Running Composer Applications in a Networked Environment

Session 370

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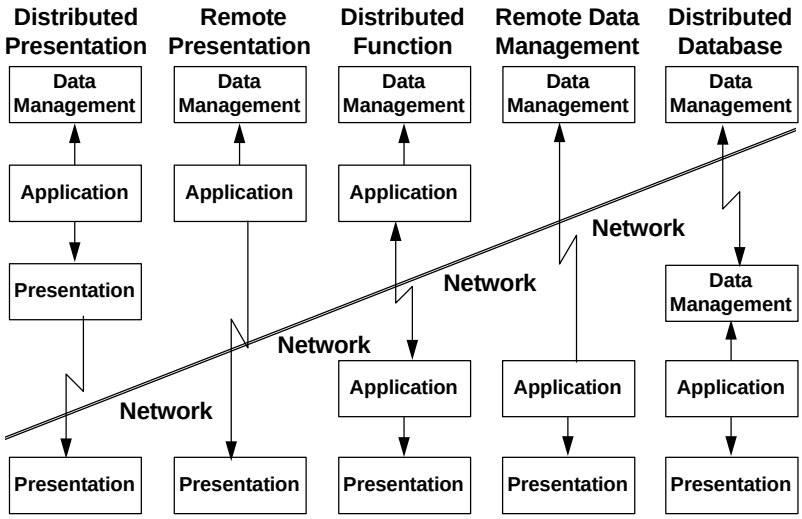
Running Composer Applications in a Networked Environment

- Client/Server styles
- Networking technologies
- Composer client/server communication components

Five Styles of Client/Server



Introduction to Networking Technologies

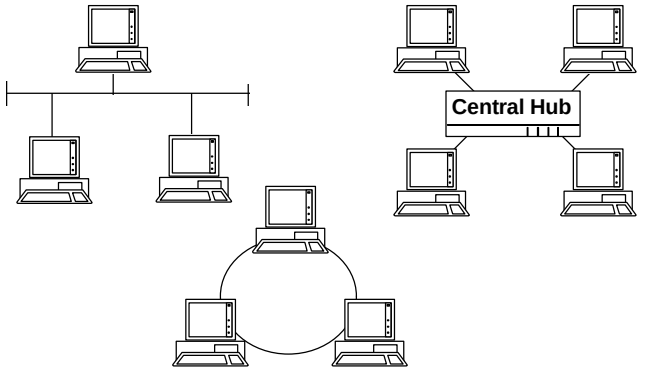
- Topologies
- Hardware
- Protocols
  - Standards
  - Implementations
- Middleware

Network Topologies–Physical

A computer network is a collection of hardware and software which supports inter-system and inter-process communication between distributed software components.

Basic types:

- Bus
- Star
- Ring
- Mesh
- Hybrid

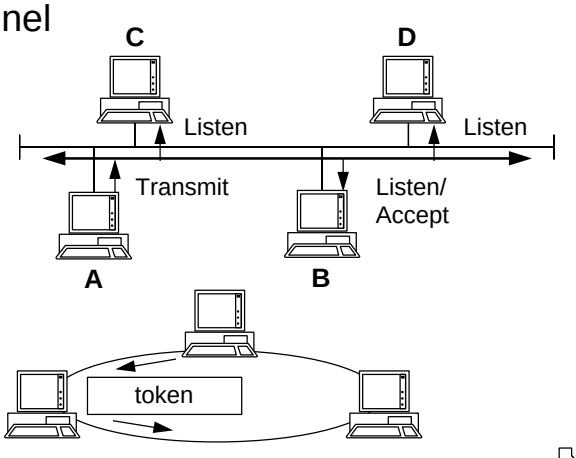


Channel Access Methods

- Channel access methods describe the rules that govern the devices as they access, transmit, and release the channel

Basic types:

- Contention
- Polling
- Token Passing



Network Hardware

- Cabling:
  - Coaxial cable
  - Unshielded/shielded twisted pair
  - Fiber, FDDI
- Interface cards:
  - Ethernet
  - Token Ring

Network Hardware

- Servers and peripherals
- Hubs and concentrators
- Internetworking:
  - Bridge
    - » Connects two unlike networks together
  - Router
    - » Connects two like networks together
  - Gateway
    - » Connects diverse networks together and allows for multiple protocols to be shipped between the networks

