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| Document Release Notes WeOS 5.16.0 | |
| Date June 20, 2023 | Document No 224004-g6ae69f6ccf |

WeOS 5.16.0 Release Notes

Contents

| | | |
|--------|---|----|
| 1 | Summary of Changes | 5 |
| 1.1 | News in 5.16.0 | 5 |
| 1.1.1 | Protocol Independent Multicast - Sparse Mode | 5 |
| 1.1.2 | Route-monitor | 5 |
| 1.1.3 | Policy-Based Routing | 5 |
| 1.1.4 | Equal-Cost Multi-Path | 6 |
| 1.1.5 | OpenVPN Multipath TCP (MPTCP) | 6 |
| 1.1.6 | OpenVPN iroute | 6 |
| 1.1.7 | Role Based Access Control | 6 |
| 1.1.8 | Train Redundancy Optimization | 6 |
| 1.1.9 | TRDP TCP Support | 7 |
| 1.1.10 | TTDP VRRP Virtual IP NAT | 7 |
| 1.1.11 | IGMP-Snooping | 7 |
| 1.1.12 | ECN Subnetting | 7 |
| 1.1.13 | DNS/TCN-DNS Local Consist uri | 7 |
| 1.1.14 | Logging to USB Default Off | 7 |
| 1.1.15 | VRRPv3 advertisement interval | 7 |
| 1.1.16 | SNMP Summary Alarm | 8 |
| 1.1.17 | New Bootloader Version | 8 |
| 2 | Fixed Issues | 9 |
| 2.1 | WeOS 5.16.0 | 9 |
| 3 | Known Limitations | 10 |
| 3.1 | Port Access Control | 10 |
| 3.2 | Login | 10 |
| 3.3 | Setting Date Manually | 10 |
| 3.4 | Available ports for boot specific functionality | 10 |
| 3.5 | Routing Hardware Offloading | 10 |
| 3.6 | SNMP | 11 |

| | |
|---------------------------------------|-----------------------------------|
| Document Release Notes WeOS 5.16.0 | |
| Date June 20, 2023 | Document No 224004-g6ae69f6ccf |

| | | |
|------|--|----|
| 3.7 | FRNT | 11 |
| 3.8 | RSTP | 11 |
| 3.9 | IEC 61375 | 12 |
| 3.10 | LLDP | 13 |
| 3.11 | Port Monitoring | 13 |
| 3.12 | Media Redundancy Protocol (MRP) | 13 |
| 3.13 | 10G SFP Ports | 13 |
| 3.14 | Search function in User Guide | 14 |
| 4 | Known Issues | 15 |
| 4.1 | List of known issues | 15 |
| 4.2 | #18163: Work-around for OSPF NSSAs convergence issue | 16 |
| 5 | Quick Start Guide | 17 |
| 5.1 | Default User and Password | 17 |
| 5.2 | General | 17 |
| 5.3 | CLI | 18 |
| 6 | Firmware Upgrade | 20 |
| 6.1 | WeOS Image | 20 |
| 6.2 | Boot Loader | 20 |
| 7 | Significant differences between WeOS 4 and WeOS 5 | 21 |



| | |
|---------------------------------------|-----------------------------------|
| Document Release Notes WeOS 5.16.0 | |
| Date June 20, 2023 | Document No 224004-g6ae69f6ccf |

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| | |
|---------------------------------------|-----------------------------------|
| Document Release Notes WeOS 5.16.0 | |
| Date June 20, 2023 | Document No 224004-g6ae69f6ccf |

Important User Information

This section details important user information, directed in particular to new users of WeOS 5:

- WeOS 5.15.1 has been interoperability tested with WeOS 4.32.5.
- When using WeConfig to manage WeOS 5.16, WeConfig 1.17.2, or later is recommended.

For help with getting started using WeOS 5, refer to the Quick Start Guide in section 5.

User Guide

In WeOS 5, the primary user documentation is referred to as the *WeOS 5 User Guide*. Compared to the *WeOS 4 Management Guide*, the User Guide is a web first publication focusing on use-cases, documented in stand-alone “HowTo:s”, and configuration guides for all supported sub-systems.

