Turning software into hardware - Hastlayer

Zoltán Lehóczky @ Lombiq

ProgSCon London

22 April 2016

Lombiq

be the hardware

software → hardware

logic expressed as software → logic expressed as hardware

computer program → computer chip

…with FPGAs

- Field-programmable gate array
- Can behave as any logic circuit (terms and conditions apply)

Image by SparkFun Electronics, Boulder, USA

computer program → FPGA logic

.NET (C#, F#, VB, C++, PHP, JavaScript, Python…) → FPGA logic

.NET → VHDL → FPGA logic

“It’s writing code so it must be like programming.”

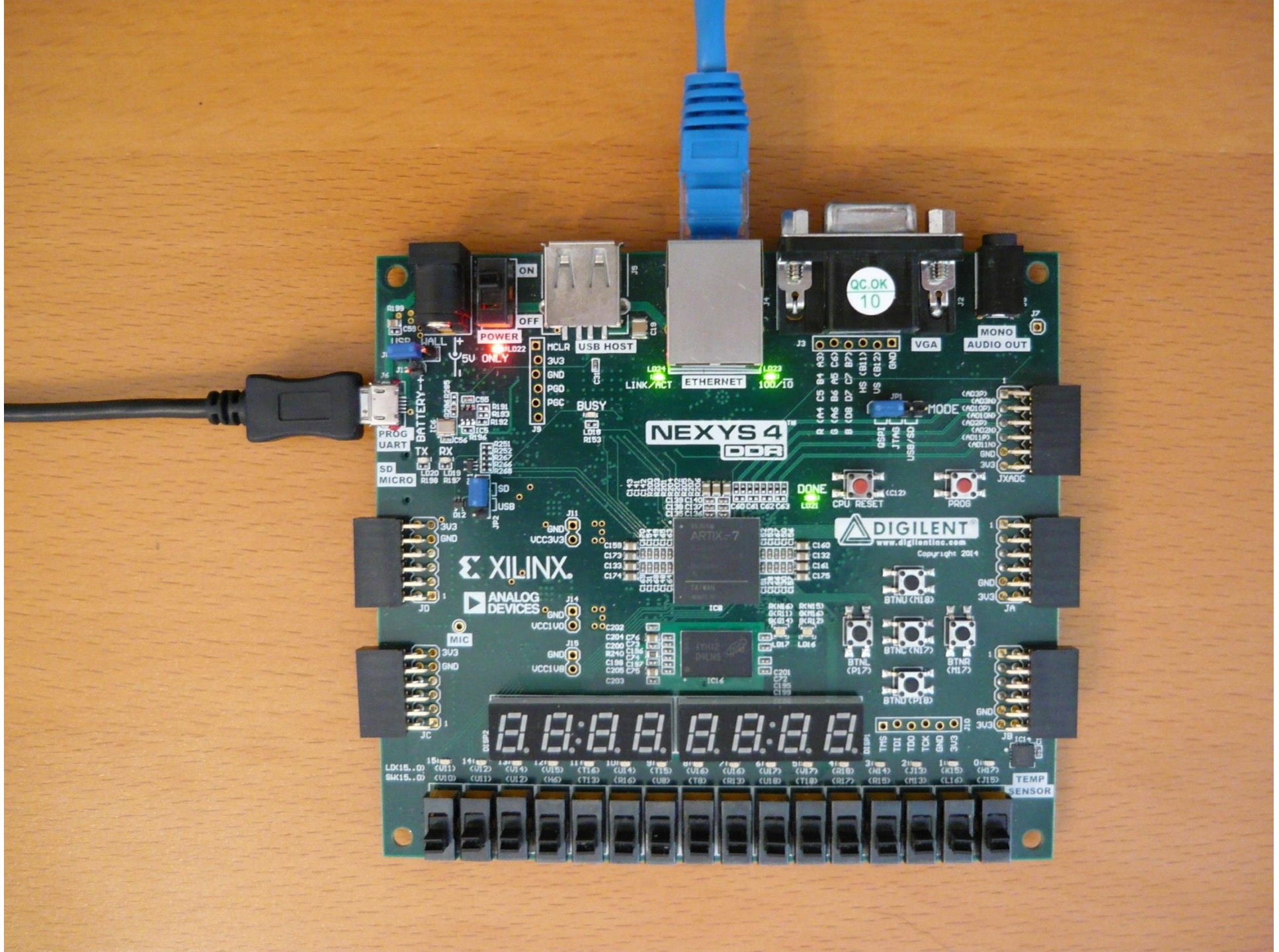
“It’s writing code so it must be like programming.”

