# CLOUD COMPUTING

## Cloud Application Design

**S.Thenmozhi**
Department of Computer Applications

## Design Considerations for Cloud Application

- Scalability
  - Serve millions of users without taking a hit on their performance
  - Application designers have to provision adequate resources to meet their workload levels
- Reliability & Availability
  - Reliability -The probability that a system will perform the intended functions under stated conditions
  - Availability - The probability that a system will perform a specified function under given conditions at a prescribed time

## Design Considerations for Cloud Application

- Security
  - Security is an important design consideration for cloud applications given the outsourced nature of cloud computing environments
- Maintenance & Upgradation
  - To achieve a rapid time-to-market, businesses typically launch their applications with a core set of features ready and then incrementally add new features as and when they are complete.
  - Design applications with low maintenance and upgradation costs
- Performance
  - Applications should be designed while keeping the performance requirements in mind

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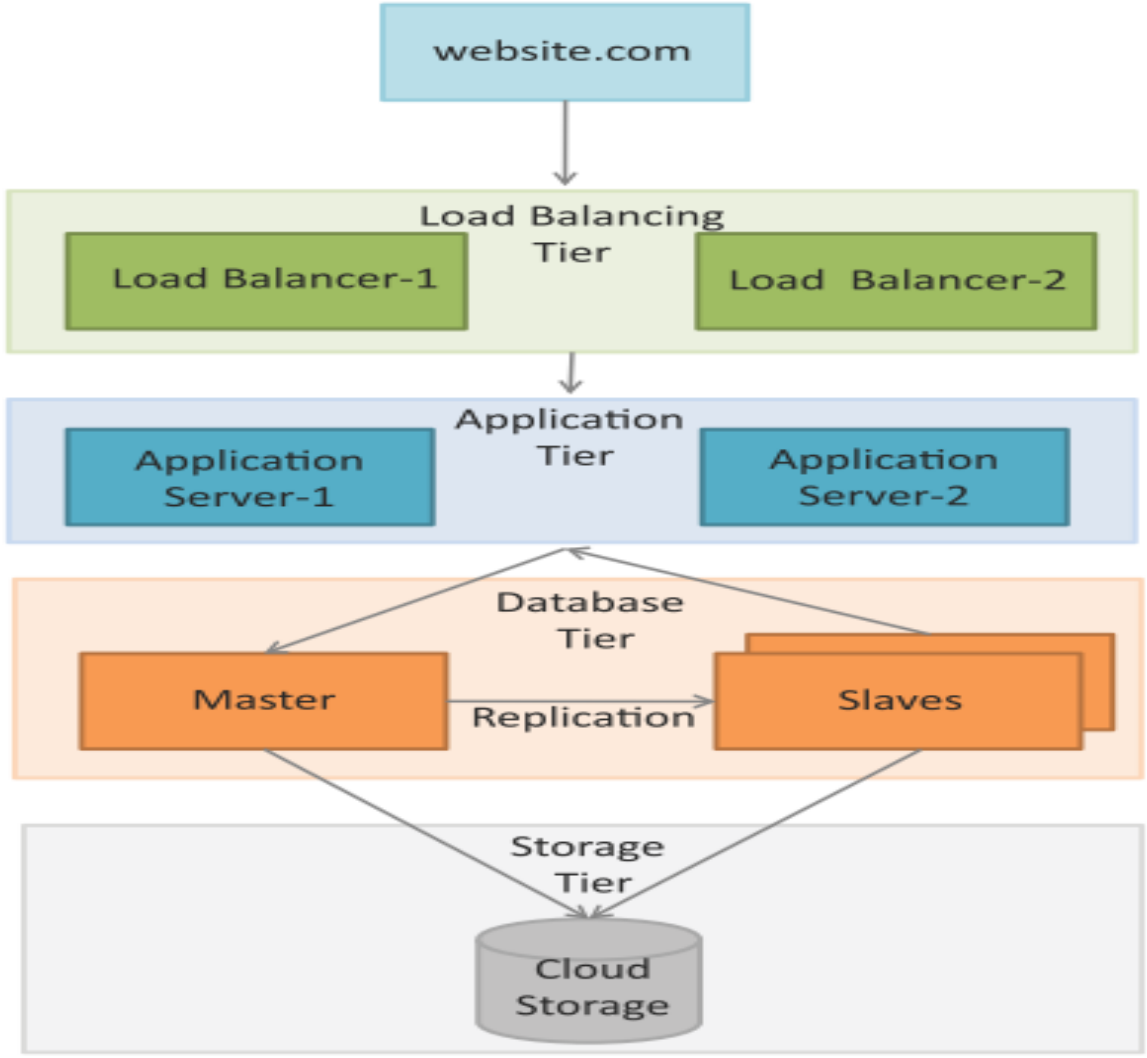
## Reference Architectures – E-Commerce /Financial Application



