

Status WR Switch, Current (v3)



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13th White Rabbit Workshop

Agenda

1. Release v6.1
2. Release v7.0

Release v6.1 (07-06-2023)

Release v6.1 (07-06-2023)

New features:

- In wr_mon
 - Display information about GrandMaster:
 - Grand Master Id
 - stepsRemoved
 - clockClass
 - timeSource
 - accuracy
 - logVariance
 - Informing about SFP match to the database (+/- in front of interface name)

```
WR Switch Sync Monitor v6.1 [q = quit]

WR time (TAI)      : 2024-03-19 08:52:09.005243  Leap seconds: 37
Switch time (UTC): 2024-03-19 08:51:32.005202  TAI-UTC      : +37.000041
PLL mode: BC      PLL locking state: LOCKED

Grand Master Info
-----
Grand Master Id | stepsRemoved | clockClass | timeSource | accuracy | logVar
7c:bc:84:ff:fe:a0:02:c6 | 4th hop | 6(GM) | 0x20(GNSS) | 0x21(100ns) | 47360

-----
Iface | Freq | Inst | Name | Config | MAC of peer port | PTP/EXT/PDETECT States | Pro | VLANS
+ri1 | Lock | 0 | wr1-1-wr-raw | slave | 64:fb:81:2f:cd:73 | SLAVE /IDLE /EXT_ON | R-W |
++ri2 | | 1 | wr2-1-wr-raw | master | 00:00:00:00:00:00 | DISABLED /IDLE /NONE | R-W |
+ri3 | | 2 | wr3-1-wr-raw | master | 22:33:0a:8d:ca:89 | MASTER /IDLE /EXT_ON | R-W |
++ri4 | | 3 | wr4-1-wr-raw | master | 00:00:00:00:00:00 | DISABLED /IDLE /NONE | R-W |
+ri5 | | 4 | wr5-1-wr-raw | master | 80:1f:12:f1:f3:36 | MASTER /IDLE /EXT_ON | R-W |
++ri6 | | 5 | wr6-1-wr-raw | master | 00:00:00:00:00:00 | DISABLED /IDLE /NONE | R-W |
--ri7 | | 6 | wr7-1-wr-raw | master | 00:00:00:00:00:00 | DISABLED /IDLE /NONE | R-W |
--ri8 | | 7 | wr8-1-wr-raw | master | 00:00:00:00:00:00 | DISABLED /IDLE /NONE | R-W |
--ri9 | | 8 | wr9-1-wr-raw | master | 00:00:00:00:00:00 | DISABLED /IDLE /NONE | R-W |
--ri10 | | 9 | wr10-1-wr-raw | master | 00:00:00:00:00:00 | DISABLED /IDLE /NONE | R-W |
--ri11 | | 10 | wr11-1-wr-raw | master | 00:00:00:00:00:00 | DISABLED /IDLE /NONE | R-W |
--ri12 | | 11 | wr12-1-wr-raw | master | 00:00:00:00:00:00 | DISABLED /IDLE /NONE | R-W |
--ri13 | | 12 | wr13-1-wr-raw | master | 00:00:00:00:00:00 | DISABLED /IDLE /NONE | R-W |
--ri14 | | 13 | wr14-1-wr-raw | master | 00:00:00:00:00:00 | DISABLED /IDLE /NONE | R-W |
--ri15 | | 14 | wr15-1-wr-raw | master | 00:00:00:00:00:00 | DISABLED /IDLE /NONE | R-W |
--ri16 | | 15 | wr16-1-wr-raw | master | 00:00:00:00:00:00 | DISABLED /IDLE /NONE | R-W |
--ri17 | | -- | | | | | | | |
--ri18 | | -- | | | | | | | |
Iface: +/- SFP in DB; Pro - Protocol mapping: V-Ethernet over VLAN, U-UDP, R-Ethernet

----- Synchronization status -----
Servo state: wr1:White-Rabbit: TRACK_PHASE
```

Release v6.1 (07-06-2023)

New features:

- Support of disabling SFPs' TX laser with `wrs_sfp_dump`
- In SNMP, addition of subset of OIDs:
 - IP-MIB (IP related)
 - BRIDGE-MIB (output of `rtu_stat`)
 - QBRIDGE-MIB (output of `wrs_vlans`)
- Improved reporting of an offset between NTP and WR time via SNMP
- Implementation of `sysObjectID` value to reflect WRS manufacturer and HW version
- Detection whether a switch is a low-jitter version (displayed in `wrs_version`, SNMP)
- Implementation of radius-802.1X for MAC authentication (subset of IEEE 802.1X)

New document “WRS: Radius Vlan”

<https://ohwr.org/project/wr-switch-sw/wikis/uploads/5f86a996d29a2fb21a389c27da7781db/wrs-radiusvlan-v6.1.pdf>

Release v6.1 (07-06-2023)

Important bug fixes:

- Fixes in handling of SFP's diagnostics (if SFP's diagnostic is used with firmware v6.0.x it can corrupt SFP's eeprom!)

