

# Hospital Appointment System storage using Cloud

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## Abstract:

Natural consistency has appeared as an striking middle-ground to architecting cloud storage systems, as it allows for high availability and low latency, while supporting stronger-than-ultimate-stability semantics. However,natural-stable cloud storage systems have seen limited deployment in practice. A key factor is these systems employ full recreation of all the data in all the data centers (DCs), suffering high cost. A simple extension of current causal systems to support partial recreation by clustering DCs into rings incurs availability and latency problems. We propose, the first system to enable causal consistency for partitioned data stores while achieving the cost advantages of partial replication without the availability and latency problems of the simple extension. Our evaluation with 64 servers emulating 8 geo-distributed DCs shows that this (i) incurs much lower cost than a fully-replicated causal store (obviously due to the lower replication factor);and (ii) offers higher availability and good performance than the above limited-recreation extension at similar costs.

## INTRODUCTION:

The “Hospital Appointment System” has been developed to disallow the problems succeeding in the practicing physical system. This application is supported to eliminate and in some cases reduce the hardships faced by this existing system.Moreover, this system is outlined for the particular need of the company to carry out operations in a smooth and productive manner. The application is reduced as much as possible to avoid debugs while entering the data. It also provides error message while entering wrong data. No fixed knowledge is needed for the user to use this system. Thus by this all it proves it is user-friendly. To achieve this several concepts of cloud were referred and learnt. Among all the referrals AMAZON AWS services is sought to be the best and have been utilized.The AWS Cloud provides a wide set of infrastructure services, such as computing power, storage options, networking and databases that are conveyed as a utility: on-demand, available in seconds, with pay-as-you-go pricing.Services such as Dynamo DB, SNS services, API Creation, Lambda Functions, Elastic Beanstalk etc.

## LITERATURE REVIEW:

Every organization whether big or small, has challenges to overcome and managing the information of the Doctor, Patients, Doctor Schedule, Booking. Every Hospital Appointment System has different Hospital needs; therefore, we design exclusive booking system that is adapted for the managerial requirements. Amazon Services were applied for the easy functioning of the management and it is quite user friendly.This is designed to assist in strategic planning and maintenance of the public visiting the doctor.The organization is equipped with the right level of information and details. These services will ultimately allow you to manage your workforce and resources.

## SYSTEM DESIGN:

While referring to many previously developed applications and learning about their system and their structure, they were quite interesting and gave a fresh thought for development. Finally, I choose to develop a web based app for the organization. The languages selected here are Html, Css and Bootstrap for the front end development of the application as shown in Fig:1.1.

