Digi WR54 / WR64 Migration Release Notes
Version 20.2 (April 2020)

INTRODUCTION

In December 2019, Digi International transitioned the Digi TransPort® WR54 and WR64 platforms to new firmware. The new firmware, known as Digi Accelerated Linux (DAL), is a specialized embedded Linux distribution owned and maintained by Digi International. The DAL firmware has been developed over the last 20 years with over 150,000 units shipped and actively supports 160 build targets across a range of CPU architectures.

The DAL firmware has a regular release cycle to provide continual security updates, new features, enhancements, and bug fixes.

Migrating your WR54 and WR64 platforms to the new firmware will provide you with expanded cellular capabilities, greater functionality, robust SureLink options, and more seamless integration with Digi Remote Manager.

UNSUPPORTED FEATURES

The following firmware features are currently not supported by the DAL firmware:

- DMNR (planned for DAL firmware release 20.8)
- VRRP+ (planned for DAL firmware release 20.8)
- Wi-Fi Client TLS authentication
- SNMP v1/v2c
- SNMP write access
- SNMP Enterprise MIB
- SSH Certificates
- DHCP Option User Classes
- IPsec Xauth server mode
- IPsec AES GCM encryption
- FIPS mode
- USB Serial support (planned for DAL firmware release 20.5)

Digi recommends that if you are dependent on these features, then you should not migrate to the DAL firmware until they are supported in a later release.

Additionally, certain xOS configuration settings cannot be migrated, but will not cause the migration to fail. See xOS configuration settings that cannot be migrated for details.

Python scripts not migrated

If you are using Python scripts on the device, these will not be migrated to the new firmware due to differences in the DAL CLI. See the Python section for further information.

IMPORTANT MIGRATION INFORMATION

IMPORTANT NOTES:

❖ Digi recommends that you test the device migration in a controlled environment with your application before you deploy production devices.

❖ Once a device has been updated to the DAL firmware, it cannot be downgraded to a Digi xOS release.

❖ Power MUST NOT be removed during the migration process as this can leave the device in an indeterminable state.

❖ Digi recommends that if possible, you should factory default the device prior to doing the migration to minimize the chances of the migration being aborted due to problems with the configuration migration.

❖ If the migration fails after the configuration has been migrated, but during the firmware update or bootloader update stages, the device may be left in an indeterminable state. If this occurs, please contact Technical Support at tech.support@digi.com for help on how to recover your unit.

❖ A few xOS configuration parameters will cause the migration to be aborted due to potentially leaving the device offline. If this occurs, the device will remain at its current xOS configuration and the reason for the failure will be captured in the **migration.log** file that can be found in the Digi xOS user directory. Please refer to the Diagnosing WR54 / WR64 / LR54 Migration Failures Knowledge Base article for details.

The WR54 and WR64 devices can be migrated to DAL-based TX54 and TX64 devices by using one of the following tools:

- Digi Remote Manager
- Local Web UI
- Command Line Interface (CLI).

Digi recommends using the Remote Manager to perform migrations, because it allows you to migrate groups of devices at the same time.

Additionally, there are two configuration migration methods:

- Automatic migration of your xOS configuration.
- Using a DAL configuration backup file to migrate your xOS devices.

Digi **strongly recommends** that you use a DAL configuration backup file to migrate xOS devices, because it means the device will be migrated with a specific configuration that has been tested prior to the migration.

To use a DAL configuration backup file, you must first migrate an initial device to DAL using the automatic method and create a configuration backup file for that device. Alternatively, Digi can provide a configuration backup file that will convert your device to the default DAL configuration. Once the backup file has been created, you can use it to migrate multiple devices, so long as there are no site-specific configurations like SIM PINs in the DAL configuration that might prevent remote access to the device.

USE DIGI REMOTE MANAGER TO MIGRATE DEVICES

Using Digi Remote Manager is preferred if you have a large number of devices to update, or for those who would like to ensure that specific settings are configured properly after the migration. This process will utilize the **Profile Manager** feature of Digi RM. See Profiles in the *Digi Remote Manager User Guide* for more information.

Devices can be migrated using Remote Manager in one of two ways:

- Using a DAL configuration backup file.
- Automatically migrating an xOS configuration.

