Organisation
Westermo Research & Development

| Prepared by | Document | |
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| Joachim Nilsson | Release Notes WeOS 4.6.0 | |
| Approved by | Date | Document No |
| | June 15, 2011 | 089604 |

# Release Notes WeOS 4.6.0

## Contents



 

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# 1 About

Westermo WeOS is a network operating system specifically designed for industrial grade rugged Ethernet switches and routers. It is based on the Cricket 3$^{rd}$ generation software platform with support for RedFox, 2$^{nd}$ generation Wolverine and Viper, Lynx+ switches, and the Falcon VDSL2 router.

The Linux based platform has been in operation since 2006 on custom made RedFox Mil, RedFox Aero and RedFox Rail products. With the advent of the RedFox Industrial line of products the platform was given a major overhaul to improve standards compliance as well as compatibility requirements with existing Westermo product offerings. The result is WeOS, the Westermo Operating System.

Westermo has several projects underway to boost hardware capability to be able to roll out WeOS on even more products than the current offering. There is also a wide range of software features on the road map for WeOS itself.

For more information about Westermo and our product offerings see http://westermo.com.

## Version Number Format

WeOS version numbers have three digits. The main reason for the third digit is to emphasize the difference between feature and bug fix releases.

The generally available (GA) releases are named 4.X.Y. The number four (4) denotes the platform generation, which currently is Cricket. The X is the feature release number, where new functionality is introduced, and Y is the patch revision number, reserved for security and bug fix releases. E.g., 4.6.1 would be the first patch release in the 4.6.0 series.

For customers in our beta release program it is worth pointing out that previously version numbers 9.00 – 9.99 were used for beta releases and developer builds. This custom has now been replaced by the more common –betaN notation, for internal and limited distribution beta releases, and –rcN, for release candidates. We believe this to be easier to keep track of since the base release version is visible in all stages of the release cycle.

 

# 2 Summary of Changes

WeOS 4.6.0 is the first release with support for the new *Lynx DSS*, a Lynx with two serial ports, one RS-232 only and one capable of RS-232/422/485. Several new serial port related features are included: Dual TCP support in Serial/IP, DTR control, as well as a full-featured Modbus gateway!

Other notable changes include dynamic priority adjustment in VRRP, also known as VRRP+, VPN failover support, 1-to-1 NAT, multinetting, TCP MSS clamping per interface, Telnet server support, GRE tunnles, loopback interface and DHCP Relay with support for Option 82.

More changes and additions are listed below. Also, see section 5, for details on bug fixes and other changes not mentioned here.

### Ping Trigger in Alarm System

First introduced in WeOS 4.5.0, the *ping trigger*, has in 4.6.0 been extended with an *outbound <IF-NAME>* setting, which is highly useful when connected to VRRP.

## 2.1 VRRP Dynamic Priority Adjustment

In WeOS 4.6.0 VRRP has been extended with an option to dynamically adjust the router priority based on upstream connectivity. The new setting *track* connects VRRP to the Alarm & Event subsystem triggers.

```
   track trigger <ID> adjust <DELTA>
e.g.
   track trigger 2 adjust -10
```

Configure a ping trigger in the alarm system (remember the *outbound* setting!) and track the state of it in VRRP. When the uplink goes does down (ping stops), the VRRP priority is automatically adjusted with the given delta and another device can assume the role as gateway in your topology.

### 1-to-1 NAT

1-TO-1 NAT adds full subnet NAT capabilities to WeOS 4.6.0. It is useful for implementing scenarios where the same local IP subnet is used on mulitple locations that need to be accessed from a central node, e.g., SCADA. It can also be used for mapping public IP addresses to servers on a LAN.

### Modbus Gateway - Modbus serial to Modbus TCP

Modbus is a communication protocol developed by Modicon systems. The WeOS Modbus gateway is used for interconnecting a TCP/IP Modbus network and a serial line Modbus network (either RTU or ASCII). Permiting Modbus clients (masters) on either of the TCP/IP or the serial network to connect to Servers (slaves) on the other network.

In a standard Modbus network, there is one master and up to 247 Slaves, each with a unique slave address from 1 to 247. The master can also write information to the slaves. The official Modbus specification is available from http://www.modbus-ida.org

### GRE Tunnels, Multinetting and Loopback Interface

Introduced in 4.5.0, as a technology preview, the following features are now fully qualified and verified WeOS 4.6.0 features:

- GRE Tunnels
- Multinetting
- Loopback Interface

GRE is a very useful technology for, e.g., tunneling multicast or other protocols that cannot (or are difficult) to route.

Multinetting is simply the ability to assign multiple secondary IPv4 addresses to interfaces. Fully supported and verified on the loopback interface (see below).

The *lo* (loopback) interface is very useful for many use cases. Specificallly related to routing, but can also be used for many other obscure setups, e.g., when bridging two Serial/IP instances.

For the VPN failover use case we recommend employing multinetting the *lo* interface to create GRE-to-GRE networks for the benefit of OSPF.

## 2.2 VPN Failover

Or, how to successfully setup a resilient multi-wan connection to transparently bridge remote sites.

In WeOS 4.6.0 you finally get the ability to run a dynamic routing protocol, such as OSPF, on top of GRE tunnels between remote sites connected with IPsec VPN tunnels. The trick to remember is to multinet the loopback interface and use that for hooking up your GRE tunnels.

## 2.3 DHCP Relay Agent, with Option 82

WeOS 4.6.0 is the first release with DHCP relay support, including option 82. This means that it is now possible to use WeOS devices to setup dynamic IP address assignment based on originating port. I.e., regardless of what device (MAC address) you connect to a given port, that port will always get the same DHCP lease address.

However, the DHCP *server* is not yet fully Option 82-aware, so a WeOS topology is not yet self-hosting w.r.t. an Option 82 setup.

 

## 2.4 Platform

- When using PPPoE over DSL on Falcon, there is a problem with some ISPs where the PPPoE negotiation will not be completed. The result of this is that the connection does not come up. Fixed in issue #6147, for WeOS 4.5.1.

- A new boot loader image is available for RedFox Industrial, v2.02. No need to upgrade on deployed units, only newly produced units with new flash chip need this.

- Non-Westermo SFPs are now allowed. Be aware that use of non-Westermo SFPs might affect the functional and environmental specifications of the product, thus no warranties are made.

- FRNT is no longer limited to having both its ring ports in the same slot. Issue #3391.

- WeOS now supports two levels of software functionality:

  – *WeOS Level 1 (Layer-2 Switch)*: Products with WeOS software level 1 includes functionality common for layer-2 switches.