Protocols

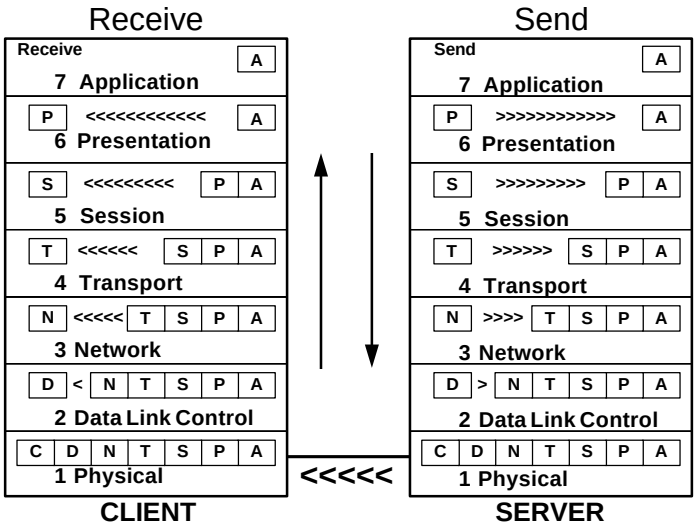
- What are they?
  - A communication protocol is a set of rules and procedures that enable systems to exchange information.
- Why are they important?
  - Protocols allow software and hardware vendors to design products that will interoperate with other vendors' products at any desired level.
- Standards organizations
- Open Systems Interconnect (OSI) Model
  - Layered architecture
  - Each layer has well-defined functions
  - Functions interrelate to functions in adjoining layers

The Open Systems Interconnect (OSI) Model

OSI Model	Function Provided
7 Application	Paper folded for an envelope
6 Presentation	An envelope which has a window to show the address
5 Session	The envelope showing the names of the recipient and the sender
4 Transport	The Post Office
3 Network	The mail carrier
2 Data Link Control / Logical Link	The mail sack
2 Data Link Control / Media Access	The mail sack
1 Physical	The mail truck

(US Post Office Analogy)

The OSI Model in Action



Protocol Implementations

- NetBIOS
- TCP/IP
- SNA
  - APPN
  - LU6.2

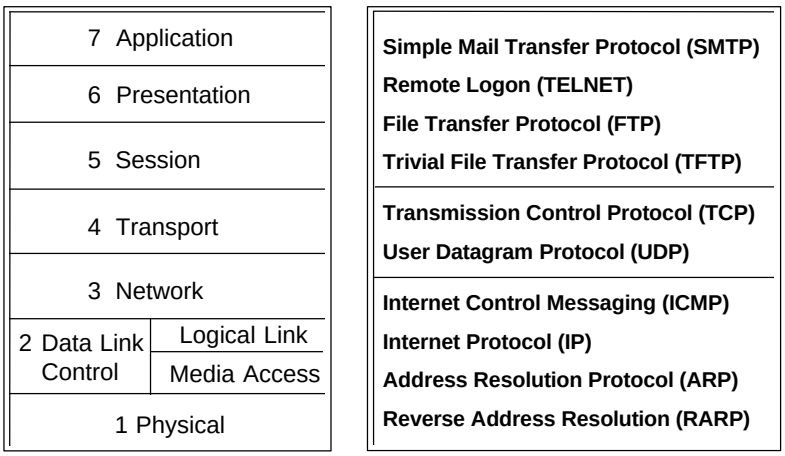
NetBIOS

- NetBIOS - Network Basic Input/Output System
  - Designed by IBM and adopted by Microsoft to support network communications in a small- to medium-sized LAN environment
- Defacto standard for small LANs
- NOT routable, must be bridged
- OSI model Session Layer protocol
- Establishes unique logical names for nodes
- Provides connection-oriented and connection-less services
- Not usually implemented in UNIX environments

TCP/IP and the Internet Protocol Suite

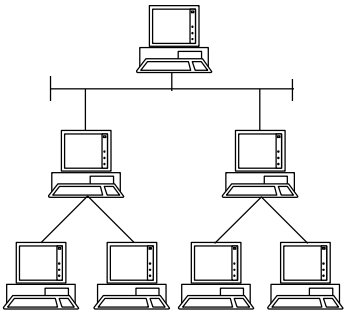
- Internet Protocol Suite
  - Developed by Stanford and BB&N
- Adopted by DARPA 1978
- Vendor hardware-independent
- IP Addressing using an address unique across the Internet
- Sockets & ports
- Transmission Control Protocol (TCP)
  - Provides full-duplex, acknowledged, connection- oriented, flow-controlled service
- Internet Protocol (IP)
  - Connection-less, non-guaranteed

