1) Main Requirements

2) History / Approach

3) Document Structure

4) Current Status of the Documents

5) Functional / Technical Specs Overview

6) Most Important Design Decisions

WR developer meeting, 10.12.2010
1) Generic and flexible approach

2) Standardization (IEEE / ISOC RFC)

3) Follow WR spec document type ("IEEE like")

4) Same HW / SW for all use cases (GSI, CERN, others)

5) Known use cases / requirements from future user groups (GSI, CERN, others)

6) Consider use cases where WR is the only network!
WR Node Specs
History / Approach

general

- Decision in WR workshop: GSI cares about WR Nodes and WR "timing master"
- Accept additional work for high benefits of generic approach and identical HW/SW at different facilities

additional information

- CERN already specifies / produces WR carrier boards in VME / PCIe → should fit to specs
- Started with early (superseded) WR specs (HP/SP,...)
- Switched to current WRS, EtherBone, etc.
- Disregard standard FAIR FEC (also WR receiver !)

HowTo

- Both functional and technical spec necessary
- Define further necessary specs
- Agree on basic concepts first, go into details later
- Care about facility integration later (e.g. FESA etc.)
current documents
(draft versions)

proposed documents

• White Rabbit Node – Functional Specification
• White Rabbit Node – Technical Specification (slim version)
• Forward Error Correction Algorithms to be used in White Rabbit Networks Specification
• Granularity Window Concept Specification
• White Rabbit Accelerator Event Specification

• Robustness in White Rabbit Specification
• White Rabbit Specification
• EtherBone Core Functional Specification

• IEEE specs, ISOC RFC specs

T.Fleck, GSI
1) Top – Down Approach → mostly low level of detail

2) Results of first detailed discussion (GSI / CERN) already considered

3) Known use cases (GSI/CERN) partly considered

4) Support for further reasonable use cases / other fields of application considered

5) Current discussion / thinking:
   VLAN possibilities
   reasonable datagram content
   WRN internal flow control
   …
WR Node Specs
Functional / Technical Chapter Overview

WRN Functional Specification

Node Functional Requirements
- Layer 1 / 2 / upper layers
- Diagnostics / Management
- Debug / Test / Fault Conditions
- Datagram content, WRN reaction
- Configurable counters

White Rabbit Node Functionality
- Layer 1 / 2 / upper layers / WR
- Counters / clock synthesis
- Host card communication
- FMC communication
- Management / Configuration
- Debug / Test / Fault Conditions

WR Node as a Master
- Clock~ / Management~ / Data Master~

Appendixes (Topology, FESA, etc.)

WRN Technical Specification

Node Requirements
- White Rabbit
- SyncE, PTP

White Rabbit Node Board
- Hardware
- Form Factors
- Interfaces

White Rabbit Node Core (modules)
- White Rabbit Core
- FEC / deFEC
- Etherbone
- Host Bridge
- Soft Cores
- Programmable Counters
- Memory
- WishBone Matrix
1) All WRNs are equal, but some are more equal...
   → Data Master, Clock Master, Management Master
   → Use identical HW for all; connect additional HW when needed

2) Use normal QoS instead of HP/SP (specified in WRS)

3) No CPU on a WRN, use soft cores instead

4) Implement Etherbone

5) Interconnect using Wishbone Matrix

6) Flexible payload content, no predefined “event structure”

7) Access all WRN functionality / configuration from both sides
   (WR interface, host bridge)
Never forget to think about

- Topology
- Robustness (and Redundancy)
- Accelerator use cases
- Remote Maintenance Capabilities
- “Outside” Management (second network)
- Errors, Fault Conditions
- Having a beer now and then with your colleagues