VXLAN Configuration Example

VXLAN support has been introduced starting with firmware version 00.07.09 and later. It is advised to update to the latest firmware available.

The information in this page is updated in accordance with **00.07.09.4** firmware version.

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Contents

Introduction

VXLAN (Virtual Extensible LAN) encapsulates Layer 2 Ethernet frames within Layer 3 packets, creating a Layer 2 network over a Layer 3 infrastructure. It acts as a virtual switch, interconnecting routers and all devices connected to them into an extended Layer 2 network, enhancing scalability and flexibility. In this article several methods to configure a **VXLAN tunnel** between **two Teltonika devices** will be demonstrated.

Prerequisites

- **Two routers** with installed VXLAN packages, will refer to these as **RUT1** and **RUT2**
- End device like Laptop or Mobile Phone
- Two Public IP addresses for configuring VXLAN over the Mobile network
- One Public IP address for configuring VXLAN over the VPN tunnel

VXLAN package Installation

First, install the VXLAN package on both RUT1 and RUT2 devices. This package is available on firmware version 07.09 and later, therefore, updating the router's firmware is a mandatory step if it is outdated. After the update, the package can be found in the Package Manager in the WebUI.

Navigate to **System > Package Manager**

1. In the search bar look for **VXLAN** package
2. Click **Install**

VXLAN over Wired WAN

In this section, the setup of VXLAN over Wired WAN using RUT1 and RUT2 devices will be described. The process will show how to create a VXLAN tunnel to connect the devices and allow them to communicate over the wired network.

Configuration on RUT1 device

Navigate to the **Network > WAN** section in the WebUI, then click the button for the wired WAN interface.

Configuration window will open. Adjust following:

1. Ensure interface is **Enabled**
2. Change Protocol to **Static**
3. Enter Ipv4 address for communication in this Wired WAN network
4. Select your preferable **IPv4 netmask**
5. Click twice

Navigate to the **Network > Devices**

1. In **Add new device** section select Type **VXLAN**
2. Press

2. Enter name of the new VXLAN interface
3. Enter VNI (VXLAN Network Identifier). It identifies a specific virtual network in a data plane and performs a function similar to a VLAN ID in regular networks. The same VNI have to be used in RUT2 VXLAN interface settings.
4. Enter the port number. The default port is 4789
5. Enter the Remote address corresponding to RUT2 wired WAN interface IP address
6. Click twice

Navigate to **Network > LAN** and click to modify existing LAN interface

In **Physical Settings** tab:

1. Asure that **Bridge interfaces** option is enabled
2. Click on the droplist and add **vxlan1** interface
3. Click twice

Configuration on RUT2 device

The configuration steps for RUT2 are similar to those performed on RUT1, with some additional adjustments. Navigate to the **Network > WAN** section in the WebUI, then click the button for the wired WAN interface.

Configuration window will open. Adjust following:

1. Ensure interface is **Enabled**
2. Change Protocol to **Static**
3. Enter Ipv4 address for communication in this Wired WAN network
4. Select your preferable **IPv4 netmask**
5. Click twice

Navigate to the **Network > Devices**

1. In **Add new device** section select Type **VXLAN**
2. Press

2. Enter name of the new VXLAN interface
3. Enter VNI (VXLAN Network Identifier). It identifies a specific virtual network in a data plane and performs a function similar to a VLAN ID in regular networks. The same VNI have to be used in RUT2 VXLAN interface settings.
4. Enter the same port number that is configured in the RUT1 VXLAN settings
5. Enter the Remote address corresponding to RUT2 wired WAN interface IP address
6. Click twice

Navigate to **Network > LAN** and click to modify existing LAN interface.

1. For testing purposes, both routers should be part of the same LAN segment, so assign unique IP addresses to prevent conflicts. RUT2 will now be accessible using its newly assigned IP address.
2. Additionally, ensure that only one DHCP server is active by disabling the DHCP server on RUT2.

In **Physical Settings** tab:

2. Asure that **Bridge interfaces** option is enabled
3. Click on the droplist and add vxlan1 interface
4. Click twice

VXLAN over Mobile network

In this section, VXLAN will be set up between two Teltonika devices using Mobile WAN, requiring two public IPs—one for each RUT device. The configuration steps will be similar to those described in the VXLAN over Wired WAN section of this page, except for the **APN** settings and the **Network > Devices** section settings, where the remote address of the created VXLAN interface will be updated to reflect the other router's public IP.

