Switch v3 Hardware Status and Plans

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Company overview

Seven Solutions (info@sevensols.com)
7S Company

- **Origin**
  - Created in 2006 as spin-off from the University of Granada
  - Technology-based created in the framework of several EU projects by a research group of the University of Granada.

- **Research and innovation awards**
  - AJE award to the best young company in Granada 2008
  - Bancaja National award to young entrepreneurs 2008
  - Entrepreneur Award XXI in Andalucía 2009

**Team: 12 active workers as manpower**

- 1 Business administration
- 1 Secretary
- 1 Part-time accountant
- 1 CEO
- 1 R&D Director
- 1 Technician
- 2 Software engineers
- 2 Telecommunications engineers
- 2 Hardware engineers
7S: The team

Direction – R&D
- Eduardo Ros
- Javier Díaz

Direction – R&D
- Miguel Ángel Reinoso
- José Rodríguez
- Alicia Medina

Engineering & production
- Miguel Méndez
- Benoit Rat
- Gabriel Ramírez
- Rafael Rodríguez
- Ángel Tobaruela
- Richard Carrillo
- Rodrigo Agís

Market & administration
- José Rodríguez
Company services & products

Services
- Electronics boards design and production
- Embedded software development (real-time, control...)
- HW/SW dependable systems & certification (DO-254, DO-178B, IEC-615)
- High-tech consulting & training
- Integration & turn-key solutions

Products
- Prototyping FPGA platforms (XircaV4, S400, SB, ViSmart, WR6)
- Custom electronic products: CODE, Sensonic, Ledlocal
- FPGA IP cores: Memory controllers, Ethernet UDP stack, motion detection, video-analytics, etc..
- White Rabbit products (Switch, Spec, FMC DIO, FMC TDC; FMC ADC... )
7S role in White Rabbit project

- **White Rabbit Switch**
- **White Rabbit integrated solutions:** production, customization, design, support and more...

**BRIDGE (7S)**
- Support
- Customization
- Production
- ...

**OPEN HW/SW COMMUNITY**

**COMMERCIAL TECHNOLOGIES / FINAL CUSTOMERS**
The white Rabbit switch

OVERVIEW & STATUS
Switch elements

The switch is composed by two main elements:

- Switch Core Board (SCB)
  - It contains the main WR elements and interfaces
- Additional board depending on configurations
  - uTCA rack (*not available ➔ under discussion?*)
  - Standalone: based on a minbackplane board, equipment inside a 19” case
White Rabbit Switch (WRS)

- SCB in uTCA. WRS Configuration:

  Tongue 4: SMI channels 7-12  
  Tongue 3: SMI channels 1-6  
  Tongue 2: Clocks (CLK1 and CLK2)  
  Tongue 1: Power, IPMB, management and Downlinks[1:12]

- SCB in Standalone. Configuration:

  Tongue 3: not used  
  Connectors for communicating boards

SCB

miniBackplane Board
WRS core board (SCB) components

The board main elements are:

- the High performance **Virtex-6 FPGA** (XC6VLX130T, XC6VLX240T or XC6VLX365T chips)
- **ARM processor** (AT91SAM9G45). Well-known architecture and Linux support.
- 32M x 16 DDR2
- 256 MB NAND Flash
- Ethernet 10/100 PHY
- 8 MB SPI Boot Flash
- Two 512Kx36 QDRII SRAM
- 8MB x 16 NOR Flash (for BPI FPGA Configuration)
- 14-Output Clock Generator with Integrated 1.6 GHz VCO (AD9516-4)
White Rabbit switch status

Prototyping era came to its end ...
- Three redesigns → few units sold
- Functionality, robustness, ergonomics driven the redesigns...

Commercial version → v3.3. Includes modifications based on:
- Features suggested on the WR list during September emails.
- Pre-CE certification test done. EMC problems detected → backplane redesign
- Bigger FPGA for advanced functionalities

XC6VLX130T → XLXXC6VLX240T
White Rabbit switch status II

Example of v3.3 modifications.

- Some ports moved to the back of the box
- Switch on/off button, front leds, reset button, etc...
- Better cooling (up to 3 fans are possible), box redesigned
- FPGA PWM control for fans → noise reduction!
- SFP cages moved to improve robustness
- Electrical safety regulations
- DIP Switch for firmware version compatibility
- ...

And commercially available for the early 2012 → really a challenge!
White Rabbit switch status III

Better with pictures!
White Rabbit switch status III

Better with pictures!
White Rabbit switch production

Production roadmap

- First prototypes for functional evaluation are available
- CE certification → December 17th.
- Few units to be deliver to beta-testers before the end of the year
- First commercial units: on the market during February 2013.
  - Many of the production processes already started.

WR community: production units & price
White Rabbit switch production II

Switch is a very complex product

- It has required several design cycles
- Open hardware, collaborative environment → sometime is fuzzy but it allows to collect/enroll really talented people

THANKS TO ALL OF YOU FOR YOUR COLLABORATION!

7S policies

- Quality procedures
- Support
- No “latency”, play with the toys asap 😊 → board stocks (switch but also SPECS, FMC cards, etc..)
SUMMARY

- Prototyping ends, commercial product start with the new year
  - Switches available next February
  - CE certified (18 ports version)
  - Different configurations available (FPGA device, 8? or 18 ports, etc...)

- Seven Solutions plans for 2013
  - Improving quality procedures & test, prices, delivery time and support
  - Exploration of new markets as a way to improve quality and reduce price
Thank you for your attention