netstat – network statistics

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[Certain] Network statistics

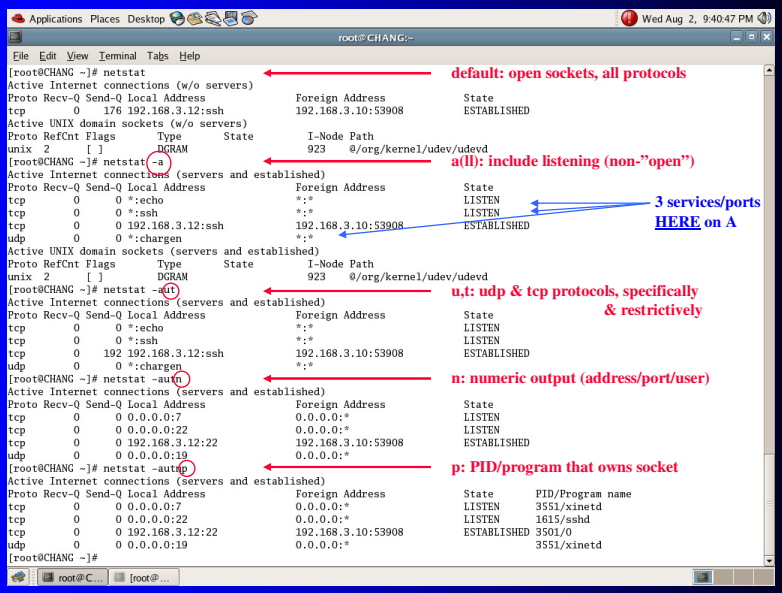
"Print network connections, routing tables, interface statistics, masquerade connections, and multicast memberships"

netstat man page

Example setting – 3 services/ports

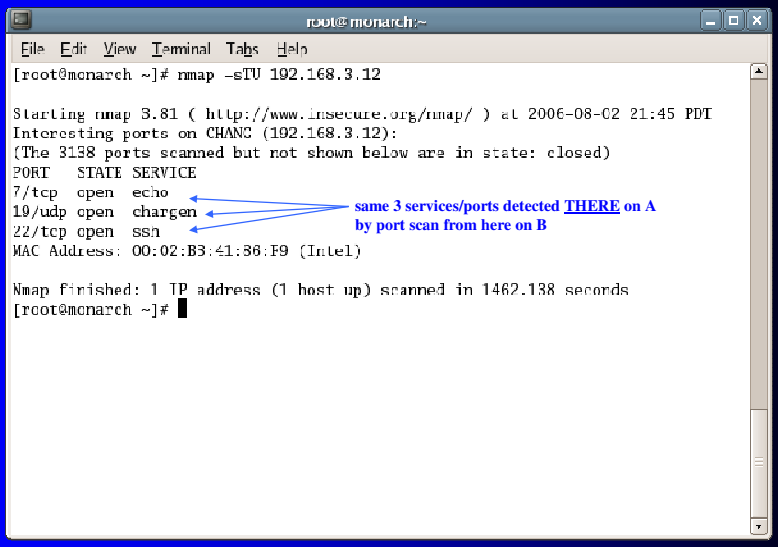
- machine A, 192.168.3.12/CHANG
  - one service in its own right
    - ssh, tcp port 22
  - two services via superserver xinetd
    - echo, tcp port 7
    - chargen, udp port 19
- machine B, 192.168.3.10/monarch; ssh client

Options – a, ut, n, p



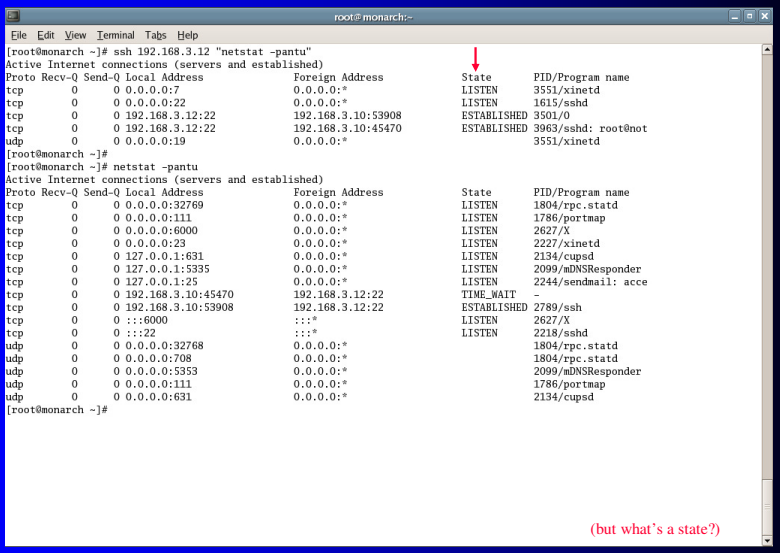
conducted thru ssh session from B (192.168.3.10) to A (192.168.3.12)

Mirrored by outside measurement



TCP connection states

conducted thru hit-and-run ssh command "session"



