

WR Collaboration: Plans for the Year Ahead



Maciej Lipiński on behalf of WRC Bureau

22nd March 2024

13th White Rabbit Workshop

Agenda

1. WRC Bureau and its role
2. WR Technology
3. Plans
 - Developments: Switch and WRPC
 - Tests
 - Training courses
 - Workshop, Website, Outreach

WR Collaboration

WRC Bureau



Maciej Lipinski
WR Engineer



Adam Wujek
WR Engineer



Amanda Diez Fernández
Community Coordinator

advise/contribute



support
(direct/forum/projects/trainings)

WRC Members

WRC Council

Nikhef



iol University of New Hampshire
InterOperability
Laboratory

SAFRAN

gmv
INNOVATING SOLUTIONS

IQD

LMS
LIQUID-MARKETS SOLUTIONS
The Power of the Possible™

jumptrading



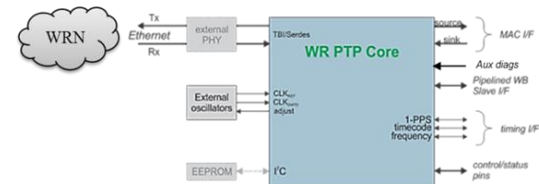
Maintain + develop



use



WR Technology



WRC Bureau and its role

WRC Bureau



Maciej Lipinski
WR Engineer



Adam Wujek
WR Engineer



Amanda Díez Fernández
Community Coordinator

- Support of WRC members
- Maintenance of WR Technology
 - Maintenance of the codebase
 - Continuous integration
- Development of WR Technology
 - Bug fixes reported by users
 - Feature requests
 - Interface requests
 - Documentation
- Calibration of “local golden calibrators”
- Development/delivery of training courses
- Maintenance of website
- Community management and outreach
- Workshops and conferences

WR Technology

WR Switch v3

- **Hardware:** Mechanics, PCBs
- **Gateware:** HDL/FPGA
- **Firmware:** code in dedicated processors with no OS
- **Software:** embedded Linux, drivers, user-space tasks
- **Documentation:** user manuals, design documents

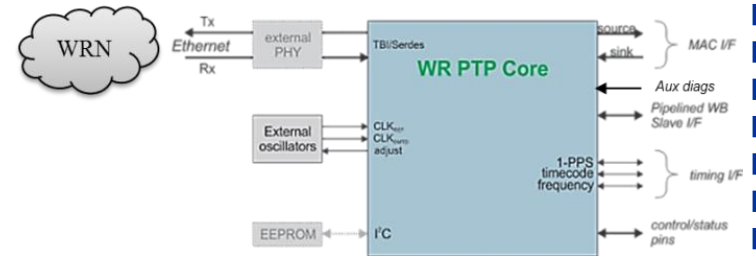
WR Node

- **Gateware:** HDL/FPGA
 - FPGA/hardware-agnostic
 - FPGA/hardware-specific
- **Firmware:** code in dedicated processor with no OS
- **Documentation:** user manuals, design documents

WR switch v3



WR PTP Core



Development plans for WR Switch in 2024 (1)

WR Switch release v7.0 – March/April 2024

- New features:
 - High Accuracy (HA) PTP Default Profile (Beta)
 - WR/HA auto-negotiation (Beta)
 - Output PPS delay adjustment for in/out PPS alignment
 - Support of build on newer OS (Ubuntu 22.04)
 - Runtime reconfiguration of selected PTP parameters (including profile and extension)
- Bug fixes:
 - Jumbo frame losses
 - BMCA wrong behavior with redundant links (PASSIVE)
 - No update of logMinDelayReqInterval
- Calibration:
 - More accurate calibration values (fixed delays and alpha)
 - “Application Note I” on calibration inaccuracies

<https://ohwr.org/project/white-rabbit/wikis/Documents/White-Rabbit-calibration-procedure>



For detailed information
see presentation by Adam Wujek
["Status WR Switch, current v3"](#)

Development plans for WR Switch in 2024 (2)

WR Switch release v7.1 – estimated Q4 2024

- New features:
 - Update Rtsubsystem (SoftPLL) from LM32 to RiscV
 - Improve support of PTP over IPv4
 - Keeping over firmware updates:
 - Management port info or full dot-config
 - RSA/DSA key
 - SoftPLL settings via command line and dot-config
 - Support IRIG-B/NMEA input on GM mode
 - Improve IIC/SPI interface (if possible)
- Improve compliance tests for HA
- Clean-up of licensing to follow WRC guidelines
- Calibration:
 - Script for semi-automatic WR Calibration (relative)
 - “Application Note 2” with detailed calibration instructions



