

UNIT-II

MIGRATION INTO A CLOUD

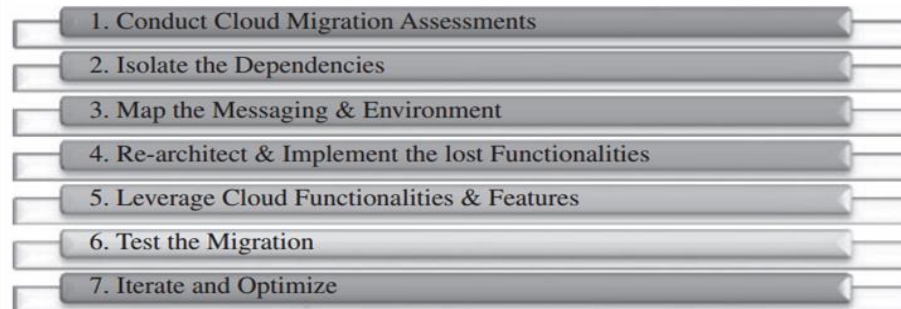
BROAD APPROACHES TO MIGRATING INTO THE CLOUD

Why Migration is important?

There are economic and business reasons why an enterprise application can be migrated into the cloud, and there are also several number of technological reasons. Many of these efforts come up as initiatives in adoption of cloud technologies in the enterprise, resulting in integration of enterprise applications running off the captive data centers with the new ones that have been developed on the cloud. At the core, migration of an application into the cloud can happen in one of several ways:

1. Either the application is clean and independent.
2. Perhaps some degree of code needs to be modified and adapted or the design (and therefore the code) needs to be first migrated into the cloud computing service environment
3. Perhaps the migration results in the core architecture being migrated for a cloud computing service setting, this resulting in a new architecture being developed, along with the accompanying design and code implementation.
4. Perhaps while the application is migrated as is, it is the usage of the application that needs to be migrated and therefore adapted and modified.
5. Migration can happen at five levels i.e.,
 - i. Application
 - ii. Code
 - iii. Design
 - iv. Architecture
 - v. Usage

Q2. Explain briefly about the Seven-Step Model of Migration into a Cloud?



Step-1: Cloud migration assessments comprise assessments to understand the issues involved in the specific case of migration at the application level or the code, the design, the architecture, or usage levels. These assessments are about the cost of migration as well as about the ROI that can be achieved in the case of production version.

Step-2: Isolating all systemic and environmental dependencies of the enterprise application components within the captive data center.

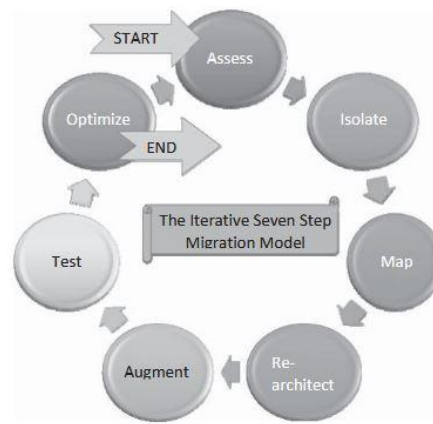
Step-3: Generating the mapping constructs between what shall possibly remain in the local captive data center and what goes onto the cloud.

Step-4: substantial part of the enterprise application needs to be rearchitected, redesigned, and reimplemented on the cloud

Step-5: We leverage the intrinsic features of the cloud computing service to augment our enterprise application in its own small ways.

Step-6: We validate and test the new form of the enterprise application with an extensive test suite that comprises testing the components of the enterprise application on the cloud as well

Step-7: Test results could be positive or mixed. In the latter case, we iterate and optimize as appropriate. After several such optimizing iterations, the migration is deemed successful