  – *WeOS Level 2 (Layer-2/3 Switch)*: Products with WeOS software level 2 includes gateway functionality (routing, NAT and Firewall, etc.) in addition to the layer-2 functionality found in *WeOS level 1*.

  Products launched with WeOS 4.4.0 and earlier will continue to work as layer-2/3 switches (WeOS level 2) after upgrading to 4.5.0. The first product being launched with WeOS level 1 is the *Lynx+ 110* switch.

- DNS proxy support is now a default feature. It is no longer necessary to enable a DHCP server on the LAN interface. Simply setup a name server and your non–primary interface is now able to forward DNS requests. Issue #5230.

- PPPoE support. The new Falcon unit has a dedicated simplified WAN setup where PPPoE is integrated. However, PPPoE support is also available on all other WeOS enabled devices. (Remember to set your external (WAN) interface as primary!)

- In #5207 support for CPU port(s) bandwidth limitation added. This is very useful when using the same device for both routing traffic between VLANs and at the same time running time critical protocols like FRNT. Because when too much traffic is being routed FRNT signaling risk being lost, issue #4951.

```
falcon:/#> configure
falcon:/config/#> system
falcon:/config/system/#> cpu-bandwidth-limit 8M
falcon:/config/system/#> leave
falcon:/#> copy run start
```

The above example sets a bandwidth limit for incoming traffic to 8 Mbps. See the Management Guide for more information.

- Possible to set NTP server address as a FQDN, not just an IP address. Issue #3601.

- As a spin-off to a bug fix (#5288) WeOS 4.4.0 includes support for static MAC filters. This is a necessary feature for setups where, e.g., OSPF/RIP/VRRP routers do not send out IGMP membership reports to subscribe to multicast groups in the 224.0.0.x range.

  *Note:* This is currently limited to *multicast* MAC filters, even though the syntax and online help says otherwise. This is due to automatic learning enabled on all ports by default today.

  The system `factory-config` for WeOS 4.4.0 has been updated to include default MAC filters for commonly used services. If you do not want to restart your setup from factory settings, simply `show factory` and paste in the relevant lines like this:

```
falcon:/#> configure
falcon:/config/#> fdb
falcon:/config/fdb/#> mac 01:00:5e:00:00:09 port ALL,CPU
falcon:/config/fdb/#> leave
falcon:/#> copy run start
```

  This example adds a filter for the RIPv2 multicast address 224.0.0.9. The fdb mac command only accepts MAC addresses, so you need to translate using RFC1112. Due to the limitations of this IP to MAC mapping the resulting address also maps to 225.0.0.9, 226.0.0.9, etc.

- The DDNS client, inadyn, suffered from a socket leak causing it to fail to update the system IP address at the DDNS service provider. Fixed in issue #5573.

- The firewall NAT rule really does allow all traffic from the internal interface to the external (as well as related replies from the outside coming back in). In 4.4.0 initial support for filtering source networks per each NAT rule and also support for deny rules.

## 2.5 CLI

WeOS now includes additional CLI settings for fine tuning of certain Ethernet PHY parameters. These settings are only expected to be used by customers with very special requirements – *the default settings is sufficient for most use cases*.

- Tab completion now works for commands in current context, global, parent and even local show commands. Issue #4906.

- The '?' key now works as expected. It lists alternatives and online help. Issue #4906.

 

- *Adapting receiver for shielded or unshielded cable:* The cable characteristics differs for shielded and unshielded TP cables. It is now possible to specify whether shielded or unshielded TP cables are used for 10/100 Base-TX ports, and thereby fine tune the receiver performance for optimal performance.
  **Default:** shielded

- *Signal power mode:* It possible to select between two signal power modes on the Ethernet data signaling pins for 10/100 Base-TX ports. The *low-power* mode is sufficient in most use cases, but for very long cables or cables with specific characteristics it may be necessary to *disable low-power mode*.
  **Default:** low-power

These settings apply to 10/100 Base-TX ports, excluding SFP/SFF ports as well as ports also capable of 1000 Mbit/s speeds.

Other features:

- From WeOS 4.3.0 and later it is possible to use the `abort` command even in the top-level configuration context. Disabling services, e.g. spanning-tree, or removing all VLANs can now safely be aborted. Remember to try the Ctrl-d key combo.

- When attempting to leave configuration context in interactive mode, the CLI now performs a simplistic sanity check and warns the user if:

  1. All ports have been disabled, or
  2. All VLANs have been disabled, or
  3. All interfaces have been disabled (`no up`), or when
  4. Any other subsystem returns an error during the “pre commit phase”.

  Unfortunately this does not cover all faulty scenarios, but the hope is that it covers at least the most common ones.

- When leaving configuration context using the `leave` or `end` commands a friendly “heads up” reminder about `copy run start` is displayed. This is currently shown regardless if the user has made any changes or not. Improvements to this are planned for a later release.

- When configuring interfaces the `inet static` stanza is now mandatory to be able to access commands to set static IPv4 address. This is in preparation for the upcoming `inet6 static`, for IPv6 configuration.
  **Note:** The WeOS .cfg configuration files have used this syntax since 4.0.0, hence this change only affects interactive use.

- A long standing issue with the awkward use of `no vlans`, et consortes, in .cfg configuration files has been resolved. When loading a configuration file the database is now first cleared and system defaults are used. This could affect users that are used to load "diff configurations", however that is still supported by pasting in into a *non–interactive* CLI session's configuration context.

- The recommended way of pasting in configurations into the terminal is to use the `copy console running-config` command.

- In an effort to become even more compliant with existing CLIs on the market, only differences to the WeOS defaults are saved in the .cfg files. This is still an ongoing effort, so not all subsystems have been updated yet.
  This is a backwards compatible change.

- When entering the configure context the ON LED will flash on the unit, similar to what the IPConfig tool does. Useful for locating a device or verifying the correct unit is being configured.

- The CLI format version has been stepped up to v1.6 in all .cfg files saved using WeOS 4.6.0.

- Upgrade from devices with a USB port is now supported (CLI only).
  **Syntax:** `upgrade <pri|sec|boot> usb://image.ext`

- Upcoming USB WeBackup (auto backup & restore) support available as a technology preview (CLI only).
  **Syntax:** `autobackup`

- Upcoming USB boot support available as a technology preview (CLI only).
  **Syntax:** `boot <usb|flash>`

## 2.6 SNMP

- Wrong DSL port type used in ifTable. Issue #5224.

- Occasionally the SNMP sub-agent caused "Out of memory" conditions on Wolverine units. Fixed in issue #5256.