## Reference Architectures – E-Commerce /Financial Application

- Load Balancing Tier
  - Load balancing tier consists of one or more load balancers
- Application Tier
  - For this tier, it is  recommended to configure auto scaling
  - Auto scaling can be triggered when the recorded values for any of the specified metrics such as CPU usage, memory usage, etc. goes above defined thresholds
- Database Tier
  - The database tier includes a master database instance and multiple slave instances
  - The master node serves all the write requests and the read requests are served from the slave nodes
  - This improves the throughput for the database tier since most applications have a higher number of read requests than write requests

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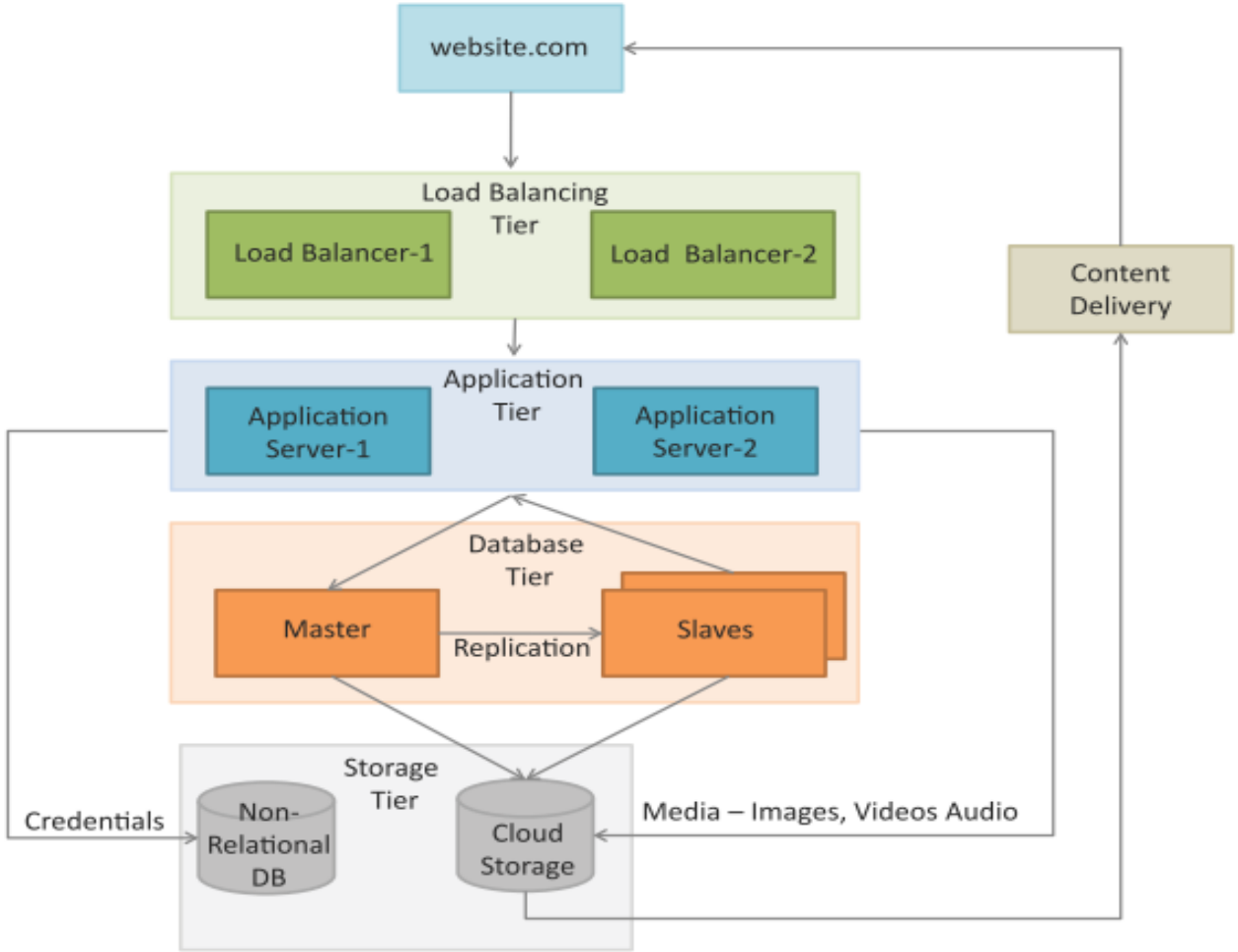
## Reference Architectures – Content Delivery Application



