

RuggedVPN Firmware Release 2024043070/ 2024070250 for Viperinet and Wantastic products; July 2024



Note: The Firmware version for the Hub 5020 differs and is 2024052290/2024070200.

The focus of this firmware release is improving performance, bonding capacity and throughput for all of our current products. Expected bonding capacity increases on 310 and 2620 routers is about 50%. So a 310 model that is rated at 150 Mbit/s in the data sheet will now be able to bond about 225 Mbit/s. A 2620 router instead of 400 Mbit/s can – under ideal WAN conditions – now reach 600 Mbit/s.

In addition to this, general performance for VPN Hubs has also been improved a lot. Most importantly the amount of RAM assigned for Tunnel Channel Buffering is using a vastly improved algorithm. Before a Hub serving a lot of Tunnel Channels, especially if some of those were fast but also had some packet loss, often the max line rate could not be reached. With the integrated changes in some setups we have seen an increase by up to 200% in channel bandwidth being available.

For the VMWare Virtual Hub 5900 the performance of the VPN encryption engine has been vastly improved, which increases the VPN throughput you can achieve with your existing installation.

Important pre-installation instructions:

- **Protect the Elderly:** Very old routers (10+ years), especially units that have been operated at sub-optimal temperature ranges often will have a faulty/very aged flash memory, and sometimes drained batteries or capacitors. Quite often they still work absolutely normally, but as soon as the flash is written with the new firmware, they fail. For those old routers installing this firmware update may cause the flash to finally die, with the router no longer starting.

Therefore when updating very old routers, please take extra care. Make sure you have taken a configuration backup, and have a replacement device in case something goes wrong.

- This firmware release is backward-compatible to old releases, including the ones from back in 2018. This means you can first upgrade the Hub, and then upgrade the Node router at a later point. Please note however that all performance enhancements will only be seen once both sides are updated.

Important change that may require re-configuration after updating

For Ethernet modules using PPPoE to connect to a VDSL modem most customers never changed the wrong default MTU of 1500. That did not matter as this setting was simply ignored, and instead a value of 1488 was used, which is safe for most VDSL installations (1488 is used if a VLAN is used on the modem, as is the case with Deutsche Telekom in Germany, 1492 is used in most of the world). However, PPPoE is also used by some fiber broadband providers, which might again have a different MTU.

For backward compatibility, if the MTU value of a PPPoE connection is right now set to 1500, you will receive a log warning message of "MTU of module has been changed from 1500 to 1488 due to PPP being used. Check if the MTU is correct!". To get rid of that warning, please set the correct MTU for your PPPoE ISP.

Now to the important part: If you in the past had set an MTU that was not 1500 but also incorrect – for example "1495", now that will be used, which may cause performance problems due to IP fragmentation.

Long story short: When installing this firmware on a router that uses PPPoE, please check the MTU settings of those WAN interfaces. There is nothing that needs to be done on VPN Hubs.

Changes compared to the October 2023 (2023032070/2023082450) Release

Improvements and new features

- A VPN Hub that is running as Replacement in the Hub redundancy system will now display in the header of the web interface.
- It is now possible to disable individual fans of the 5020 through the web interface. Unlike on our other Hub products, disabling a fan however will not stop it completely, but only lower the speed to 300 RPM. This is due to a technical limitation.
- Much lower CPU load is caused when reading from the LAN interface. This speeds up VPN Hubs mostly.
- Google Chrome recently starting to require a stupid and unused certificate extension for SSL certificates. Our self-generated SSL certificates for the web interface did not have these, so access was blocked when using Chrome. Other browser including other Chromium-based browsers like Edge or Vivaldi where not affected. Google Chrome works now again, too.
- Channel bandwidth autotuning now also takes the current CPU load into account and does no longer increase the speed if the CPU is fully used.
- Due to the times of ISDN and GPRS being over, the default speed test starting value has been increased from 128 to 512 kbit/s. And you no longer can set a speed test starting value lower than 128kbit/s.
- Reports on high CPU load are now only issued if a new report was higher than the previous. Less log spam.
- The CPU load for writing data to tunnel channels has been reduced. This speeds up the device performance in sending direction, so typically mostly on VPN Hubs.
- The communication system with the identity- and license servers for Virtual Hubs has been improved. It is now much quicker and more stable in resolving IPs for these servers
- All TCP buffering options for tunnel channels have been highly optimized both for the sending and receiving directions. Prior to this, when a VPN Hub was serving multiple high-speed connection that had some packet loss or high latency, the max RAM assigned for those buffers could run out, causing less than the optimal amount of buffering to be used, limiting speed. In real life customer setups that had a long distance between Hubs and Nodes, high speed and/or packet loss, speed that a channel can achieve has increased by 100-250%.
- In the "Performance finetuning" settings of a VPN Tunnel Channel you are able to select which TCP Congestion Control will be used for a tunnel

channel. By default "BIC" was used during the last years. We have removed the long list of outdated algorithms, and have only kept those that actually make sense trying. We have added the new "BBR" algorithm which is designed to keep latency low and speed stable on lossy links - so it will not optimize for peak speed. This is useful if you want to do VoIP over lossy WAN links. BIC and Cubic are for stable broadband links, and Hybla or BBR can be tried on Satellite links and very long distance connections around the globe with 400ms or more. However in our tests if peak speed is what counts, BIC will still win.

Bug fixes

- Corrected log warning message if an Ethernet Port during Auto-Negotiation is using a half-duplex connection, which is something you never want.
- For SNMP, it was possible that the router trying to update a 64 Bit counter value could fail. Other MIB data types were not affected.
- For the Hub 5020, in the previous firmware release the integrated hardware watchdog was used, but only the software one. Now both are used.
- For the Hub 5020, in the previous firmware release when trying to upload a config backup from a different Hub model, that config file would be rejected as incompatible. It's now possible to upload and automatically upgrade Hub configuration files from any other Hub model to the Hub 5020.
- While a VPN Hub with Hub redundancy was probing for other Hubs being available, it would send some broken ARP packets to the network.
- If the system was unable to open an Ethernet device for reading for whatever reason, the system did leak memory. It no longer does that.
- On systems with fan speed control (VPN Hubs), in theory if a CPU or system temperature sensor would return "-1", the fan control could crash and cause the Hub to reboot. This has never been seen in real life.
- For VPN Hubs with a single Ethernet Interface (In theory Amazon AWS Virtual Hub, but that is no longer supported) when a tunnel was connecting through the web interface IP, some memory would leak.
- Under rare circumstances, the integrated DNS resolver could cause the router to crash and reboot while resolving hostnames.
- For the VMWare Hub, some options for the Ethernet driver have been changed to work around a bug in some versions of VMWare.