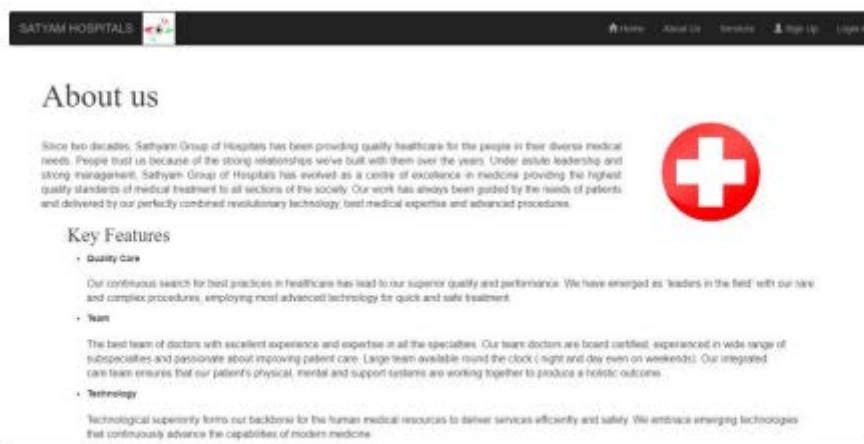


Fig:1.1: **Front end of the application**

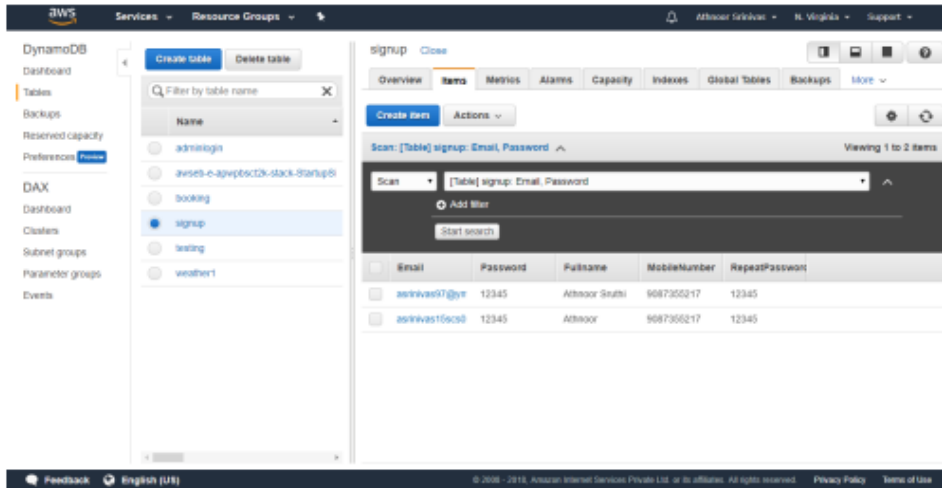


Fig:1.2: *Dynamo DB(Database)*



Fig:1.3: *Elastic Beanstalk*

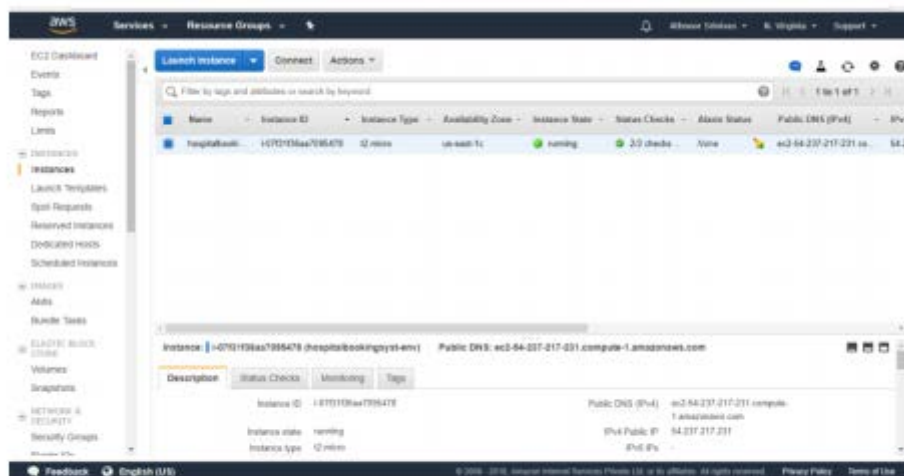


Fig:1.4: *EC2 Instance*

Three static pages have been developed for conveying the information about the organization such as the establishment year, Chairman's information, chief doctors and facilities provided in the organization. Also we used the concept of Carousel for displaying the images of the organization. A Signup page has been developed for the new patients who wish to book an appointment in the hospital with some additional details. A login page has been created for both the patients and the admin separately allowing them to get into their respective portals. To work with this login page, we need a backend supporting language and also a database. These services were supported by the AWS. Our backend language was NodeJs and the database was Dynamo Db, a splendid database which have a primary key and the sort key use to secure the information. The representation of the database is shown in Fig:1.2.

A new feature has been used in the booking system of the patient's login where on registering in the site will receive a confirmation mail using the SNS system. To receive such services, the patient has to subscribe to the mails services. Even after booking an appointment the patient can get a status through mails. The Cloud supported the application in all the means and successfully hosted the application using the Elastic Beanstalk as shown in Fig:1.3.

where it uses the EC2 instances which is used to create a virtual server and provide the virtual environment for the application to work shown in Fig:1.4. It is accessed using the key pairs generated during the creation of virtual server and some of the access tokens present in the user profile. The application is turned on and off as required by the user and charges are applicable. According to the usage. Amazon is a pay-per-use category which charges a decent amount