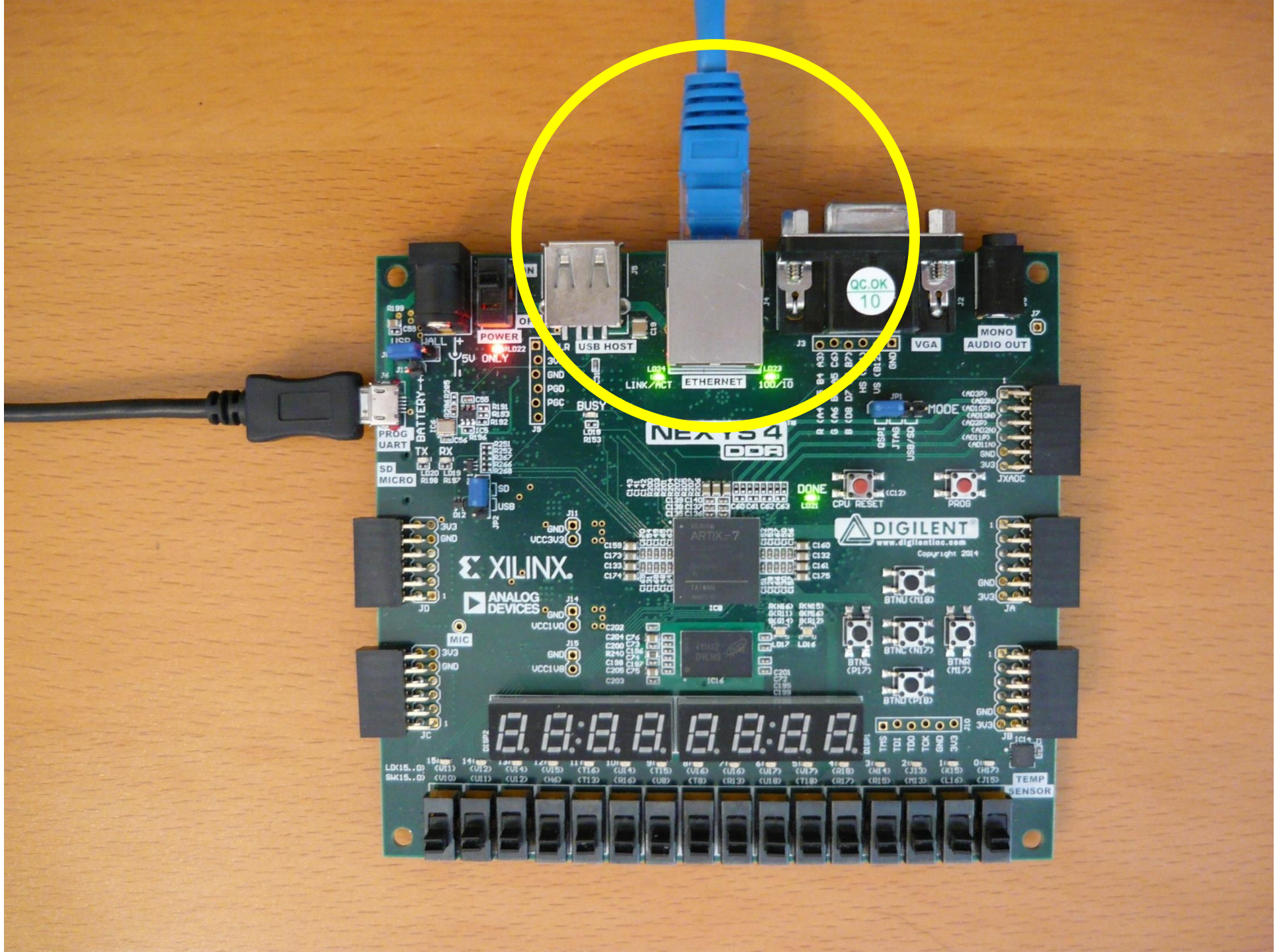
But why?