- FRNT traps always showed port state as forward. Fixed in issue #5293.

- The implementation of StaticEgressPorts in the Q-BRIDGE, VLAN, MIB was incorrect, issue #3572. This is fixed in 4.5.0-beta1, issue #5467.

 

## 2.7 Web

- A Basic Setup page has been added for Falcon. It wraps most common settings needed for WAN access in one page.
- DHCP Server now possible to configure in Web.
- The location indicator ("Here I am!") blink with the ON LED is now also possible to access from the Web UI. See Tools –> IPConfig for “Flash On LED”.
- Support for firewall deny rules.
- Support for adding new firewall rules at a specific position.
- Possible to reorder firewall rules.
- New generic WeOS header image. With product name, firmware version and hostname@location displayed for easy identification purposes.

## 2.8 SHDSL

- Turbo Speed now available, up to 15.3 Mbps data rate.
- Possible to disable SHDSL ports. Useful to check link traps on the other side of a link. Issue #5238.
- The SHDSL SNR monitoring trigger does not use HI/LO levels, issue #4961.

## 2.9 Firewall

- Issue #5369: Changing the input policy to allow no longer gives access to management services *disabled* in the interface management setting. I.e., if HTTP is disabled on an interface it is no longer possible to gain access simply by changing the input policy to allow. In cases where this is actually desired, an explicit allow rule must be created.
- Issue #6118 details how the service rules for Serial/IP could not be overridden with custom packet filter rules. Fixed in 4.6.0-beta3.
- Issue #6156: The stateful inspection function in the WeOS firewall blocks asymmetric traffic flows. This occurs both when the firewall is enabled and disabled. Asymmetric traffic flows can occur when you, e.g., have two equal cost paths to reach a remote IP subnet, and the router(s) on that subnet chose a different return path.
  Fixed in WeOS 4.5.1 by introducing the firewall `[no] spi` setting, default is to have Stateful Packet Inspection enabled. Hence, to handle assymetric setups you need to disable SPI.

 

- Support for deny rules and rule reordering, both CLI and Web.
- Sometimes the forward chain policy did not stay set after a reboot. Fixed in issue #5193.

## 2.10 VPN

- IPsec/IKEv1 support in WeOS 4.5.0 has been upgraded to Openswan v2.6.32.
- The VPN LED (previously ST2), visible on all new products, is now fully supported.
- In some (invalid) setups the IPsec daemon "pluto" crashed and did not recover, issue #5056. Improved documentation and online validation of the configuration has been added to WeOS 4.4.0.

  **Symptoms:** First the user notices that all tunnels go down, then the CLI command `show tunnel ipsec` gives no output at all, even if there are multiple tunnels configured.

  To be sure this bug is the problem, in the CLI issue the command `show log` and look for the line `ipsec__plutorun: Segmentation fault`:

```
Feb  4 01:12:00 lynx pluto[2824]: packet from 10.0.0.1:500: received and ignored
       informational message
Feb  4 01:12:00 lynx ipsec__plutorun: Segmentation fault
Feb  4 01:12:00 lynx ipsec__plutorun: !pluto failure!:  exited with error status
       139 (signal 11)
Feb  4 01:12:00 lynx ipsec__plutorun: restarting IPsec after pause...
```

- Sometimes when updating an existing IPsec tunnel the changes did not take effect, issue #5036.

 

# 3 Known Limitations

This section includes known reported bugs and missing features, which may not necessarily be *limitations*, in many cases they may constitute severe operational drawbacks.

## 3.1 Platform

- A system with many VLANs setup requires more time at boot. This was first reported in #3291, but even after having fully optimized all data paths there still remains a significant delay. E.g., creating 128 VLANs on a RedFox Industrial takes apx. 6 seconds longer than creating a single VLAN.
- On some computers, with some operating systems, the Westermo console port USB cable can block the boot sequence. Disconnect the USB-to-console cable when no terminal program, e.g., PuTTY is running. Issue #5984.
- The new alarm configuration lacks support for RMON triggers. Furthermore the community string that can be configured for each SNMP alarm action is missing in the actual trap.
- Issues #4494, #4502 and #4508 concern continued caveats with the feature preview link aggregation support.
- Running an FRNT ring over copper SFPs is currently not supported, or recommended, due to slow response time from copper SFPs.
- No CLI configuration support for managing multiple users and their capabilities.
- No CLI configuration support for static multicast routes.
- No LACP support in link aggregation.
- RSTP, IGMP Snooping, FRNT, etc. not supported over link aggregates.
- No support for any port authentication, either MAC nor IEEE 802.1x based.
- Limited support for low–level interaction with PHYs and link partners.
- Moving ports from one VLAN to another can change the MAC address of the corresponding VLAN interface leading to loss of connectivity. The symptoms are that Web and SSH connections to the device suddenly “freeze” due to stale ARP caches. The effects of which can take several minutes to resolve.

  WeOS 4.3.0, and later, include support for gratuitous ARP on MAC address changes. However, not all client systems allow gratuitous ARP, although configurable, for security reasons. For cases where this effect is undesirable, e.g. a management interface, it is recommended to set a static MAC address using the CLI.

- Port monitoring fails to preserve the VLAN priority. Fix planned for a later release.
- SHDSL link can sometimes be lost due to slowly dropping SNR margin, issue #5317. This seems to be caused by high traffic load on the link. Fix currently unknown.
- When toggling bridge priority on the elected root bridge storm is easily provoked, issue #4203. Fix planned for a later release.
- In some setups when RSTP gets link up it has been reported to take very long to reconfigure, issue #4707. This may however be fixed in #5625.
- LLDP does not work correctly in all configurations. It has been disabled in the Westermo factory defaults, issue #4067. Fix planned for a later release.
- When downgrading to a release < 4.1.0 the user must perform a password reset due to password cryptography enhancements from 4.1.0 and later. A password reset is only allowed on the console port, simply login with user “password” and password “reset”, see the Management Guide for details.

  If a console port access is not available a crossed cable factory reset may be the only way to regain access.

  **Note:** In most cases the downgrade results in the password being reset to system default.
- Default routes learned from DHCP or PPPoE (primary interface) are set as “kernel routes”. This is not expected to cause any problems, but may cause some confusion when listing the ip routing table.

