

Cloud Computing – Unit 01

RGPV One-Night Topper Notes

1. Service Oriented Architecture (SOA)

Definition

Service Oriented Architecture (SOA) is a software design architecture in which different services communicate with each other over a network to perform tasks.

Easy Introduction

SOA ek architecture hai jahan software ko small-small services me divide kiya jata hai.

Har service ek specific kaam karti hai.

Example:

- payment service
 - login service
 - email service
-

Why This Topic is Important

SOA cloud computing ka base concept hai.

Ye:

- flexibility
- reusability

- scalability

provide karta hai.

Detailed Explanation

SOA me applications directly tightly connected nahi hoti.

Services loosely connected hoti hain.

Main Features

Feature	Meaning
Loose Coupling	Services independent hoti hain
Reusability	Same service multiple places use ho sakti hai
Interoperability	Different systems communicate kar sakte hain
Scalability	Easy expansion

Working / Steps

1. Client request bhejta hai
 2. Service provider service provide karta hai
 3. Message exchange hota hai
 4. Required output milta hai
-

Flow of Process

Client → Request → Service → Response

Diagram

User



SOA Services

|—— Payment Service

|—— Login Service

|—— Email Service

Real-Life Analogy

Restaurant example:

- Customer = client
 - Waiter = communication
 - Kitchen services = SOA services
-

Advantages

- Reusable services
 - Easy maintenance
 - Better scalability
 - Flexible system
-

Disadvantages

- Complex management
 - Security issues possible
 - Network dependency
-

Applications

- E-commerce systems
 - Banking
 - Cloud platforms
 - Enterprise software
-

Important Keywords

Loose Coupling, Reusability, Interoperability, Services, Scalability

Conclusion

SOA modular and reusable architecture provide karta hai jo cloud computing ka important base hai.

2. Web Services

Definition

Web Services are software components that allow communication between applications over the internet using standard protocols.

Easy Introduction

Web service ek medium hai jo different applications ko internet ke through communicate karne deta hai.

Why It Is Needed

Different programming languages and systems ko connect karna difficult hota hai.

Web services interoperability provide karta hain.

Detailed Explanation

Web services mainly XML and HTTP use karta hain.

Main Components

Component	Work
SOAP	Messaging protocol
WSDL	Service description
UDDI	Service registry

Working / Steps

1. Client service request karta hai
 2. Server request process karta hai
 3. Response internet ke through return hota hai
-

Diagram

Client ↔ Web Service ↔ Server

Advantages

- Platform independent
 - Reusable
 - Internet communication support
 - Easy integration
-

Disadvantages

- Security issues
 - XML processing overhead
 - Internet dependency
-

Applications

- Online payment
 - Weather API
 - Banking systems
 - E-commerce
-

Important Keywords

SOAP, XML, HTTP, WSDL, UDDI, Interoperability

Conclusion

Web services different systems ko internet ke through communicate karne ki facility deti hain.

3. Basic Web Service Architecture

Definition

Web service architecture defines how web service provider, requester and registry interact with each other.

Main Components

Component	Work
Service Provider	Service provide karta hai
Service Requester	Service use karta hai
Service Registry	Services store karta hai

Working / Steps

1. Provider service publish karta hai
 2. Registry service details store karti hai
 3. Requester registry search karta hai
 4. Requester service invoke karta hai
 5. Response receive hota hai
-

Diagram

Provider → Registry ← Requester
 ↘ Service ✓

Important Keywords

Provider, Requester, Registry, Publish, Discover, Invoke

Conclusion

Web service architecture service discovery and communication ko organized banati hai.

4. SOAP

Definition

SOAP (Simple Object Access Protocol) is an XML-based messaging protocol used for communication between web services.

Easy Introduction

SOAP web services ke beech message exchange karne ke liye use hota hai.

Why It Is Needed

Secure and structured communication ke liye SOAP use hota hai.

Detailed Explanation

SOAP message XML format me hota hai.

SOAP Structure

Part	Work
Envelope	Message structure define karta hai
Header	Additional information
Body	Actual message
Fault	Error information

Diagram

SOAP Message

|—— Envelope

|—— Header

- ┆ Body
 - ┆ Fault
-

Advantages

- Secure
 - Standardized
 - Platform independent
-

Disadvantages

- Heavy protocol
 - Slow processing
 - XML overhead
-

Applications

- Banking
 - Enterprise systems
 - Secure web services
-

Important Keywords

SOAP, XML, Envelope, Header, Body, Fault

Conclusion

SOAP secure and structured web service communication provide karta hai.

5. WSDL

Definition

WSDL (Web Services Description Language) is an XML-based language used to describe web services.

Easy Introduction

WSDL web service ka instruction manual hota hai.

Ye batata hai:

- service kya karti hai
 - kaise use karni hai
 - kaha available hai
-

Diagram

Client → Reads WSDL → Uses Web Service

Advantages

- Service description
 - Easy integration
 - Standard communication
-

Important Keywords

WSDL, XML, Service Description, Interface

Conclusion

WSDL web services ki details describe karta hai.

6. UDDI

Definition

UDDI (Universal Description Discovery and Integration) is a directory service used to register and discover web services.

Easy Introduction

UDDI web services ki phone directory jaisa hota hai.

Working

1. Provider service register karta hai
 2. Requester UDDI search karta hai
 3. Service details milti hain
-

Diagram

Provider → UDDI Registry ← Client

Advantages

- Easy service discovery
 - Central registry
 - Better integration
-

Important Keywords

Registry, Discovery, Integration, Service Directory

Conclusion

UDDI web services ko discover and manage karne me help karta hai.

7. RESTful Services

Definition

RESTful services are lightweight web services based on REST architecture using HTTP methods.