#### **METHODOLOGY:**

##### **Overview Of Amazon Web Services :**

To make our application work efficiently we need to utilize the services of the cloud. As we are going to implement the amazon web services, some of its resources are quite useful. The AWS Cloud provides a large set of infrastructure services, such as calculating power, storage options, networking and databases that are distributing as a utility: on-demand, available in seconds, with pay-as-you-go pricing. From data warehousing to deployment tools, directories to satisfied delivery, over 90 AWS services are accessible. New services can be sustained quickly, without upfront capital consumption. This allows enterprises, start-ups, small and medium-sized businesses, and customers in the public sector to approach the building blocks they need to react quickly to changing business requirements. This whitepaper provides you with an overview of the benefits of the AWS Cloud and introduces you to the services that make up the platform. With the cloud, businesses no longer need to plan for and buy up servers and other IT infrastructure weeks or months in advance. Instead, they can directly spin up hundreds or thousands of servers in minutes and give results faster.

Today, AWS provides a reliable and cost effective platform in the cloud that powers businesses in 190 countries around the world. They are steadily expanding global infrastructure to help their customers to achieve lower latency and higher throughput, and also ensure that their data resides only in the AWS region they specify. As their customers grow their businesses, AWS will continue to provide infrastructure that meets their global requirements. The AWS Cloud infrastructure is built around availability Zones. Availability Zones consist of one or more datacenters, each with power, networking facility, and connectivity, housed in separate facilities. These Availability Zones offer you the ability to operate production applications and databases that are more highly available, fault tolerant, and scalable than would be possible from a single data center. The AWS Cloud operates 42 Availability Zones within 16 geographic Regions around the world, with five more Availability Zones and two more Regions came online in 2017. Each Amazon Region is designed to be completely outlying from the other Amazon Regions and also it attains the greatest possible defect tolerance and stability. Each Availability Zone is outlayed, but the Availability Zones in a Region are connected through low-latency links.

Amazon Elastic Compute Cloud (Amazon EC2) is also a kind of web service which provides secure, resizable enuncerate capacity in the cloud. It is designed to make web-scale measuring easier for developers. The Amazon EC2 simple web service interface allows you to obtain and configure capacity with minimal friction. It provides you with complete control of your measuring resources and lets you run on Amazon's proven computing environment. Amazon EC2 decrease the time required to obtain and boot new server instances (called Amazon EC2 instances) to minutes, allowing you to quickly scale capacity, both up and down, as your measuring requirements change and also it changes the economics of computing by empowering you to pay only for capacity that you actually use. It provides developers and system administrators the tools to build failure resilient applications and isolate themselves from common failure scenarios.

##### **Storage Services**

###### **Amazon S3**

Amazon Simple Storage Service (Amazon S3) is object storage with a web service interface which is used to store and retrieve data from anywhere on the web. It is designed to deliver 99.999999999% durability, and scales past trillions of objects worldwide. You can use Amazon S3 as main storage for cloud-native applications; as a bulk repository storage, or "data lake," for analytics; as a target for backup and recovery and disaster recovery; and with server less computing. It's simple to move large volumes of data into or out of Amazon S3 with Amazon's cloud data relocating options. Once data is stored in Amazon S3, it can be automatically tiered into lower cost, longer-term cloud storage classes like Amazon S3 standard - Infrequent Access and Amazon Glacier for archiving Fig:1.5

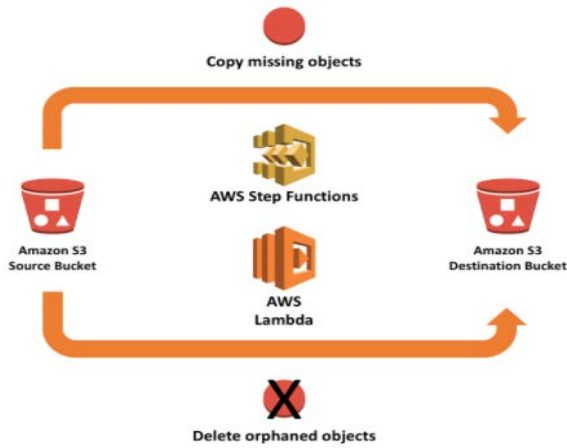


Fig:1.5 S3 architecture

**DATABASE SERVICES**

**Amazon RDS**

Amazon Relational Database Service (Amazon RDS) makes it easy to set up, utilize, and scale a relational database in the cloud. It provides cost-efficient and resizable capacity while managing time-consuming database administration tasks, releasing you up to focus on your applications and business. Amazon RDS provides you six familiar database engines to choose from, including Amazon Aurora, PostgreSQL, MySQL, Maria DB, Oracle, and Microsoft SQL Server.

