upload
	file to upload Decompress Kona_Micro_SW_BSP_5.1.1.zip "of '	browse
Profit - 3 ''''''''''''''''''''''''''''''''''''	<pre></pre>	
Close 🗹 Detail	3	

Figure-5 File Transfer

Uploading Upgrade Files (Continued)

Gateways that use the **admin credentials** to access the gateway have additional steps to perform, as **the admin account does not have sufficient permissions** to administrate and maintain the gateway.

- 1. Login to the gateway via SSH. Credentials can be found here.
- 2. Create a new folder: **sudo mkdir /lib/firmware/bsp**
- Unzip the uploaded upgrade package: sudo unzip /dev/shm/<upgrade-package-name>.zip -d /lib/firmware/bsp
- (Optional) Remove the upgrade package to conserve space: sudo rm /dev/shm/<upgrade-packagename>.zip

Editing Configuration File

The configuration file tells the gateway where the upgrade files are. The steps below will create the configuration file on the gateway.

- 1. Go to **Board Details → SW Management** tab
- 2. Find **Upgrade Servers** as shown in Figure-4.
- 3. Click on **Read Server Config** to see check for any existing entries.
- Verify the existing entries according to the next slide. Add them if they do not exist via Add Entry.
- 5. Click on Write Server Config to save these changes
- 6. Click on **Read Server Config** to verify the saved changes



Figure-6 Upgrade Servers

Editing Configuration File (Continued)

The following entries are used when upgrading to the Universal BSP v7.0.x. To edit an entry, double-click the field and copy-paste from the table below.

Туре	Name	Path
src/gz	bsp	file:///lib/firmware/bsp/bsp
src/gz	gpio-fpga	file:///lib/firmware/bsp/gpio-fpga
src/gz	fe-fpga	file:///lib/firmware/bsp/fe-fpga
src/gz	networking-extra	file:///lib/firmware/bsp/networking-extra
src/gz	python-extra	file:///lib/firmware/bsp/python-extra
src/gz	utils	file:///lib/firmware/bsp/utils
src/gz	webserver	file:///lib/firmware/bsp/webserver

Table-3 Upgrade Servers Entries for the Universal BSP (v7.0.x+)

Initiating BSP Upgrade

This slide will detail the standard method for upgrading gateways.

- 1. Go to the **SW Management** tab.
- 2. Click on **Read Upgradable** option. It will list down all the packages which needs to be upgraded shown in Figure-5.
 - If no packages appear, ensure the <u>files have been uploaded</u> to the location <u>corresponding to the paths</u> <u>specified.</u>
 - By default, KonaFT will upload the files to **/lib/firmware/bsp/**
 - To verify the location of files, SSH into the GW and run the command: Is /lib/firmware/bsp
- 3. A prompt showing the title **BSP Upgrade Detected** will appear. Click on **YES** to initiate the upgrade process of BSP on the GW.
- 4. While BSP is upgrading, Upgrade status message will display the status of the process as shown in Figure-6.

Note: BSP Upgrade may take up to 15-30 minutes.

Initiating BSP Upgrade (Continued)

BIST	Results Performance SW Management Backup and Res	tore Misc	
Shor	t List T Read Versions Special packages detected, bu	Ilk upgrade/install operations disabled Bsp Status Rea	ad Upgradable Read Installable Upgrade All Upgrade Selected
	Component	Current Version	New Version ^
50	ntp	4.2.8p13-r0-tektelic2	4.2.8p13-r0-tektelic6
51	tektelic-add-users	1.3-r3	1.5-r24
52	syslog-ng	3.19.1-r0.arago0-tektelic0	3.19.1-r0.arago0-tektelic7
53	kona-network-monitor	0.19-r6	0.33-r19
54	curl	7.64.1-r0	7.64.1-r0.tektelic0
55	strongswan-plugin-nonce	5.7.1-r0.arago4	5.9.8-r0.arago4-tektelic1
56	libopkg1	1:0.4 BSP Upgrade Detected X	1:0.4.0-r0-tektelic2
57	tektelic-hw-reset-tool	1.0.0 BSP Upgrade has been detected	2.1.1-r0
58	packagegroup-core-boot	1.0-r Would you like to upgrade now?	1.0-r17-tektelic2
59	kernel-devicetree	1:3.1. Yes No	1:5.10.82-r16
60	tektelic-system-monitor	0.14-rz	2:0.25.0-r1
~	1 1. e 1 e	10.20 110	C 1.0. 140