TCP/IP vs. OSI



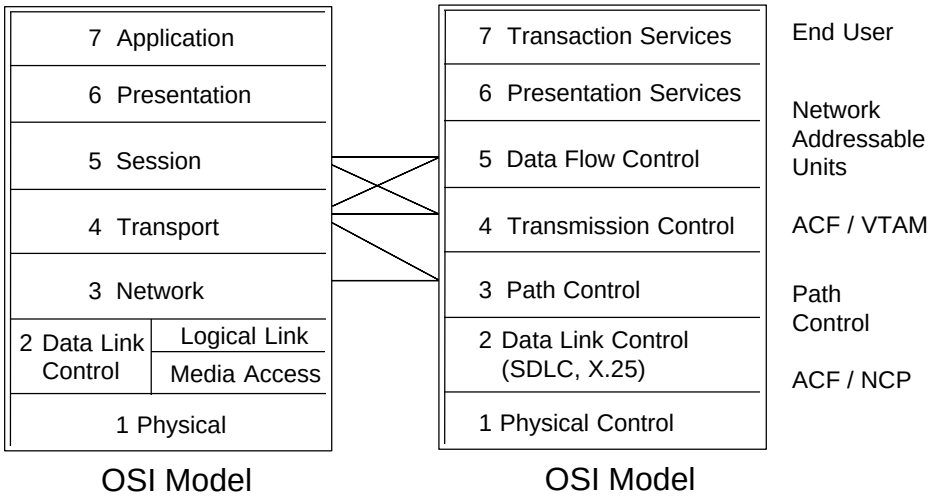
OSI Model TCP/IP Stack

IBM Systems Network Architecture (SNA)



- IBM's proprietary networking architecture first introduced in 1974
- One of the most complex, complete, and widely used network architectures
- Hierarchical architecture, adapted over the years to new technology
- Primary basis for the OSI Model
- APPN supports client/server

OSI vs. SNA



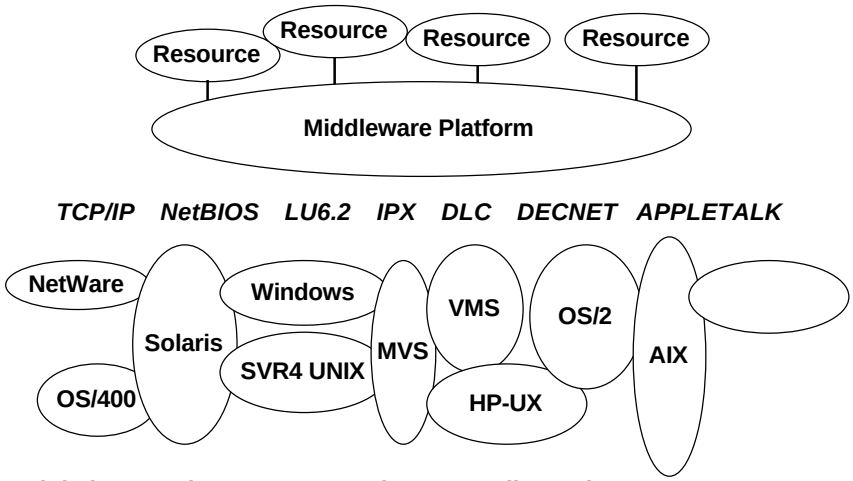
IBM APPN

- Advanced Peer to Peer Networking (APPN)
  - Variation of SNA that evolved to address peer to peer, dynamic, multi-vendor networking environments
- Advanced Program to Program Communications (APPC) is the API for APPN
- LU6.2 is the primary protocol in APPN
- Each node handles network communications
- Key to IBM's strategy for Distributed Transaction Processing (DTP)
- Mainframe participation optional
- APPN fully supported by Composer

