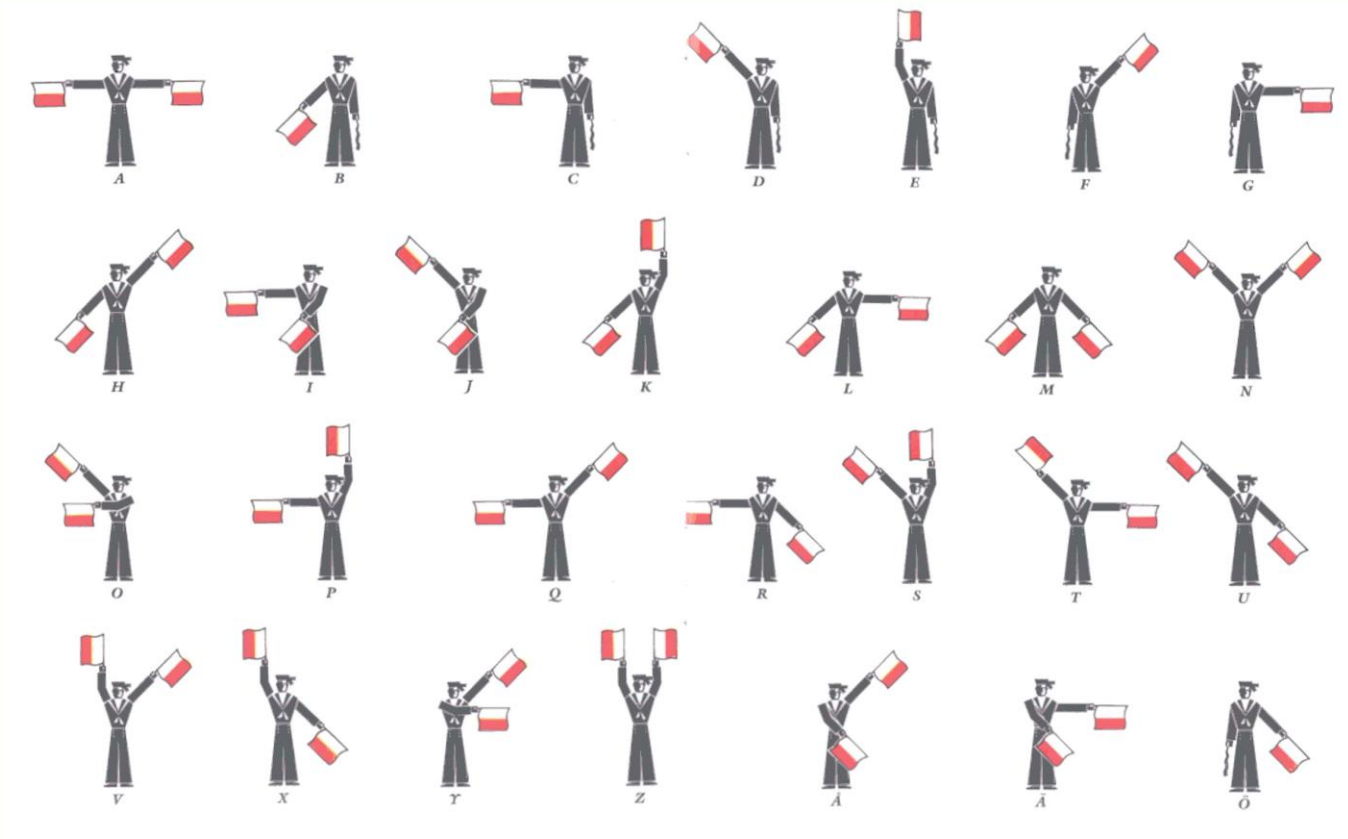
College of Engineering

School of Electrical Engineering & Computer Science

CS344 – Operating Systems I

R. Jesse Chaney – chaneyr@eecs.orst.edu

IPC Using Signals, An Example



IPC Using Signals, An Example

- Use of Unix signals for inter-process communication seems pretty limited and it is, but
- You can do a surprising amount of work using just an exchange of signals between some cooperating processes.
- In this (brief) lecture, we'll look at how you can implement a simple game of tennis, using 3 different processes, exchanging only signals between them.