Use Remote Manager to migrate devices by using a DAL configuration backup file

To use the Remote Manager to migrate devices by using a DAL configuration backup file:

1. **Create a DAL configuration backup file**

   NOTE: These instructions describe how to create a DAL configuration backup file. Alternatively, Digi can provide you with a DAL configuration backup file that will allow you to migrate the device to a DAL factory default state. For more information on this option, contact Technical Support at tech.support@digi.com.

   1. Migrate a device to the DAL firmware using the Web UI or the CLI. See Use the local Web UI to migrate devices or Use the CLI to migrate devices for information.
   2. (Optional) Factory default the device if you want to start with the DAL default configuration.
   3. Make any necessary configuration changes.
   4. Create a DAL backup file:
      a. Log into the Web UI.
      b. Select **System** > **Configuration Maintenance**.
      c. Under **Configuration backup**, click **SAVE**.

2. **Rename and upload the backup file**
   1. Rename the DAL backup file to **backup-archive.bin**.
   2. Upload the **backup-archive.bin** file to all xOS devices that will be migrated.
      You can upload the backup file onto the device using a utility such as Secure Copy (SCP), SSH File Transfer Protocol (SFTP), or an SFTP application such as FileZilla. See Upload and Download files section in the *Digi WR Router User Guide* for more information.

3. **Download the migration firmware image**
   Download the migration image for your device from the Digi support website.
   - WR54 Single-Cellular WR54-Single-Cellular-20.2.162.162-Migration.bin
   - WR54 Dual-Cellular   WR54-Dual-Cellular-20.2.162.162-Migration.bin
   - WR54 Dual-Wi-Fi   WR54-Dual-Wi-Fi-20.2.162.162-Migration.bin
   - WR64   WR64-20.2.162.162-Migration.bin

4. **Create a profile to migrate devices to DAL**
   Create a new profile that will act as a filter to migrate devices. This profile is only used to download and run the migration image.
   1. Log into Remote Manager (https://my.devicecloud.com).
   2. Select **Device Management** > **Profiles**.

3. Click **Create Profile**.
4. Type a **Profile Name**.
5. For **Snapshot Device**, select an xOS device of the same device type as the devices that are being migrated. Because we will be performing a firmware update using the migration file, the specific device does not matter, so long as it is the same device type.
6. Click **Save and Continue**.
7. In **Step 2: Targets**:
    a. Select the devices that you want to migrate.
    b. Click **Save and Continue**.
8. In **Step 3: Settings**:
    a. Select ONLY **Firmware**.
    b. Click **Choose File**.
    c. Select the migration image that you downloaded in step 3.
    d. Type in the firmware version that matches the migration image file, if Remote Manager does not auto-populate it.
    e. Click **Save and Continue**.
9. In **Step 4: Schedule**:
    a. Select when you want the migration to begin.
    b. Check the **Remediate - Bring Device into Compliance with Profile** checkbox.
    c. Click **Activate Profile**.

IMPORTANT: Digi recommends that you review the configuration of migrated devices once the process completes, to ensure the device is secure and is configured correctly.

Use Remote Manager to migrate devices without using a DAL configuration backup file

To use the Remote Manager to migrate devices without using a DAL configuration backup file:

1. **Download the migration firmware image**

   Download the migration image for your device from the Digi support website.
   - WR54 Single-Cellular   WR54-Single-Cellular-20.2.162.162-Migration.bin
   - WR54 Dual-Cellular   WR54-Dual-Cellular-20.2.162.162-Migration.bin
   - WR54 Dual-Wi-Fi   WR54-Dual-Wi-Fi-20.2.162.162-Migration.bin
   - WR64   WR64-20.2.162.162-Migration.bin

2. **Create a profile to migrate devices to DAL**

   Create a new profile that will act as a filter to migrate devices. This profile is only used to download and run the migration image.
   1. Log into Remote Manager (https://my.devicecloud.com).
   2. Select **Device Management** > **Profiles**.
   3. Click **Create Profile**.
   4. Type a **Profile Name**.
   5. For **Snapshot Device**, select an xOS device of the same device type as the devices that are being migrated. Because we will be performing a firmware update using the migration file, the specific device does not matter, so long as it is the same device type.
   6. Click **Save and Continue**.