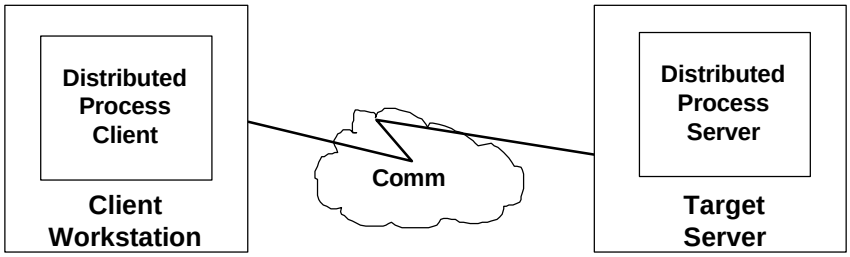
Middleware

- Message-oriented software accessible via an API
- A framework for distributed computing:
  - Comprised of an application (logical) network created by multiple instances of the middleware Kernel
  - Allows distributed application components to find each other quickly and to communicate reliably
  - Symmetrical, peer to peer system, created and maintained by the multiple instances of the Kernel
  - Complex communications considerations become transparent to the application developer and user

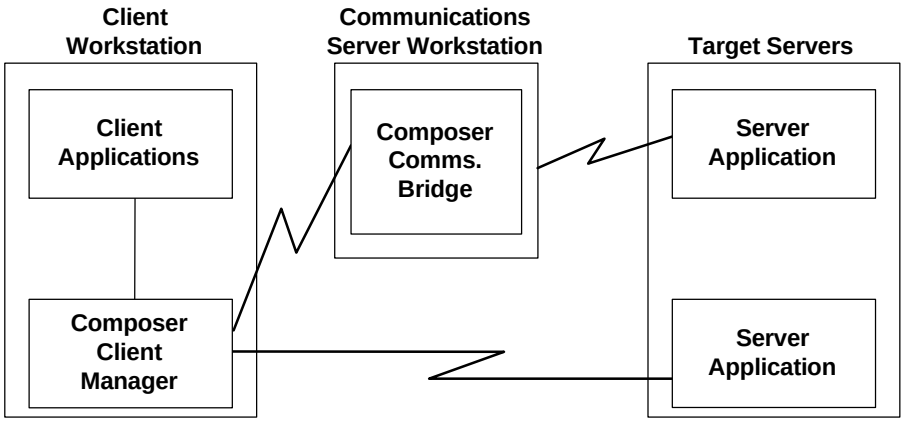
Middleware Platform



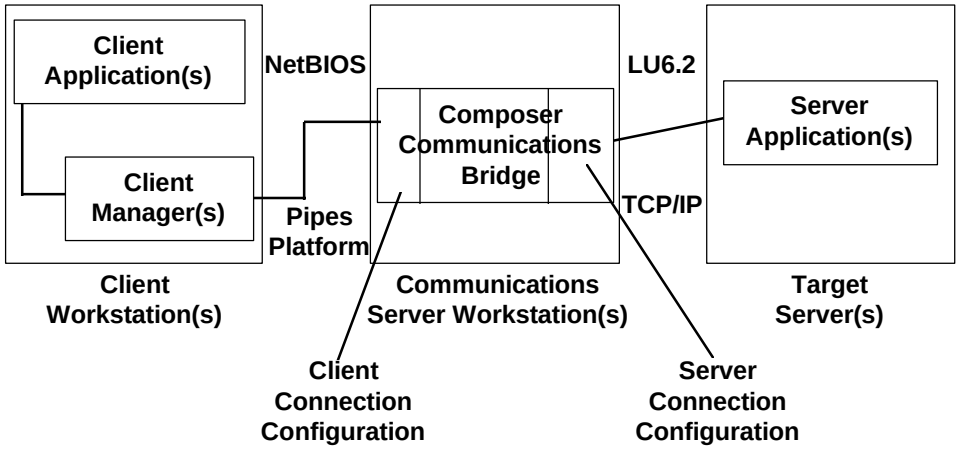
Composer Distributed Process Application Environment



