



# Bonding, VLAN and VXLAN

## Feature Description

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# 1 Introduction

LoadMaster bonding/Virtual LAN (VLAN) tagging can be easily set up and configured using the LoadMaster Web User Interface (WUI). Successful deployment requires that the pre-requisites have been satisfied.

The LoadMaster also supports Virtual Extensible LAN (VXLAN) and VXLAN Tunnel Endpoint (VTEP) capabilities. LoadMasters have the ability to proxy across VXLAN to non-VXLAN networks.

VXLAN is an overlay technology that encapsulates MAC frames at Layer 2 into a UDP header providing a way for multi-tenant “cloud” networks to span large networks. It is an overlay network in that it allows the creation of Layer 2 networks on top of Layer 3 networks. Communication is established between two or multiple tunnel end points called VTEPs which encapsulate Virtual Machine traffic in a VXLAN header as well as stripping the encapsulation off to present it to the destination Virtual Machine with the original Layer 2 packet. This allows Virtual Machine communication across subnets without the use of a Layer 3 router to bridge the segments via tunnelling.

This guide is designed to introduce interface bonding, VLAN and VXLAN configuration on the LoadMaster. Bonding support is available with all network modules.

## 1.1 Prerequisites

The switch being used must be compatible with:

- VLAN tagging
  - IEEE 802.1Q
- Bonding/teaming (802.3ad/Active-Backup)
  - IEEE 802.1AX/IEEE 802.3ad/LACP

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It is not possible to bond interfaces on Azure or Amazon Web Services (AWS) LoadMasters.

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### 1.1.1 Switch Configuration

Enabling the Active-Backup mode generally does not require switch intervention and can be configured directly on the LoadMaster. Using the 802.3ad bonding mode will require configuring a link aggregation group on the switch in conjunction with the LoadMaster. Please read your switch

## 1 Introduction

documentation to establish the corresponding team/bond. Common terms for link aggregation include "Ethernet trunk", "NIC teaming", "port channel", "port teaming", "port trunking", "link bundling", "EtherChannel", "Multi-Link Trunking (MLT)", "NIC bonding", "Network Fault Tolerance (NFT)" and "LAG".

When enabling VLAN trunking on the switch port, make sure to configure the port to support the appropriate mode; General; Access or Trunking. Descriptions are as follows, but please check your switch documentation for specifics:

- General — The port belongs to VLANs, and each VLAN is user-defined as tagged or untagged (full 802.1Q mode)
- Access — The port belongs to a single untagged VLAN
- Trunk — The port belongs to VLANs in which all ports are tagged

## 1.2 Intended Audience

This document is intended to be read by anyone, specifically network administrators, who have an interest in finding out about bonding, VLAN and VXLAN configuration on the LoadMaster.

# 2 Bonding/Teaming (802.3ad/Active-Backup)

There are a few key points to keep in mind when creating bonds/teams:

- Interface bonding on the LoadMaster is supported in Azure, but bonding on the Azure switches is not
- You can only bond interfaces higher than the parent. For example, if you start with port 10 you can only add ports 11 and greater.
- When using a Virtual LoadMaster (VLM), all NICs must be added prior to configuring bonding or adding VLANs. If a new NIC is needed you must remove the bond and/or remove the VLANs.
- If VLAN tagging is required, bond the links first and then add VLANs after the bond has been configured
- Bonding interfaces 0 and 1 is not permitted
- You should never bond all interfaces
- In order to add a link to a bonded interface, any IP addressing must first be removed from the link to be added. The NIC to be added to the initial interface must not have an IP address.
- Enabling the Active-Backup mode generally does not require switch intervention
- The **802.3ad** mode is an active-active setup
- Ensure that all bonded interfaces are configured for the same link speed, both on the switch and the LoadMaster
- If you want to bond port 0, you should strongly consider moving the web administrative interface and/or the remote SSH access to a different port temporarily until that bonding has been completely configured

## 2.1 Creating a Bond/Team

To create a bond/team, follow the steps below:

1. In the main menu of the WUI, navigate to **System Configuration > Network Setup > Interfaces**.
2. Click the link for the relevant interface.

