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# Release Notes

## Introduction

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## **LarchOS software explained**

### **LarchOS at glance.**

LarchOS is a software build on top of proven Carrier grade NOS for Marvell packet processor based devices. Larch OS brings the whole set of network management features and protocols, available in, market leading IP Infusion system, to the world of Marvell Packet processor based hardware platforms. Larch Systems is adapting the proven code from IP Infusion to 100Gbps Marvell Bobcat3 devices and now to Marvell Falcon devices.

LarchOS is full-featured network OS for Marvell Packet Processor based devices. Its features include advanced capabilities, such as extensive switching and routing protocol support, possible extensions for MPLS (Multiprotocol Label Switching), and SDN (software defined networking).

### **Comprehensive possible Feature List**

The system adapts IP Infusion widely-deployed and time-tested ZebOS network stack, that support over 200 network protocols and conforms to leading IEEE, IETF and MEF industry-specific standards. System control plane software design is highly modular with multiple processes handling each individual protocols. The processes are managed and contained by a process handler framework, which also monitors the processes, restarts and maintains event logging for them.

### **Development / porting direction**

Main direction Larchos is being adapted on Marvell Falcon is with existing customers in mind and thus currently Larch chase

- extensive support for IPv6 MP-BGP with target to reach full VxLAN EVPN abstraction that is already available on LarchOS running on Marvell Bobcat3.
- As well as a separate provisions are made for all kind of port breakout support
- Entropy sources for hash calculation (configurable): ingress interface, L3 and L4 fields, IPv6 flow label
- Pluggable optics info (power, temperature, signal levels etc.)
- All kind of consistent hashing
- Per detailed statistics
- High capacity Tables stress test with at least 60k IPv4 AND 60k IPv6 routes supported in HW for BGP and redistributing

## Currently Implemented functionality of the system on Marvell Falcon platform

### Port configuration:

System is configured for two split DAC cables of QSFP56-DD <> 8xSFP56 format for connecting devices at speeds of 1/10/25/50Gbps - implemented in static mode on first two physical ports numbered 1 and 2.

Ports ce1-ce2 are not accessible in the system configuration

Other QSFP-DD ports are marked as ce3-cexx

16xsplit outputs ports are labeled accordingly as xe1-xe16 and may be used both with QSFP-DD split cables and QSFP-4xSFP cables as well. Speeds on ports xe1-xe16 are configurable.

### Switching:

- VLAN:
- Jumbo Frames of at least 9100 bytes
- 802.1AD – vlan stacking
- Native VLAN support on trunk ports (trunk L2 port must forward untagged packets in both directions if native VLAN is configured on port)
- 802.1ax link aggregation (LAG)
- IGMP Snooping

### Routing:

- IPv4 address on port;
- IPv4 address on VLAN;
- IPv6 L3 (routed) interfaces 3
- Static routing:
- 32-bit ASN
- AS-Path relax feature
- BFD single hop (including IPv6 link-local support)
- MP-BGP
- eBGP over IPv6 link-local addresses
- PIM
- IP IGMP

### Multicast:

- Multicast
- Protocol Independent Multicast: RFC 4601
- PIM SM v4/v6

- RFC 5059 Bootstrap Router (BSR) Mechanism for PIM
- PIM - Dense Mode (PIM-DM): Protocol Specification (Revised)
- PIM SSM
- MSDP Multicast Source Discovery Protocol
- IGMP ver 1-3, RFC 1112, RFC 2236, RFC 3376.
- MLD ver 1-2, RFC 2710, RFC 3810, RFC 4604.
- IGMP snooping v4-v6
- IGMP report suppression for v1, v2 and v3
- IGMP Proxy IGMP-based Multicast Forwarding ("IGMP Proxying")
- IGMP Fast Leave

#### **Control systems:**

- VRF-aware OoB management
- All related services (DNS, SSHv2, Telnet, SNMP, NTP, FTP/SFTP, Tacacs, Syslog) over OoB
- Management, Instrumentation and API requirements
- Chassis and environmental info (power, temperature, fan RPM etc.)
- Pluggable optics info (power, temperature, signal levels etc.)
- System info (CPU, memory, disk etc.)
- Interface statistics
- SNMP version 2
- ACL statistics (per-ACE match counters)
- Key-based SSH authentication for at least 32 users
- Firmware update over HTTP/FTP
- LLDP

#### **Classification, Filtering and QoS:**

- QOS and ACL modification without traffic disruption
- Ingress interface
- L2 header fields (802.1Q: VLAN ID)
- L3 header fields (IPv6: SRC, DST, PROTO, ICMP: Code and type)
- L4 header fields (TCP/UDP: SPORT, DPORT, TCP: Flags)
- Granular classification based on combination of fields from L2, L3 and L4 headers

## **Unsupported functionality in the version and known issues**

- Flow control mechanisms are turned off

- Support for split cables is configured in static mode on ce1-2 ports – «port breakout enable» commands work is in progress. (may require device reboot)

## Issue updates

### Fix board reboot issue

### Use 128 virtual port mode – fix VLAN numbering issue

### Enable Multicast

### Pass stress tests with 60k IPv4 and 60k IPv6 routes simultaneously.

Decrease timeout for flushing fdb to 2 sec

Add timeout for flushing fdb due to imish stuck #21544

fix Command "switchport/no switchport" causes imish to freeze #21544

cpss\_l3\_add\_uc\_prefix: fix errcode to GT\_FULL for FDB manager call + log formatting

