Palluel Julien

With inputs from his colleagues
CERN, for BE/CO Technical Meeting, 08/06/2017 @ CERN

White Rabbit as a CO service
Project status
Project team & purpose

Project Owner & Involved People

- **Project owner:** J. PALLUEL
- **Involved people:**
  - M. LIPINSKI, G. DANILUK, A. WUJEK
  - S. PAGE
  - E. FORTESCUE, P. LE ROUX
  - L. BURDZANOWSKI
  - C. DEHAVAY, B. NINET, E. SAID, M. BJORK

Project Purpose

- Provide a BE-CO support, similar to what exists for WorldFip, to any CERN user, regarding the installation, operation and the maintenance of a White Rabbit-based network, available and fully operational for the start of LS2.
Project background, scope & constraints

Project Background

- White Rabbit is a versatile solution for building distributed hard real-time controls and data acquisition systems. It has already been deployed for the LHC Instability Trigger Distribution and the BTrain. It will be deployed for OASIS triggering and GMT distribution. It is likely that more applications will arise.

- **No official CO support exists** for White Rabbit, similar to what is proposed for WorldFIP, with: installation procedures, documentation and diagnostics tools.

- A support model is also missing, which our users can rely on, to guarantee timely resolution of problems.
Project Scope

Included

- A support service: installation, operation, maintenance and all required documentation;
- The training for support team;
- Creation of monitoring tools for diagnostics;
- Data modelling in existing CO databases;
- The safety review of the switch kernel software;
- The asset management (stock management);
- The script for extracting the White Rabbit switch configuration from CCDB.
Project Scope

Excluded

- New installation projects;
- The GMT renovation project.
Project constraints

• Impact of the monitoring review on the global monitoring solution;

• The start of LS2 is a deadline that cannot be missed. It would be better to foresee some months for testing before this date.
Plan overview

White Rabbit as CO Service

Plan is divided into 20 milestones

Start = 22/02/17, after SLM approval

End = Beginning of 2018

Categories

Actors

Timeline

Dependencies

Milestones

All Actors were consulted to assign them with the right task in the right schedule

Goal Directed Project Management

- BE/CO/IN
- 08/06/2017

Plan is divided into 20 milestones

Timeline

Dependencies

Milestones

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Goal Directed Project Management

Plan is divided into 20 milestones

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Goal Directed Project Management
Project Milestones (1/2)

**Layout team**: Model data for White Rabbit infrastructure’s proof of concept

**CCDB team**: Basic configuration of the WR switch

**WR Hardware team**: Security test interface, knowledge transfer and extraction script for the configuration file

**Installation team**: Asset management, adapt Hardware Installation portal

**Project owner**: Prototype monitoring of WR switches and nodes, and test on a real installation
- **Layout team**: Layout tools finalized and data sync with CCDB
- **CCDB team**: Integration of the VLANs and IP configuration
- **WR Hardware team**: Extraction script updated
- **Project owner**: Provide monitoring for all networks recorded in layout, write procedures for installation, testing and diagnostics
- **Installation team**: Train for installation, diagnostics and operation
- **Sys admin team**: Configuration of boot server and nodes
Actual project status

White Rabbit as CO Service

When the Project Mandate is finished, and approved at SLM

When the Kernel OS of the White Rabbit switches passed the security tests

When layout database specification is established

When the workflow of an installation is clear through a demo made by HT

When the installation portal for White Rabbit part will be perfectly adapted

When a Proof of Concept of the White Rabbit layout is done

When the topology of the White Rabbit networks can be recorded in the layout

When White Rabbit equipments are fully integrated into asset management

When the CCDB web interface of the switches cover the basics possibilities

When the White Rabbit Switch configuration extraction script is validated

When diagnostic tools will have a prototype

When the diagnostic solution is validated on an existing facility, ex: BTRAIN

When a proof of concept permit to set the VLANs and the IP addresses

When the script of CCDB extraction is updated with last changes

When Bootp server and nodes configuration server are validated

When the White Rabbit configuration tools are finalized

When diagnostic tools become available for every fieldbus recorded in layout

When the installation, testing and diagnoses procedures will be written

When the people in the installation group have undergone training

When the project is closed

https://edms.cern.ch/document/1740912
**Actual project status**

<table>
<thead>
<tr>
<th>Date</th>
<th>Milestone</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017-Mar-06</td>
<td>D3</td>
<td>When the Kernel OS of the White Rabbit switches passed the Stephan Lueders security tests, with a methodology update clarified procedure</td>
</tr>
<tr>
<td>2017-Mar-08</td>
<td></td>
<td>When layout database specification is established on the basis of an existing installation.</td>
</tr>
<tr>
<td>2017-Mar-13</td>
<td>E2</td>
<td>When the complete workflow of an installation is clear and the needs on the hardware installation portal defined through a demo installation of a White Rabbit network made by HT</td>
</tr>
<tr>
<td>2017-Mar-21</td>
<td>D5</td>
<td>When the fieldbus installation portal v1 for White Rabbit part will be perfectly adapted, with the improvements that will arise from the demo</td>
</tr>
<tr>
<td>2017-Mar-24</td>
<td></td>
<td>When a Proof of Concept of the White Rabbit layout is done and its modeling is compatible with at least one existing network</td>
</tr>
<tr>
<td>2017-Apr-07</td>
<td></td>
<td>When the topology of the White Rabbit networks can be recorded in the layout</td>
</tr>
<tr>
<td>2017-Apr-20</td>
<td>E8</td>
<td>When White Rabbit equipments are fully integrated into asset management and all the update/test procedures are ready</td>
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</tbody>
</table>

**D3 : Security tests of the switch incomplete**

- In collaboration with Stefan Lueders
- Low impact on next direct milestone E8
- E8 : Installation/Update procedure has been written and tested
- E8 : WR Hardware already declared in asset management system
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### C6: Proof of concept not ready

- **Rack & Circuit Layout template: Excel files delivered**
- **Still not filled with all BTRAIN data: Taking longer than expected**
## Actual project status

### C7: Not completed yet

- **Needs more development time: foreseen in June**
- **No blocking dependencies on other milestones**

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<td>2017-Apr-07</td>
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C11 : Progressing well

In the scope of the COSMOS project:

- First white rabbit switch checks have been coded and tested

- Performance tests ongoing
Conclusion

Global project state:

- **Delayed but still in line with plan**
  - CCDE interface done
  - Installation procedure written
  - Asset management almost completed
  - Monitoring ongoing
  - Layout upload mechanism delayed
  - Security tests late but not critical
  - Specification of Layout data for proof of concept late (plan over-optimistic)
Additional Functionalities like:

- automatic topology generated by the switches
- an open source solution to export diagnostic to external user (ex: raspberry pi based)
- **automatic firmware update management through the database (reboot)**