Formal Models for Parallel and Distributed Systems Exercise 3 (January 8)

Wolfgang Schreiner
Wolfgang.Schreiner@risc.uni-linz.ac.at

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The exercise is to be submitted by **January 8** (hard deadline)

1. as a single PDF file sent to me per email, or
2. as a paper report (cover page with full name and Matrikelnummer, pages stapled) handed out to me in class.

1 Calculus of Communicating Systems (CCS)

1. Construct a CCS model of the client/server system of Exercise 1.
2. Draw the transition graph of the CCS system "Protocol" for the reliable transmission of a signal received from port "in" to a port "out" with an unreliable intermediate transmission:

$$\begin{array}{rcl} \text{Sender} & := & \text{in.Send} \\ \text{Send} & := & \overline{\text{send}}\text{.WaitAck} \\ \text{WaitAck} & := & \text{ackP.Sender} + \text{ackN.Send} \\ \text{Receiver} & := & \text{send.Analyze} \\ \text{Analyze} & := & \overline{\text{out}}.\overline{\text{ackP}}\text{.Receiver} + \overline{\text{ackN}}\text{.Receiver} \\ \text{Protocol} & := & (\text{Sender} \mid \text{Receiver})\backslash\{\text{send,ackP,ackN}\} \end{array}$$

3. How does the graph change, if we modify the specification as follows?

$$\begin{array}{rcl} \text{Receiver} & := & \text{Analyze} \\ \text{Analyze} & := & \text{send}.\overline{\text{out}}.\overline{\text{ackP}}\text{.Receiver} + \text{send}.\overline{\text{ackN}}\text{.Receiver} \end{array}$$