Figure-7 BSP Upgrade Prompt

Initiating BSP Upgrade (Continued)

	tust • Read versions special packages detected, b	uik upgrade/install operations disabled bsp Status Re-	ad Opgradable Read Installable Opgrade All Opgrade	Selected		
	Component	Current Version	A 2 9=12 =0 toltolise			
	ntp	4.2.8p13-r0-tektelic2				
		2 10 1 -0	2 10 1 -0			
2	sysiog-ng		3.19.1-ru.aragou-tektelic7			
3	kona-network-monitor	7.64.10	0.33-r19			
+		7,04,1-r0	7.04.1-r0.textellc0	_		
5	strongswan-plugin-nonce	5.7.1-ru.arago4	5.9.8-r0.arago4-tektelic1	-1		
• -		BSP Upgrading in Progress X	1:0.4.0-r0-tektelic2			
/	tektelic-hw-reset-tool	Upgrading BSP from 3.0.4-r5 to 5.1.1-r8 Do not turn off your board	1.0-117-tektelic2			
В	packagegroup-core-boot	The board may reboot several times				
9	kernel-devicetree	8% OK	1:5.10.82-r16			
)	tektelic-system-monitor		2:0.25.0-r1			
Jpg	rade Servers	- 10.20 - 110				
U	ser Name: Password:	Use authentication				
	Type Name	Path	Read Server C	onfig		
			Add Entry			
			Remove Sele	cted		
			Write Server (

Initiating BSP Upgrade (Continued)

Upon the successful completion of the BSP upgrade, BSP Upgrade Succeeded message will be shown.

	special packages detected, t	uik upgrade/ilistali operations disabled BSp Status Rea	upgradable Read Installable Upgrade All Upgrade Selec			
50	Component	Current Version 4.2.8p13-r0-tektelic2	New Version 4.2.8p13-r0-tektelic6			
51	tektelic-add-users	1.3-r3	1.5-r24			
52	syslog-ng	3.19.1-r0.arago0-tektelic0	3.19.1-r0.arago0-tektelic7			
53	kona-network-monitor	0.19-r6	0.33-r19			
54	curl	7.64.1-r0	7.64.1-r0.tektelic0			
55	strongswan-plugin-nonce	5.7.1-r0.arago4	5.9.8-r0.arago4-tektelic1			
56	libopkg1	1:0.4.0-r	1:0.4.0-r0-tektelic2			
57	tektelic-hw-reset-tool	1.0.0-r2	2.1.1-r0 1.0-r17-tektelic2			
58	packagegroup-core-boot	1.0-r17-t				
59	kernel-devicetree	1:3.12-te OK	1:5.10.82-r16			
50	tektelic-system-monitor	0.14-r5	2:0.25.0-r1			
	rade Server	10.20 110	C 1 0 140			
U	Jser Name: Password:	Use authentication				
Γ	Type Name	Path	Read Server Config			
			Add Entry			
			Remove Selected			
			Write Server Confi			
ddre	ss 10.7.7.225 SNMP V2c 🔻					
	161 Stop Connected	Interval: 5 s				
	Pol	Now Do Not Poll	LUKA ILINILLIY			

Figure-9 BSP Upgrade Success Status

Installation of Geo-location features

NOTE for Kona Gateways with Geo-location features:

- Starting from BSP 4.3.X, all BSP upgrade packages will include the files required for the Geo-location feature. If you require files from a lower BSP version, please raise a ticket on <u>https://support.tektelic.com</u>
- After the upgrade files are uploaded to the gateway, below is the high-level procedure to install geolocation features.
- 1. Use this guide and follow all the steps to upgrade BSP.
- 2. Click the **Read Installable** button located near the **Read Upgradable** button in the top right.
- 3. Select the row with **"gl"** as the package name, then click **Install Selected** to install the package.
- 4. Install Success message will appear on bottom left corner upon successful installation.