### Network Interface 1

Interface Address (address[/prefix])
Set Address

Link Status
No Link Detected
Automatic
Force Link

MTU:
Set MTU

Additional addresses (address[/prefix])
Add Address

VLAN Configuration
VXLAN Configuration
Interface Bonding

3. Click **Interface Bonding**.

Convert eth0 to a bonded device
Create a bonded interface 0

<-Back

4. Click **Create a bonded interface**.
5. Click **OK**.
6. Click **OK** again.

### Interface Converted

Converted Interface to be used as bonded device

Continue

7. Click **Continue**.
8. In the main menu, select **System Configuration > Network Setup > Interfaces** and click the bnd link.

Network Interface 0

Bonded Interface (eth0)

Interface Address (address[/prefix])

10.154.11.70/16

Set Address

Use for GEO Responses and Requests

☒

Additional addresses (address[/prefix])

Add Address

VLAN Configuration

VXLAN Configuration

Bonded Devices

9. Click **Bonded Devices**.

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Bonding Management

Bonding mode

802.3ad

Unbond this interface

Unbond

Add Link

No ports available

Add Link

Port eth0

Unbind Port

Unbind Port

Link Status

Speed: 10000Mb/s, Full Duplex

Automatic

Force Link

10. Select the relevant interface and click **Add Link**.

## 2.2 Removing a Bond/Team

To remove a bond/team, follow the steps below:

1. In the main menu of the LoadMaster WUI, go to **System Configuration > Network Setup > Interfaces**.
2. Select the bond to be removed.



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### Bonding Management

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Bonding mode 802.3ad ▼

Unbond this interface Unbond

Add Link No ports available ▼ Add Link

---

### Port eth0

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Unbind Port Unbind Port

Link Status Speed: 10000Mb/s, Full Duplex Automatic ▼ Force Link

- Click **Bonded Devices**.
- Un-bind each port by clicking the **Unbind Port** button. Repeat this until all ports are removed from the bond.
- Once all of the child ports have been un-bonded, the parent port can be unbonded by clicking **Unbond**.

### Interface Unbound

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Deleted bonding support from Interface

Continue

- Click **Continue**.

# 3 VLAN Tagging

Things to keep in mind:

- Configure VLAN tagging on the switch first, if required
- Start by deciding if you need bonding. If you do, first establish the bonded configuration. Then, proceed by adding the VLAN tagging information.
- VLANs can be added to physical interfaces or bonded interfaces
- The VLAN interface IP address cannot be in the same subnet as the VXLAN interface

## 3.1 Add a VLAN

To add a VLAN, follow the steps below:

1. In the main menu of the WUI, go to **System Configuration > Network Setup > Interfaces**.
2. Click the relevant interface.

### Network Interface 1

Interface Address (address[/prefix])	<input type="text" value="10.154.11.71"/>	<button>Set Address</button>
Link Status	Speed: 10000Mb/s, Full Duplex	<input type="text" value="Automatic"/> <button>Force Link</button>
	MTU: <input type="text" value="1500"/>	<button>Set MTU</button>
Additional addresses (address[/prefix])	<input type="text"/>	<button>Add Address</button>

VLAN Configuration VXLAN Configuration Interface Bonding

3. Click **VLAN Configuration**.
4. Enter the **VLAN Id** and click **Add New VLAN**.
5. Click **Continue**.
6. Repeat as needed.

To view the VLANs, in the main menu of the WUI, select **System Configuration > Network Setup > Interfaces** and expand the drop-down list.

### 3.2 Remove a VLAN

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Before removing a VLAN, please ensure that the interface is not being used for other purposes, for example as a multicast interface, WUI interface, SSH interface or a GEO interface.

