Università
degli Studi di
Messina
DIPARTIMENTO DI INGEGNERIA

Dependable Computing
Modeling and Simulation

An example of simulator (in MATLAB: "packet_source.zip")

Master degree in

Engineering in Computer Science

The system

- Computer system sending packets
- It has two operational conditions
  - Transmitting
  - Suspended
- When in "suspended" operational condition, the system does not send any packets
- The system alternates between the two operational conditions

Parameters

λ_{th} = computer system throughput when transmitting

$\frac{1}{\lambda_1}$ = mean time spent in transmitting mode

$\frac{1}{\lambda_2}$ = mean time spent in suspended mode

We want to measure the system throughput

$$Th = \frac{N_p}{TE}$$

where Np is the number of sent packets in the time interval from 0 to TE

States

- The system can be into two states
  - "transmitting" state ("Tr")
  - "suspended" state ("Su")

Events

- Four events are identified
  - Transmission of one packet ("send")
  - Change from Tr to Su state ("c_tr_s")
  - Change from Su to Tr state ("c_s_tr")
  - End of simulation ("end")

"send" event

- Clock is updated to the time of the event
- State does not change
- When in Tr state
  - New sending event is generated
  - Np=Np+1
- When in Su state
  - All sending event in the future event list is deleted
  - Np is not updated

"c_tr_s" event

- Clock is updated to the time of the event
- State changes into Su
- New event "c_s_tr" is generated

"c_s_tr" event

- Clock is updated to the time of the event
- State changes into Tr
- New event "c_tr_s" is generated
- New event "send" is generated