This release uses exactly the same FPGA bitstream as the v6.0.x, thus the same calibration parameters apply!

More:

<https://ohwr.org/project/wr-switch-sw/wikis/Release-v61>

<https://ohwr.org/project/wr-switch-sw/milestones/1>

Release v7.0 (soon)

Release v7.0

When we talk about White Rabbit it may mean:

- A rabbit
- A PTP Profile
- A PTP Extension
- An Implementation

Profile vs. Extension

PTP Extension:

Refers to an enhancement or addition to the core PTP protocol (e.g., L1Sync optional feature), developed to address specific use cases or requirements that are not covered by the base protocol.

PTP Profile:

Definition of set of parameters with their allowed ranges and which extensions (optional feature) can be used with it.

More in Maciej Lipinski's talk about standardization.

Profile vs. Extension

In WRS v6.1, you can configure:

- Per instance/port:
 - Default Profile or WR (implies extension)

In WRS v7.0, you can configure:

- Globally:
 - Profile (e.g., value of priority1)
- Per instance/port:
 - Profile (e.g. put constraints on PTP message rates)
 - Extension (e.g. L1Sync)

Release v7.0

- Added support of High Accuracy (HA) PTP profile with L1Sync extension (IEEE1588-2019)
 - Still beta, but we encourage people to try!
- Added support of HA/L1Sync to Wireshark 4.2 (e.g. in Ubuntu 24.04LTS)
- Extension autonegotiation between WR and L1Sync

Release v7.0, Extension autonegotiation

- Plans for long time support:
 - WR switch: HA and WR (at the same time)
 - WRPC (node): HA or WR (one at the time)
- Extension autonegotiation priority:
 - L1Sync
 - WR
 - No extension

Release v7.0, runtime reconfiguration

- ppsi
 - PTP related:
 - announce-interval, delay-req-interval, priority1/2, sync-interval
 - Profile/extension related:
 - global-profile, profile, extension, extension autonegotiation
 - Other:
 - diags (globally and per port), tracking, alpha
- hal (PPS in-out offset in GM mode)

More in next releases

Release v7.0

- Software:
 - Support of fan-less version of a switch from SyncTechnology
 - Support building the firmware on Ubuntu 22.04
 - Cosmetic updates in SNMP (MIB)
- Gateware:
 - Support of Fan-Less switch from SyncTechnology
 - Bug fix for Jumbo frames
 - NOTE: Changed bitstream! Will require new calibration values!

We published Application Note for calibration

https://ohwr.org/project/white-rabbit/wikis/uploads/11f29675590d6d62b296064bd4e87921/WR_Calibration-Application_Note_1_v0.4.pdf

Release v7.0

- Important bug fixes:
 - Fix wrong behavior of BMCA with redundant passive links
- Bug fixes (less important):
 - Don't allow setting ports to slave for GM
- Number of non-backward compatible changes in dot-config:
 - Related to the PTP parameters (if not using standard values)
 - Related to setting BMCA/external port configuration
 - Selection of PTP profile/extension