The User Guide is included in the release Zip file in the sub-directory: `user-guide/`. To access the documentation, open the following file in your web browser:

`file://Downloads/WeOS-5.16.0/user-guide/index.html`

The *User Guide* is also available online at <https://docs.westermo.com/weos/weos-5/>.

| | |
|---------------------------------------|-----------------------------------|
| Document Release Notes WeOS 5.16.0 | |
| Date June 20, 2023 | Document No 224004-g6ae69f6ccf |

1 Summary of Changes

This section details new features added in this major release.

Users new to WeOS 5 are recommended to read section 7 carefully, as it highlights some of the major differences between WeOS 4 and WeOS 5.

1.1 News in 5.16.0

The subsections below describe news in WeOS 5.16.0. In addition, section 2.1 includes information on fixed issues.

1.1.1 Protocol Independent Multicast - Sparse Mode

Protocol Independent Multicast - Sparse Mode (PIM-SM) is a dynamic multicast routing protocol.

As the name hints at PIM Sparse Mode is suitable for use in network topologies where any interested receivers, of any given multicast group, will be sparsely scattered throughout the network. What this really means is that it is expected that the majority of the subnets in the network has no interest in receiving most of the multicast traffic, at least not at the same time.

PIM-SM generally scales pretty well in larger network topologies, as long as the above mentioned condition holds, that most of the subnets in the network is not interested in all of the relevant multicast groups at the same time.

For more information on configuring PIM-SM, see the WeOS User Guide section *Configuration Guides* → *Routing/PIM-SM*.

1.1.2 Route-monitor

Static routes can be monitored using ping trigger and policy route, Using route monitor routes will be uninstalled if the routes becomes unreachable. And if it become reachable again then it will be re-installed.

For more information on configuring route monitor, see the WeOS User Guide section *Configuration Guides* → *Routing* → *static-routing* → *Monitor a route (Dynamic Administrative Distance)*.

1.1.3 Policy-Based Routing

Policy-Based Routing (PBR) allows for more specific routing decisions based on specified policies, defined by the administrator. Utilizing PBR can allow the user to route traffic throughout the network in a more precise manner, when the situation deem it necessary or advantageous.

For more information on configuring policy-based routing, see the WeOS User Guide section *Configuration Guides* → *Routing* → *Policy-Based Routing (PBR)*.

| | |
|---------------------------------------|-----------------------------------|
| Document Release Notes WeOS 5.16.0 | |
| Date June 20, 2023 | Document No 224004-g6ae69f6ccf |

1.1.4 Equal-Cost Multi-Path

Equal-Cost Multi-Path routing (ECMP), is a routing behavior that allows for multiple routes for the same destination to be active at the same time, if they share the same cost. This means that flows of packets, bound for any particular destination, could be routed using different paths to reach the destination, if such paths are available.

For more information on configuring ECMP, see the WeOS User Guide section *Configuration Guides* → *Routing* → *Equal-Cost Multi-Path Routing (ECMP)*.

1.1.5 OpenVPN Multipath TCP (MPTCP)

If there are multiple routes between the client and server and both client and server have MPTCP support MPTCP can be used as protocol for the connection. This enhance the reliability and the throughput of the tunnel. MPTCP can be used as protocol for openvpn ssl tunnel in both the client and server There is current limitations for the MPTCP:

- Only one instance of MPTCP client is supported.

For more information on configuring MPTCP and OpenVPN, see the WeOS User Guide sections *Configuration Guides* → *Tunnels and VPN* → *OpenVPN mptcp*.

1.1.6 OpenVPN iroute

OpenVPN internal routes can be configured when a specific client may have another network behind it. What the iroute command will do is to inform the server which client is responsible for handling the specifically provided network.

For more information on configuring iroute, see the WeOS User Guide sections *Configuration Guides* → *Tunnels and VPN* → *OpenVPN Tunnels* and *HowTos* → *Tunnels and VPN* → *OpenVPN Internal Routes*.

1.1.7 Role Based Access Control

The new user role *operator* was introduced in addition to the previously available user role *guest*. Both guest and operator now use the same CLI as the admin user but in restricted mode where only some commands are available. The previously used rclish shell for guest users has been merged together with the standard CLI. If you have scripts that depend on the exact syntax of the guest prompt make sure to update them.

1.1.8 Train Redundancy Optimization

A new TTDP setting has been added that will reduce the VRRP failover time for redudant, single ECN consist. In case a single ECN is used with redudant backbone nodes in TTDP this setting will improve

| | |
|---------------------------------------|-----------------------------------|
| Document Release Notes WeOS 5.16.0 | |
| Date June 20, 2023 | Document No 224004-g6ae69f6ccf |

the failover times when the VRRP-master is detected to have been lost on the network.

