Review of SystemVerilog

E155 Lecture 1

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A Historical Detour – Intel 4004

http://www.cedmagic.com/history/intel-4004.html
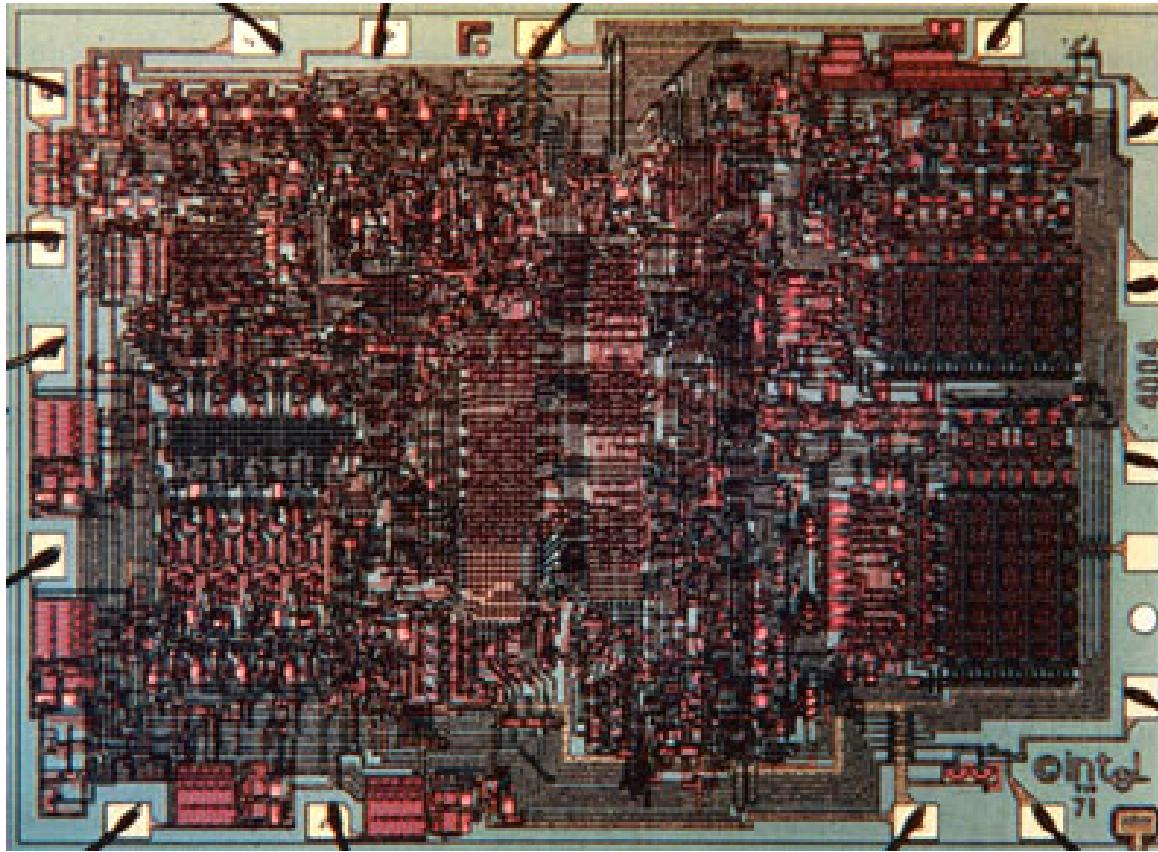
- 4004 first microprocessor on market
- Someone drew each transistor.