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To remove a VLAN select the **System Configuration > Network Setup > Interfaces** menu option and select the appropriate VLAN ID from the drop-down list.

Once selected, delete the IP and then click **Set Address**. Once the IP has been removed you will have the option to delete the VLAN, by clicking the **Delete this VLAN** button.

Repeat as needed. To view the VLANs select the **System Configuration > Network Setup > Interfaces** menu option and select the appropriate VLAN ID from the drop-down list.

# 4 VXLAN

There are a few key points to keep in mind when creating a VXLAN:

- VXLANs can be added to physical interfaces as well as bonded interfaces
- It is possible to create a VLAN on top of a VXLAN
- IPv6 is not supported for VXLAN
- VXLAN is not supported when LoadMaster clustering is configured
- VXLANs use UDP destination port **8472**
- The VXLAN interface IP address cannot be in the same subnet as the VLAN interface.

## 4.1 Add a VXLAN

To add a VXLAN to an interface in the LoadMaster, follow the steps below:

1. In the main menu of the LoadMaster WUI, go to **System Configuration > Network Setup** and click the relevant interface link.

### Network Interface 0

Interface Address (address[/prefix])

10.154.11.70/16

Set Address

Use for GEO Responses and Requests

☒

Link Status

Speed: 10000Mb/s, Full Duplex

Automatic

Force Link

MTU:

1500

Set MTU

Additional addresses (address[/prefix])

Add Address

VLAN Configuration

VXLAN Configuration

Interface Bonding

2. Click the VXLAN Configuration button.

### Add New VXLAN

VNI

2

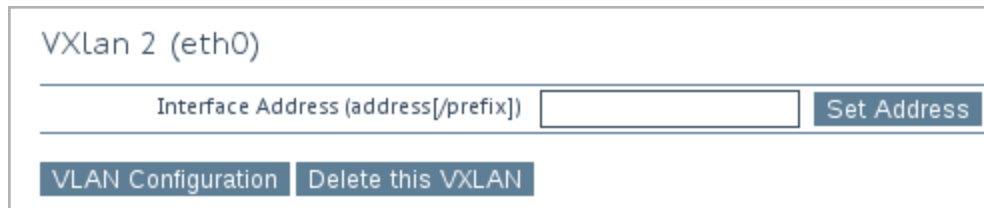
Group or Remote address

10.154.11.72

Add New VXLAN

<-Back

3. Enter a new VXLAN Network Identifier (**VNI**).
4. Enter the multicast group IP address or remote end-point (VTEP) IP address (in the case of a unicast point-to-point VXLAN).
5. Click **Add New VXLAN**.
6. To configure the VXLAN, go to **System Configuration > Network Setup** and select the relevant VXLAN from the drop-down list.



VXlan 2 (eth0)

Interface Address (address[/prefix])  **Set Address**

**VLAN Configuration** **Delete this VXLAN**

7. Enter the address of the interface and click **Set Address**.

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If configuring a VXLAN in a High Availability (HA) setup, you will also have to specify the **HA Shared IP address**, the **HA Partner IP address** and specify whether or not to use the interface for HA checks.

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If required, a VLAN can be created on top of the VXLAN by clicking the **VLAN Configuration** button.

## 4.2 Remove a VXLAN

A VXLAN can only be deleted if there are no VLANs created on top of it and if there are no IP addresses assigned to the VXLAN. If a VLAN has been created on top of a VXLAN, first delete the VLAN and then you can delete the VXLAN.

To delete a VXLAN, follow the steps below:

1. In the main menu of the LoadMaster, go to **System Configuration > Network Setup** and select the relevant VXLAN from the drop-down list provided.
2. Click **Delete this VXLAN**, as shown in the screenshot above.

# References

Unless otherwise specified, the following documents can be found at <http://www.kemptechnologies.com/documentation>.

**Web User Interface, Configuration Guide**

# Last Updated Date

This document was last updated on 27 July 2023.