7. In **Step 2: Targets**:
    a. Select the devices that you want to migrate.
    b. Click **Save and Continue**.
8. In **Step 3: Settings**:
    a. Select ONLY **Firmware**.
    b. Click **Choose File**.
    c. Select the migration image that you downloaded in step 1.
    d. Type in the firmware version that matches the migration image file, if Remote Manager does not auto-populate it.
    e. Click **Save and Continue**.
9. In **Step 4: Schedule**:
    a. Select when you want the migration to begin.
    b. Check the **Remediate - Bring Device into Compliance with Profile** checkbox.
    c. Click **Activate Profile**.

3. **Create a profile representing the new DAL model**
    After the migration, the devices will have a new device type. It will be one of the following:

    - Digi TX54-Single-Cellular
    - Digi TX54-Dual-Cellular
    - Digi TX54-Dual-Wi-Fi
    - Digi TX64

    Because the device has a new device type, it will no longer match the migration profile, which is configured for xOS device types. As a result, you must create a new profile that represents the desired DAL firmware version and configuration.

    For this step, you must have one device that has already been migrated to DAL and that has a configuration that you want reflected across your installed base of new Digi TX devices. See Use the local Web UI to migrate devices or Use the CLI to migrate devices for information about migrating a single device, so that you can created a profile from that device.
    These settings will be replicated to all units after they have been migrated. If you have settings that are unique per device, you can set those during the profile creation step, or at any time after that.

    1. Repeat the steps in Create a profile to migrate devices to DAL to create a new profile.

    2. For **Snapshot Device**, select the DAL device that has the configuration that you want reflected across your installed base of new Digi TX devices.

    3. For **Step 2: Targets**, select the DAL devices that were migrated in Create a profile to migrate devices to DAL that will be configured to match the master device.

    4. For **Step 3: Settings**, select the configuration settings that you want to have applied to all of your Digi TX devices.

    5. In **Step 4: Schedule**:
        a. Select when you want the migration to begin.
        b. Check the **Remediate - Bring Device into Compliance with Profile** checkbox.
        c. Click **Activate Profile**.

IMPORTANT: Digi recommends that you review the configuration of migrated devices once the process completes, to ensure the device is secure and is configured correctly.

USE THE LOCAL WEB UI TO MIGRATE DEVICES

This method can be used to migrate a single device to the DAL firmware by using either a DAL configuration backup file or by automatically migrating xOS configuration.

Devices can be migrated using the Web UI in one of two ways:

- Automatic migration of an xOS configuration.
- Using a DAL configuration backup file.

Use the local Web UI to automatically migrate an xOS configuration
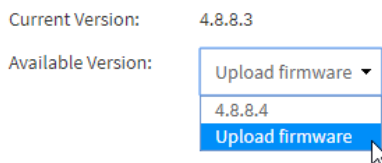
1. **Download the migration firmware image**

   Download the migration image for your device from the Digi support website.

   - WR54 Single-Cellular WR54-Single-Cellular-20.2.162.162-Migration.bin
   - WR54 Dual-Cellular   WR54-Dual-Cellular-20.2.162.162-Migration.bin
   - WR54 Dual-Wi-Fi   WR54-Dual-Wi-Fi-20.2.162.162-Migration.bin
   - WR64   WR64-20.2.162.162-Migration.bin

2. **Migrate the device**

   1. Log into the Web UI.
   2. Click **System** > **Firmware Update**.

      If the device firmware is not at the latest version, in **Available Version**, select **Upload firmware**.

   3. Click **Choose File** and select the migration image you downloaded in step 1.
   4. Click **UPDATE FIRMWARE**.
   5. The device will automatically reboot and the migration process will begin.

When the migration is complete, the Power LED will stop flashing and you can log into the device using the same username and password as before. If you are accessing the device via an interface using DHCP to get an IP address, the IP address over which you are connected may change as a result of the device rebooting.

IMPORTANT: Digi recommends that you review the configuration of migrated devices once the process completes, to ensure the device is secure and is configured correctly.