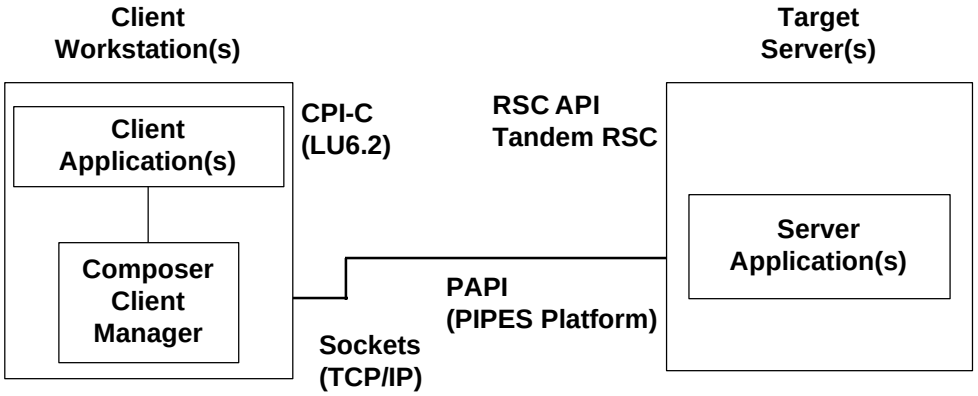
Components of a Composer C/S Distributed Process Application Network Environment



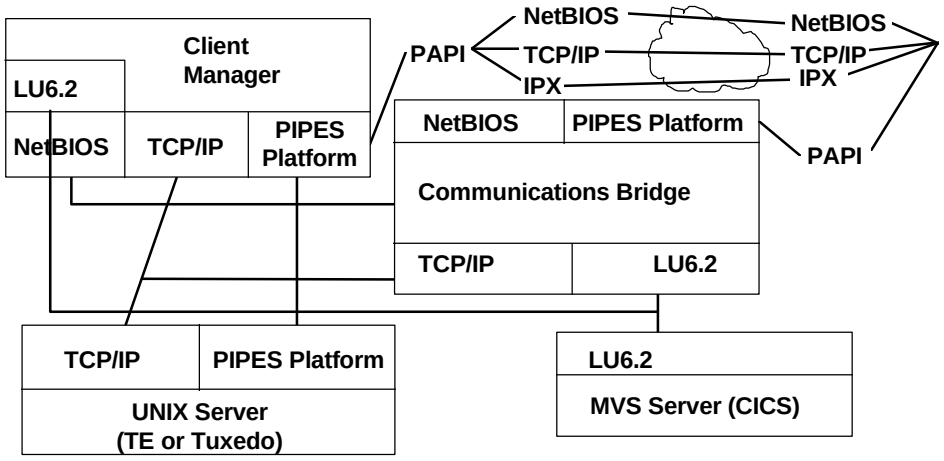
Client and Server Connections for the Communications Bridge



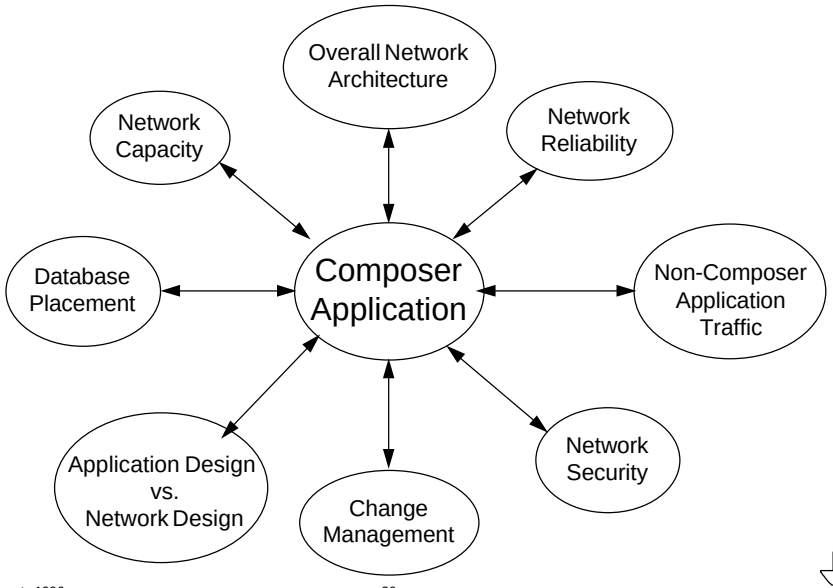
Direct Connect In a Composer C/S Distributed Process Application Network



Distributed Processing Client Communications Options



Complex Client/Server



Summary

- You have now been introduced to:
  - Client/server styles
  - Networking technologies
  - Composer client/server communication components
- Composer allows analysts to develop applications without detailed knowledge of networking technologies, BUT...
- Design of the network to support the application is THE critical added task to successful client/server development

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