## 3.2 Serial over IP

- All configuration changes on a Serial over IP profile will disrupt your communication on all configured Serial over IP profiles temprarly. This is due to that the daemon needs to be restarted, resulting in that the TCP connections will have to be renegotiated.
- When configured as TCP server. If a client reboots due to power failure or otherwise loose the connection without properly closing the TCP session. The server may take up to 16 minutes to detect that the session is lost. During this time the client want be able to reconnect to server. Issue #6033.
- When a TCP client lose the connection to a TCP server without a proper reset (a power failure on the client for example) and the server at the same time tries to send data to that client, the client will not be able to reconnect to the server for around 15 minutes instead of the normal timeout on 2 minutes.
  **Workaround:** Have the unit sending data as the TCP client or use Peer mode.

 

- Setting the serial-over-ip packing algorithm frame-size limit will make the WeOS-device limit both sent and received data, i.e. when sending data from Ethernet to the serial port or vice-versa, the algorithm will use the limit on both sides. For instance, setting the frame-size limit to 8 and then send more than 8 bytes from an Ethernet-source destined to the serial port the WeOS-device will just use the first 8-bytes. Fix planned for later releases.
  **Workaround:** Use same frame-size on all nodes

## 3.3 CLI

- When issuing, e.g., `show running` not all settings are shown. This is due to WeOS 4.3.0 and later only showing differences to the system default. Support for `show running [all]`, where the optional 'all' keyword would list everything, is planned for a later release.

- The on–line help is not only insufficient, it is sometimes even misleading. E.g., some commands do not support the `no` prefix, some commands do not support `show` and no commands in configure context support `repeat`. Cleanup and improvement is a work in progress.

- No support for displaying SNTP status, NTP server stats. Best way currently is to manually check system time against another SNTP synchronized computer. The syslog is also a possible location to see what is going on. See "show log".

- No support (yet) for scheduled upgrades, i.e. ability to upgrade @02:30 to limit downtime during regular office hours. Feature request registered in issue #3363. Support planned for a later release.

## 3.4 Web

- Inspecting RMON counters in the Port Statistics page may need a manual reload before the actual values are displayed.

## 3.5 IPConfig Tool

Limitations in current v10.4.0 of IPConfig Tool for Windows™.

- The WeOS version is encoded in the old version numbering format to be fully compliant in all Windows™ releases. E.g., version 4.3.0 is encoded as 4.03 and version 4.3.1 is also encoded as 4.03. Hence, version 4.10.0 would be encoded as 4.10.

- Due to limitations in the version field of IPConfig the patch level of the WeOS version is not visible in the tool. No fix planned.
  **Workaround:** Verify patch revision from Web, CLI or SNMP.

- Limitations in field length causes problem with upgrade from IPConfig Tool, i.e. too long file names are not supported. No fix planned.
  **Workaround:** Rename image file name to a shorter name before attempting upgrade. Note, the file name is *not* used in any way to encode any information for the upgrade process.

## 3.6 Firewall

- Port forwarding does not work well with interfaces using DHCP assigned IP addresses. A fix is planned for a later release.

## 3.7 VPN

- In some cases when one of the IPsec endpoints closes the tunnel the connection cannot be reestablished automatically. This may occur when the connection is configured with static peer IP addresses on both end points and the tunnel uses NAT traversal.
  **Workaround:** The IPsec connection on one or both peers have to be restarted manually. In the CLI this is done in admin-exec context using: `tunnel ipsec restart`

- MTU override may not work as expected, sending a message over the IPsec tunnel will not respect mtu override on the other end. **Workaround:** Always have the same MTU on the interfaces on both ends of the tunnel.

- The remote IP address of the IPsec gateway may in some circumstances not be reachable from an IP address associated with the IPsec tunnel. Issue #5987
  **Workaround:** Always connect to an IP on the IPsec gateway that is reachable from within the tunnel.

- It should be impossible to select “clear” as dpd-action on an initiator, it is however currently available as a configurable option. (Also, “hold” as dpd-action should work, but currently does not.)

- Supernetting using IPsec may stop access to local WeOS interface. This will be the case if for example configure local-subnet: 192.168.2.0/24, remote-subnet: 192.168.0.0/16 and a local interface with IP address 192.168.2.200/24, in this case nodes located on the 192.168.2.0/24 subnet will not be able to contact or receive services from 192.168.2.200. Issue #6153.

## 3.8 Link aggregation

*Link aggregation is only provided as an unsupported technology preview feature. All use of the link aggregation feature except for testing is discouraged.*

WeOS supports basic link aggregation in line with IEEE 802.3ad. However, the current support for link aggregation contains several limitations such as:

 

- Aggregation control: Link aggregates can be configured statically or be managed dynamically via the Westermo FLHP protocol. LACP is currently **not** supported.
- VLAN support: There is no support to add a link aggregate to a VLAN. Instead, each of the individual member links need to be added to the appropriate VLANs.
- Port settings: There is no support to configure port settings for the link aggregate. Instead, each of the individual member ports need to be configured uniformly, e.g., with respect to port speed/duplex mode.
- Layer-2 protocols: Layer-2 redundancy protocols such as FRNT or RSTP cannot be used on a link aggregate or any of its member ports. Neither can IGMP snooping, thus VLANs where any link aggregate has a member port must have IGMP disabled.

*When configuring link aggregation on switches in an operational network, there is a potential risk for a broadcast storm to occur. WeOS currently does not support the use of RSTP or FRNT on aggregated ports. The operator must therefore ensure that no layer-2 forwarding loop is established when connecting switches via aggregated links.*