Add support of fdb routing for host routes #21492

Init shared memory to fdb=32, em=0, lpm=0, arp=4 by default

fix: Interfaces disappear after reboot #21530

fix: nsm\_crash\_at\_halk\_talk\_bug #21525

fix: hostpd\_crash #21498

fix: network\_operator\_login\_bug #21513

### BGP Community with last two bytes equals zero #21483

Add support of fdb routing for host routes #21492

warning when creating bridge for vlan-interface #21484

cpss\_pkt\_process: skipping proprietary Cisco frames and frames with Length field #21485

hostp\_debug\_hw\_snmp: fix buffer overflow for float values

### permitting BGP community numbers like 65535:XXXXX #21483

Add additional verifications for call appDemoDxChPortMgrPortModeSpeedSet #21356

cpss\_get\_eport\_counters: fix switch case value

Fix QSFP ddm output

Fix ECN marking bug. Added binding profile to the port #21103

Fix ipv6 acl bug #21301

Edit cnc related code to support Falcon

## System boot/login process

The system is preferable provided with preinstalled firmware on the SSD drive in the hardware.

Device boot process

```
Bios -> GRUB -> +  
->Linux -> NOS  
->ONIE -> Linux -> NOS
```

Firmware update is possible by NOS or using the ONIE installation system

To update the firmware, follow the corresponding instructions below.

After booting the Linux system, the Linux login prompt appears and the NOS and switch packet processor are initialized in parallel.

*Note* - The NOS boot process takes slightly longer than the operating system boot process. At the same time, messages about the initialization of NOS modules are displayed on the console. Access attempts before the initialization of the switch is complete will generate a login error message.

Wait until the initialization of the NOS modules is complete before logging in.

To access the switch, use the username / password **admin / admin**

The system will open the switch command line software

## Software Installation instructions

Instructions for updating the firmware of the Falcon device

### INTRODUCTION

We assume that a prepared SSD drive is inserted into the device and required bootup components are present in the devices. (such as GRUB/ONIE) or the system is already running.

### Updating the device is possible in the following ways

- 1) Using the LarchOS system interface through the HTTP / FTP server
- 2) Using the ONIE system installation environment interface from a network
- 3) Using the ONIE system installation environment and an image on USB device

Prerequisites to update the device over network with this instruction:

- a) have a connection to the console port of the switch
- b) DHCP server is available to assign an IP address to the switch
- c) for updating using the system interface over the network - an FTP or HTTP server is required to host the firmware file

To update using the ONIE system installation environment interface it is also possible to use firmware file written to a USB drive and connected to the USB port of the device

Updating over the network can be done from a separate computer or using the enterprise network.

The instruction below is written taking into account the use of a separate computer running MS Windows

### PREPARATION FOR FLASHING THE DEVICE

Connect the device to the computer from which you plan to update

- 1) Console cable - use a Cisco compatible RJ45 COM cable  
Port parameters - 115200 8N1
- 2) When updating over the network - connect a computer or corporate network to the switch port designated MGMT (on the left of the front panel)



use a crossover cable if necessary

the port supports speeds of 10 / 100Mbps and 1Gbps

When using a stand-alone computer, use software with DHCP and FTP / HTTP server functions

Free TFTP64 software can be used for Windows system

When using a separate computer, configure the automatic distribution of IP addresses

Further, the instructions assume that the computer (and FTP server) have the address 10.0.0.1

And the switch received the address 10.0.0.147 automatically via DHCP

place the firmware file on FTP / HTTP server

## **UPDATING THE DEVICE USING THE LarchOS SYSTEM INTERFACE**

Run the terminal program for the console port you are using.

Turn on the device. You will see the boot process of the device.

The boot process will launch the GRUB boot manager, then the ONIE installation environment, then the main NOS system.

after booting the system, you will see a login prompt in the device console

It is necessary to wait for the final boot of the device - there are no messages in the console for one to three minutes after the prompt appears

If you try to log in before the boot process is complete, you may receive a message stating that the login information is incorrect.

### **Use login and password - admin / admin**

after entering the username, the password prompt does not appear,

you can press Enter a second time for the prompt to appear, or enter your password right away.

You will be taken to the device management interface.

run the command to enter privileged mode

```
switch> enable
```

check the correctness of obtaining the IP address via DHCP

```
switch#show ip interface brief
```

'\*' - address is assigned by dhcp client

Interface	IP-Address	Admin-Status	Link-Status
eth0	*10.0.0.147	up	up
lo	127.0.0.1	up	up
lo.management	127.0.0.1	up	up

install the new version with the command  
switch # sys-update install vrf management <URL>  
confirm the installation of the new version and save / reset the configuration file  
- reboot the device with the reboot command

after reboot, a new version will be loaded (in the ONIE menu, an item for downloading the previous version will also be available)

## **UPDATE USING THE ONIE INSTALLATION INTERFACE over the network**

When the system boots, you will see the ONIE environment menu  
Select the ONIE Rescue menu item

the bootloader with the connected MGMT interface and the presence of a DHCP server will receive an IP address from the server  
If there is no DHCP server in the network, you must wait for the timeout to receive an address

## **UPDATE USING THE ONIE INSTALLATION INTERFACE using USB drive**

When updating using a USB device - format the device using the FAT file system,  
copy the file to the root of the device and connect the device to the USB port of the switch.

When updating the system using a USB drive, mount the drive with the following command  
mount / dev / sdb1 / mnt / usb

- install the new software version with the command  
onie-nos-install <image file URL>  
where <image file URL> is the FTP / HTTP address of the available server that hosts the file  
or  
onie-nos-install / mnt / usb / <image file>  
where <image file> is the name of the file on the mounted USB drive

reboot to the new version will happen automatically.  
After the update only the new software version will be available in the ONIE menu.

## **Additional documentation**

Is available on the ONIE installation environment and can be found at



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<https://opencomputeproject.github.io/onie/user-guide/index.html>