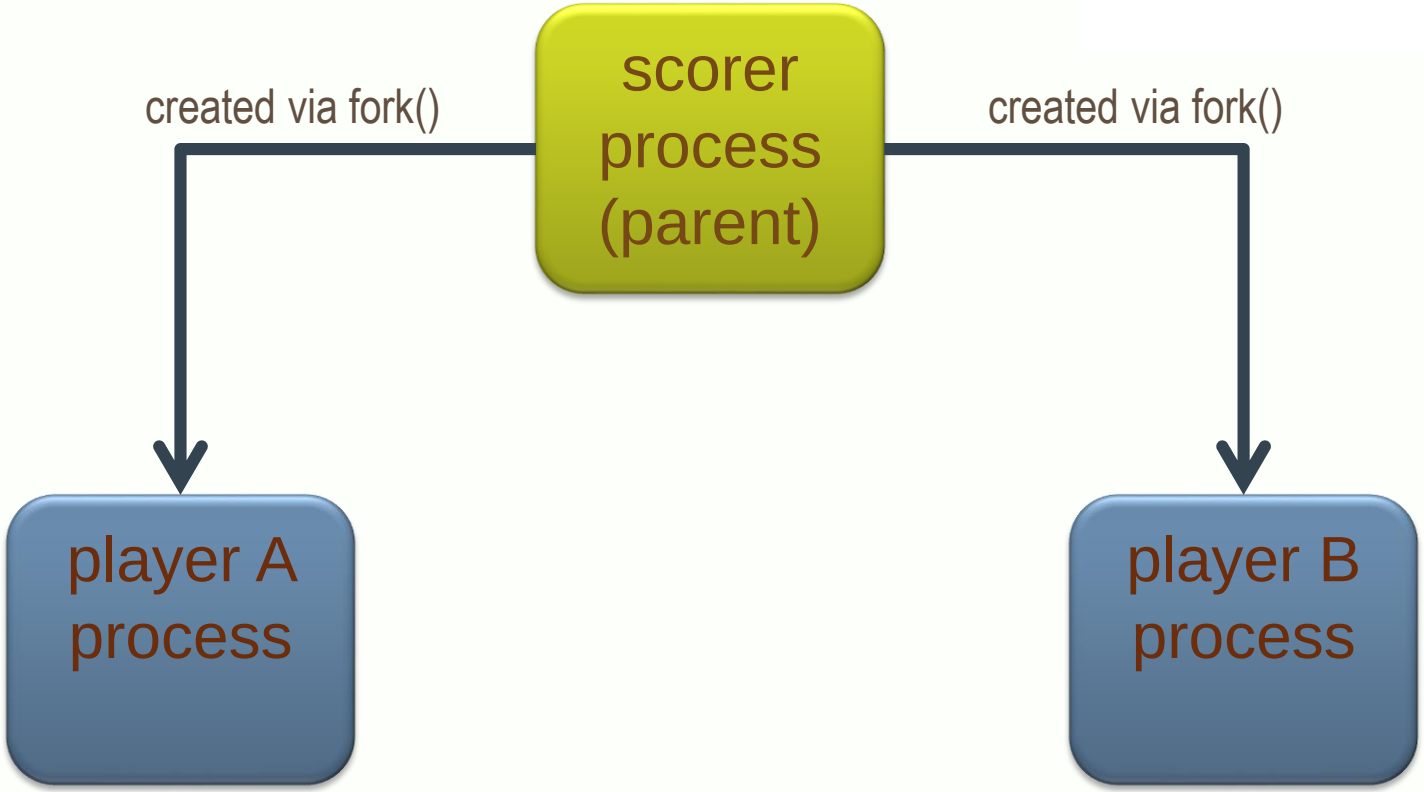
R. Jesse Chaney – chaneyr@eecs.orst.edu

Signal Tennis – The Simplified Rules

- There is a scorer (could be called a judge).
- There are 2 players, A and B.
- A game is the first player to 4 points (15, 30, 40, game).
- A set is the first player to win 3 games.
- A match is the first player to win 3 sets.
- A player gets a second serve if the first one is out.
- Initial serve is determined by a coin flip.
- Serve changes side after each set.
- A ball is in or out as determined by probabilities.