# 4 Known Issues

| Issue | Category | Description |
|---|---|---|
| #3139 | QoS | QoS interboard contention |
| #3248 | System | No warning in CLI/Web when other users are managing the system |
| #4067 | System | LLDP does not work as expected |
| #4203 | RSTP | Storm occurs quite frequently when toggling RSTP bridge priority |
| #4494 | FLHP | Aggregated SHDSL Link does not work after FLHP reboot |
| #4502 | FLHP | Traffic across link aggregation breaks when a physical link is removed |
| #4506 | FLHP | FLHP and aggregation configuration |
| #4508 | FLHP | Link aggregation with FLHP does not start when activated, needs reboot |
| #4707 | RSTP | Long reconfiguration time for RSTP at link up, up to 32 sec |
| #4856 | DSL | SHDSL link up indicated on LEDs and CLI/Web before link is fully qualified |
| #4895 | RSTP | RSTP show blocked port on LED when port is in forwarding state |
| #4929 | RSTP | Looping admin edge ports causing a storm |
| #4951 | FRNT | FRNT goes down during sustained high network load |
| #5317 | DSL | SHDSL SNR Margin falls with high load over the link |
| #5571 | FRNT | Focal Point does not indicate FRNT Alarms as it should |
| #5649 | RSTP | Non root switch sends out BPDUs with the same bridge ID as the root |
| #5818 | DSL | Auto-negotiated SHDSL link does not respect the desired SNR criteria |
| #5984 | System | Unit does not boot if console is attached to system w/o running terminal client |
| #5987 | System | Wayward ARP caused by IPsec route |
| #6022 | SNMP | Not all OIDs in hdsl2ShdslEndpointCurrTable implemented |
| #6033 | Serial over IP | Long timeout for lost TCP-server connections |
| #6112 | VPN | IPsec initiator dpd-action hold and clear does not work |
| #6180 | System | RedFox 8FX: System instability issues with 1000Mbps fiber in 100Mbps SFP slot |
| #6213 | System | Loading new config, or restoring backup, does not terminate old PPP/PPPoE sessions |
| #6223 | Ports | Unit crashes when traffic is looped back to the interface it came from |
| #6281 | Serial over IP | AT mode CONNECT messages completely unsynchronised |
| #6303 | VPN | VPN Led and Web pages show wrong VPN status |
| #6399 | Modbus | Missing CLI admin-exec command "show modbus" to display modbus status |
| #6431 | Serial over IP | Improved status information of serial over ip connections |
| #6433 | Serial over IP | Buffering of data before connect |
| #6453 | DSL | ADSL PPPoE on Sunrise DSL Switzerland not connecting |
| #6463 | DSL | SHDSL link does not always come up on 4.5.x/4.6.x |
| #6530 | DSL | Very high CPU load on shdsld during boot |
| #6551 | CLI | Issues with password protected PKCS#12 certificates |
| #6582 | VPN | IPsec: Using WeOS as a VPN responder with DR250/260 in aggressive mode fails on i.MX27 |

 

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| Issue | Category | Description |
|---|---|---|
| #6611 | System | USB stick sometimes not found/recognized at boot |
| #6700 | System | USB phy fails to communicate after powercycle on i.MX27 |
| #6804 | Serial over IP | Packing algorithm framesize limit data destined to and from serialport(s) |

# 5 Fixed Issues

This includes all -beta releases leading up to 4.6.0 from 4.6.0-beta1

### 4.6.0

### 4.6.0-rc3

| Issue | Category | Description |
|---|---|---|
| #6777 | CLI | Conflicting serial ports in seroip and modbus renders wrong error message |
| #6700 | System | USB phy fails to communicate after powercycle on i.MX27 |
| #6784 | VPN | IPsec rejects some valid(?) IP addresses |
| #6766 | VPN | IPsec responder fails to bring up more than one tunnel |
| #6782 | WEB | IPsec crypto algorithm AES192 not available in system, only in web |
| #6768 | Modbus | Exceptions not working in client mode |

### 4.6.0-rc2

| Issue | Category | Description |
|---|---|---|
| #6254 | System | Ping command from CLI hanged (once in testing), Ctrl-C does not work |
| #6521 | System | zcip daemon lingering in system when changing from inet dhcp to inet static |
| #6701 | SNMP | WeOS private mib files have incorrect last-updated date |
| #6706 | VPN | IPsec fails when supernetting on the responder |
| #6708 | CLI | Pressing '?' => missing newline => help text slightly garbled output |
| #6711 | VPN | ike crptyo blowfish does not work on initiator aggressive mode |
| #6712 | VPN | ESP, crypto blowfish does not work with aggressive mode |
| #6713 | VPN | IPsec sometimes fails to come up in nightly during various ipsec tests |
| #6717 | WEB | Factory reset in web only do restart |
| #6721 | CLI | Ctrl-C does not work when trying to abort "copy console running-config" |
| #6722 | WEB | VRRP Virtual Address shows 0.0.0.0 in web page but correct in CLI |
| #6723 | WEB | Saving VPN settings makes Firefox ask if the password for username "120" should be remembered |
| #6726 | Serial over IP | DTR control of server looses first 1-2 characters that are buffered |
| #6727 | Serial over IP | secondary Failover client can not start communication after reboot |
| #6730 | CLI | Tab completion of copy command broken on running/startup/factory |
| #6731 | CLI | Serial over IP deamon restarts on every configuration change when using ATCMD |
| #6732 | Modbus | Modbus exception handling "ignore unknown" does not seem to have any functionality |
| #6733 | GRE | RIPv2 update not sent over GRE |

 

| Issue | Category | Description |
|---|---|---|
| #6735 | Modbus | MODBUS gateway interrupts communication on RS-485 bus |
| #6736 | VPN | IKE/ESP DH groups 17 and 18 are visible in the web but is not supported in CLI or config |
| #6737 | WEB | IPsec: Lifetimes do not display correctly in pop-up details of tunnel config overview |
| #6739 | CLI | The copy command copies the TO to the FROM |
| #6740 | WEB | Basic setup in falcon does not recognize factory-reset configuration |
| #6746 | WEB | Serial over IP, bad cleanup when apply settings fail. |

### 4.6.0-rc1

| Issue | Category | Description |
|---|---|---|
| #6113 | Serial | Missing baudrate in WeOS for Lynx-DSS and DDW-142 |
| #6276 | Serial over IP | Add support for DTR controlled connection in TCP-server and TCP-client |
| #6312 | CLI | Audit serial port syntax changes/additions for 4.6.0 |
| #6371 | CLI | Serial: The "show port" command does list serial ports in configure context |
| #6387 | CLI | Modbus: Insufficient check of modbus client map command |
| #6505 | Serial | Refuse "no enable" for RS-232 serial ports |
| #6562 | Serial over IP | Disable the peer in TCP client result in flooding of the log |
| #6569 | CLI | Ability to run one-shot SSH commands in the CLI |
| #6603 | CLI | Update CLI help for serial over ip frame-separator command |
| #6609 | CLI | Support for modbus enable/disable option |
| #6628 | Serial | Factory reset does not reset serial port ownership |
| #6632 | CLI | Insufficient check of port speed when selecting type RS-232 |
| #6633 | DHCP | Creating a DHCP server starts the daemon but it does not respond |
| #6635 | CLI | Not possible to manage terminate rx and tx settings independently for RS-422 |
| #6636 | CLI | Logged out when giving incorrect arguments to "show serial port" (admin exec) |
| #6637 | Serial over IP | TCP server secondary connection Failover not reestablishing as expected |
| #6640 | CLI | Serial port status "show serial port ID" does not work on Falcon and DDW-226 |
| #6646 | CLI | Possible to set hw-flow control (RTS/CTS) when port is in RS-422/485 mode |
| #6652 | Serial over IP | Timeout in TCP server secondary connection slotted mode not working as expected |
| #6654 | WEB | DHCP server domain name is limited to 15 chars in the Web GUI |
| #6661 | Alarm | Lynx-1400G reports SFP wrong speed error in alarm log even with no SFP mounted |
| #6675 | Modbus | Client mode does not handle Internet connection failures well |
| #6676 | SNMP | Requesting multiple OIDs in one GET cause error in IF-MIB::ifName |
| #6682 | WEB | Checkbox for enable should be removed for RS-232 ports |
| #6698 | VPN | IPSec does not always reconfigure when unit gets new gateway from the DHCP server |