Use the local Web UI to migrate a device using a DAL configuration backup file

1. **Create a DAL configuration backup file**

   NOTE: These instructions describe how to create a DAL configuration backup file. Alternatively, Digi can provide you with a DAL configuration backup file that will allow you to migrate the device to a DAL factory default state. For more information on this option, contact Technical Support at tech.support@digi.com.

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   1. Migrate a device to the DAL firmware using the automatic method.
   2. (Optional) Factory default the device if you want to start with the DAL default configuration.

3. Make any necessary configuration changes.
4. Create a DAL backup file:
    a. Log into the Web UI.
    b. Select **System** > **Configuration Maintenance**.
    c. Under **Configuration backup**, click **SAVE**.

2. **Rename and upload the backup file**
    1. Rename the DAL backup file to **backup-archive.bin**.
    2. Upload the **backup-archive.bin** file to the xOS device to be migrated.

       You can upload the backup file onto the device using a utility such as Secure Copy (SCP), SSH File Transfer Protocol (SFTP), or an SFTP application such as FileZilla. See [Upload and Download files](#) section in the *Digi WR Router User Guide* for more information.

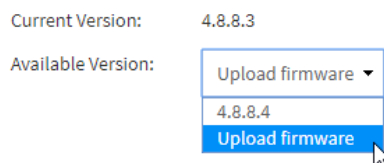3. **Download the migration firmware image**

    Download the migration image for your device from the [Digi support website](#).

    - WR54 Single-Cellular   [WR54-Single-Cellular-20.2.162.162-Migration.bin](#)
    - WR54 Dual-Cellular   [WR54-Dual-Cellular-20.2.162.162-Migration.bin](#)
    - WR54 Dual-Wi-Fi   [WR54-Dual-Wi-Fi-20.2.162.162-Migration.bin](#)
    - WR64   [WR64-20.2.162.162-Migration.bin](#)

4. **Migrate the device**
    1. Log into the Web UI.
    2. Click **System** > **Firmware Update**.

       If the device firmware is not at the latest version, in **Available Version**, select **Upload firmware**.

       | Current Version: | 4.8.8.3 |
       | Available Version: | Upload firmware ▼ |
       | | 4.8.8.4 |
       | | **Upload firmware** |

    3. Click **Choose File** and select the migration image you downloaded in [step 3](#).
    4. Click **UPDATE FIRMWARE**.
    5. The device will automatically reboot and the migration process will begin.

When the migration is complete, the Power LED will stop flashing and you can log into the device using the same username and password as before. If you are accessing the device via an interface using DHCP to get an IP address, the IP address over which you are connected may change as a result of the device rebooting.

IMPORTANT: Digi recommends that you review the configuration of migrated devices once the process completes, to ensure the device is secure and is configured correctly.

USE THE CLI TO MIGRATE DEVICES

This method can be used to migrate a single device to the DAL firmware by using either a DAL configuration backup file or by automatically migrating xOS configuration.

Devices can be migrated using CLI in one of two ways:

- Automatically migrating an xOS configuration.
- Using a DAL configuration backup file.

Use the CLI to automatically migrate an xOS configuration

1. Download the migration image for your device from the Digi support website.
   - WR54 Single-Cellular   WR54-Single-Cellular-20.2.162.162-Migration.bin
   - WR54 Dual-Cellular   WR54-Dual-Cellular-20.2.162.162-Migration.bin
   - WR54 Dual-Wi-Fi   WR54-Dual-Wi-Fi-20.2.162.162-Migration.bin
   - WR64   WR64-20.2.162.162-Migration.bin
2. Copy the migration image onto the device by using a utility such as Secure Copy (SCP), SSH File Transfer Protocol (SFTP), or an SFTP application such as FileZilla. See Upload and Download files section in the *Digi WR Router User Guide* for more information.
3. Log into the CLI.
4. Issue the following command:
   `update firmware migration_image_name`
5. Reboot the device. This will begin the migration process.

When the migration is complete, the Power LED will stop flashing and you can log into the device using the same username and password as before. If you are accessing the device via an interface using DHCP to get an IP address, the IP address over which you are connected may change as a result of the device rebooting.

