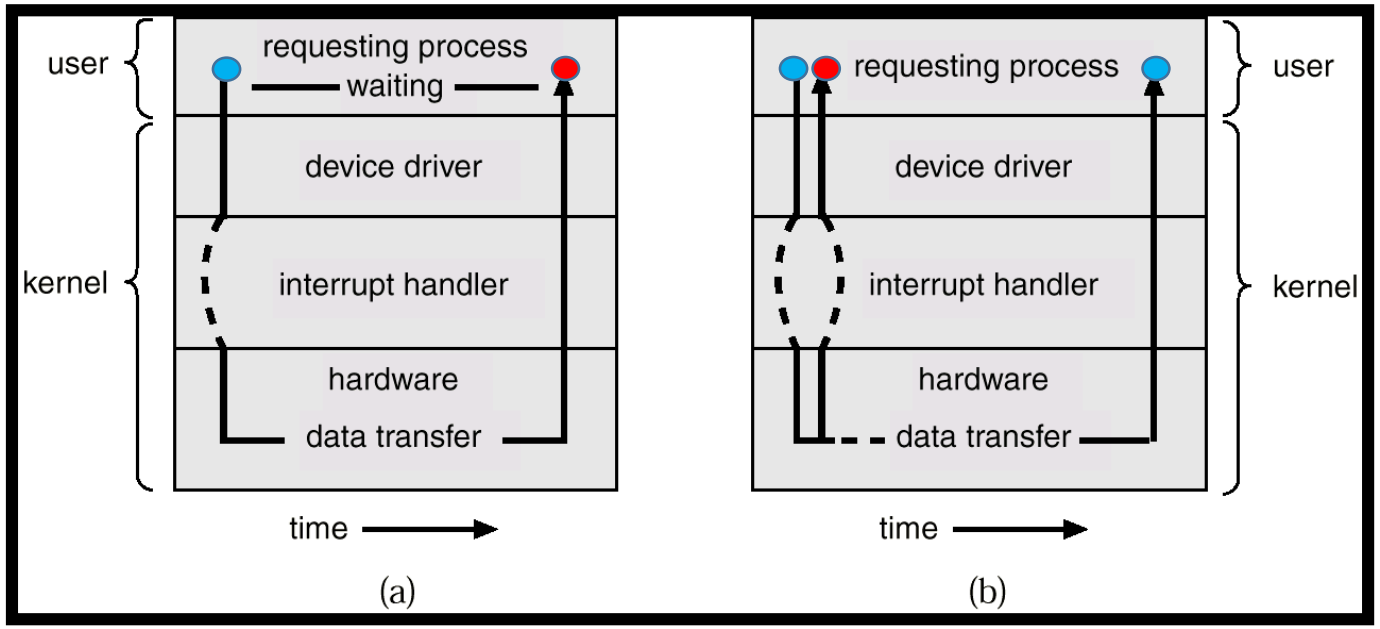
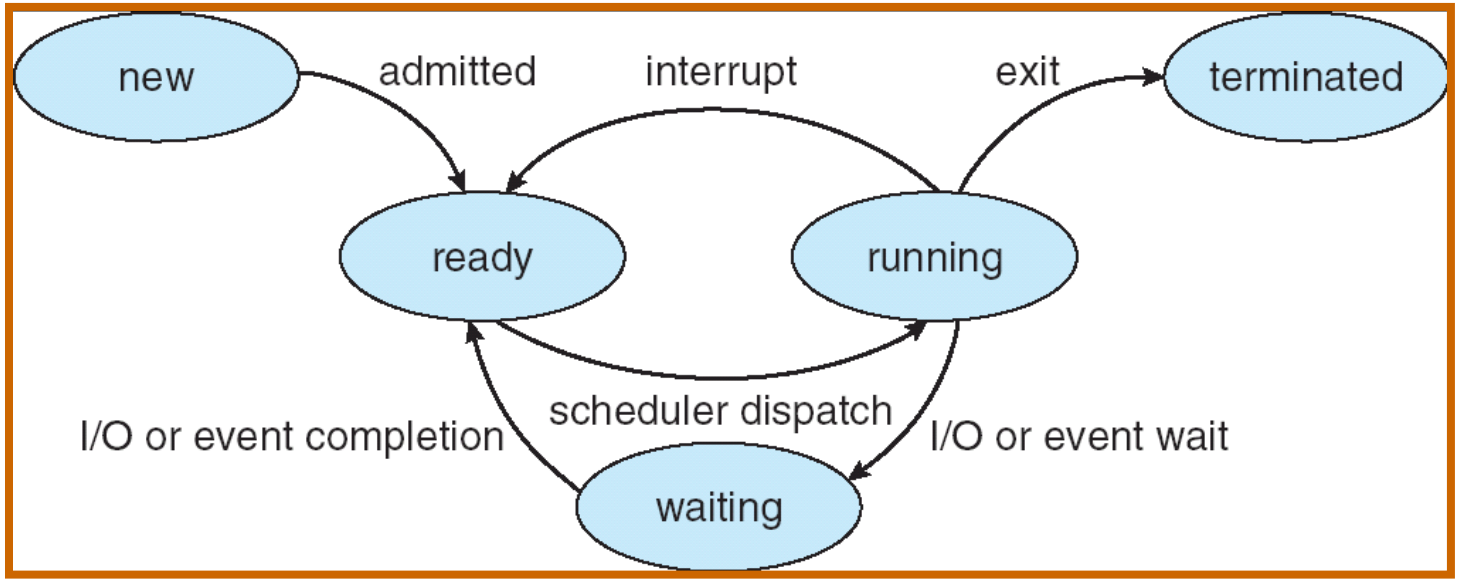


(a) Synchronous read: The requesting process needs to wait for the data to come back (at the red point) before it can do something else

(b) Asynchronous read: The requesting process can do something else after the red point and receives the data later (i.e. at the second blue point).



State transition diagram of a process

Here is how the state of the requesting process changes over time:

(a) Synchronous read: at the blue point, it switches from running to waiting, and it switches back to ready at the red point and immediately to running if the scheduler dispatches this process.

(b) Asynchronous read: at the first blue point, it switches from running to waiting, and switches from waiting to ready at the red point. Assuming that OS starts to run it immediately at the red point (i.e, scheduler dispatch), it switches from ready to running at the red point and switches to waiting again at the second blue point when it starts to receive data.