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A comparative study of System Network Architecture Vs Digital Network Architecture

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Abstract

The efficient managing system of sources is mandatory for the successful running of any network. Here this paper describes the most popular network architectures one of developed by IBM, System Network Architecture (SNA) and other is Digital Network Architecture (DNA). As we know that the network standards and protocols are needed for the network developers as well as users. Some standards are The IEEE 802.3 standards (The Institute of Electrical and Electronics Engineers 1980) (LAN), IBM Standards SAN (LAN), CCITT Standards (Comité Consultatif International Téléphonique et Télégraphique) (WAN) is the former, but still widely used, name for the ITU (International Telecommunications Union1865), it became a United Nations agency in 1947, a Geneva-based organization that sets international communications standards. SNA Network management is part of Open-Network Architecture (ONA) and is performed centrally by using management platforms such as NetView and others. It is distributed into five functions which are similar to the Open System Interconnection (OSI) model.

Keywords: *sna, dna, hdlc, connectionless network services.*

Introduction

Basically the architecture of a network based on networking models and types of network. The network community has set many standards and specification of network architecture. The networks are managed according the series of layers for reducing the complexity. These layers are arranged as one over the other. The functioning and contents varies of each layer from network to network. In 1978 OSI (open System Interaction) is accepted by ISO.

Network architecture: - A set of rules and conventions by which a network is built.

Layers: - Co-relating functions and managing them into hierarchically distinct levels in the reference model is known by layering.

Peer Layer: - The layer at the same level of hierarchy in the source and destination systems.

Types of Network Standards

- De Facto

A widespread consensus on a particular protocol which has not been ratified by any official body. These standards are generally used with exclusive right and usually remain unpublished.
De Facto further divided into open and closed system. Most of the closed system are redesigned to act like open system. The IBM "System Network architecture" SNA is following the same path.

- De Jure

De Jure standards are developed with intent of enhancing connectivity and interoperability. These standards are planned and developed by authorized standards creating bodies. IEEE standards, OSI, ISO standards and TCP/IP are an example of nonproprietary de jure.

System Network Architecture (SNA)

SNA has designed for IBM systems only to provide the networking facility. Due to this, it is used by only limited set of users. It is IBM's proprietary networking architecture, developed in the mid 1970s. SNA describes general characteristics of computer hardware and software required for interconnection. The OSI reference model was developed a decade after the SNA. SNA supports distributed processing, internetworking, network management and many advanced features. To implement the SNA there are requirement of various communication packages, most popular is Virtual Telecommunication Access Method (VTAM) i.e the mainframe package for SNA communication. A communication protocols for exchange of control information, data and synchronous data link control (SDLC). APPC, APPN and HPR are some examples of the protocols included with SNA. They can be used to connect the iSeries[tm] server with other IBM or number of IBM systems.

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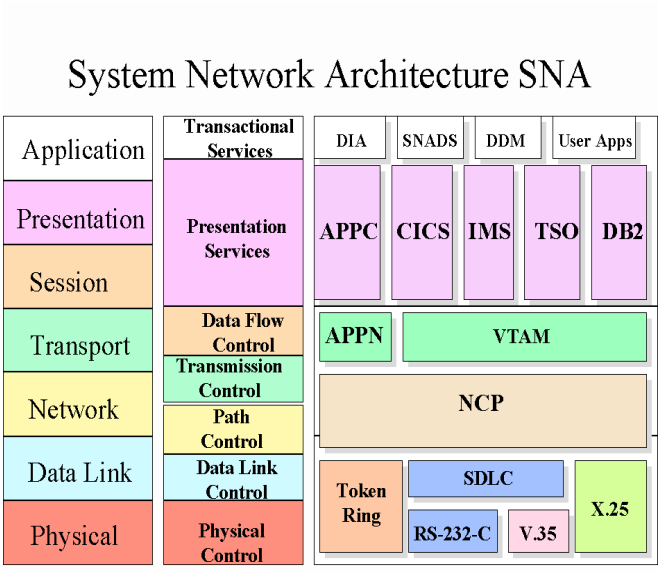
- Physical Control: -. This deals with electrical, mechanical, and procedural characteristics of the media and interfaces to the physical media, and is similar to the OSI physical layer
- Data Link Control: - Similar to the data link layer, SNA defines SDLC protocol for message transfer across a communication link. It supports DLS (Data Link Switching), QLLC (Qualified Logic Link Control over X.25) protocols as well.
- Path Control:- Path control layer includes many function of the network layer; it performs packet formation, path selection, routing and packet reassembling, controlling virtual routes. Network Addressable Units (NAU) and Advanced Peer to Peer Networking (APPN) are the supportive components which facilitate the communication between Transaction Program and SNA network.
- Transmission Control:- The function of this layer likely to the transport layer, the main functions are to verify the sequence number when packets are receiving, managing the rate at which requests are sent and received between logical Units.



- Data Flow Control:-The function of this layer is to manage the source and destination stations. Request and response processing is done here (similar to the session layer).
- Presentation Services:-Resource sharing and data translation algorithms are performed here.
- Transaction Services (NAU Services):- Application services are provided through programs

Architectural Components

The architecture of SNA is based on entities called nodes.