1.1.9 TRDP TCP Support

It is now possible to set a TCP mode for some TRDP messages.

These messages will be sent as TCP if the new 'tcp' setting is enabled: ComID 102/103, 104/105, 106/107, 108/109, 110/111, 122/123 and 140/141.

1.1.10 TTDP VRRP Virtual IP NAT

It is now possible to send TRDP traffic to the VRRP virtual IP address on redundant ETBNs.

1.1.11 IGMP-Snooping

IGMP snooping required flooding of unknown multicast to be enabled on affected ports in WeOS 5.15. This limitation has been removed in WeOS 5.16.

1.1.12 ECN Subnetting

For more detailed information about ECN Subnetting support, see the WeOS User Guide sections *APPENDIX* → *Train* → *ECN-Subnetting*.

1.1.13 DNS/TCN-DNS Local Consist uri

Train DNS lookup preference can now be controlled through a new TTDP setting called 'dns-lookup-mode'. With this setting the preference lookup can be configured to prefer either Local or Global scope as a first lookup.

In this update it has also been included support to lookup local Consist Information before inauguration has been completed.

1.1.14 Logging to USB Default Off

Logging to USB has been by default set to off. Writing a lot of logs to USB can cause the system to slow down depending on the performance of the attached USB.

1.1.15 VRRPv3 advertisement interval

The lowest configurable advertisement interval for VRRPv3 has been changed to 10ms. The general recommendation is that advertisement interval should not be lowered below 100ms. If set to a lower value proper system load testing should be performed as lower values can cause system instabilities.

| | |
|---------------------------------------|-----------------------------------|
| Document Release Notes WeOS 5.16.0 | |
| Date June 20, 2023 | Document No 224004-g6ae69f6ccf |

1.1.16 SNMP Summary Alarm

It is now possible to get SNMP information if any device Alarm have been triggered.

For more information about SNMP Summary Alarm, see the WeOS User Guide section *Configuration Guides* → *Alarm* .

1.1.17 New Bootloader Version

Lynx 3500 Series (Envoy): Barebox 2022.08.0-2 For more information, see associated Barebox release notes included in the WeOS 5.16.0 release zip.

| | |
|---------------------------------------|-----------------------------------|
| Document Release Notes WeOS 5.16.0 | |
| Date June 20, 2023 | Document No 224004-g6ae69f6ccf |

2 Fixed Issues

2.1 WeOS 5.16.0

Fixed issues in WeOS 5.16.0 (as relative to 5.15.0).

| Issue | Category | Description |
|--------|--------------|---|
| #19271 | IP-Multicast | Disabling multicast-proxy-query has no effect |
| #19258 | Alarm | Web when editing an existing ping trigger, Not all parameters are visible |
| #19229 | System | Copy of config file via CLI not working in WeOS-5.15.x using HTTP |
| #19221 | IGMP | IGMP Unknown Multicast Flood Ports Overwritten on reboot |
| #19207 | TCN | Unwanted load when acting as multicast router (HW offloading on) and multicast route has not been explicitly set up |
| #19198 | WEB | Web 'function code' line shown on non-VLAN network interface Web page |
| #19171 | System | Unreachable syslog-sink causes device to become unresponsive |
| #19106 | LED | Some LEDs do not turn green (Viper-x20A) |
| #18843 | TCN | Manually configured DNS entries when train protocol is used are not persistent cross reboot |

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|---------------------------------------|-----------------------------------|
| Document Release Notes WeOS 5.16.0 | |
| Date June 20, 2023 | Document No 224004-g6ae69f6ccf |

3 Known Limitations

This section describes known limitations in WeOS.

3.1 Port Access Control (IEEE 802.1X and MAC Authentication)

Wake-on-LAN is currently not possible on controlled ports. The reason is that broadcast traffic is not allowed to egress a controlled port until there is at least one MAC address authenticated on the port.

3.2 Login

Known limitations related to the Login service.

Side-effect of disabling console login

When disabling login from console, login via telnet is also prohibited (even when telnet login is enabled).