Development plans for WR Switch beyond 2024

In the pipeline to implement after 2024 unless implemented as contributions or a projects on:

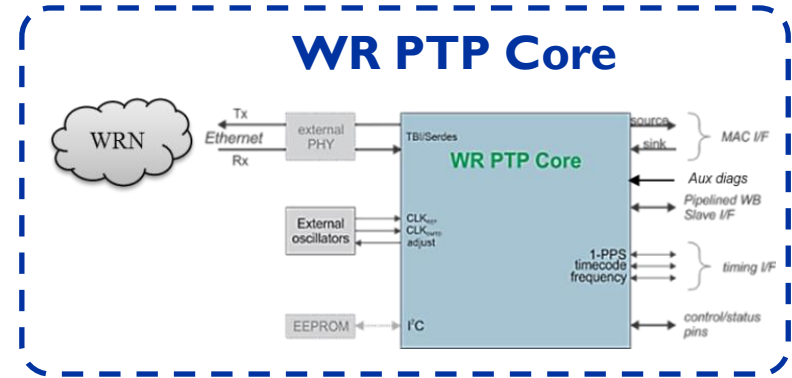
- Runtime reconfiguration
- Implementation of PTP MIB according to IEEE1588e
- Implementation of In-situ calibration according to IEEE1588f



Development plans for WRPC in 2024

To be implemented in 2024

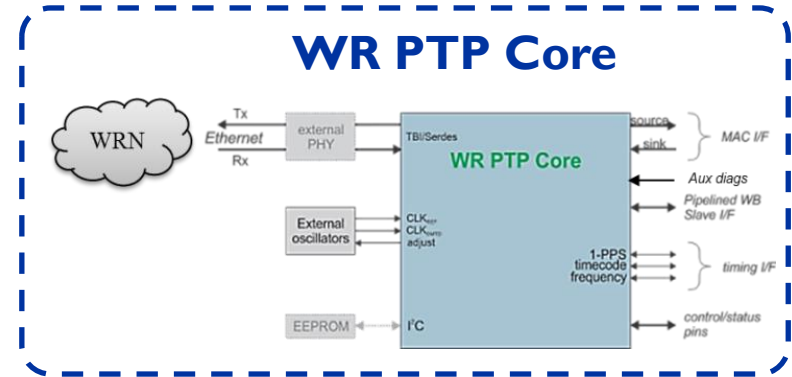
- High Accuracy (HA) PTP Default Profile (Beta)
- UTC (expose leap second flag/value)
- SoftPLL settings via CLI and config
- IRIG-B output signal
- IIC/SPI interface improvements (if needed?)
- Provide a configurable PWM output like 10MHz



Development plans for WRPC beyond 2024

In the pipeline to implement after 2024 unless implemented as contributions or a projects on:

- Multiboot support
- Lock-sweep
- WR without external oscillators & support for a Xilinx US+ COST dev-board
- NMEA output signal
- Support for more WR-enabled boards: (DI/OT SB, WR NIC by META/OCP-TAP)
- Integration with Corundum
- Implementation of In-situ calibration according to IEEE1588f
- Dual-ports support



Test definition plan

WR Bureau with the Test and Calibration Committee

Basic idea and the end goal:

- Well defined procedures/guidelines/templates for tests of Qualified Products
 - Compliance tests
 - Synchronization performance measurement
 - WR calibration
 - Report template
- Associated Labs implement/perform the above
- WRC Bureau has its own instance of the testbed/implementation
- Reports of the tests are submitted to WRC

Goal for 2024:

- First draft of procedures/guidelines/templates
- Definition of an example equipment needed for the testbed

Training plans

WR Bureau with the Training Committee

Online:

- Live online session only for personnel of WRC members
- Material and recording from the session available publicly/freely
- Proposed subjects:
 - WR Introduction
 - WR Switch architecture, WR Node architecture
 - WR Calibration
 - WR Switch – practical guide for users/operators
 - WR implementation details
 - Guide to oscillators and holdover (by IQD)

On CERN/external site:

- Participation only for personnel of WRC members, at CERN and/or WRC member premises
- Material available publicly/freely
- Proposed subjects:
 - WR Switch – practical guide for users/operators **with labs**
 - WR Calibration **with labs**

Workshop, Website, Outreach

Workshop

- When: November/December 2024
- Where: at CERN

Website

- Maintain and update
- Library of WR-related documentation, presentations, articles and trainings materials

Outreach

- Promote WRC in conferences (ITSF, ISPCS)
- Liaise with communication teams of the WRC Members to coordinate official communication
- LinkedIn posts series:
 - Discover the members
 - Discover the use-cases

Thank you