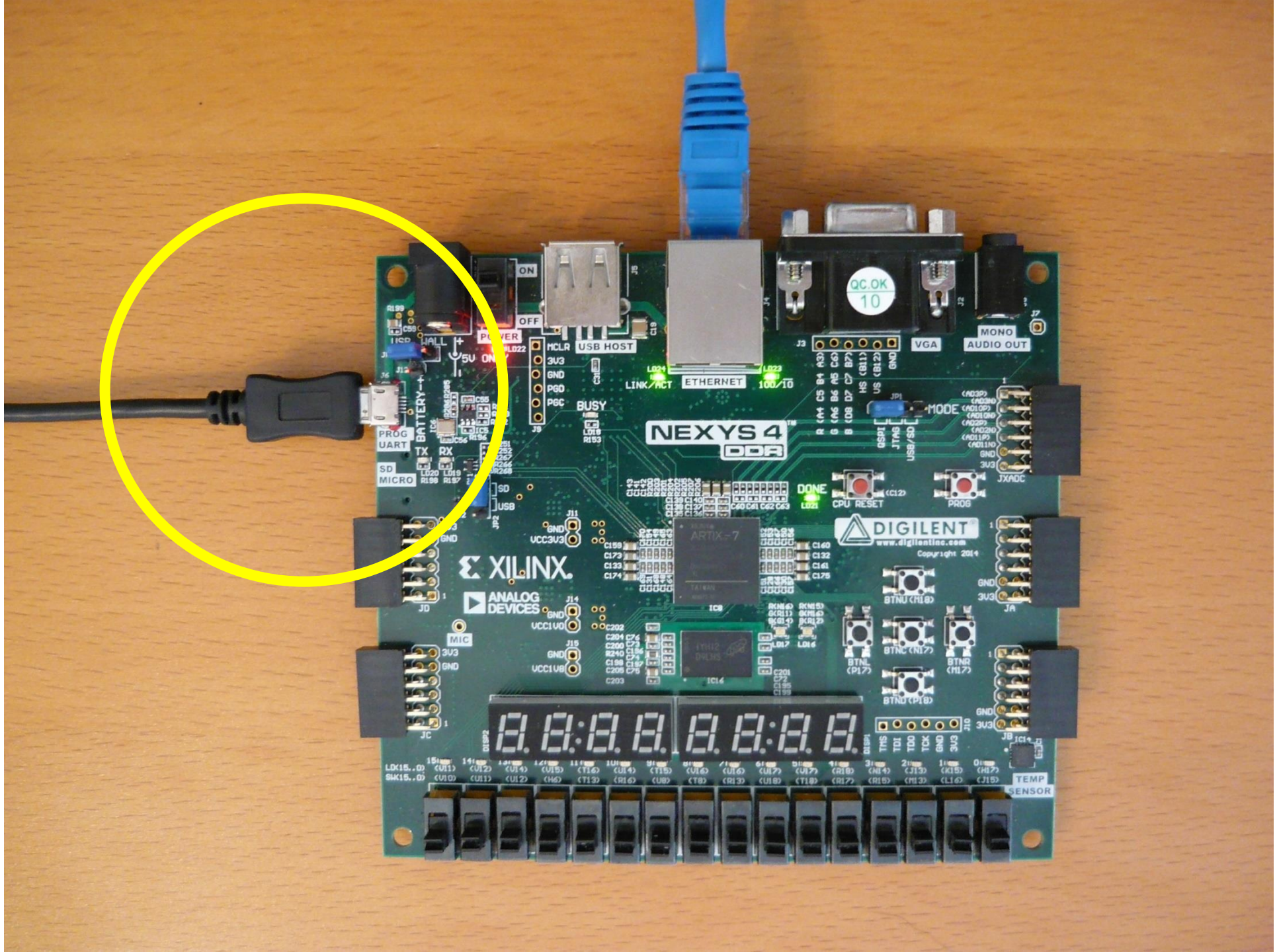
- 10-100x faster
- 10-100x less power consumption
- Free*