Intel Haswell i7 (22nm)
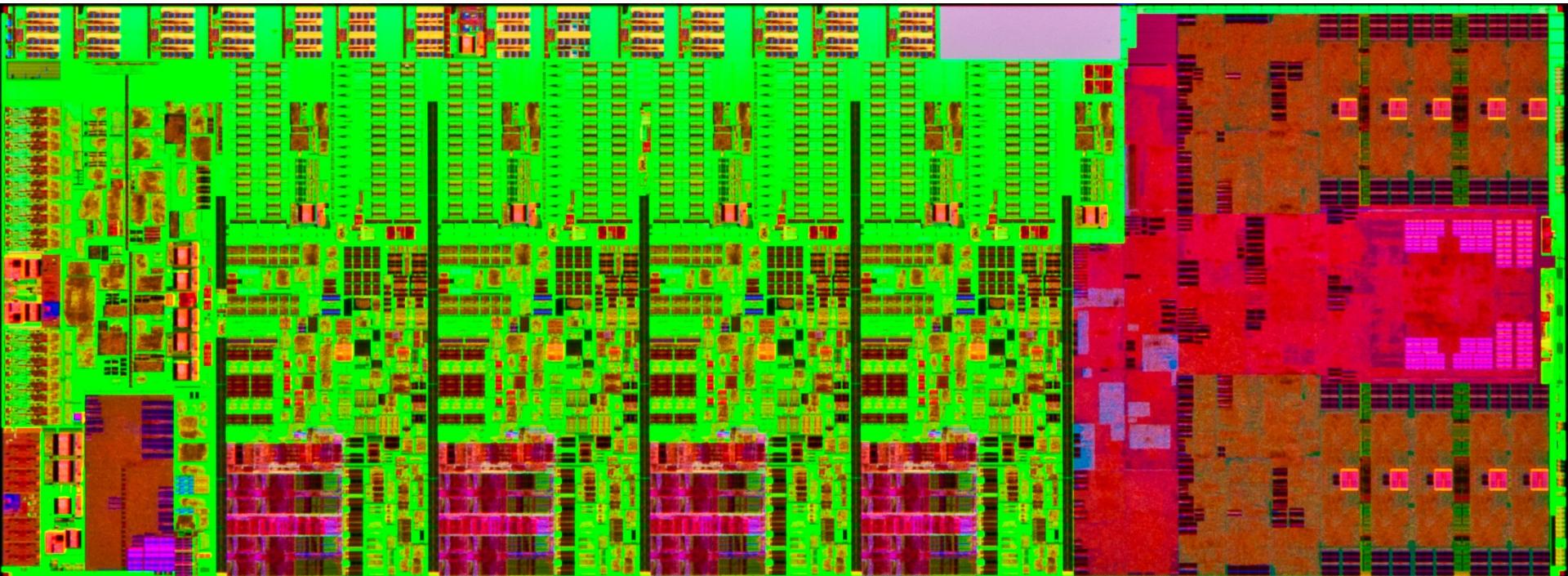
http://download.intel.com/newsroom/kits//core/4thgen/gallery/images/4th_Generation_Intel_Core_Die_07.jpg

- Any guesses how many transistors on this?
- Need dense way to specify our logic.

Hardware Description Language

- Specify your logical function with language

- Let a computer figure out how to map that to transistor/ gate/ LUT (i.e.: synthesize a netlist)

- BEWARE! This is not a programming language
  - Ex: for loops generate multiple <u>copies</u> of blocks

- Think about the hardware you want

Competing HDLs Exist

- VHDL (1981) – IEEE std. 1076 in 1987

- Verilog (1984) – IEEE std. 1364 in 1995

- SystemVerilog (2005) – IEEE std. 1800-2009

- VHDL (2008) – IEEE std. 1076-2008

Contents

- Intro and Justification for HDL

- Syntax

- Signal Manipulation (and modules)

- Some Special Blocks (and big modules)