## Reference Architectures – Content Delivery Application

- Figure shows a typical deployment architecture for content delivery applications such as online photo albums, video webcasting, etc
- Both relational and non-relational data stores are shown in this deployment
- A content delivery network (CDN) which consists of a global network of edge locations is used for media delivery
- CDN is used to speed up the delivery of static content such as images and videos

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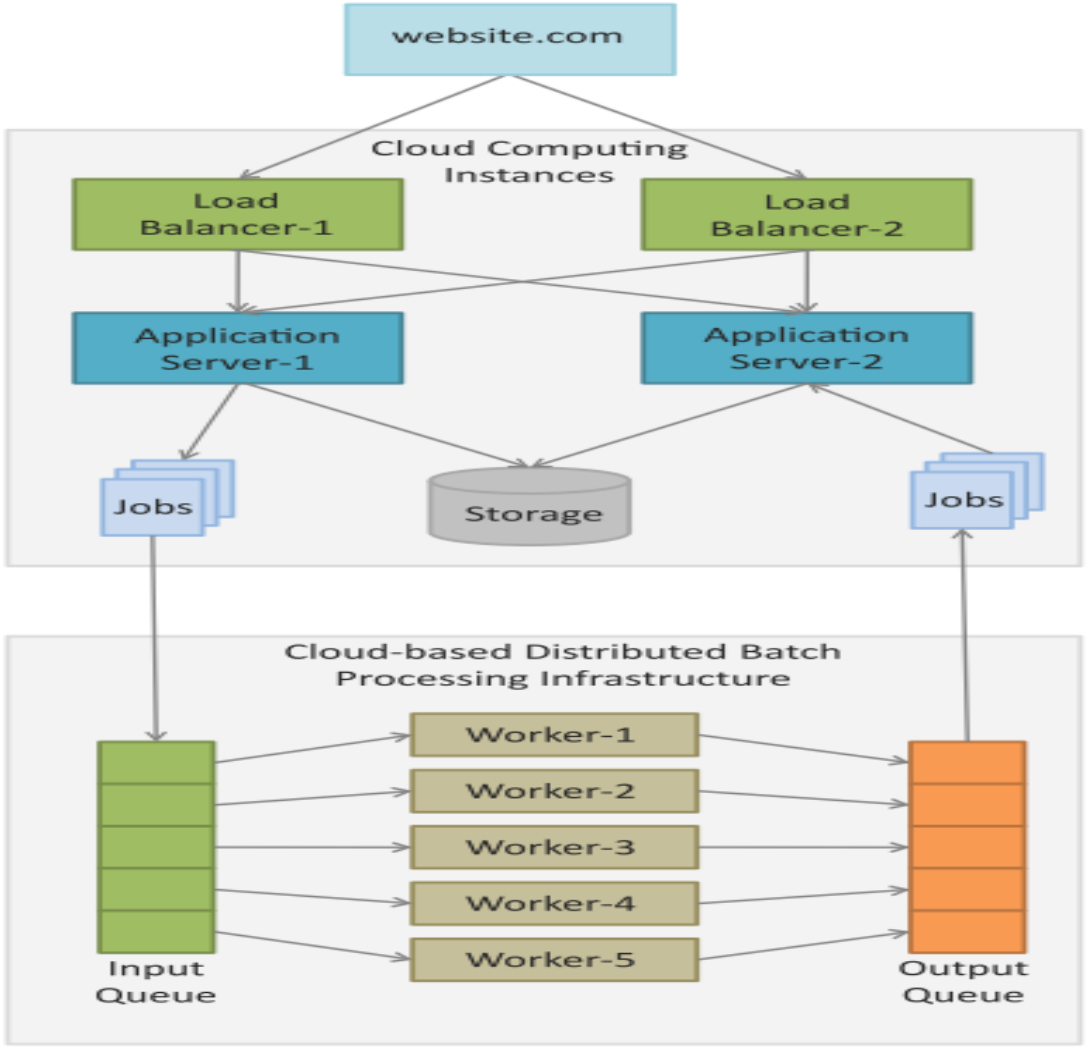
## Reference Architectures – Analytics Application



