### NAME

vmx - VMware VMXNET3 Virtual Interface Controller device

## SYNOPSIS

To compile this driver into the kernel, place the following lines in your kernel configuration file:

## device iflib device vmx

Alternatively, to load the driver as a module at boot time, place the following line in loader.conf(5):

if\_vmx\_load="YES"

### DESCRIPTION

The **vmx** driver provides support for the VMXNET3 virtual NIC available in virtual machines by VMware. It appears as a simple Ethernet device but is actually a virtual network interface to the underlying host operating system.

This driver supports the **VMXNET3** driver protocol, as an alternative to the emulated le(4), em(4) interfaces also available in the VMware environment. The **vmx** driver is optimized for the virtual machine, it can provide advanced capabilities depending on the underlying host operating system and the physical network interface controller of the host. The **vmx** driver supports features like multiqueue support, IPv6 checksum offloading, MSI/MSI-X support and hardware VLAN tagging in VMware's VLAN Guest Tagging (VGT) mode.

The **vmx** driver supports VMXNET3 VMware virtual NICs provided by the virtual machine hardware version 7 or newer, as provided by the following products:

- VMware ESX/ESXi 4.0 and newer
- VMware Server 2.0 and newer
- VMware Workstation 6.5 and newer
- VMware Fusion 2.0 and newer

For more information on configuring this device, see ifconfig(8).

# **MULTIPLE QUEUES**

The **vmx** driver supports multiple transmit and receive queues. Multiple queues are only supported by certain VMware products, such as ESXi. The number of queues allocated depends on the presence of MSI-X, the number of configured CPUs, and the tunables listed below. FreeBSD does not enable MSI-X support on VMware by default. The *hw.pci.honor\_msi\_blacklist* tunable must be disabled to enable

MSI-X support.

## LOADER TUNABLES

Tunables can be set at the loader(8) prompt before booting the kernel or stored in loader.conf(5).

hw.vmx.txnqueue

#### hw.vmx.X.txnqueue

Maximum number of transmit queues allocated by default by the driver. The default value is 8. The maximum supported by the VMXNET3 virtual NIC is 8.

#### hw.vmx.rxnqueue

### hw.vmx.X.rxnqueue

Maximum number of receive queues allocated by default by the driver. The default value is 8. The maximum supported by the VMXNET3 virtual NIC is 16.

### hw.vmx.txndesc

### hw.vmx.X.txndesc

Number of transmit descriptors allocated by the driver. The default value is 512. The value must be a multiple of 32, and the maximum is 4096.

### hw.vmx.rxndesc

## hw.vmx.X.rxndesc

Number of receive descriptors per ring allocated by the driver. The default value is 256. The value must be a multiple of 32, and the maximum is 2048. There are two rings so the actual usage is doubled.

## EXAMPLES

The following entry must be added to the VMware configuration file to provide the **vmx** device:

```
ethernet0.virtualDev = "vmxnet3"
```

### SEE ALSO

altq(4), arp(4), em(4), iflib(4), le(4), netintro(4), ng\_ether(4), vlan(4), ifconfig(8)

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# AUTHORS

The **vmx** driver was ported from OpenBSD and significantly rewritten by Bryan Venteicher *<bryanv@freebsd.org>*. The OpenBSD driver was written by Tsubai Masanari.