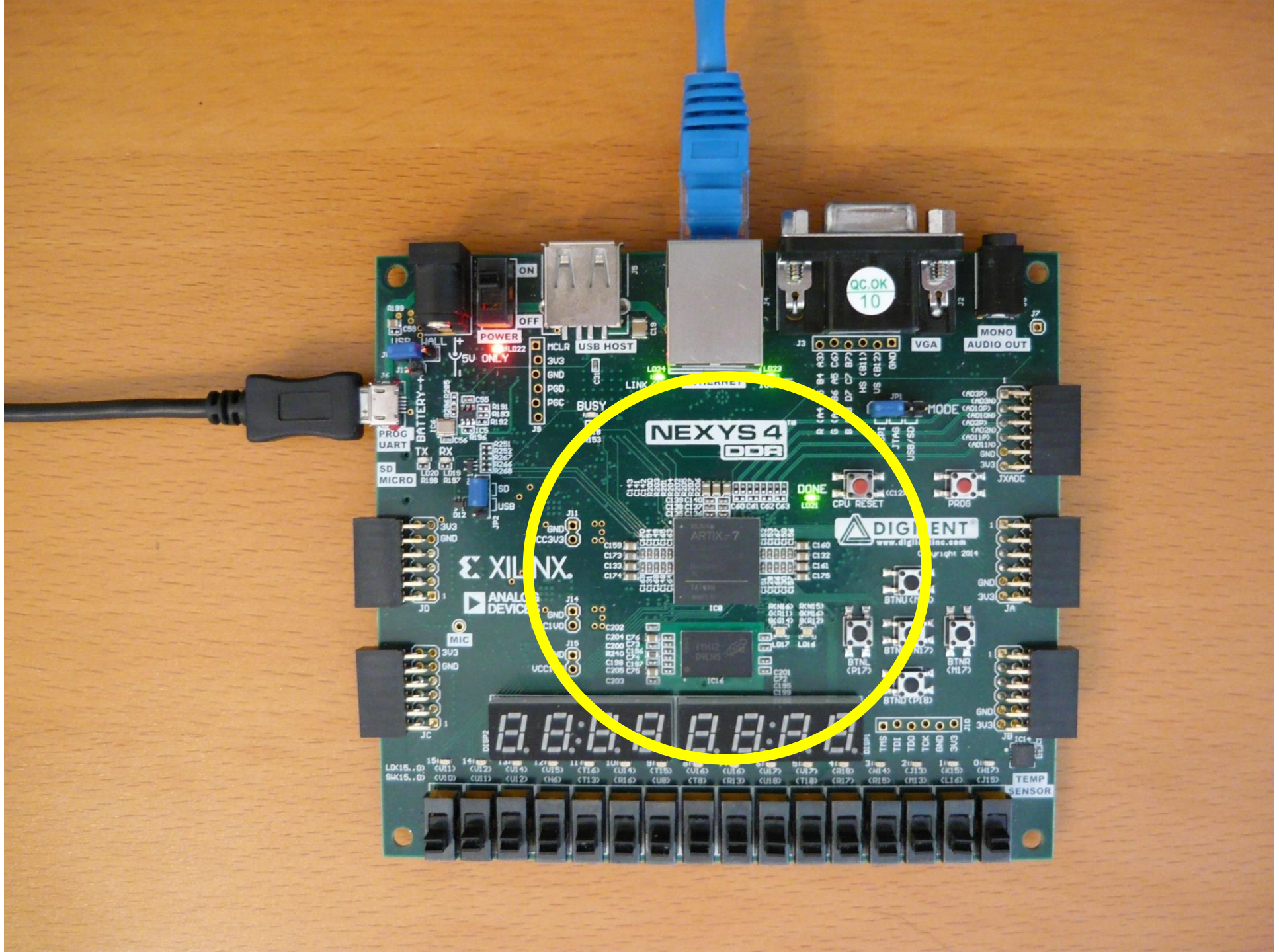
*not actually free

Demo time!


NEXYS 4
DDR
XILINX
DIGILENT
ANALOG DEVICES
ETHERNET
USB HOST
VGA
MONO AUDIO OUT
POWER
PROG UART
SD MICRO
CPU RESET
PROG
MODE
TEMP SENSOR


POWER
USB HOST
ETHERNET
VGA
MONO
AUDIO OUT
QC.OK
10
LINK/ACT
100/10
BUSY
MODE
PROG
UART
SD
MICRO
DONE
CPU RESET
PROG
DIGILENT
XILINX
ANALOG
DEVICES
MIC
TEMP
SENSOR


NEXYS 4
DDR
DIGILENT
XILINX
ANALOG DEVICES
ETHERNET
USB HOST
VGA
MONO AUDIO OUT
PROG UART
SD MICRO
BATTERY
BUSY
MODE
DONE
CPU RESET
PROG
TEMP SENSOR
MIC
ON
OFF
QC.OK
10


NEXYS 4
DDR
POWER
USB HOST
VGA
MONO
AUDIO OUT
PROG
UART
SD
MICRO
CPU RESET
PROG
MIC
TEMP
SENSOR

Demo time!

Beyond the infinite

- Open-source
- Hastlayer Cloud
- FPGAs in every datacenter (Xeon + FPGA)

That’s all folks

- zoltan.lehoczky@lombiq.com
- http://hastlayer.com
- http://lombiq.com/psc