

# Chapter 13

## Fault Tolerant Cloud Systems

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### ABSTRACT

*Cloud computing refers to a model for accessing computing resource like networks, servers, storage, applications, and services remotely. Cloud computing offers these resources as a service, namely infrastructure-as-a-service, platform-as-a-service, and software-as-a-service. To use these services, two roles involved: the cloud provider offers the service and the cloud customer consumes the service. These resources are efficiently shared and utilized by customers and it is called workload. The requirement of workload depends on customer demands that vary from higher to lower. Based on the customer demand, cloud provider makes the resource available efficiently. In the context of cloud, the workload is based on web-based service or jobs processed in batch mode. The arrival process of jobs in the cloud is not often deterministic. The irregular increase or decrease in workload has a vital impact on resource provision. Monitoring the resources helps in measuring the performance of the cloud so that the resource can be provisioned to customers efficiently.*

### INTRODUCTION

Computing is a study of algorithms, automation, programming the information. Programming is a way of designing algorithms which are aimed at controlling, executing the computing devices. These devices have the basic features such as the amount of data they can store and process speed to perform in a reliable time. Traditionally in 1980's desktop personal computers (PCs) are used to support in creating, editing and manipulating documents. Further, these PCs are connected to the devices like a scanner to scan the documents, printer to take hard copies of the documents, etc. Later these devices are connected together to form a simple network. Since PCs has more of devices and it occupies more space the devices like laptop, tablet, mobile phone came into the context.

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## BACKGROUND

### Computing Shift from Mainframe to Cloud

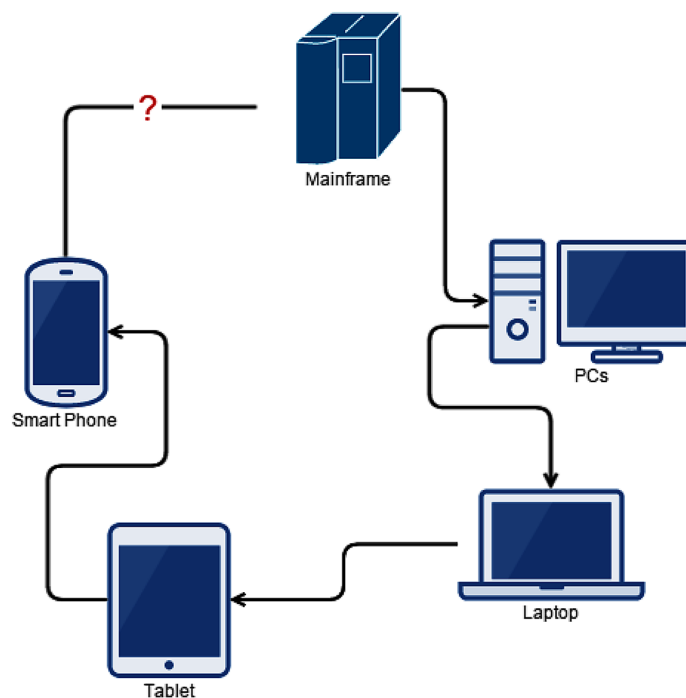
There are five distinct stages that cloud computing arrived. Initially one computer terminals like keyboard monitor to access the mainframes systems. In stage1, personal computers (PCs) were used to manipulate user requirements. In stage2, several PCs were connected to form a network called local network and user can access the PCs from their own PCs. In stage3, several local networks were connected to a global network called the internet. From the internet, the users can remotely access the systems. In stage4, the grid computing came into the context where resources were shared distributedly. The user uses PCs to access the grid. In stage5, the user employs a computing technique called cloud computing that allows users to access the resources through the internet.

## COMPUTING TECHNIQUES ERA

### Cluster Computing

A cluster computing consists of several stand-alone computers which are a distributed loosely or tightly connected system and performs several tasks which are viewed as a single system. The features of cluster computing are reducing cost, power; it uses improved network technology, availability, and scalability.

Figure 1. Sample computing paradigm shift



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