R. Jesse Chaney – chaneyr@eecs.orst.edu

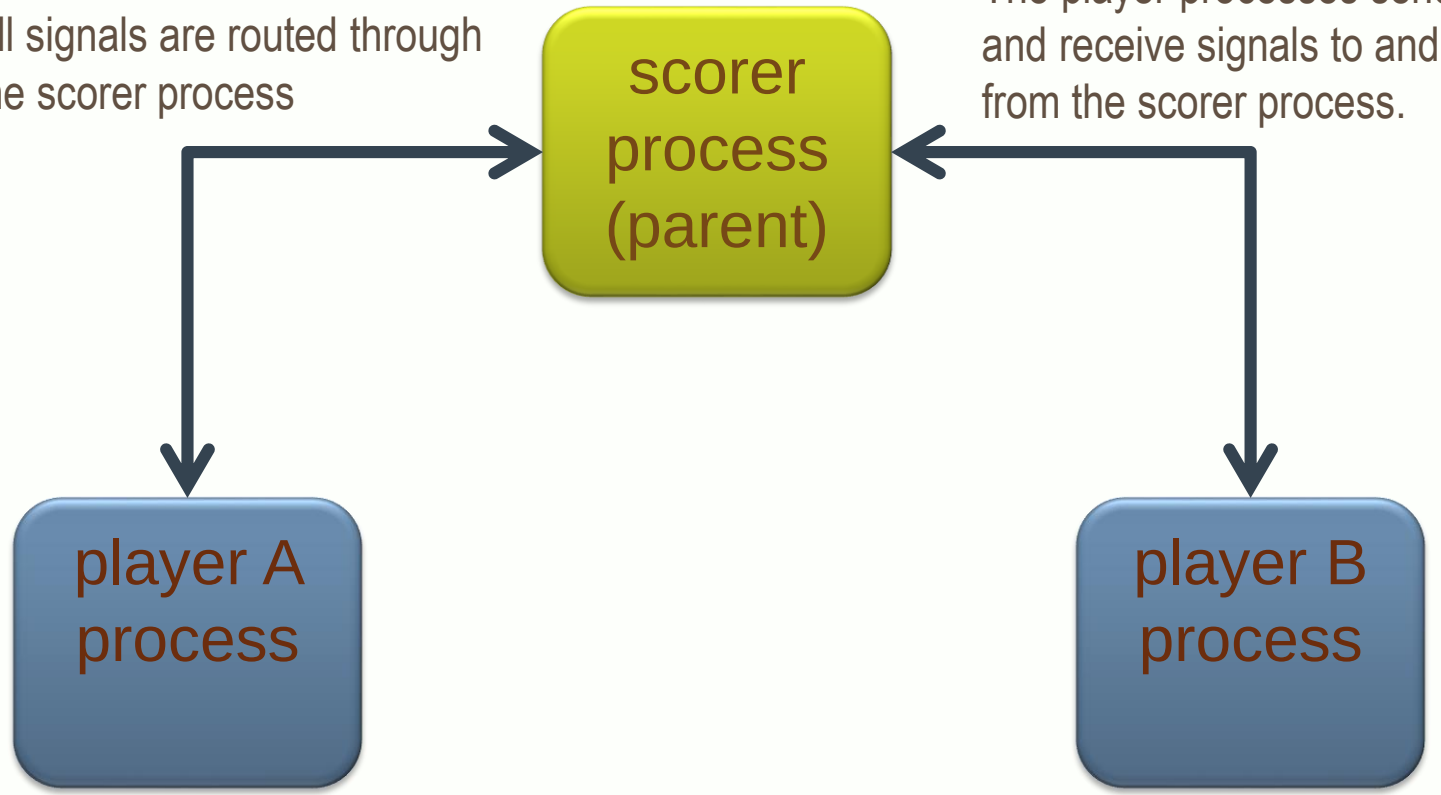
Signal Tennis – Process Layout