Configuring APN settings

First, both RUT1 and RUT2 devices must have **Public IP** addresses. To achieve this, manually assign the relevant APN settings to their mobile interfaces to obtain Public IPs:

Navigate to the **Network > WAN** section in the WebUI, then click the button for the mobile WAN interface.

Configuration window will open. Adjust the following:

1. Disable **Auto APN**
2. Select an APN that will provide your router with a **Public IP**
3. Click twice

Configuration on RUT1 device

Navigate to **Network > Devices**. To create a new instance, click the button. If editing an existing interface from the **previous configuration**, click

1. In **Remote address** section enter **RUT2 Public IP** address
2. Click twice

Configuration on RUT2 device

Navigate to **Network > Devices**. To create a new instance, click the button. If editing an existing interface from the **previous configuration**, click

1. In **Remote address** section enter **RUT1 Public IP** address
2. Click twice

VXLAN over VPN tunnel

If only one Public IP address is available, VXLAN can be configured through a VPN tunnel. In this case, an IPsec VPN will be used, where RUT1 acts as the VPN server and RUT2 as the client. The VPN creates remote tunnel endpoints, which can then be integrated into the VXLAN configuration to enable Layer 2 communication between the routers.

The configuration steps will be similar to those outlined in the VXLAN over Wired WAN section of this page, with the addition of **IPsec configuration** and adjustments in the **Network > Devices** settings, where the remote address of the created VXLAN interface will be updated to correspond to the VPN tunnel endpoint of the other router.

Configuration on RUT1 device

Navigate to **Services > VPN > IPsec**:

1. Enter Instance name
2. Click on the

2. Enable instance
3. Since RUT1 will serve as the server device, the Remote endpoint field should be left blank
4. Select **Pre-Shared Key** as the authentication method
5. Enter the key. This key must match the one that will be entered later in the RUT2 IPSec settings
6. Enter the RUT1 LAN IP address as the **Local identifier**
7. Enter the RUT2 LAN IP address as the **Remote identifier**

Scroll down to **Connection settings**:

2. Select "**Start**" in **Mode** section
3. Select "**Tunnel**" as connection type
4. Enable "**Route based IPSec**"
5. Enter the **IP address** of the RUT1 tunnel endpoint
6. Enter lower MTU to reduce packet size (optional)
8. Leave all other settings at their default values and click the twice

Navigate to **Network > Devices**. To create a new instance, click the button. If editing an existing interface from the **previous configuration**, click

1. Enter **IP address** of RUT2 VPN **tunnel endpoint**
2. Click the twice

Configuration on RUT2 device

Navigate to **Services > VPN > IPsec**:

1. Enter Instance name
2. Click on the

2. Enable instance
3. Enter RUT1 Public IP
4. Select **Pre-Shared Key** as the authentication method
5. Enter the key. This key must match the one that was entered the RUT1 IPSec settings
6. Enter the RUT2 LAN IP address as the **Local identifier**
7. Enter the RUT1 LAN IP address as the **Remote identifier**

Scroll down to **Connection settings**:

2. Select "**Start**" in **Mode** section
3. Select "**Tunnel**" as connection type
4. Enable "**Route based IPSec**"
5. Enter the **IP address** of the RUT2 tunnel endpoint
6. Enter lower MTU to reduce packet size (optional)
7. Leave all other settings at their default values and click the twice

Navigate to **Network > Devices**. To create a new instance, click the button. If editing an existing interface from the **previous configuration**, click

1. Enter **IP address** of RUT1 VPN **tunnel endpoint**
2. Click the twice

Configuration testing

The best way to test the configuration after setting up VXLAN between the routers is to ping between devices on either side of the routers using their LAN IPs and check the ARP tables. This

ensures that devices on the same LAN segment can communicate over the Layer 2 (L2) network through the routers.

Configuration testing from RUT1 side:

If the MAC address for the specified IP address in the ARP table matches the RUT2's MAC address, it confirms that the configuration is functioning correctly.

Configuration testing from RUT2 side: