Vidyavardhini's College of Engineering and Technology

Department of Artificial Intelligence & Data Science

AY: 2025-26

Class:	TE-AIDS	**Semester:**	V
Course Code:	CSC501	**Course Name:**	CN

Name of Student:	Divya Davane
Roll No. :	14
Assignment No.:	5
Title of Assignment:	Cisco SDNA and 3 layer hierarchical Model
Date of Submission:	2/10/25
Date of Correction:	6/10/25

Evaluation

Performance Indicator	Max. Marks	Marks Obtained
Completeness	5	05
Demonstrated Knowledge	3	03
Legibility	2	02
Total	10	10

Performance Indicator	Exceed Expectations (EE)	Meet Expectations (ME)	Below Expectations (BE)
Completeness	5	3-4	1-2
Demonstrated Knowledge Legibility	3	2	1
Legibility	2	1	0

Checked by

Name of Faculty :

Signature :

Date : 6/10

CN Assignment - 5

A company wants to improve application performance and resource utilization across its enterprise network. Find the Cisco SONA architecture layers to be applied to design an optimized and scalable network infrastructure for this scenario with appropriate design.

Ans

1. The CISCO framework allows customers to build a more intelligent network infrastructure.
2. A company that wants to improve application performance and resource utilization can adopt the Cisco SONA framework.
3. The Cisco SONA framework demonstrates building of integrated systems and it also guides the enterprises evolution towards more intelligent networks.
4. These framework improves the flexibility and increase efficiency of enterprises.
5. Architecture.

PTO.

6. The figure shows how integrated systems allows dynamic, flexible architecture.
7. It offers operational efficiency
8. layers of SONA :-

It defines 3 layers :

i) Networked infrastructure layer
ii) Interactive service layer
iii) Application layer

i) Networked infrastructure layer:

a) In this, all IT resources are interconnected across converged network foundation.

b) The IT resources contains servers, storage and client.

c) The IT resources exist in different places in the network

d) Different places in the network include the campus, branch, data centre, enterprise edge, WAN, MAN and Teleworker etc.

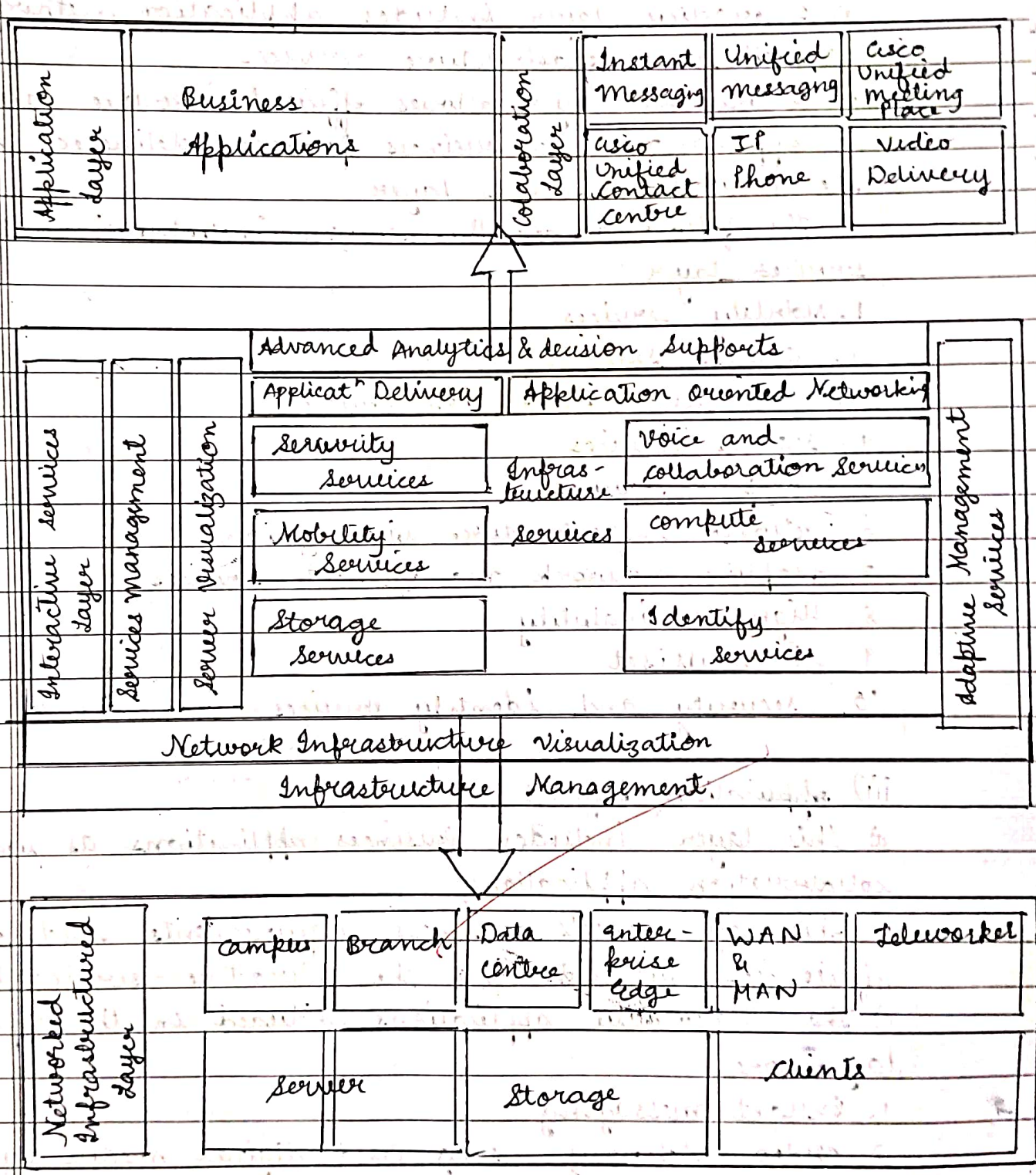
e) The main aim of this layer is to provide connectivity anytime and anywhere.