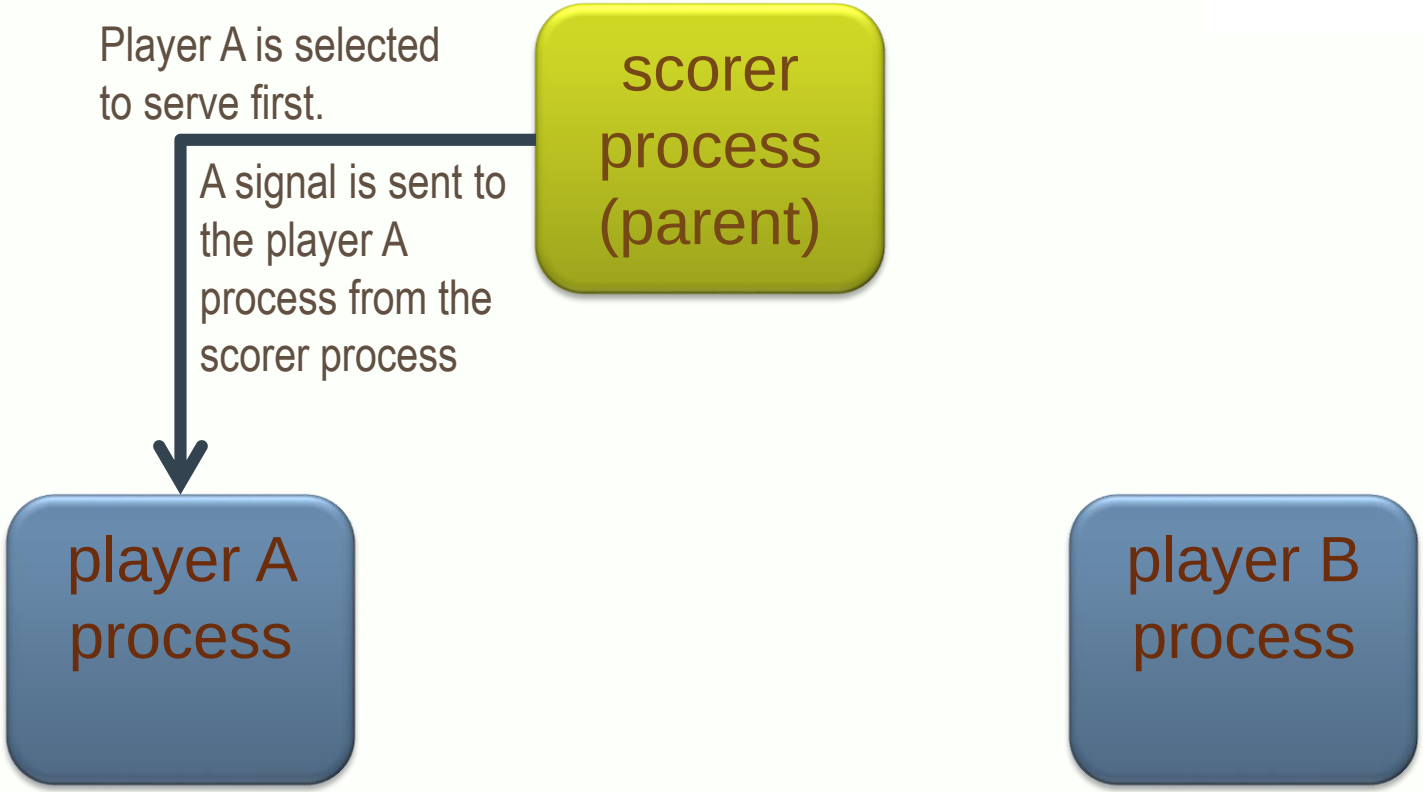
Signal Tennis – Signal Paths

The player processes send and receive signals to and from the scorer process.