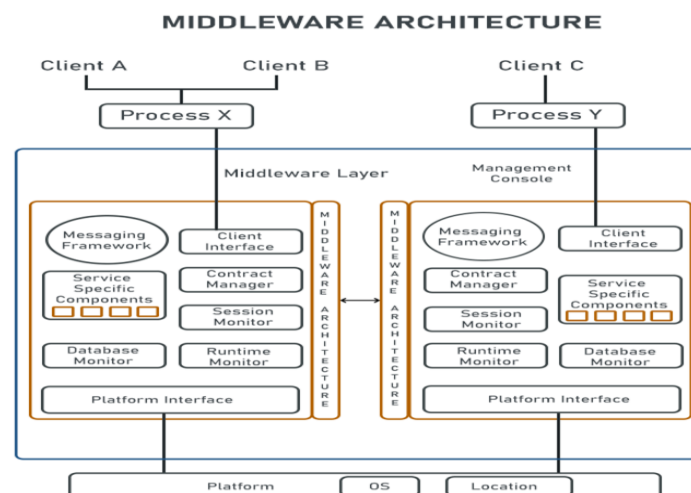
When you migrate from a client to the cloud, what are the issues you will face?

1. **Security:-** Security is an obvious threshold question, if the cloud is not secure, enterprises will not consider migrating to it fearing their sensitive data will be tampered.
2. **Vendor Management :-** When the user is going to migrate with the outsource providers, then the service level agreements and its terms are thoroughly checked. While the whole idea behind cloud computing is to propose a standardized, multi-tenant infrastructure, cloud vendors may not offer the same level of custom SLAs as IT managers
3. **Technical Integration :-** Most firms that migrate to the cloud environment in a hybrid model, are keeping certain key elements of their infrastructure in-house and under their direct control, while outsourcing less susceptible or core components. Integrating internal and external infrastructures can be a technical concern.
4. **Bussiness View :-** While the whole idea behind cloud computing is to propose a standardized, multi-tenant infrastructure, cloud vendors may not offer the same level of custom SLAs as IT managers.

What is the need of cloud middleware? Explain with suitable Diagram?

Middleware is to say that it is software that acts as a liaison between applications and networks. The term is often used in the context of cloud computing, such as public or private cloud.

Most middleware follows the service-oriented architecture (SOA) design or is designed as a platform-as-a-service (PaaS) solution.



- i. **Middleware management console :-** This console provides an overview of events and activities, transactions, configuration management, and contract rules.
- ii. **Platform interface :-** Middleware needs to work across multiple platforms, irrespective of where it resides. This is the interface that is in direct contact with the backend servers.
- iii. **Common messaging framework :-** Middleware requires messaging services to communicate with services, applications, and platforms. Most of these frameworks rely on existing standards such as simple object access protocol (SOAP), representational state transfer (REST), or Javascript object notation (JSON).

What is the need of cloud Middleware? Explain briefly

1. **Configure and control connections and integrations:-** Based on information in a client or front-end application request, middleware can customize the response from the back-end application or service.
In a retailer's ecommerce application, middleware application logic can sort product search results from a back-end inventory database by nearest store location, based on the IP address or location information in the HTTP request header.
2. **Secure connections and data transfer:-** Middleware typically establishes a secure connection from the front-end application to back-end data sources using Transport Layer Security (TSL) or another network security protocol.
3. **Manage traffic dynamically across distributed systems:-** When application traffic spikes, enterprise middleware can scale to distribute client requests across multiple servers, on premises or in the cloud. And concurrent processing capabilities can prevent problems when multiple clients try to access the same back-end data source simultaneously.
4. **Quality of service- issues in Cloud :-** Quality of Service refers to the ability of networks to attain maximum bandwidth and handle other network elements like latency, error rate and uptime. Quality of Service include the management of other networks resource by allocating priorities to specific type of data (audio, video and file).

What do you mean by cloud Interoperability and discuss the standards interoperability categories?

Cloud interoperability :- This term refers to the ability of two or more systems or applications to exchange information and to use the information that has been exchanged together.

There is a strong need for the development of integrated interoperability authentication among all provider

Standards :- When consumer wishes to migrate from one cloud Provider to another, interoperability falls into these categories:

- i. **Data and Application Portability:** It means by running applications and data, consumers should be able to migrate easily from one cloud provider to another without any lock-in issue.
- ii. **Platform Portability:** It means application development environment or IDE should be capable enough to run over any type of cloud infrastructure.
- iii. **Infrastructure Portability:** It means virtual server or machine images should have the freedom of portability. They should be able to migrate from one cloud provider to another