f) This layer contains the network devices and links to connect servers, storage and client in different places in the network.

g) Resource utilization is improved by leveraging technologies like virtualization and adaptive bandwidth allocation, ensuring that the network segments handle loads efficiently without bottlenecks.

(Figure)

Cisco Service Oriented Network Architecture



ii) Interactive services layer :

a) Interactive layer includes application networking as well as infrastructure services.

b) Interactive layer allows efficient resource allocation to applications and business processes delivered through the networked services layer.

c) The following are the services included in interactive services layer :

1. Mobility services
2. Wireless services
3. Voice and collaboration services
4. Storage services
5. Compute services
6. Network infrastructure virtualization
7. Adaptive network management services
8. High availability.
9. IP multiset
10. Security and identity services

iii) Application Layer :

a) This layer includes business applications as well as collaboration applications.

b) This layer meets business requirements and achieves efficiencies by controlling the interactive service layer

c) The collaborative applications included in the application layer are :-

1. Instant messaging
2. Video delivery using Cisco digital media system.
3. IP telephony

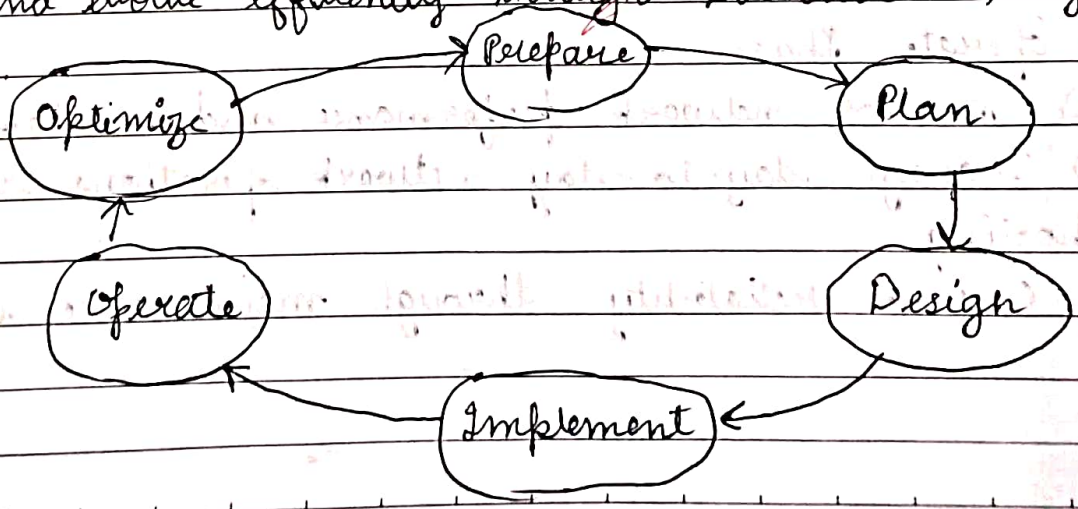
4. Cisco IP communicator and cisco unified IP phones
5. Cisco Unified meeting place.
6. Cisco unified contact centre.
7. Cisco unity.

d) By centralizing applications here, the network can prioritize traffic flows based on business importance

Q.2. A financial institution is modernizing its data centre to support growing demands, increased security and improved performance for its real-time transaction processing systems. Identify the different phases of PPDIOO methodology to ensure that networks are designed, deployed, and maintained in a structured and efficient manner.

Ans

1. The network design methodology is derived from the CISCO prepare, Plan, Design, Implement, operate, and optimize (PPDIO) methodology.
2. It ensures that networks meet organizational goals and evolve efficiently through structured stages.
3.



i) Prepare phase
a) Identify business goals and technical requirements.
b) Access current network and determine gaps
c) Develop a high-level strategy and feasibility study.

ii) Plan phase
a) Create detailed project plans, timelines and budgets
b) Analyze risks and define resource requirements
c) Develop network policies and performance targets

iii) Design Phase
a) Design network topology, architecture and addressing scheme
b) Define hardware, software and security specifications
c) Ensure scalability, reliability and redundancy in design.

iv) Implement Phase
a) Install and configure network devices and services
b) Integrate hardware and software components.
c) Test and verify the network functionality.

v) Operate Phase
a) Monitor network performance and availability.
b) Manage day-to-day network operations and trouble-shooting
c) Ensure reliability through maintenance and updates

vi) Optimize
a)

vi) Optimize phase

a) Analyze performance data for improvements.

b) Apply upgrades or modifications to enhance efficiency.

c) Plan for future growth and evolving business needs.