Release v7.0

- wr_mon:
 - add "c" keypress to display some more config options (PPSi)
 - freeze + refresh
 - display number of errors from servo
 - display domain number
 - display info about the used BMCA
 - display configured profile/extension/extension autonegotiation
 - add which extension is used (displayed before extension state)

```
NR Switch Sync Monitor v6.1- -dirty [qquilt,r=refresh,f=freeze,t=toggle,servo,c=extra ppst_params]
WR time (TAI) : 2024-01-12 12:05:17.008734 Leap seconds: 37
Switch time (UTC) : 2024-01-12 12:04:40.008689
PLL mode: BC PLL lockInn state: LOCKED BMCA: Standard Domain: 0
ClockSource: 1 : fff7e0210101 clockClass: z40(bC) clockAccuracy: uXf(unkn) logVar: 65535
brlo1: 128 brlo2: 128
-----
Grand Master Info
Grand Master Id : fff7e0371:01 stepsRemoved : 1st hop : 193(FR) timeSource : 0x40(IntOscillator) accuracy : 0x20(25ns) logVar : 50973
-----
HAL :
-----
PPSi
-----
Interface | Freq | Instl | Name | Config | MAC of peer port | PTP/EXT/PROTECT States | ... | annI | syncI | delReqI | pdeReqI | VLANs
-----
-wr1 | Lock | 0 | wr1-1 | auto | : : 03:77:1:02 | SLAVE /WR/DLE /EXT_ON | V-wr/H | 1 | 0 | 0 | 0 | 10
-wr12 | 1 | wr12-1 | auto | : : 189:08:9e | MASTER /WR/DLE /EXT_ON | R-wr/H | 1 | 0 | 0 | 0 | 10
-wr13 | 2 | wr13-1 | auto | 00:00:00:00:00:00 | DISABLED /WR/DLE /NONE | R-wr/H | 0 | 0 | 0 | 0 | 10
-wr14 | 3 | wr14-1 | auto | 00:00:00:00:00:00 | DISABLED /WR/DLE /NONE | V-wr/H | 0 | 0 | 0 | 0 | 10
-wr15 | 4 | wr15-1 | auto | 00:00:00:00:00:00 | DISABLED /WR/DLE /NONE | R-wr/H | 1 | 0 | 0 | 0 | 400
-wr16 | 5 | wr16-1 | auto | 00:00:00:00:00:00 | DISABLED /WR/DLE /NONE | R-wr/H | 0 | 0 | 0 | 0 | 400
-wr17 | 6 | wr17-1 | auto | 00:00:00:00:00:00 | DISABLED /WR/DLE /NONE | R-wr/H | 0 | 0 | 0 | 0 | 400
-wr18 | 7 | wr18-1 | auto | 00:00:00:00:00:00 | DISABLED /WR/DLE /NONE | R-wr/H | 0 | 0 | 0 | 0 | 400
-wr19 | 8 | wr19-1 | auto | 00:00:00:00:00:00 | DISABLED /WR/DLE /NONE | R-wr/H | 0 | 0 | 0 | 0 | 400
-wr110 | 9 | wr110-1 | auto | 00:00:00:00:00:00 | DISABLED /WR/DLE /NONE | R-wr/H | 0 | 0 | 0 | 0 | 400
-wr111 | 10 | wr111-1 | auto | 00:00:00:00:00:00 | DISABLED /WR/DLE /NONE | V-wr/H | 0 | 0 | 0 | 0 | 400
-wr112 | 11 | wr112-1 | auto | 00:00:00:00:00:00 | DISABLED /WR/DLE /NONE | R-wr/H | 0 | 0 | 0 | 0 | 400
-wr113 | 12 | wr113-1 | auto | 00:00:00:00:00:00 | DISABLED /WR/DLE /NONE | R-wr/H | 0 | 0 | 0 | 0 | 400
-wr114 | 13 | wr114-1 | auto | 00:00:00:00:00:00 | DISABLED /WR/DLE /NONE | R-wr/H | 0 | 0 | 0 | 0 | 400
-wr115 | 14 | wr115-1 | auto | 00:00:00:00:00:00 | DISABLED /WR/DLE /NONE | R-wr/H | 0 | 0 | 0 | 0 | 400
-wr116 | 15 | wr116-1 | auto | 00:00:00:00:00:00 | DISABLED /WR/DLE /NONE | R-wr/H | 0 | 0 | 0 | 0 | 400
-wr117 | 16 | wr117-1 | auto | 00:00:00:00:00:00 | DISABLED /WR/DLE /NONE | R-wr/H | 0 | 0 | 0 | 0 | 400
-wr118 | 17 | wr118-1 | auto | 00:00:00:00:00:00 | DISABLED /WR/DLE /NONE | R-wr/H | 0 | 0 | 0 | 0 | 400
-----
SFP in DB; PrConf-Protocol config: V-Eth over VLAN, U-UDP, I-Net; a-ext autoneg, r-ext U-WR, i-HA
annI-logAnnounceInterval;syncI-logSyncInterval;delReqI-logMinDelayReqInterval;pdeReqI-logMinPDelayReqInterval;
-----
Servo state: wr1:White-Rabbit: TRACK_PHASE
-----
Timing parameters
-----
| meanDelay : 55.112 nsec | err state: 2
| delayNS : 55.112 nsec | err offset: 2
| delayMH : 1143.787 nsec | err delta: 3
| delayAsymmetry : 0.000 nsec
| delayCoefficient : +0.000000000000000000 fpa : 0
| ingressLatency : 275.901 nsec
| egressLatency : 238.903 nsec
| semiStaticLatency : 0.000 nsec
| offsetFromMaster : 0.003 nsec
| Phase setpoint : -7.460 nsec
| Skew : -0.001 nsec
| Estimated link len: 11.249 meters
| Update counter : 147763 times
| Master PHY delays TX: 239.923 nsec RX: 278.835 nsec
| Slave PHY delays TX: 238.903 nsec RX: 275.901 nsec
-----
Temperatures
PPGA: 54.25 PLL: 53.00 PSL: 50.75 PSR: 53.31
```


Thank You!