Synthesis and Simulation of exmpl
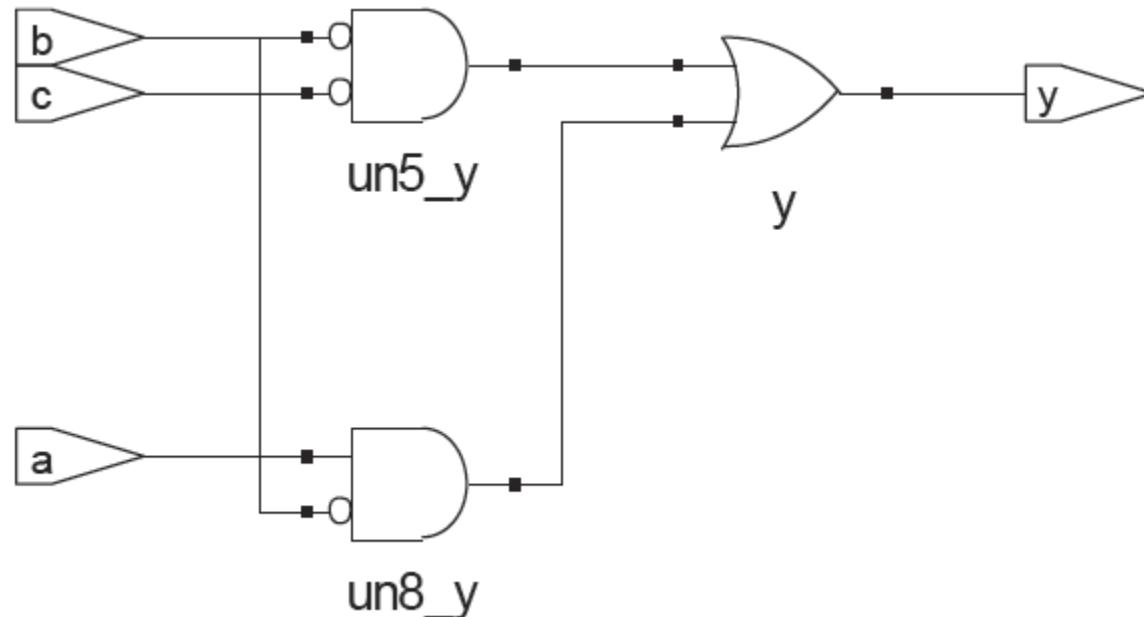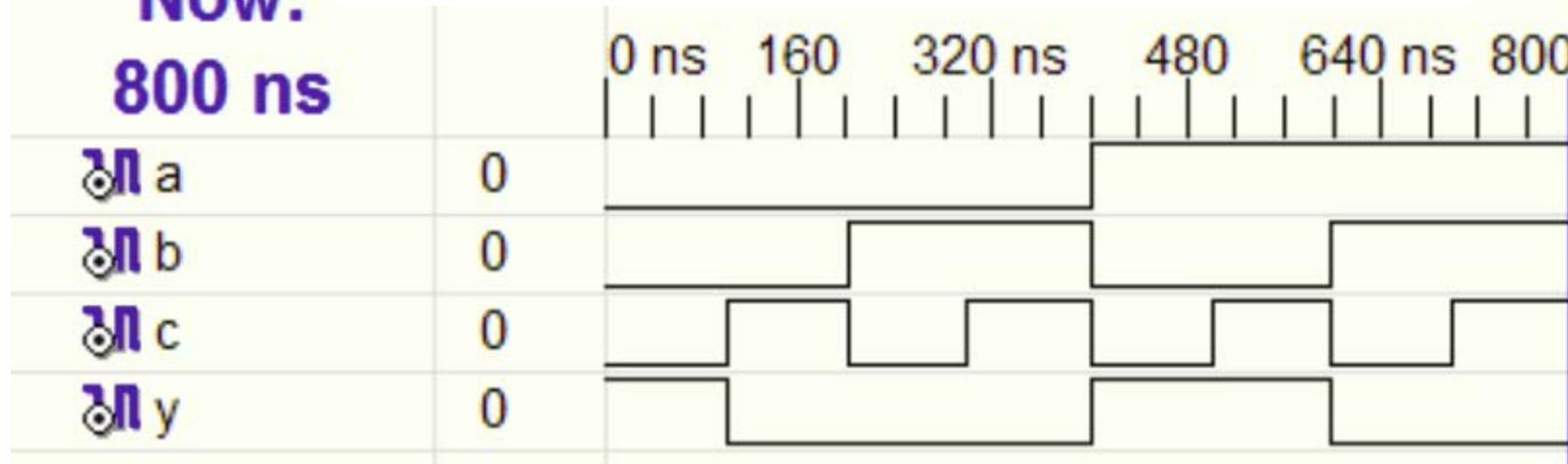
Order of operations

Highest		
	~	NOT
	*, /, %	mult, div, mod
	+, -	add,sub
	<<, >>	shift
	<<<, >>>	arithmetic shift
	<, <=, >, >=	comparison
=== and !== for x and z	==, !=	equal, not equal
	&, ~&	AND, NAND
	^, ~^	XOR, XNOR
	|, ~|	OR, NOR
Lowest	?:	ternary operator