IMPORTANT: Digi recommends that you review the configuration of migrated devices once the process completes, to ensure the device is secure and is configured correctly.

Use the CLI to migrate a device using a DAL configuration backup file

1. Create a DAL configuration backup file

NOTE: These instructions describe how to create a DAL configuration backup file. Alternatively, Digi can provide you with a DAL configuration backup file that will allow you to migrate the device to a DAL factory default state. For more information on this option, contact Technical Support at tech.support@digi.com.

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1. Migrate a device to the DAL firmware using the automatic method.
2. (Optional) Factory default the device if you want to start with DAL default configuration.
3. Make any necessary configuration changes.
4. Create a DAL backup file:
   a. Log into the CLI.
   b. Execute the following command:
      `> system backup /tmp/backup-archive.bin`

5. Download the backup file to your local filesystem:
```
> scp host host-ip user username remote remote-path local
/tmp/backup-archive.bin to remote
```
where:

- *host-ip* is the hostname or ip address of the remote host.
- *username* is the name of the user on the remote host.
- *remote-path* is the location on the remote host where the file will be copied.

6. Upload the **backup-archive.bin** file to the xOS device to be migrated.

   You can upload the backup file onto the device using a utility such as Secure Copy (SCP), SSH File Transfer Protocol (SFTP), or an SFTP application such as FileZilla. See Upload and Download files section in the *Digi WR Router User Guide* for more information.

7. Download the migration image for your device from the Digi support website.
   - WR54 Single-Cellular   WR54-Single-Cellular-20.2.162.162-Migration.bin
   - WR54 Dual-Cellular   WR54-Dual-Cellular-20.2.162.162-Migration.bin
   - WR54 Dual-Wi-Fi   WR54-Dual-Wi-Fi-20.2.162.162-Migration.bin
   - WR64   WR64-20.2.162.162-Migration.bin

8. Copy the migration image onto the device by using a utility such as Secure Copy (SCP), SSH File Transfer Protocol (SFTP), or an SFTP application such as FileZilla. See Upload and Download files section in the *Digi WR Router User Guide* for more information.

9. Log into the CLI.

10. Issue the following command:
```
update firmware migration_image_name
```
11. Reboot the device. This will begin the migration process.

When the migration is complete, the Power LED will stop flashing and you can log into the device using the same username and password as before. If you are accessing the device via an interface using DHCP to get an IP address, the IP address over which you are connected may change as a result of the device rebooting.

IMPORTANT: Digi recommends that you review the configuration of migrated devices once the process completes, to ensure the device is secure and is configured correctly.

XOS CONFIGURATION SETTINGS THAT CANNOT BE MIGRATED

The following xOS configuration settings cannot be migrated, but will not prevent the migration from being completed:

- DAL only supports full and read-only admin access. This means only **super** and **read-only** level admin users will be migrated to DAL.
- The xOS logging configuration will not be migrated to DAL. DAL has separate logging configuration for individual event categories, which are enabled by default. See Event logging in the *Digi TX54 User Guide* or Event logging in the *Digi TX64 User Guide* for more details.
- For remote logging, the **syslog port** and **mode** is not configurable in DAL. The device will default to use the standard syslog port 514 and UDP mode.
- SNTP or NTP support cannot be disabled in DAL. The device will default to use Digi's **time.devicecloud.com** server.
- The Ethernet interface speed and duplex is not configurable in DAL. The device will default to auto negotiating the speed and duplex.
- The xOS Wi-Fi **wpa-wpa2-personal** or **wpa-wpa2-enterprise** security options are not supported in DAL. The device will default to the DAL **psk2** or **wpa2** options, respectively.
- The Wi-Fi transmit power is not configurable in DAL. The device will default to 100% transmit power.
- Port-forwarding rules cannot be configured to forward packets received over OpenVPN or GRE tunnels. Any xOS port forwarding rules configured with a source OpenVPN or GRE interface will not be migrated.
- The xOS **analyzer** configuration will not be migrated. The analyzer has been updated in DAL to support multiple traffic captures that can be enabled or disabled individually. See the Analyzer section in the User Guide for more details.
- The Digi xOS **system ipsec-debug** configuration will not be migrated to DAL. IPsec debug can be enabled via the shell. Please refer to the User Guide for more information.