SSH Public Key Lost When Disabling Built-in User

WeOS 5.13.0 introduces support for importing SSH public key for built-in users, as well as the ability to enable/disable a user. When disabling a user, the intention is that the user shall be prohibited from logging in, while other user configuration is till kept in the configuration file.

However, the disabling of a user currently implies that any SSH public key associated with the user is removed and needs to be imported again upon enabling the user.

3.3 Setting Date Manually

Setting a manual date on the WeOS unit before 1 January 2000 will render an error message.

3.4 Available ports for boot specific functionality

The boot loader rescue mode only supports regular copper ports, not SFP ports. On RedFox-5528, ports 1-4 are also not supported until the system has booted.

3.5 Routing Hardware Offloading

The routing hardware offloading support for Viper-TBN introduced in WeOS 5.8 has shown to have instabilities. In particular, when used with dynamic routing, there are issues not yet solved. Therefore hardware offloading has temporarily been disabled by default. For use cases with static routing setups, hardware offloading can be enabled as shown in the example below.

| | |
|---------------------------------------|-----------------------------------|
| Document Release Notes WeOS 5.16.0 | |
| Date June 20, 2023 | Document No 224004-g6ae69f6ccf |

```
viper:/#> configure
viper:/config/#> ip
viper:/config/ip/#> offload
viper:/config/ip/#> leave
```

When offloading is enabled, regular IPv4 forwarding is handled in hardware with some exceptions, see the WeOS 5 User Manual for details (section 'Configuration Guides'/'Routing'/'Offloading').

Use of the WeOS Firewall together Hardware Offloading is not supported and the behaviour of doing so is undefined. The exception is when firewall configuration is limited to *filter input* rules.

Hence, if the Firewall is use to configure *filter forwarding* rules, *NAPT* rules or *port forwarding* rules on a Viper-TBN, it is necessary to disable the hardware offloading (opposite steps to the example above).

```
viper:/#> configure
viper:/config/#> ip
viper:/config/ip/#> no offload
viper:/config/ip/#> leave
viper:/#>
```

3.6 SNMP

SNMP in WeOS 5 is read-only.

When configuring SNMPv3 authentication it will not inform the user if the password length is valid (minimum of 8 characters).

The MIBs folder in the release ZIP-file contains a conformance folder listing all supported MIBs and OIDs.

3.7 FRNT

Fastlink must be enabled manually for FRNT (gigabit Ethernet) ring ports.

Fastlink is a unique feature of Westermo products to optimise gigabit Ethernet link-down fail-over times in layer-2 redundancy protocols such as FRNT.

3.8 RSTP

WeOS 5 supports RSTP, compliant to IEEE 802.1D-2004. Due to limitations in the WeOS 4 implementation of RSTP, a WeOS 4 unit will keep ports in blocking mode longer than needed when connected to a WeOS 5 node.

Hence, mixing WeOS 4 and WeOS 5 units in RSTP topologies may exhibit relatively long periods with limited connectivity during topology changes, this applies to both link failure and when a link comes up again.

| | |
|---------------------------------------|-----------------------------------|
| Document Release Notes WeOS 5.16.0 | |
| Date June 20, 2023 | Document No 224004-g6ae69f6ccf |

Link aggregate path-cost use the configured port speed value(s) and not the negotiated speed value. This can lead to RSTP making the non-optimal path selection. Work-around this issue by setting a fixed path-cost in the spanning-tree port configuration.

3.9 IEC 61375

In this release, not all of the recovery use cases, nor the optional cases, are supported.

It is possible to manually configure DNS rules when the train protocols are enabled. But the manually added rules, will be removed when train protocols updates the DNS configuration after inauguration. Thus, manually added DNS configuration currently cannot co-exist with the IEC 61375 support.

TTDP and non-TTDP multicast can be used simultaneously in this release, but is considered unstable and is strongly recommended to be avoided.

"Automatic Gap Insertions", when several vehicles have the same name, can lead to unexpected behaviour. This is also true when Ethernet speed on backbone ports is set to Gigabit speed.

When recovery-mode is set to deferred/wait, an ECSC must be running on the configured multicast address. If no ECSC is running and sending data on the configured multicast address, no node will come up at all.

Gigabit speed on backbone ports limits the handling of lost and recovering middle nodes.

Since hardware offloading was introduced in WeOS 5.8.0, Viper TBN can now route data at a faster rate than the CPU could previously, leading to a potential of overloading the CPU during the time when the offloading tables are being set up. Since this happens during TTDP train inauguration, it is strongly recommended to enable inauguration inhibition on all nodes to reduce spurious re-inaugurations and guarantee a stable train communication.