### 4.6.0-beta5

| Issue | Category | Description |
|---|---|---|
| #5648 | System | Indication of wrong startup config |
| #6265 | Firewall | Unify the firewall packet filter/access control terminology |
| #6526 | CLI | Prompt for confirmation before overwriting a file |
| #6575 | CLI | Sorting of interfaces not in alphabetical order |
| #6613 | CLI | Entering "ip fire cpu" in exec context crashes CLI |

### 4.6.0-beta4

| Issue | Category | Description |
|---|---|---|
| #3802 | SNMP | Enable/disable of IP addresses in SNMP |
| #5817 | Firewall | Add support for 1:1 NAT |
| #5821 | Firewall | Support NAT from any interface |
| #5905 | SNMP | Port numbering in bridge MIB not according to standard. |
| #6062 | DSL | SHDSL GHS handshake signal not detected on good cables where non-westermo SHDSL modem works at full speed |
| #6073 | Documentation | Cannot find details on how many access rules WeOS products can handle |
| #6220 | System | Implement Modbus Gateway for WeOS |
| #6233 | Serial | Add RS-422/485 termination settings |
| #6369 | Serial over IP | Add Multiple SerOverIP instances |
| #6372 | System | Add support for link change counter to Ethernet ports |
| #6382 | Serial over IP | Serial over IP in (TCP) client mode requires listen interface setting to start |
| #6403 | VRRP | VRRP virtual IP can be set to 0.0.0.0 and other special adresses |
| #6407 | DHCP | Possible to create DHCP server for subnet 0.0.0.0 |
| #6408 | VPN | Peer address 0.0.0.0 is accepted by the configuration |
| #6411 | System | Do not save "iface lo" to startup-config unless secondary address is available |
| #6428 | VPN | 'show tunn ipsec' dispalys wrong status when tunnel disabled. |
| #6429 | Alarm | Missing checks of temperature trigger threshold values |
| #6443 | Serial over IP | reconfig active AT command profile and serial ports stops responding |
| #6445 | Serial over IP | auto-answer 0 is no auto-answer but no auto-answer is not auto-answer 0 |
| #6450 | WEB | Add outbound interface setting to ping trigger in web |
| #6459 | Alarm | Disabled link alarm stll triggers alarm and port LED |
| #6460 | System | Add support for the new hardware variants RFR-12 with IP-65 spec |
| #6473 | Firewall | Conntrack flushing disturbs Serial-over-IP |
| #6484 | Serial | Serial status pins (DSR and DCD) toggles at Power-On |
| #6492 | CLI | Serial-over-IP: Not possible to remove first peer |
| #6493 | CLI | Serial-over-IP: Issues with multiple instances |

 

| Issue | Category | Description |
|---|---|---|
| #6500 | CLI | Possible to enter primary address on iface-ppp0 without warning |
| #6507 | Firewall | 1-to-1 NAT only destination NAT |
| #6511 | CLI | The abort function for the serial port configuration does not work |
| #6513 | Alarm | Ping trigger can reference a VLAN owned by PPP, but not the PPP interface |
| #6515 | System | DC1/DC2 indication does not work on Viper12 |
| #6522 | Serial over IP | Add basic tcp-server/client logging to ease support |
| #6523 | System | Regression: HW Setup fails at boot for various RedFox units |
| #6524 | VPN | IPSec fails to start at boot on Wolverine |
| #6537 | CLI | Not possible to show statistic for serial-over-ip |
| #6543 | VPN | IPsec: setup of super-netting environment causes local subnet to become inaccessible |
| #6544 | Serial | Error after setting xonxoff |
| #6563 | Serial over IP | Not possible to disable a Serial/IP instance |
| #6564 | System | Reorder CLI warnings when "copy usb://xxx.cfg startup-config" |
| #6568 | Kernel | IP fragments are randomly dropped |
| #6581 | WEB | Serial over IP in Peer mode, Frame Separator handling strange |
| #6587 | Serial | Serial buffer not empting in flow control mode |
| #6591 | Serial over IP | TCP server is listening to 0.0.0.0:9000 despite choosing specific listen iface. |
| #6595 | Serial over IP | Serial over IP crashes and restarts repeatedly with AT-cmd mode with no cmd profile |
| #6638 | SNMP | Unexpected error messages when creating a VLAN |
| #6639 | SNMP | Errors when creating FRNT instance using SNMP. |

### 4.6.0-beta3

| Issue | Category | Description |
|---|---|---|
| #4134 | CLI | Port range parser too strict on systems with less ports than reference |
| #5923 | VPN | Refactor start/stop/restart of ipsec to remove start-stop scripts |
| #5965 | System | DDNS not updated after DSL reconnect |
| #5966 | NTP | NTP time not updated after ADSL reconnect |
| #6024 | CLI | Display of firewall rules show port names, not numbers, c.f. Web UI. |
| #6043 | Firewall | Combine firewall "allow" and "deny" as parameters in general "filter" CLI command |
| #6048 | System | Secondary IP of loopback interface also set on another unrelated interface |
| #6089 | CLI | The command "show ip default-gateway" missing from admin-exec |
| #6090 | CLI | The command "show ip forwarding" missing from admin-exec context |
| #6091 | CLI | The command "show ip domain" missing from admin-exec context |
| #6092 | CLI | The command "show ip ddns" missing from admin-exec context |
| #6110 | CLI | Issues when deleting "first name-server" and adding a new one |
| #6118 | Firewall | Serial Over IP allow rules inserted before configurable packet filter rules |
| #6119 | CLI | Firewall: show allow/deny in config context do not show position for passive rules |

