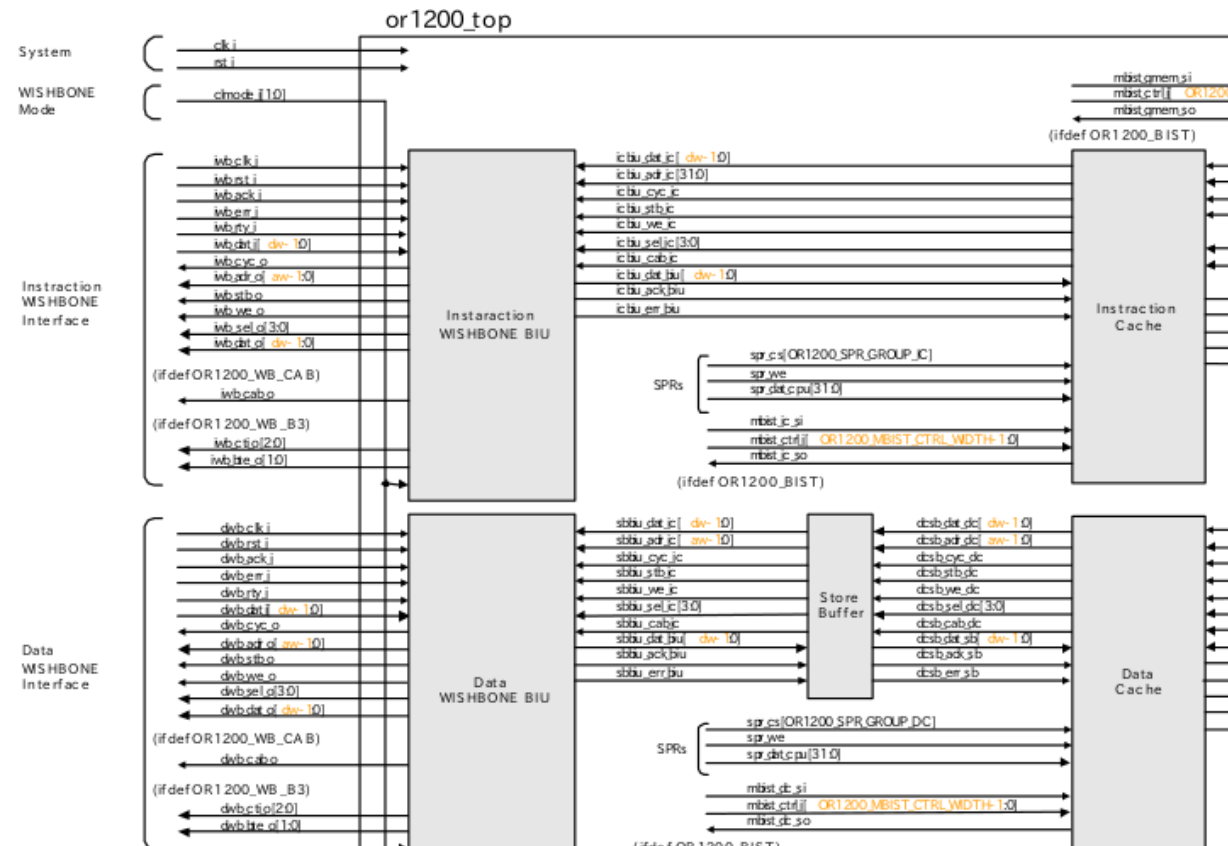


Field Programmable Gate Array  
OpenRISC  
Open System-On-A-Chip  
rtl-sdr

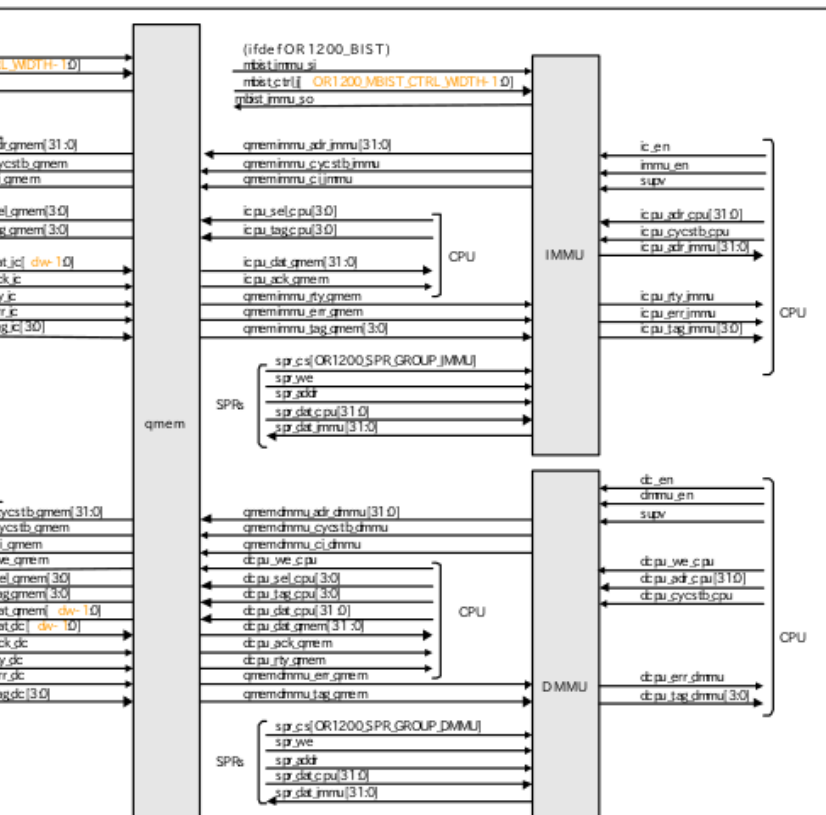
Linux



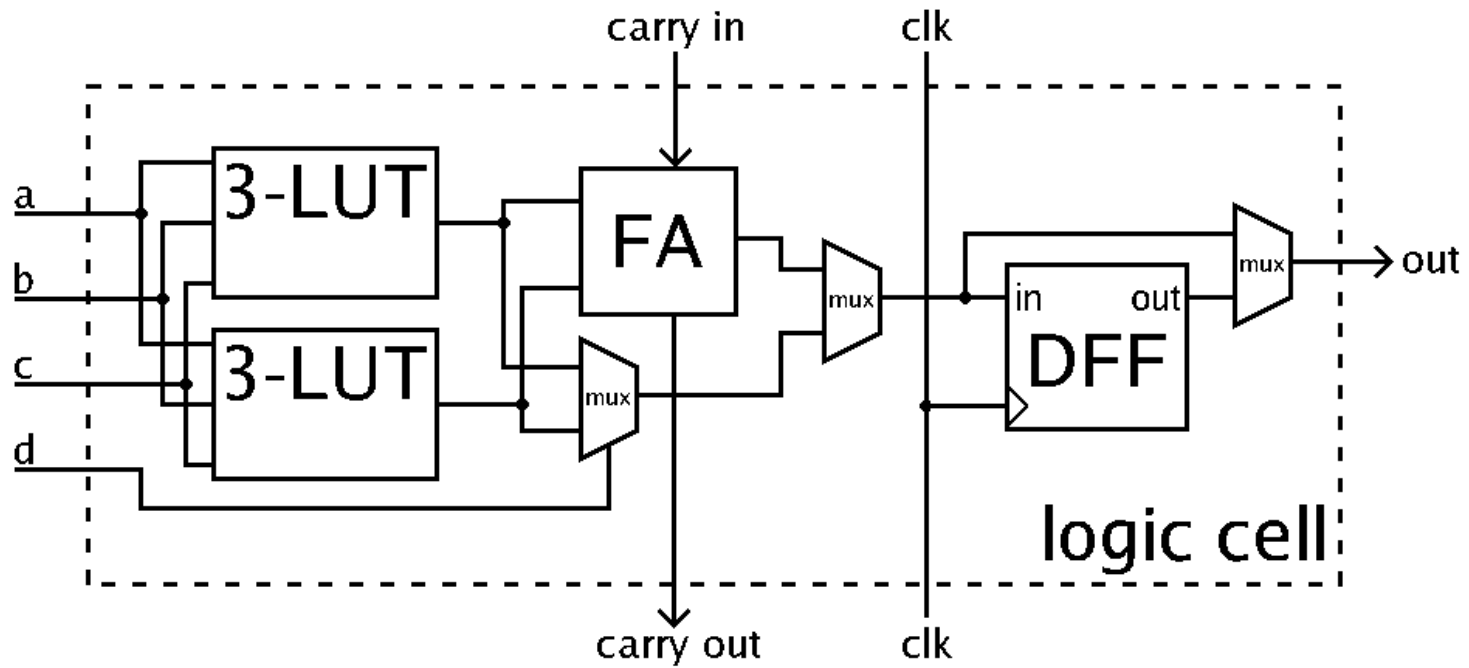
# What is an FPGA ?

cells (K )

A Few Lookup Tables  
 A Full Adder  
 A Flip Flop  
 A Few Multiplexers



Field Programmable Gate Array  
 OpenRISC  
 Open System-On-A-Chip  
 rtl-sdr



Why does this exist?

Custom Logic  
Prototyping  
Performance  
Research

Field Programmable Gate Array

OpenRISC

Open System On-A-Chip

rtl-sdr



Field Programmable Gate Array  
OpenRISC  
Open System On-A-Chip  
rtl-sdr

# W h a t is OpenRISC ?

O p e n S o u r c e

3 2 & 6 4 b i t

1 0 0 0 v s 1 2 0 0

L G P L a n d G P L ( f i r m w a r e )

L i n u x K e r n e l 3 . 1

F r e e R T O S , e C o s

V e r i l o g

Field Programmable Gate Array

OpenRISC

Open System-On-A-Chip

rtl-sdr

Why isn't OpenRISC Everywhere?