For applications with HW offloading active in the system there is currently a known limitation in case high loads of multicast traffic for which a multicast route has not been explicitly set up, when the device is otherwise acting as a multicast router. This commonly happens with backup devices in TTDP using VRRP where the backup device will receive all routed multicast data from the backbone in the CPU causing unwanted load to the device. With 5.14.3 a temporary workaround has been introduced which require a manual configuration change with an added VLAN used as blackhole for the multicast traffic. The solution with an additional VLAN is only for TTDP and might not cover all use cases.

The "ECSP inhibit sync" function should only be enabled in consists with simple or straightforward ECN configurations. In complex configurations with non-symmetric ETBN/ECN connections and/or configurations where different ETBNs are master routers for different ECNs simultaneously, the backup ETBNs will not be able to unambiguously determine which ETBN is the master router/ECSP, which can in turn lead to unexpected behaviour with regards to the local inauguration inhibition value. In these cases, manually setting the local inauguration inhibition values on the backup ETBNs, via the ETBN_CTRL telegram, should instead be performed.

| | |
|---------------------------------------|-----------------------------------|
| Document Release Notes WeOS 5.16.0 | |
| Date June 20, 2023 | Document No 224004-g6ae69f6ccf |

3.10 LLDP

When using Link Aggregation, the individual member ports will transmit LLDP frames using the MAC address of the link aggregation interface, i.e. all member links in an aggregate will be using the same MAC address.

3.11 Port Monitoring

It is not possible to utilise port monitoring directly on a link aggregation port interface. However it is still fully possible to monitor the individual member ports that constitute any given link aggregate.

Therefore, in order to fully monitor an aggregate, monitoring must be configured for each of the aggregate member ports.

3.12 Media Redundancy Protocol (MRP)

- *MRM not supported for MRP 30 profile:* WeOS 5 units can be configured to operate in MRP 200 or MRP 30 profile. However, for MRP 30 profile, configuring the WeOS 5 unit as MRP Master (MRM) is not supported. A WeOS 5 unit can be used as MRP Client (MRC) with MRP 30 profile with MRMs from other vendors.

More details: When a link comes up between two MRP clients, the clients send *link-up* messages to the MRP master. The MRP 30 ms profile only gives the MRP master 4 ms to block its secondary port from the time the MRP clients send their first *link-up* message. The WeOS 5 MRP Master is not always capable of doing that, resulting in a short transient loop in the MRP ring when the ring is healed.

To avoid this, it is recommended to use the MRP 200 ms profile instead. For link-down scenarios, MRP 200 ms profile conducts failover as fast as the 30 ms profile, given that MRCs in the ring are capable of sending MRP *link-down* messages (WeOS units have this capability).

- *Use of MRP with virtual L2 ports (SSL VPN ports):* MRP is specified for use with Ethernet ports (full duplex, 100 Mbit/s or higher). WeOS enables the use of running MRP over SSL L2 VPNs, but requires the VPN to run over a high-performance network to work well. Furthermore, only the MRP '200 profile' can be used with SSL VPNs.

3.13 10G SFP Ports

The 10G SFP ports on RedFox-7528 have the following limitations:

- IEEE 1588/PTP is currently not supported on 10G SFP ports.
- 10G SFP ports are only to be used for 10G Fiber SFPs or 1G Fiber SFPs, not copper SFPs or 100 Mbit/s Fiber SFPs.

| | |
|---------------------------------------|-----------------------------------|
| Document Release Notes WeOS 5.16.0 | |
| Date June 20, 2023 | Document No 224004-g6ae69f6ccf |

- Status of MDI/MDIX and polarity shows value 'Invalid' ('N/A' or 'Not Applicable' would be more appropriate).

3.14 Search function in User Guide

The User Guide included within the release-zip is Web based. The Search function in the User Guide navigation pane only works if you make the pages available via a Web Server. That is, the Search function does not work when opening the User Guide via your local file system.