PYTHON

Supported versions of Python:

- DAL 20.2: Python 3.6.10
- Digi xOS 4.8.7 : Python 3.5.9

Python scripts will not be converted as part of the migration and will have to be updated manually.

Any Python scripts will be moved to the DAL scripts directory (/etc/config/scripts) as part of the migration, but any auto-start configuration will be disabled so that the Python scripts will not run automatically until they have been updated. See the Application section in the User Guide for more details.

As the DAL CLI is different from the Digi xOS CLI, Python scripts that use the **digidevice** CLI module will have to be updated to use the DAL CLI. See the digidevice CLI section in the User Guide for more details.

DAL does not support an interactive Python mode via the CLI. Instead, interactive Python mode is run via the Linux shell. See the Python section in the User Guide for more details.

For more information and help on converting Python scripts, please see our support options on the Digi Support website.

New Python modules

The **digidevice** library on DAL has two new modules, **config** and **runt,** which can be used to configure the device and to get status and statistic information.

digidevice config

The config module provides an interface to the DAL configuration. It can be used to both get and set configuration parameters.

```
>>> from digidevice import config
>>>
>>> cfg = config.load(writable=True)
>>> cfg.get("network.interface.lan1.ipv4.address")
'192.168.2.1/24'
>>>
>>> cfg.set("network.interface.lan1.ipv4.address", "192.168.49.1/24")
>>> cfg.get("network.interface.lan1.ipv4.address")
'192.168.49.1/24'
>>> cfg.commit()
True
>>>
```

For more information on the config module, run the Python command **help(config)** after importing the runt module. See the digidevice config section in the User Guide for more details.

digidevice runt

The runt module provides an interface to the DAL runtime database that stores the status and statistics for the features running on the device.

Status and statistical information can be both stored and retrieved using runt, and can be used by Python scripts to store and retrieve information generated by the Python script.

```
>>> from digidevice import runt
>>>
>>> runt.start()
>>> runt.get("system.model")
'Digi TX64'
>>>
>>> runt.set("yourdata.abc", "123")
>>>
>>> runt.get("yourdata.abc")
'123'
>>>
>>> runt.stop()
>>>
```

The complete set of items stored in the runt database can be obtained by running the **runt dump** command in the Linux shell.

For more information on the runt module, run the Python command **help(runt)** after importing the runt module. See the digidevice runt section in the User Guide.

Serial interface

The Python names for the serial ports have changed on the TX54 and TX64.

	Serial Port	USB Front Port	USB Rear Port 1	USB Rear Port 2
WR54	/dev/ttySerial1	N/A	/dev/ttyUSBSerial1	N/A
TX54	/dev/serial/port1	N/A	/dev/serial/*name*	N/A
WR64	/dev/ttySerial1	N/A	/dev/ttyUSBSerial1	/dev/ttyUSBSerial2
TX64	/dev/serial/port1	/dev/serial/*name*	/dev/serial/*name*	/dev/serial/*name*

where *name* is the configured name of the serial port.

In order to use these serial interface names with Python, the serial port must be configured in the **application** mode.

For example, to use Python with a USB serial adaptor plugged into the front USB port of a TX64, the configuration would be similar to:

```
> config
(config)> serial
(config serial)> add my_usb_serial
(config serial my_usb_serial)> usb port front
(config serial my_usb_serial)> mode application
(config serial my_usb_serial)> save
>
```

Python would then be able to use **/dev/serial/my_usb_serial**

NOTE: The USB serial interface support will be available in the DAL 20.5 release.

FURTHER INFORMATION

For more information, see the following resources:
- [Digi TX54 product page](#)
- [Digi TX64 product page](#)
- *[Digi TX54 User Guide](#)*
- *[Digi TX64 User Guide](#)*

TECHNICAL SUPPORT

Get the help you need via our Technical Support team and online resources. Digi offers multiple support levels and professional services to meet your needs. All Digi customers have access to product documentation, firmware, drivers, knowledgebase, and peer-to-peer support forums.

For issues or questions on the migration procedure, contact Technical Support at tech.support@digi.com. You can also review available support options at https://www.digi.com/support.