CS 61C Spring 2010 — Intro to Synchronous Digital Systems

Scott Beamer (cs61c-ta)

Buzz Words from Topic Name
- *Digital* - all information is represented by discrete values
- *Synchronous* - operations are coordinated and controlled by a clock signal

Types of Circuits
- *Combinational*
  - Output is completely dependent on inputs (pure function)
  - Stateless
- *Sequential*
  - Has state elements
  - Output can depend on the stream of last inputs

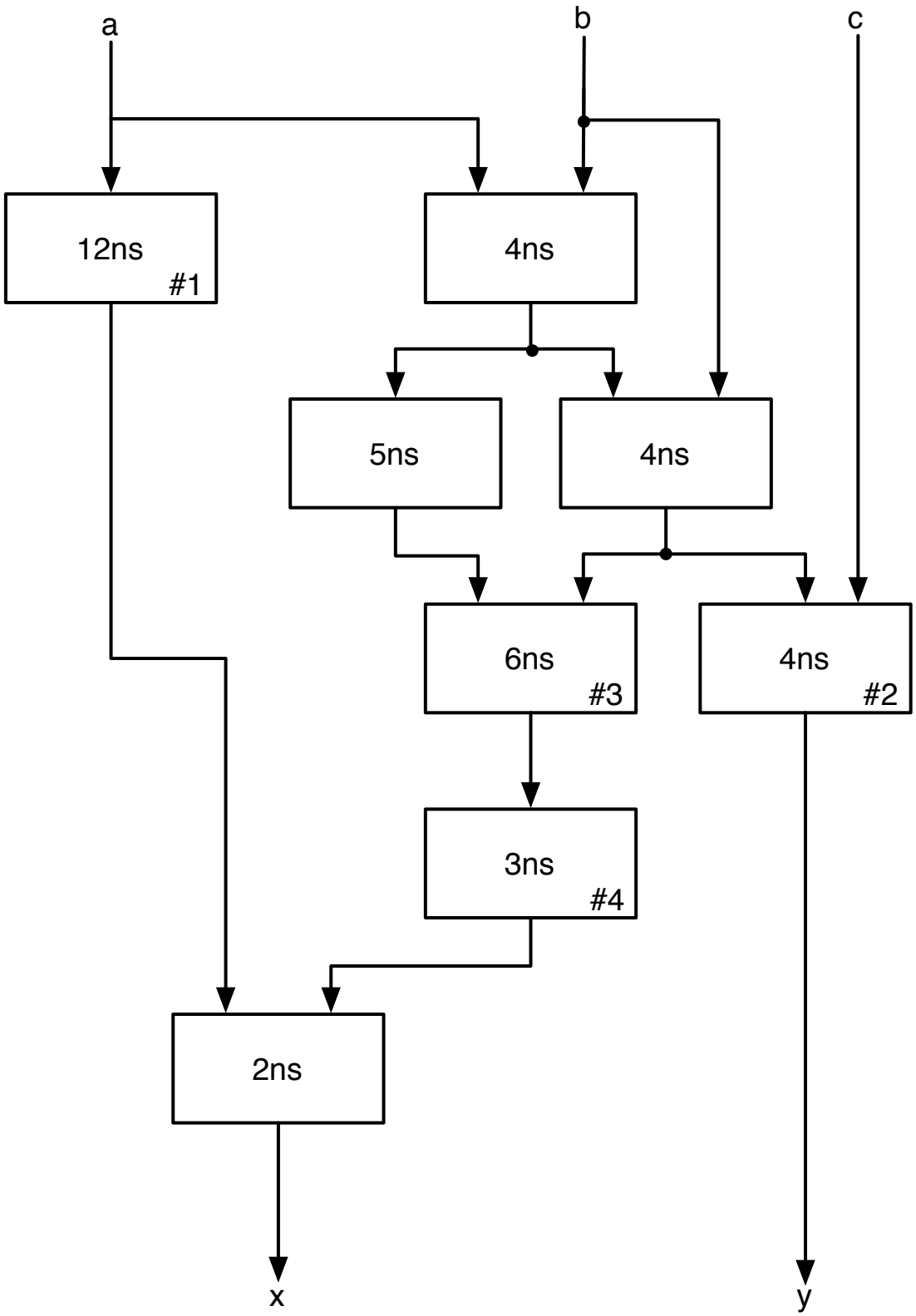
Signals
- Output of one is the input of another
- For this class, wires are effectively instantaneous
- Signals are continuously propagated

Delay Problem
- Use the figure on the back. What is the critical path, and what is its delay in ns?

- What is the maximum frequency the critical path can operate at?

- Could it run at 20MHz? What about 62.5MHz? To make it run at 62.5MHz, what must its period be?

- You want to make it run at 62.5MHz. Choose what you would do and why would it work?
  - A) Do nothing
  - B) Make box #1 have delay 8ns
  - C) Make box #2 have zero delay
  - D) Make box #3 have delay 3ns and box #4 have delay 2ns


a
b
c
12ns
#1
4ns
5ns
4ns
6ns
#3
4ns
#2
3ns
#4
2ns
x
y