- Host or type 5:- A main frame or midrange computers is known as a HOST. The Host controls a collection of physical and logical units, control domains, which include one or more subareas. Single SNA network may include several host nodes.
- Communication controllers or type 4:- These nodes are used for controlling the flow of data in a hierarchical structure.
- Peripheral node or type 2:- Peripheral devices on the hierarchical network such as cluster controllers, printers, terminals work as type 2 node.
- Physical units: - PUs are a combination of entities such as hardware, software, and firmware that manage and monitor the resources of a node. The following are some types:-

Type 1.0	Terminal node
Type 2.0	Terminals, printers, Cluster controllers and other that can communicate with only a mainframe.
Type 2.1	Minis, gateways, work stations that can communicate with a mainframe or another Type 2.1 device.
Type 4.0	Communication controllers that link lost mainframes and cluster controllers.
Type 5.0	Host computers

- Logical Units: - These allow applications to access the network. Virtual Terminal Access Method (VTAM) provides the functions for users and applications to access the network

Type 0	General purposes LU used in program-to-program connections
Type 1	Used for application program that communicates with single or multiple devices.
Type 2	Terminals (like the 3270)
Type 4	Used for application programs in old peer-to-peer connections
Type 6.1	Used for sub-systems to communicate with each other.
Type 7	Support session between host applications and computers.

Digital Network Architecture (DNA)

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Introduction

Digital Equipment Corporation (DEC) has given affirm to network connectivity for networks. DEC has its own architecture known as Digital Network Architecture (DNA). The DNA was developed in 1974 to provide communication facility between various DEC systems.
It is designed as peer to peer network. On the network there is no node master. Any DECnet node can communicate with other node. The major design issues of DECnet are the peer to peer design.

DNA Architecture

High-Level Data Link Control (HDLC)

HDLC supports synchronous and asynchronous communication. It is a data link layer protocol and defines both the format of the data frames and the commands needed to establish frame transfer.

DECnet Locates Hosts Using Area/Node Address Pairs:

DNA supports Digital Equipment Corporation (DEC) proprietary protocols and standards-based protocols. Products using DNA are referred to as DEC net products.
Digital Data Communications Message Protocol (DDCMP)
Operates under asynchronous and synchronous communication and can be used in full- or half- duplex communication.

Connectionless Network Service (CLNS)

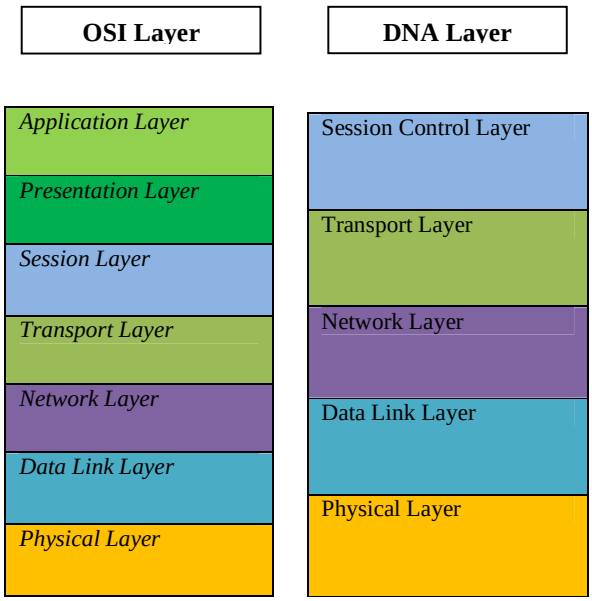
Supported at the network layer, CLNS supports connection-oriented and connectionless network services. DNA Phase V (current version) uses CLNS.

Connection-Oriented Network Service (CONS)

Functions at the network layer, but for CLNS are more often used.
DNA layers communicate with each other to provide required communication facility. Each layer follows a different type of protocol. Session Control Layer is responsible for routing the packets between DNA nodes and transport layer protocols. The rest of three layers perform physical network functions and to avail the necessary interface. Network service protocol (NSP) provides an uninterrupted service via sub channels. For maintaining the function of network, DECnet maintains two databases. These are the permanent database and the volatile database. The permanent database contains static information about the network nodes, interfaces and the status of node initialization.
The volatile database is used to record the information that dynamically changes during the network running time. The volatile database exists until the network is alive. It is erased when the network is down or crashes. DECnet gateways permit access to other networks such as SNA and X.25 based Networks.

Conclusion:

It assumes that there will be high competition between vendors in the area of network management architecture. Digital Network Architecture has evolved over a parallel time span. The latest phases of both SNA and DNA have seen the introduction of long awaited network management product. System Network Architecture a seven layered model, DEC introduced lower end machines at a reasonable cost on DNA, a five layered architecture. The bottom three layers of both architecture performed very similar functions. Commonly in user interfaces, databases, protocols and functions reduce the complexity. Digital Network Architecture defines the architecture in general states the specifications for each layer of the architecture and describes the



protocols which operate with each layer. Network architectures incline to be layered, that serves to heighten their ontogenesis and management. While they chiefly address issues of data communications, they also include some data processing activities at the utmost layers. These upper layers address application software processes, presentation format, and the establishment of user sessions. Each independent layer, or level, of network architecture addresses different functions and responsibilities. The layers work together, as a whole, to maximize the performance of the process.

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www.ijcsms.com

References

[1] RS Rajesh, R Balasubramanian. Manonmaniam Sundaranar

[2] UniversityTirunelveli. Computer Networks and Applications.

Vikas Publishin House 2006.

[3] www.cisco.com

[4]www.javvin.com