Chapter 2 (3rd Edn)

## System Models

Kinds of models

- **Architectural:**
  - components and their relationships
  - e.g.: Client-server (Web) , peer-to-peer (Gnutella)

- **Fundamental (or formal)**
  - mostly driven by time indeterminacy
  - performance; failure-modes; security

2.1 Architectural Models

- Issues:
  - where to put processes (which host[s])
  - functional relationships (process-message graph)
- Two paradigms:
  - peer-to-peer
  - client/server
  - are there more?

2.2.1 Layers

Applications
Middleware
OS
Host hardware + network
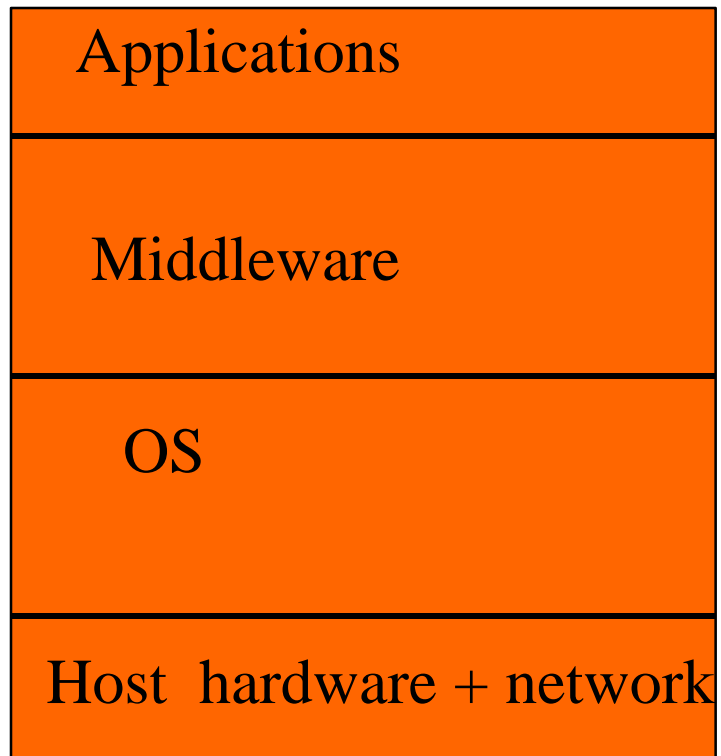
Layers:
What's in them?

- Platform:
  - Windoze, MacOS, unix, . . .
  - Ethernets, ATM, internets, token rings, ...
- Middleware: (things that should be in the OS or the application?)
  - interhost transparent procedure calling
  - interhost transparent object message passing, e.g.

Middlewares

- Procedure calling: (Bruce Jay Friedman)
  - Sun RPC
- object message passing:
  - Common Object Request Broker Architecture (CORBA)
  - Microsoft DCOM (Resistance is Futile)
  - Voyager
  - Java RMI   etc etc

Middlewares

- CAUTION:

  - much of the error & security checking is application-dependent

  - well-meaning efforts to provide it for the app programmer are therefore considered harmful
    - (Saltzer, Reed & Clarke)