At <https://docs.westermo.com/weos/weos-5/> you can browse the WeOS 5 User Guide online, with Search function included.

| | |
|---------------------------------------|-----------------------------------|
| Document Release Notes WeOS 5.16.0 | |
| Date June 20, 2023 | Document No 224004-g6ae69f6ccf |

4 Known Issues

4.1 List of known issues

| Issue | Category | Description |
|--------|------------------|--|
| #19301 | IGMP | Duplicate multicast packets when changing router timeout |
| #19295 | Any | Upgrade of pkg:s will complete with error printouts |
| #19293 | GRE | OSPF doesn't route over GRE tunnel |
| #19291 | IEEE1588/PTP | PTP transparent clock not working with some third-party Grandmasters |
| #19288 | FRNT | After configuring FRNT2 on Coronet/Viper 20A the FRNT leds are flashing red |
| #19262 | Ports | Traffic not handled on Envoy ports using Copper SFPs |
| #19257 | Alarm | Alarm config is not loaded correctly from startup config |
| #19255 | QoS | Priority-mode IP fails when both ingress and egress ports are fiber ports on Envoy platform |
| #19253 | TCN | Name resolution issue with DNS and TCN-DNS not defining all the train/consist unique entries |
| #19231 | TCN | 2-3 inauguration may never reach operational traindir shared |
| #19196 | SNMP | RMON-MIB does not respond |
| #19181 | Ports | Port-Priority-mode IP and Offloading broken with DSCP set field |
| #19173 | Firewall | Firewall counters can not be shown in CLI |
| #19163 | TCN | SNAT not performed when routing with global addresses between local CNs |
| #19024 | Link Aggregation | Using link-aggregates as FRNT ring ports gives long failover times in ring topology changes |
| #18967 | System | Joins on SSL ports does not lead to the CPU port being added to the ATU |
| #18910 | TCN | TTDP Topology timeout not adapted for Gigabit ETB, causing ETB inaugurations upon ETBN down event |
| #18886 | IP Multicast | Static multicast route with wildcard source fails to forward when group first heard on other interface |
| #18855 | Alarm | Alarm action id not stored correctly in configuration, causing issues with noncontiguous lists of identifiers |
| #18808 | Alarm | Link-alarm with multiple ports makes status-relay indicate OK when some port is up and others down |
| #18742 | System | Duplex settings won't work correctly after switch reboot |
| #18675 | Link Aggregation | Long failover time (aggregate member link up/down) in link-aggregate interoperability case (WeOS5 'Dagger' vs WeOS4) |

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| | |
|---------------------------------------|-----------------------------------|
| Document Release Notes WeOS 5.16.0 | |
| Date June 20, 2023 | Document No 224004-g6ae69f6ccf |

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| Issue | Category | Description |
| #18643 | IEEE1588/PTP | RedFox 5528/5728 fiber ports (Eth1-4) have more jitter in the correction field accuracy than the other fiber ports |
| #18638 | CLI | CLI does not allow "?" when configuring local user accounts password using clear-text |
| #18622 | FRNT | Rebooting two neighbor FRNT nodes simultaneously occasionally gives short storm |
| #18614 | TCN | TTDP NAT rules incorrectly modifies packets between local CNs |
| #18593 | QoS | Tagged ports with 'priority-mode ip' is broken |
| #18377 | Logging | Syslog events may be missed during syslogd restart |
| #18362 | TCN | Broken/missing ECSPs in train composition handled incorrectly |
| #18356 | General | mDNS is not functional when configured to listening on specific interfaces |
| #18275 | VRRP | Not possible to match on VRRP interface in firewall |
| #18163 | OSPF | Routes to 'redistributed connected E1 routes' lost within NSSA areas upon topology change |
| #18151 | Logging | Long-running programs log events to syslog with the wrong time stamp on timezone changes |
| #18076 | MRP | Probing MRP status (30 ms profile) during heavy load may cause reboot (Viper-TBN) |
| #18069 | QoS | ARP packets treated with lowest priority and may be missed/dropped under load |
| #18024 | System | DDNS service crashes if there are special characters in password |
| #17995 | System | Service discovery not available in safe-config |
| #17941 | IP Multicast | Manual FDB MAC entry skips CPU port and automatically adds all ports with a VLAN with IGMP snooping disabled (Viper-TBN) |
| #17353 | Alarm | Link Alarm can fail when included in aggregate |

4.2 #18163: Work-around for OSPF NSSAs convergence issue

When using OSPF Not-So-Stubby Areas (NSSAs), failover when a router goes down may take a lot longer time than expected. There are two possible work-arounds until this bug is fixed:

- Alternative 1: Let each router get an address on its loopback interface, and include them in the OSPF area, e.g., use OSPF setting "network 192.168.1.5/32 area 1" for a router in (NSSA) area 1 with address 192.168.1.5/32 assigned to its loopback interface (lo).
- Alternative 2: Use 'regular' OSPF areas instead of NSSA areas.

| | |
|---------------------------------------|-----------------------------------|
| Document Release Notes WeOS 5.16.0 | |
| Date June 20, 2023 | Document No 224004-g6ae69f6ccf |

5 Quick Start Guide

WeOS 5 devices are intended to be usable out-of-the-box as a switch. All access ports are assigned to the same VLAN (untagged) and the device tries to acquire a management IP address via DHCP. It also acquires a link-local address (in the 169.254.x.x range). These addresses are advertised with mDNS (Linux/Apple), SSDP (Windows), and LLDP.

5.1 Default User and Password

user: admin

password: admin

5.2 General

Apple, Linux, and Windows users with mDNS installed, can either use an mDNS client to find the device's IP address, or connect using a web browser:

- <http://weos.local>
- <http://redfox-4d-3b-20.local>

The first example is not available if there are many WeOS devices on the same LAN. The latter, and more reliable address, is a combination of the hostname and the last three octets of the device's MAC address in that LAN. In this example the hostname is `redfox` and the MAC address is `00:07:7c:4d:3b:20`.

Windows users without mDNS have SSDP to discover WeOS devices. In Windows 7 there is the *Network and Sharing Center* where a clickable icon for each discovered WeOS device should appear under *Network Infrastructure*. The PC must, however, be in the same subnet (DHCP or link-local) for this to work. Windows users also have the Westermo WeConfig tool to manage their WeOS devices.

Expert users can also use `nmap`, a port scanner, to scan the network for the device. Be aware though that this might be frowned upon should your device be located on a shared network.

| | |
|---------------------------------------|-----------------------------------|
| Document Release Notes WeOS 5.16.0 | |
| Date June 20, 2023 | Document No 224004-g6ae69f6ccf |

5.3 CLI

WeOS comes with a Command Line Interface (CLI) that can be accessed via a console port at 115200@8N1, or Secure Shell (SSH). Only SSH protocol version 2 is supported. To gain access to the CLI using SSH you need:

- An SSH client, see below
- The device's IP address or DNS/mDNS name, see above
- The user name and password, default user: admin, password: admin

SSH Clients

There are many of SSH clients available, some of them can even be used to connect to the devices using a (USB) serial console port. A few free clients are listed below. Please follow the directions for installation and usage applicable to your operating system and client.

UNIX, Linux, Apple macOS OpenSSH, <https://www.openssh.com>

Apple macOS Termius, <https://www.termius.com>

Windows PuTTY, <https://www.chiark.greenend.org.uk/~sgtatham/putty/>

CLI Overview

The CLI has two main scopes: admin-exec and configure context. The former is what the user lands in after initial login.

```
redfox-4d-3b-20 login: admin
Password: *****
.-----
| | | | | -_|_ --|_ _| -_|_ | . . | _ | http://www.westermo.com
\_/ \_/ |____.____| | | |____|_ | | | |____| info@westermo.se
Robust Industrial Data Communications -- Made Easy
```

```
\\ / Westermo WeOS v5.3 5.3.x-g7890bde -- Oct 24 19:30 CEST 2018
Type: 'help' for help with commands, 'exit' to logout or leave a context.
```

```
redfox-4d-3b-20: /#> help
```

Central concepts in WeOS are: ports, VLANs, and interfaces. To see status of each in admin-exec context, use `show ports`, `show vlans`, and `show ifaces`.

To change settings, enter the configuration context with the command `config`. The same commands as above also apply here, but now display the configured settings. Notice how the CLI prompt changes to show the current scope.

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|---------------------------------------|-----------------------------------|
| Document Release Notes WeOS 5.16.0 | |
| Date June 20, 2023 | Document No 224004-g6ae69f6ccf |

```
redfox-4d-3b-20:/config/#> iface vlan2
```

To show or change the interface and VLAN properties the user enters the command: `iface vlan2` and `vlan 2`, respectively, with an optional “show” as prefix. E.g. `show iface vlan2`.

```
redfox-4d-3b-20:/config/iface-vlan2#> help inet
```

The help command is always available. Use it stand-alone or with a context-specific setting to get more detailed help.