| Issue | Category | Description |
|---|---|---|
| #6120 | CLI | Firewall "move" command does not accept "-1" as first argument |
| #6121 | CLI | Firewall: Not possible to insert a packet filter rule at a specific position |
| #6161 | Ports | Port names are mixed in CLI between copper and DSL in fallback mode. |
| #6222 | System | Refactor alias interfaces into multiple addresses per interface |
| #6226 | VPN | IPsec is not restarted when outbound interface settings are modified |
| #6228 | Documentation | Document Viper-12 console cable in Management Guide |
| #6234 | Serial | Add support for serial port ownership |
| #6246 | HW | Increase drive strength of I/Os for termination on Lynx DSS |
| #6252 | Serial | Lynx DSS, Duplex relay not closed in RS-485 mode |
| #6261 | CLI | CLI crashes when doing TAB completion in certain cases |
| #6271 | Documentation | Not mentioned in the web help how to reach turbo dsl speed. |
| #6306 | CLI | Ping trigger help text says "show show" is a viable command. |
| #6326 | CLI | Unknown interfaces in config results in a invalid configuration. |
| #6330 | VPN | Aggressive mode tunnel not reestablished |
| #6334 | Ports | No warning on Westermo I-line SFP |
| #6347 | System | show interfaces displays bad MAC/PtP adresses for gre and lo interfaces |
| #6353 | System | "no address" on interface lo removes the primary IP 127.0.0.1 |
| #6355 | CLI | Entering 'leave' when configuring a DHCP server will log you out |
| #6362 | CLI | Serial: Show port command does not fully work for serial ports |
| #6365 | CLI | Serial: RTS/CTS info should not be shown in RS422/RS485 mode |
| #6367 | CLI | Serial: Possible to set 5/6 databits in MXC based devices, not supported by CPU |
| #6368 | CLI | Serial: Use Enabled/Disabled for RS-485 termination values instead of ON/NO |
| #6373 | CLI | Add support for showing MDI/MDIX Ethernet port status |
| #6375 | WEB | Ping trigger interval missing unit info (seconds/minutes/hours) |
| #6378 | WEB | Add information about expected file format for firmware upgrade. |

### 4.6.0-beta2

| Issue | Category | Description |
|---|---|---|
| #6218 | WEB | Remove possibilty to change configuration on PPP base interface |
| #6227 | CLI | Firewall: "no alg" without protocol does not work |
| #6250 | System | Add support for telnet daemon and client |

### 4.6.0-beta1

| Issue | Category | Description |
|---|---|---|
| #4215 | VPN | No IP connection with local interface |
| #4815 | SNMP | SNMP sub agent restarts continuously at high network load |

 

| Prepared by | Document | |
|---|---|---|
| Joachim Nilsson | Release Notes WeOS 4.6.0 | |
| Approved by | Date | Document No |
| | June 15, 2011 | 089604 |

| Issue | Category | Description |
|---|---|---|
| #4888 | VPN | Error in local routing when supernetting using VPN |
| #4965 | Alarm | Alarm actions and triggers does not reuse old numbers |
| #5092 | VPN | IPsec: ID type inet fails in aggressive mode between WeOS peers |
| #5169 | System | Mount log has strange entrys |
| #5236 | System | Ping does not issue error or fragment packet when packetsize is too big. |
| #5479 | Firewall | Add support for setting TCPMSS |
| #5734 | VPN | IPsec: PFS (Perfect Forwarding Secrecy) configurable in Web and CLI |
| #5806 | VRRP | Extension of VRRP to VRRP+ |
| #5816 | DHCP | Add support for "Renew Lease" in DHCP client |
| #5895 | WEB | Configuration of SNMP community for alarm action snmp not possible in web. |
| #5960 | Kernel | Upgrade kernel to 2.6.35.X |
| #5963 | System | Add support for the Lynx-DSS in WeOS |
| #6084 | VPN | IPsec: Change from dpdaction=restart to dpdaction=restart_by_peer |
| #6085 | FRNT | FRNTsometimes report one ringport as DISABLED |
| #6097 | WEB | The Deactivate text does not fit correctly on the button in the Firewall |
| #6100 | System | Possible to set net address on alias interfaces |
| #6109 | VPN | Configuring IPsec tunnel stops all routed traffic |
| #6114 | System | Add a specific factory config file for the Lynx-DSS |
| #6117 | Firewall | UDP ports 5097-5098 opened in firewall input filter |
| #6123 | CLI | Hide alias commands in tab completion |
| #6128 | System | Removing all vlans from "copy con run" leaves system in bad state |
| #6150 | VPN | IPsec firewall rules does not always exist |
| #6151 | CLI | "show" command missing in "config/ip/icmp" context |
| #6153 | VPN | IPsec: Supernetting hijacks services |
| #6155 | Ports | SFP ports swapped |
| #6157 | System | No alarm for illegal speed |
| #6158 | System | System Info for SFPs are duplicated |
| #6165 | FRNT | No Link up on FRNT fibre ports at start-up |
| #6169 | RIP | RIP passive-interface command does not work (always non-passive) |
| #6172 | VRRP | VRRP will not enter BACKUP state |
| #6213 | System | Loading new config, or restoring backup, does not terminate old PPP/PPPoE sessions |
| #6237 | RSTP | RSTP tries to change state on FRNT ports |
| #6238 | PPP | PPPoE restart does not terminate the PPP session properly |

# 6 Accessing the Command Line Interface

The RedFox switch supports a classic Command Line Interface (CLI) that can be accessed via the console port at 115200@8N1 or Secure Shell (SSH), for details see the Secure Shell RFC4251. WeOS supports protocol version 2 only.

Issue `help` or `show tutorial` at the prompt to access the built–in help and tutorials. See the WeOS Management Guide for more information.

## Recommended Clients

**UNIX** OpenSSH, http://www.openssh.com

**Win32** PuTTY, http://www.chiark.greenend.org.uk/~sgtatham/putty/, note that PuTTY is also useful for connecting to serial port consoles.

Please follow the directions for installation and usage applicable to your system and client.

## Logging In

To gain access to the CLI you need:

- An SSH client
- The switch IP#
- The user name and password

Units shipping with WeOS have by default all ports assigned untagged to VLAN 1, RSTP enabled on all ports and a static IP address: 192.168.2.200 with netmask 255.255.255.0.

Use the IPConfig tool, an LLDP client or nmap to find your device. If you have a DHCP server available you can set it up to hand out a known IP addresses for the registered devices MAC addresses. Each unit comes with 16 or 32 MAC addresses assigned, depending on the port count, the base address should be printed on the box and on the unit itself.

The unit is fairly quick to boot, in under 10 seconds is the unit up requesting an IP address — depending on the existence of a DHCP server the fall back to link–local address can take a while. To be on the safe side while scanning for your device, expect it to take anything from 30 seconds to one minute after power–on.