Installation of Geo-location features

Preferences Tools Board Details Utilities Configuration Firewall Wireless Modem HM Alarm General Loc BIST Results Performance SW Management Backup and Restore Misc Bsp Status Read Upgradable Read Installable Install All Install Selected Short List 🔻 Read Versions Component Version 2.8.9-tek0.0.1 acme.sh aws-iot-securetunneling-localproxy 1.1.0-tektelic2 2 2.0.0-r5 kona-pkt-forwarder-misc 6.0.3-r142 4 5 kona-pkt-forwarder-update-mac 6.0.3-r142 6 libbsd0 0.8.3-r0 1.44.5-r0 libcom-err2 libestr0 0.1.11-r0 8 2.1.8-r0 9 libevent 10 libfastjson4 0.99.8-r0 11 libgdbm-compat4 1.18.1-r0 1 10 1 (a) (2) (4) Upgrade Servers Use authentication User Name: Password: A Read Server Config Path Type Name 1 src/qz bsp file:///lib/firmware/bsp/bsp Add Entry 2 src/qz qpio-fpga file:///lib/firmware/bsp/gpio-fpga Remove Selected file:///lib/firmware/bsp/fe-fpga 3 src/qz fe-fpga Vite Server Config IP Address 10.7.7.164 SNMP V2c 💎 Polling Interval: 5 s -LoRa Port Stop Reboot Connected Poll Now Do Not Poll Update Host IP Host IP Auto communicati GUI S/W v0.43 FE FPGA v 1020 GPIO FPGA v 0x4848.40 BSP v 5.1.8 Agent v1.10.0

Figure-10 Geolocation package

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 or backup the system, 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.

To check how much space you have on your gateway, run the following command: **df** Generally, having 50% space free in **ubi0:rootfs** is enough to commence an upgrade.

root@kona-micro	:~# df				
Filesystem	1K-blocks	Used	Available	Use%	Mounted on
ubi0:rootfs	256512	229880	26632	90%	/
devtmpfs	242764	12	242752	0%	∕dev
tmpfs	255168	104	255064	0%	/run
tmpfs	65536	492	65044	1%	/var/volatile
ubi1:log	19 <u>2</u> 852	14136	173880	8%	/var/lib/logs

Figure-11 SW Management tab

Conserving Gateway Space (Files)

The files and upgrade package can <u>only</u> 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/<upgradepackage-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: **Is /backup**
- 3. Remove backups as desired: sudo rm -rf /backup/<Three digit backup index>

KonaFT:

- 1. <u>Connect to the gateway.</u>
- 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)

(onaFT											_	
erences Too	2											
eneral Board	d Details	ties Cor	figuration F	irew ? Wireless M	odem HM Alar	rm Log						
DICT Desults	Desferments	CW Man		chup and Restore	Maa							
DIST RESULTS	Performance	SW MdH	agent ba	Skup and Restore	VIISC							
	Backup and	d Restore St	tatus						Backup Error	Reason		
Restore												
	Update Tab	ole		E 5 Se	lected		Delete Selected	d	Con	pare Selected		
	Da	ite					Description	n				
0 2023-05	5-19T20:49:35		d	list-upgrade: before	updating from B	3SP 3.0.4-r5 to 4.0.2	r7					
								_				
Backup												
Description											Start Back	up
Address 10.7	7 7 220 CNIME	×2- ▼										
Address 10.7.	.7.230 SINMP	vzc •		Polling Interval:	5 s 🗘			\sim				~
rt 161		Stop	Connected			Reboot		InPa	TM	KIF	•	
				Poll Now	Do Not Doll			LUNA			_	
												_
st IP Auto	Upda	te Host IP			DO NOLPOI				com	munic	atio	on s
st IP Auto) Vpda	ite Host IP						۲	com	munic	atio	on s
at IP Auto) 🗸 Upda	te Host IP						3	com	munic	atio	on s

Figure-12 Deleting Backups

Best-In-Class, Carrier Grade & Most Cost Effective Portfolio of Gateways, Network Server, Sensors & Applications