GPL firmware  
Community not Corporation  
1000 vs 1200  
Generic 5 stage pipeline  
No ASIC

Field Programmable Gate Array

OpenRISC

Open System-On-A-Chip

rtl-sdr

# What is OpenSOC?

22k Gates

32M b ram

1 M b flash

SDIO

10/100 Ethernet

USB host/slave

USB power, configuration, UARTs

Expansion

Field Programmable Gate Array

OpenRISC

Open System-On-A-Chip

rtl-sdr



W h a t is RTL-SDR?

U S B -D V B -A D C

~\$20

14-1700M hz

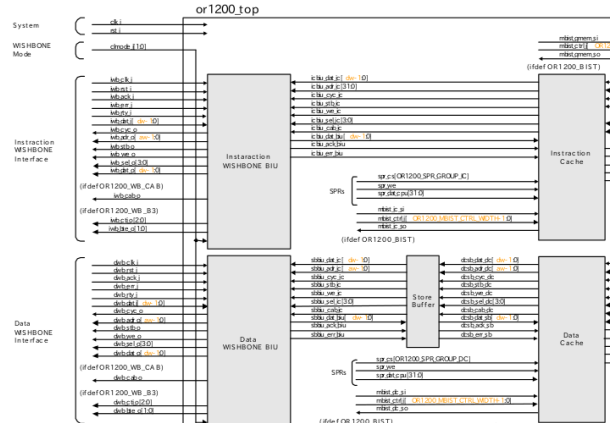
1 M hz bandwidth window

1 M samples per second

8bit resolution

Field Programmable Gate Array  
 OpenRISC  
 Open System-On-A-Chip  
 rtl-sdr

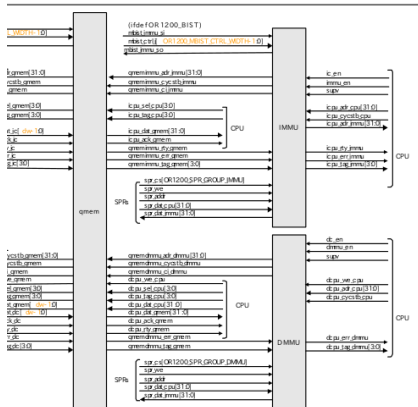
Linux



Robert Keizer  
 Manitoba Unix User Group  
 November 2012

# What is an FPGA ?

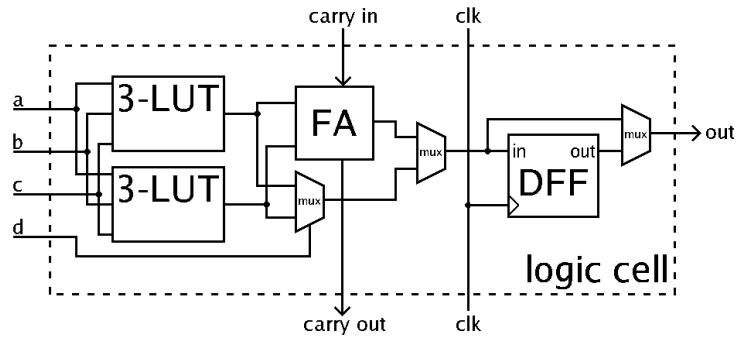
cells (K )



A Few Lookup Tables  
A Full Adder  
A Flip Flop  
A Few Multiplexers

Field Programmable Gate Array  
OpenRISC  
Open System-on-A-Chip  
rtl-sdr

LUT  
Full Adder  
D Style Flip Flop  
A few Muxers



Why does this exist?

Custom Logic  
Prototyping  
Performance  
Research

Field Programmable Gate Array  
OpenRISC  
Open System-On-A-Chip  
rtl-sdr

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Logic  
Proto  
Perf  
Research



Field Programmable Gate Array  
OpenRISC  
Open System-On-A-Chip  
rtl-sdr

# W h a t is OpenRISC ?

Open Source  
32 & 64bit  
1000 vs 1200  
LGPL and GPL (firmware)  
Linux Kernel 3.1  
FreeRTOS, eCos  
Verilog

Field Programmable Gate Array  
**OpenRISC**  
Open System-On-A-Chip  
rtl-sdr

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1000 is the arch, 1200 is the implementation.

Why isn't OpenRISC Everywhere?

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1000 vs 1200  
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No ASIC

Field Programmable Gate Array  
**OpenRISC**  
Open System-On-A-Chip  
rtl-sdr



# What is OpenSOC?

22k Gates

32M b ram

1M b flash

SD IO

10/100 Ethernet

USB host/slave

USB power, configuration, UARTs

Expansion

# What is RTL-SDR?

USB-DVB-ADC

~\$20

14-1700Mhz

1Mhz bandwidth window

1M samples per second

8bit resolution

Field Programmable Gate Array  
OpenRISC  
Open System-On-A-Chip  
rtl-sdr

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SNMP MIB OID