The following example illustrates how to login to the switch using OpenSSH from a GNU/Linux based host system. The process is similar with PuTTY or other SSH clients.

The operator lists the running configuration with the command `show running`, an overview of ports, vlans and interfaces is available by typing `show ports`, `show vlans` and `show ifaces`. See the `help` or the `show tutorial` for more on line help.

 

To change some settings, enter the configuration context with the command `conf`, short for "configure". The same commands as shown above also apply here, but now display configured settings.

To show or change the interface and VLAN properties the operator uses the command: `interface vlan2` and `vlan 2`, respectively, with an optional "show" as prefix. E.g. `show iface vlan2`.

To leave a level the operator must use the command `end` to save and `abort` to cancel.

Any new settings are activated only when the operator leaves the configuration context, using "end".

To save settings to non–volatile RAM (flash disk), the operation uses `copy run start` from admin–exec context.

```
$ ping -b 192.168.2.255
PING 192.168.2.255 (192.168.2.255) 56(84) bytes of data.
64 bytes from 192.168.2.200: icmp_seq=1 ttl=64 time=10.4 ms
64 bytes from 192.168.2.200: icmp_seq=2 ttl=64 time=0.895 ms
^C

$ swping -i eth1
MAC                IP                  Ver.           Type     Status
==============================================================================
00:07:7c:86:04:b5  192.168.2.200/24    4.0.           RedFox   -------------SI

$ ssh admin@192.168.2.200
The authenticity of host '192.168.2.200 (192.168.2.200)' can't be established.
RSA key fingerprint is 1d:ce:fe:4b:8e:c2:73:42:11:68:73:02:e5:a6:e4:8b.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '192.168.2.200' (RSA) to the list of known hosts.
admin@192.168.2.200's password: westermo

.--.--.--.-----.-----.------.-----.-.--.--------.-----.
|  |  |  |  -__|__ --|_    _|  -__|   _|  .  .  |  _  | http://www.westermo.com
 \__/\__/|_____|_____| |__| |_____|__| |__|__|__|_____|        info@westermo.se
   Robust Industrial Data Communications -- Made Easy

Westermo/RedFox Version 4.0.0 cricket/4.0.x@13930 -- May 18 14:20 CEST 2009
redfox:/#> ^D
$
```

This is a typical session where broadcast ping is first used to locate the device, followed by an IPConfig scan and then SSH login using the default user and password.

 

# 7 Firmware Upgrade

Firmware upgrade is supported from the CLI, Web and IPConfig tool. All of them support FTP/TFTP upgrade, but the Web also supports CGI upload from the browser – making it the ultimate choice if you have no FTP/TFTP server available or do not care to set one up.

Note, the secondary CPU image and the boot loader firmewares can only be upgraded from the CLI. The version string listed in the output from the `show system-information` command is only updated after reboot.

## 7.1 What Firmware Image to Use

The image file names are currently limited in length to what the IPConfig tool is capable of handling. This is an intermediate limitation before introducing support for longer human–readable file names in a future IPConfig replacement. The file names are built around the product name and the model, or operating system, it is based upon.

### Primary and Secondary

List of primary and secondary CPU firmware images.

**fw4XY.img:** Falcon, WeOS 4.X.Y

**lw4XY.img:** Lynx+, WeOS 4.X.Y

**lm4XY.img:** Lynx 1400G, WeOS 4.X.Y (customer specific)

**rw4XY.img:** RedFox, WeOS 4.X.Y

**ww4XY.img:** Wolverine DDW-225/226, WeOS 4.X.Y

### Boot Loader

The boot loader firmware can only be upgraded from the CLI. The current version (updated at boot) is visible in the output from the `show system-information` command.

Please note, the boot loader firmware does not follow the WeOS version numbers, it has its own version numbering scheme and is also very CPU platform specific. Also, unless the release notes explicitly recommends it you should not upgrade the boot loader. List of bootloader firmware images:

**imx27-redboot-4.XX.bin:** Falcon, Lynx+, Lynx 1400G, Wolverine DDW-225/226

**xscale-redboot-2.XX.bin:** All RedFox products

Use the command `upgrade boot <ip-addr> <firmware>` to upgrade the bootloader.

 

## 7.2 Upgrading early RedFox units to 4.3.0 or later

Early RedFox units (Industrial and Rail) delivered with WeOS 4.0.0, comes with a flash memory partition unsuitable for the larger firmware image size of WeOS 4.3.0 and later.

You find information on your product's type of *model*, *article number*, and *serial number* via the Web interface (Menu path: Home ⇒ Details), or via the CLI `show system-information` command.

| Model | Article number | Serial number |
|---|---|---|
| RFI-18-F4G-T4G | 3641-3300 | < 1190 |
| RFI-14P-F4G | 3641-3200 | < 1180 |
| RFI-10P | 3641-3110 | < 1220 |
| RFI-18P | 3641-3100 | < 1111 |

See the management guide for details on how to safely upgrade the system flash table.

## 7.3 Upgrading From the CLI

To be able to upgrade the switch firmware the user must install and run an FTP server or a TFTP server on a network connected to the device. The (T)FTP upgrade uses anonymous login with the password 'support@westermo.se'.

The example below shows that the upgrade command, in CLI, Web and IPConfig first tries FTP and then TFTP, should the FTP connection fail.

```
redfox:/#> upgrade pri 192.168.2.42 rw400.img
Reading MTD partition information from FLASH
netflash: login to remote host 192.168.2.42
ftp: connect: Connection refused
netflash: ftping file "rw400.img" from 192.168.2.42
No control connection for command: Connection refused
netflash: failed to load new image
Trying TFTP instead...
Reading MTD partition information from FLASH
netflash: fetching file "rw400.img" from 192.168.2.42
.....................................................................................
netflash: got "rw400.img", length=5918720
netflash: Signature OK - Sig = RFox
netflash: CramFS OK - CRC = 0x194F663B
netflash: Flashing primary image, reboot is forced.
netflash: Killing processes to protect FLASH during upgrade...
netflash: programming FLASH device /dev/mtd1
.................................
netflash: Updating RedBoot FIS directory
```

```
Writing updated MTD partition information to FLASH
netflash: Rebooting.
Restarting system.
```

The system will force a reboot when upgrading the primary image. This to protect against flash corruption issues seen in earlier releases, caused by simultaneous access to the flash during programming or when starting new processes after upgrade.

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

This is how far the release notes goes, please see the management guide for details. Or get in touch with your local distributor, or Westermo for any questions, support or course material.

Good Luck! //The WeOS Team

 