To leave a level use the command `end` to save or `abort` (or Control-D) to cancel. To save and exit all levels, and go back to admin-exec, use `leave` (or Control-Z).

```
redfox-4d-3b-20:/config/iface-vlan2#> leave
```

Applying configuration.

Configuration activated. Remember "copy run start" to save to flash (NVRAM).

The CLI, unlike the WebUI and WeConfig, has a concept of a running configuration. This is an activated but volatile (RAM only) file that must be saved to built-in flash (non-volatile storage) before rebooting. Many separate config files can be saved, but only one can be the selected startup-config. For details, see the built-in help text for the admin-exec copy and show commands.

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| Document Release Notes WeOS 5.16.0 | |
| Date June 20, 2023 | Document No 224004-g6ae69f6ccf |

6 Firmware Upgrade

Firmware upgrade is supported from the CLI, WebUI, and WeConfig tool. The CLI only supports FTP/TFTP upgrade but the WebUI and WeConfig tool can also upgrade via CGI upload – making them the ultimate choice if you have no FTP/TFTP server available or do not care to set one up.

6.1 WeOS Image

WeOS devices run from a built-in flash disk and usually comes with three partitions: primary, secondary, and boot. The latter is for the boot loader (see below) and the primary is the main WeOS image partition. Should this ever get corrupted, e.g. due to power-loss during upgrade, the device will boot using an image from the secondary (or backup) partition. This is a very appreciated, but mostly unknown, robustness feature.

```
redfox-4d-3b-20:/#> upgrade primary <SERVER-ADDRESS> WeOS-5.16.0.pkg
```

The system must reboot when upgrading the partition image the system started on. This protects against flash corruption issues seen in earlier releases, caused by simultaneous access to the flash during programming or when starting new processes after an upgrade. Also, WeOS warns when one of the partitions has an image with invalid CRC. Attempting to upgrade the partition with the OK CRC is discouraged, upgrade the partition with the invalid CRC first.

As usual, when upgrading from an earlier release, we always recommend backing up your configuration beforehand.

Note: The version string listed in the output from the `show system-information` command in the CLI, or the System Details page in the WebUI, is only updated after reboot.

6.2 Boot Loader

The boot loader firmware has its own version numbering scheme and is CPU platform specific. Please note, unless the release notes explicitly recommends it, there is usually no need to upgrade the boot loader.

The boot loader firmware is included in the WeOS-5.16.0.pkg.

- Viper Series (Coronet): Barebox 2017.12.0-11
- RedFox-5700/7500 and Lynx-5500/5600 Series (Dagger): Barebox 2017.12.0-11
- Lynx 3300/3500 Series (Envoy): Barebox 2022.08.0-1

```
redfox-4d-3b-20:/#> upgrade boot <SERVER-ADDRESS> WeOS-5.16.0.pkg
```

| | |
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| Document Release Notes WeOS 5.16.0 | |
| Date June 20, 2023 | Document No 224004-g6ae69f6ccf |

7 Significant differences between WeOS 4 and WeOS 5

Some aspects of the CLI are different between WeOS 4 and WeOS 5. Here are some examples:

- Access port names have changed, e.g. `Eth 1` is now `eth1`. Similarly, on products with M12 ports, `Eth X1` is now `ethX1`.
- Port ranges (lists) have changed, e.g. `Eth 1-8` is now `eth1..eth8`
- Server and Internet port settings are now usually input as `ADDR:PORT`
- IGMP settings have been renamed from `igmp-foo` to `multicast-foo` due to the included MLD snooping support. Hidden compatibility aliases exist to ease the transition
- Stateless NAT (NAT 1-to-1) has moved out from the firewall context
- Enabling management services per interface has moved to each specific service
- Configuration of management services have moved to a separate management sub-context
- New discovery services, in addition to LLDP, are mDNS and SSDP. The latter is for discovery on Windows systems, see also section 5
- The DHCP relay agent CLI syntax has changed considerably
- The `show running-config` command now lists an actual file, in JSON format as mentioned previously. An optional keyword now lists the first level JSON object, and more advanced keywords can also be given in `jq` syntax¹. For more information, see the CLI online help text for `help running-config`

¹For more information on `jq`, a JSON query tool, see <https://stedolan.github.io/jq/>

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