## Reference Architectures – Analytics Application

- Figure shows a typical deployment architecture for compute intensive applications such as Data Analytics, Media Transcoding, etc
- Comprises of web, application, storage, computing/analytics and database tiers
- The analytics tier consists of cloud-based distributed batch processing frameworks such as Hadoop which are suitable for analyzing big data
- Data analysis jobs (such as MapReduce) jobs are submitted to the analytics tier from the application servers
- The jobs are queued for execution and upon completion the analyzed data is presented from the application servers

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## Service Oriented Architecture

- Service Oriented Architecture (SOA) is a well established architectural approach for designing and developing applications in the form services that can be shared and reused
- SOA is a collection of discrete software modules or services that form a part of an application and collectively provide the functionality of an application
- SOA services are developed as loosely coupled modules with no hard-wired calls embedded in the services
- The services communicate with each other by passing messages
- Services are described using the Web Services Description Language (WSDL)
- WSDL is an XML-based web services description language that is used to create service descriptions containing information on the functions performed by a service and the inputs and outputs of the service

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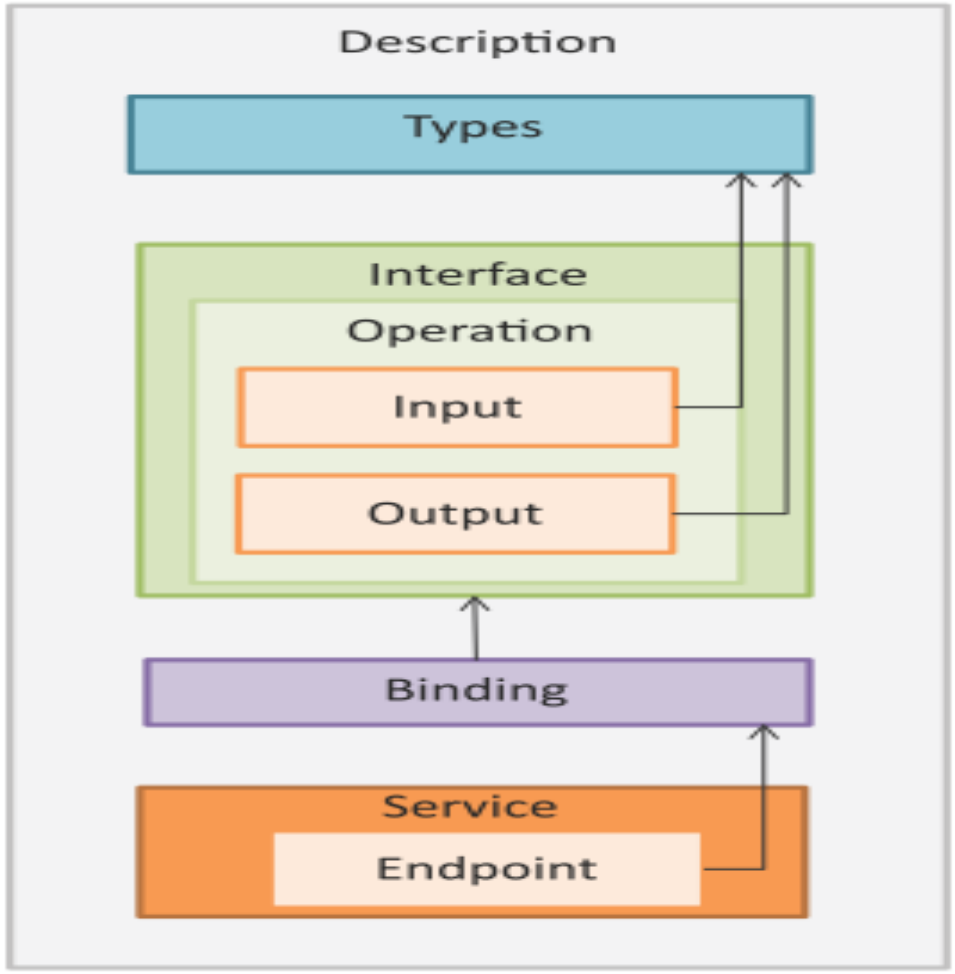
## SOA



## SOA Layers

- Business Systems
  - This layer consists of custom built applications and legacy systems such as Enterprise Resource Planning (ERP), Customer Relationship Management (CRM), Supply Chain Management (SCM), etc
- Service Components
  - The service components allow the layers above to interact with the business systems. The service components are responsible for realizing the functionality of the services exposed
- Composite Services
  - Composed of two or more service components. Composite services can be used to create enterprise scale components or business-unit specific components

## SOA Layers

- Orchestrated Business Processes
  - Composite services can be orchestrated to create higher level business processes. In this layers the compositions and orchestrations of the composite services are defined to create business processes.
- Presentation Services
  - This is the topmost layer that includes user interfaces that exposes the services and the orchestrated business processes to the users.
- Enterprise Service Bus
  - This layer integrates the services through adapters, routing, transformation and messaging mechanisms.