All signals are routed through the scorer process

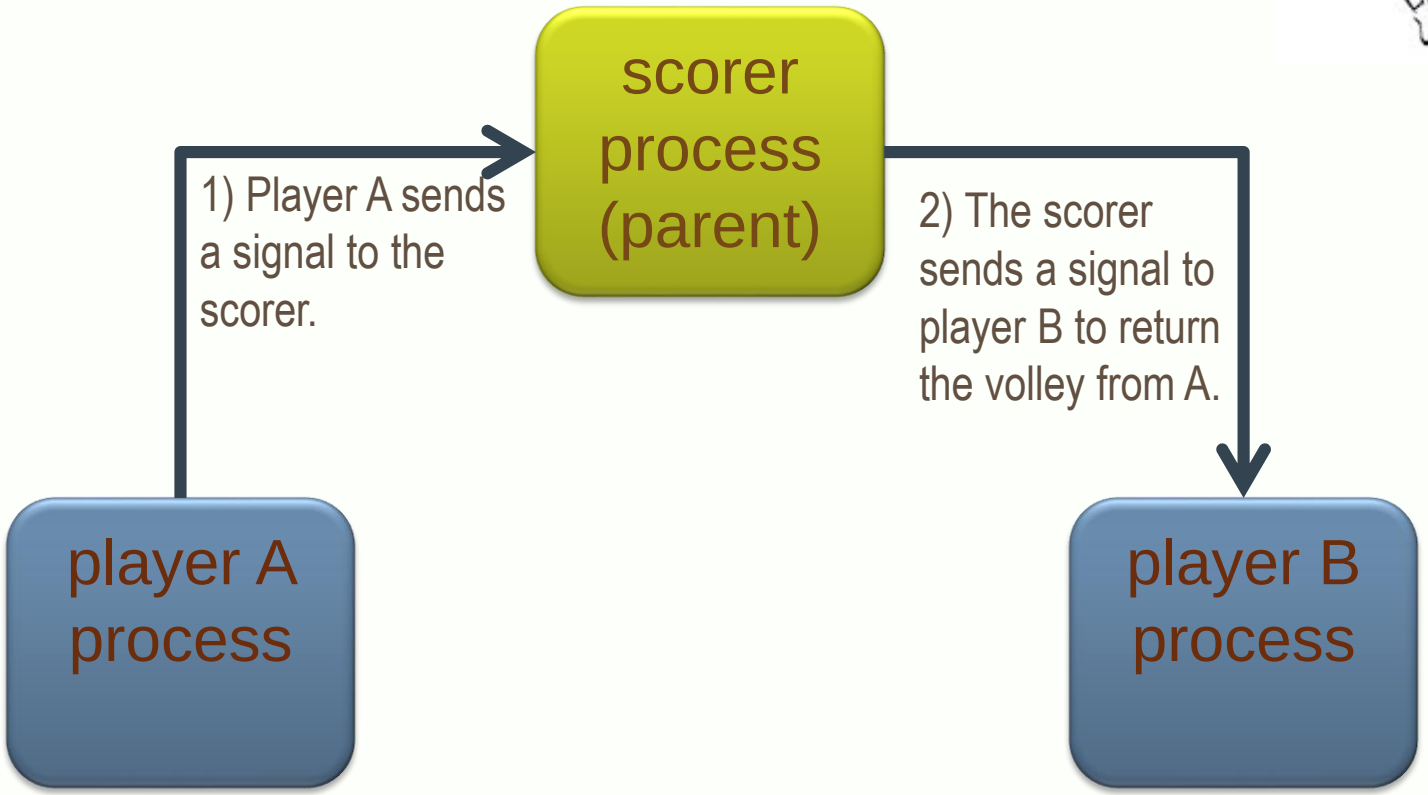


Signal Tennis – Example Volley, Server Selection



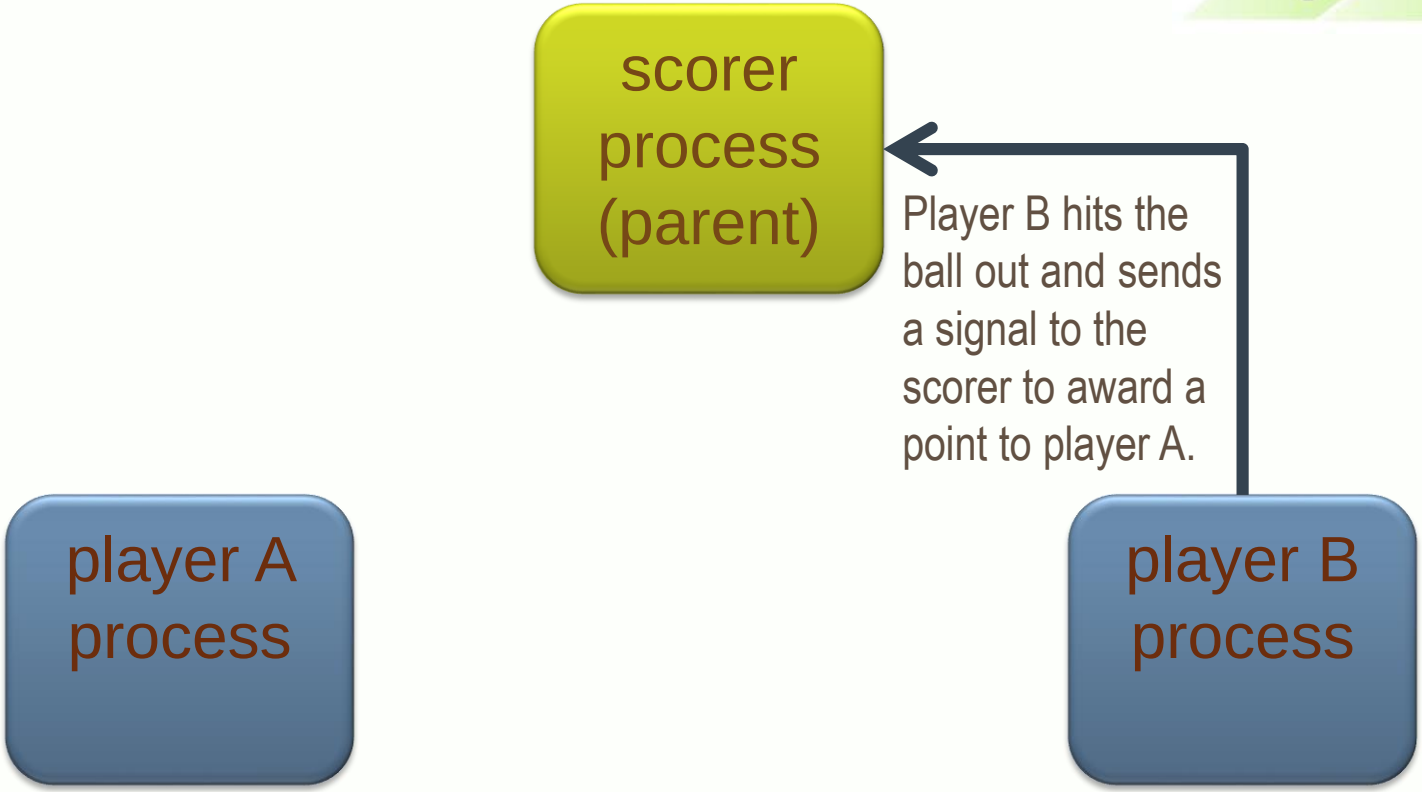
R. Jesse Chaney – chaneyr@eecs.orst.edu

Signal Tennis – Example Volley, Serve



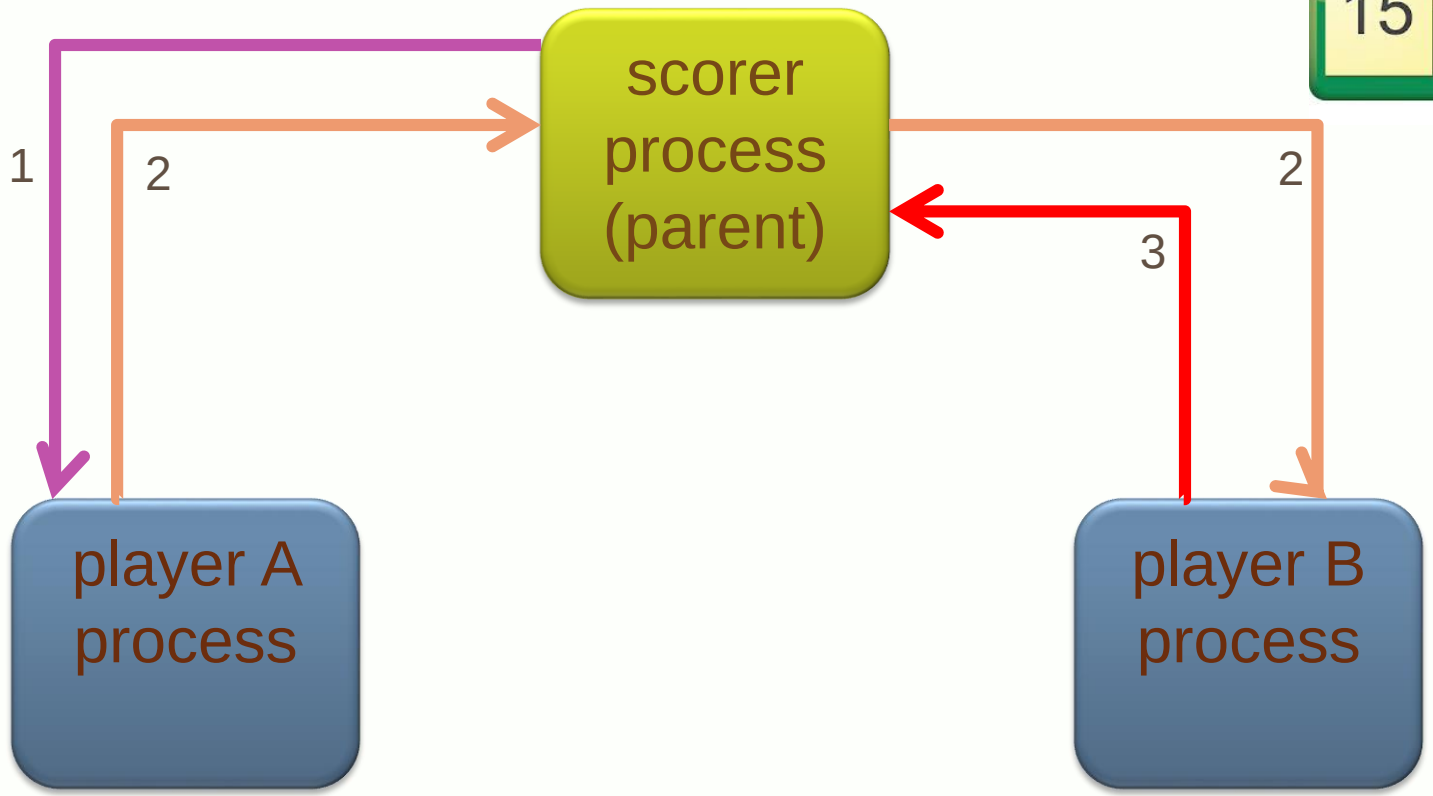
R. Jesse Chaney – chaneyr@eecs.orst.edu

Signal Tennis – Example Volley, Service Return



R. Jesse Chaney – chaneyr@eecs.orst.edu

Signal Tennis – Complete Game



1	Player A to serve	2	Player A serves to Player B	3	Player B returns ball out. Point player A

R. Jesse Chaney – chaneyr@eecs.orst.edu

Tennis as an Example for IPC

- Using tennis as an example of how we can demonstrate inter-process communication is something we'll do a couple more times in this class.
- Look through the source code.
- Compile it. Run it.
- There are 4 source files:
  - tennisMatch_common.c, tennisMatch_common.h
  - tennisMatch_Signals.c, tennisMatch_Signals.h
- Compile with this command
  - gcc –o tennisMatch_Sig tennisMatch_common.c tennisMatch_Signals.c