Easy Introduction

REST web services simple and lightweight hoti hain.

SOAP se easy aur fast hoti hain.

Characteristics of REST

Characteristic	Meaning
Stateless	Server session maintain nahi karta
Client-Server	Separate roles
Cacheable	Data cache ho sakta hai
Uniform Interface	Standard communication

HTTP Methods Used

Method	Work
GET	Data read
POST	Data create
PUT	Data update
DELETE	Data delete

Diagram

Client → HTTP Request → REST API → Server

Advantages

- Lightweight
 - Fast
 - Easy to use
 - JSON support
-

Disadvantages

- Less secure than SOAP
- Stateless limitation

Applications

- Mobile apps
 - Cloud APIs
 - Social media APIs
-

Important Keywords

REST, HTTP, GET, POST, PUT, DELETE, Stateless

Conclusion

RESTful services lightweight and fast communication provide karti hain.

8. SaaS (Software as a Service)

Definition

SaaS is a cloud service model in which software applications are provided over the internet.

Examples

- Gmail
 - Google Docs
 - Zoom
-

Advantages

- No installation

- Accessible anywhere
 - Automatic updates
-

Disadvantages

- Internet dependency
 - Security concerns
-

Diagram

User → Internet → SaaS Application

9. PaaS (Platform as a Service)

Definition

PaaS provides a platform and environment for developers to build and deploy applications.

Examples

- Google App Engine
 - Heroku
 - Microsoft Azure
-

Advantages

- Easy development
- No hardware management

- Faster deployment
-

Disadvantages

- Vendor dependency
 - Limited customization
-

10. Organizational Scenarios of Clouds

Definition

Organizational cloud scenarios define how organizations use cloud infrastructure based on their requirements.

Types

Type	Meaning
Public Cloud	Shared cloud
Private Cloud	Organization-specific
Hybrid Cloud	Combination
Community Cloud	Shared by similar organizations

Applications

- Government systems
 - Enterprises
 - Educational organizations
-

11. Administering & Monitoring Cloud Services

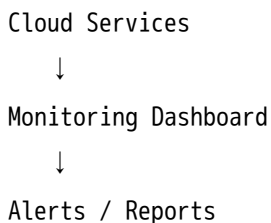
Definition

Cloud administration and monitoring involve managing cloud resources, performance and security.

Activities

- User management
 - Resource monitoring
 - Performance tracking
 - Security management
 - Backup management
-

Diagram



Advantages

- Better performance
- Security control

- Fault detection
-

12. Benefits and Limitations of Cloud Computing

Benefits

Benefit	Meaning
Scalability	Easy expansion
Cost Saving	Less hardware cost
Remote Access	Anywhere access
Backup	Data safety

Limitations

Limitation	Meaning
Security Risk	Data theft possible
Internet Dependency	Network required
Downtime	Service outage
Vendor Lock-in	Provider dependency

13. Hypervisor

Definition

Hypervisor is software that creates and manages virtual machines (VMs).

Easy Introduction

Hypervisor ek manager hai jo ek hardware par multiple virtual systems run karwata hai.

Types of Hypervisor

Type	Meaning
Type-1	Runs directly on hardware
Type-2	Runs on operating system

Diagram

Hardware



Hypervisor

|—— VM1

|—— VM2

|—— VM3

Advantages

- Resource sharing
 - Virtualization support
 - Better utilization
-

Disadvantages

- Performance overhead
 - Security risk
-

Applications

- Cloud data centers
 - Virtual machines
 - Server virtualization
-



MOST IMPORTANT TOPICS

- ★ SOA
 - ★ RESTful Services
 - ★ SOAP
 - ★ SaaS & PaaS
 - ★ Hypervisor
 - ★ Web Service Architecture
-



MOST IMPORTANT 7-MARK

QUESTIONS

1. Explain SOA.
 2. Explain SOAP architecture.
 3. Explain RESTful services.
 4. Explain SaaS and PaaS.
 5. Explain Hypervisor.
 6. Explain WSDL and UDDI.
 7. Explain web service architecture.
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MOST IMPORTANT 14-MARK

QUESTIONS

1. Explain SOA and web services architecture.

2. Explain SOAP, WSDL and UDDI in detail.
 3. Explain RESTful services with characteristics.
 4. Explain cloud service models (SaaS, PaaS).
 5. Explain hypervisor and virtualization.
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PYQ-BASED EXPECTED QUESTIONS

Very High Probability

- ✓ RESTful Services
- ✓ SOAP
- ✓ SOA
- ✓ Hypervisor

High Probability

- ✓ SaaS vs PaaS
- ✓ WSDL and UDDI
- ✓ Web Service Architecture

Medium Probability

- ✓ Cloud monitoring
 - ✓ Organizational cloud scenarios
-

ONE-NIGHT REVISION NOTES

Topic	Quick Revision
SOA	Service-based architecture
SOAP	XML messaging protocol
REST	Lightweight HTTP service

Topic	Quick Revision
WSDL	Service description
UDDI	Service registry
SaaS	Software over internet
PaaS	Development platform
Hypervisor	VM manager

MEMORY TRICKS

REST Methods

👉 “GPUD”

- G = GET
 - P = POST
 - U = PUT
 - D = DELETE
-

SOAP Structure

👉 “EHBFF”

- E = Envelope
 - H = Header
 - B = Body
 - F = Fault
-

TOPPER ANSWER WRITING TIPS

Draw diagrams for:

- ✓ SOA architecture
- ✓ SOAP message structure
- ✓ REST architecture
- ✓ SaaS/PaaS model
- ✓ Hypervisor architecture

Keywords to Underline

SOA, SOAP, REST, WSDL, UDDI, SaaS, PaaS, Hypervisor, Virtualization