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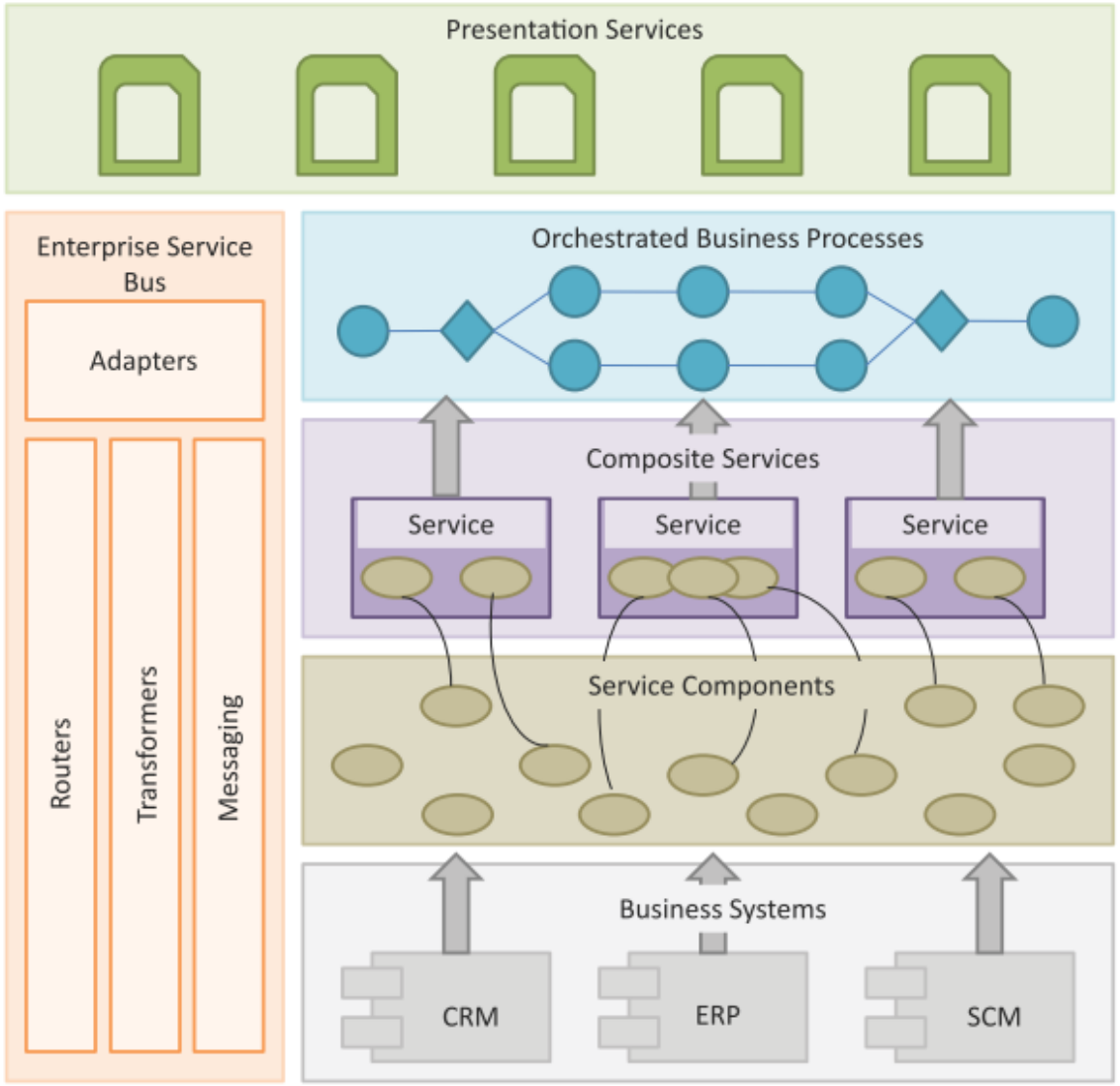
## SOA




# THANK YOU

**S. Thenmozhi**

Department of Computer Applications

**thenmozhis@pes.edu**

+91 80 6666 3333 Extn 393