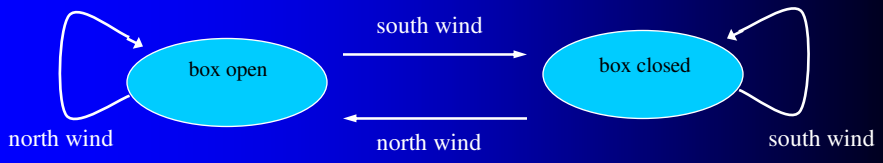
State machines in a nutshell

- a set of states
- a set of inputs (might be events)
- a transition function f(s,i) of state, input
  - if you're in this state
  - and that input comes along
  - to which other state do you transition?
- describe operation of dynamic systems

State machines – example

- square box, lid hinged along south edge
- states – lid is open, lid is closed
- inputs – wind blows north, wind blows south
- transition function F(state, input)
  - box open, wind north → box open
  - box open, wind south → box closed
  - box closed, wind north → box open
  - box closed, wind south → box closed

State diagram - example



states – ovals

inputs –wind occurrences

transition function – the set of arrows

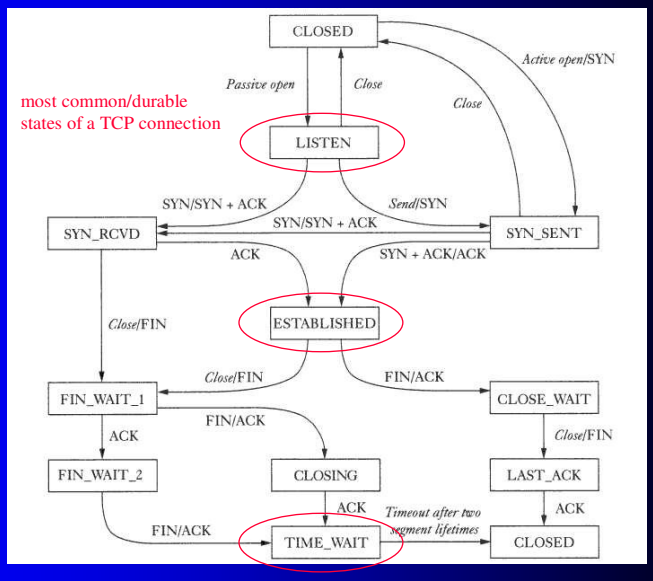
TCP state diagram

states – the rectangles

inputs –receipt of packets with the indicated flag-bit settings

transition function – the set of arrows

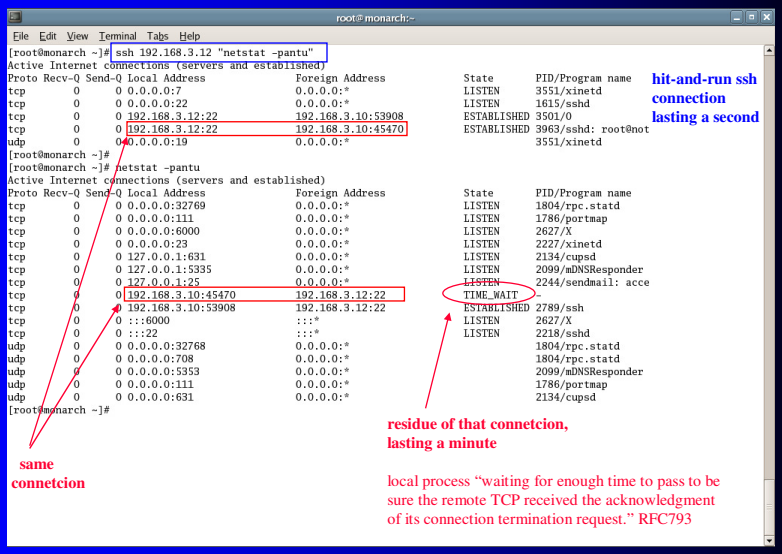
see rfc 793



TCP states… wait a minute!

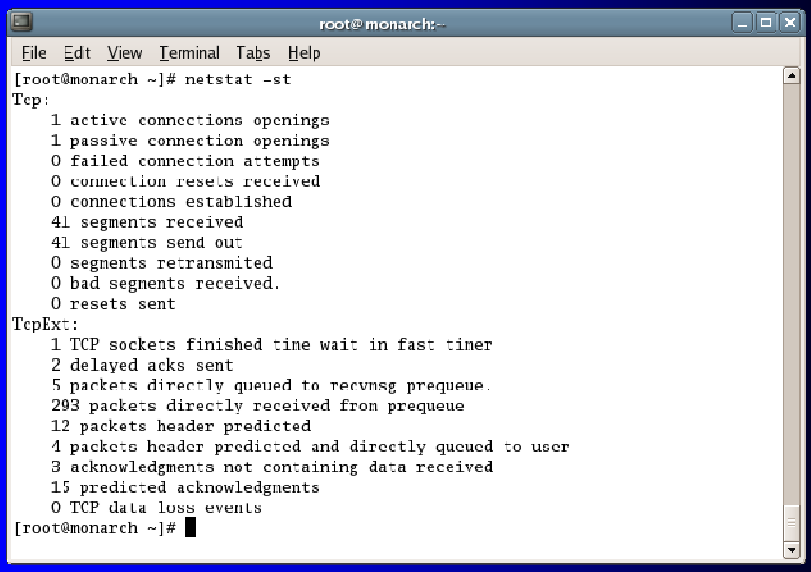
machine A ->

machine B ->

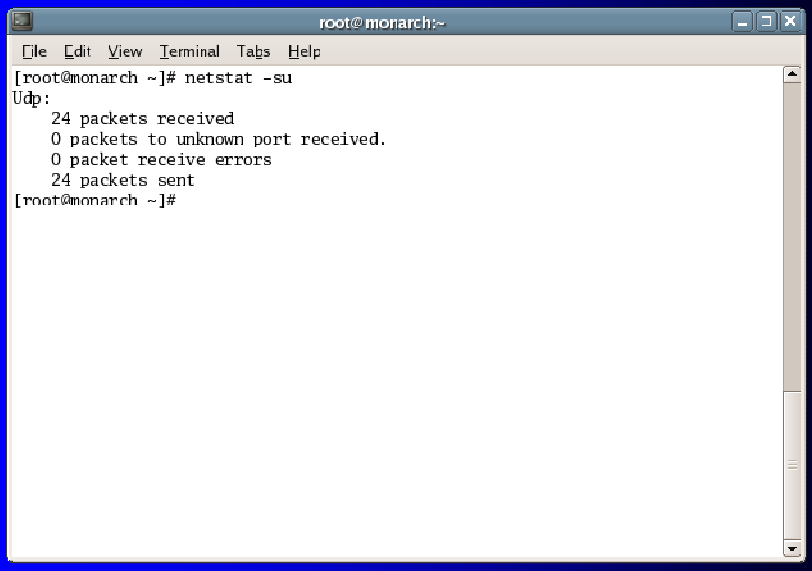


local process "waiting for enough time to pass to be sure the remote TCP received the acknowledgment of its connection termination request." RFC793

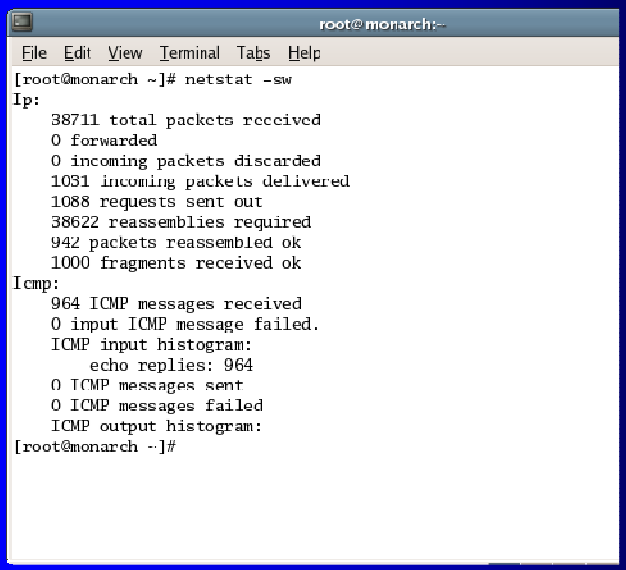
Options – s, statistics (tcp)



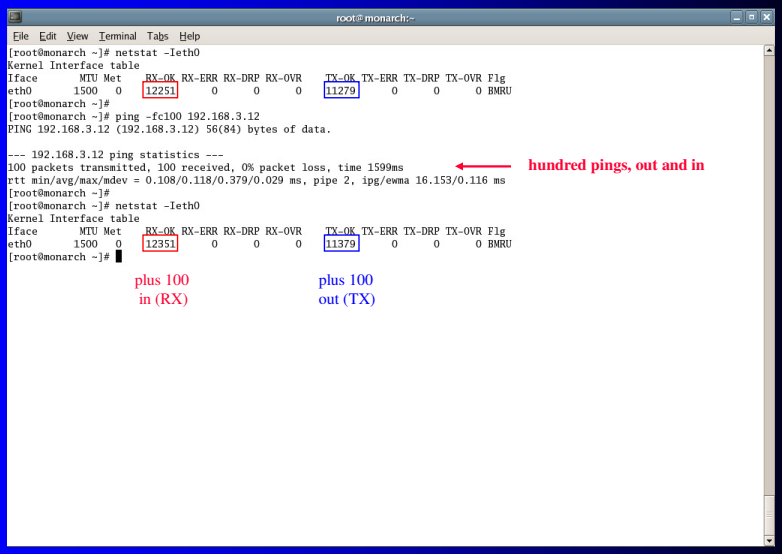
Options – s, statistics (udp)



Options – s, statistics (ip)



Options – i, traffic measurement



Options – i, traffic measurement