Benefits:

- **Fast and Easy to Administer:** Amazon RDS makes it easy to go from project creation to deployment. Use the AWS Management, the AWS RDS Command Line Interface, or simple API calls to entrance the potentiality of a production-ready relational database in minutes. No need for infrastructure suppling, and no need for installing and maintaining database software.
- **Highly Scalable:** You can scale your database's measuiring and storage resources with only a few mouse clicks or an API call, often with no downtime. Many Amazon RDS engine types allow you to begin one or more read copies to offload read traffic from your primary database instance.
- **Secure:** Amazon RDS makes it easy to control network gaining access to your database. Amazon RDS also lets you run your database instances in Amazon VPC, which enables you to isolate your database samples and to connect to your existing IT infrastructure through an industry-standard encrypted IPsec VPN. Many Amazon RDS engine types offer encryption at rest and encryption in progress.
- **Inexpensive:** You pay very low rates and only for the resources you actually pre-occupy. In addition, you benefit from the option of On-Demand pricing with no up-front or long-term commitments, or even lower hourly rates using our Reserved Instance pricing.

**Application Services**

**Amazon API Gateway**

Amazon API Gateway is a fully directed service that makes it easy for developers to create, publish, maintain,

monitor, and secure APIs at any scale. With a few clicks in the AWS Management Console, you can create an Appliaction Interface that acts as a “front door” for applications to see data, business logic, or functionality from your back-end services, such as workloads running on Amazon EC2, code running on AWS Lambda, or any web application. Amazon API Gateway handles more tasks involved in accepting and processing up to hundreds of thousands of concurrent API calls, including traffic management, authorization and access control, monitoring, and API version management.



Fig:1.6: Database Engines

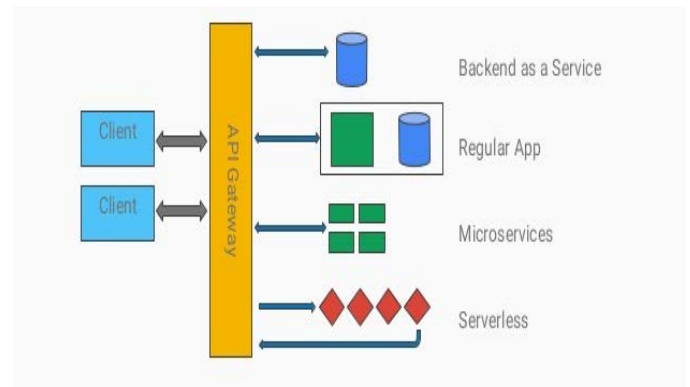


Fig1.7API Gateway Architecture

**RESULTS:**

An electronic management in a Hospital or a Nursing Home would require to very accurate and must result into cost cutting and systemetic management. We have developed this revolutionary product” Hospital Management System” is very detailed in its approach and suit all environments including large, medium or small sites. The crucial points that “Hospital Management System” emphasis on are listed in the following paragraph. You will require less number of staff to care more patients in very less time. You would have the choice to re-deploy them at other satisfactorylocations.Hospital Management System not only provides an opportunity to the hospital to enhance their patient care but also can increase the convinence of the organization.Hospital Management System would enable Hospitals or Nursing Homes to serve the rapidly growing number of health care consumers in a cost effective manner.Hospital Management System can also save more money on your current computer hardware shopping. Hospital administrators would be able to

crucially improve the operational control and thus streamline operations. This would enable to improve the response time to the demands of patient care because it computerize the process of collecting, collating and retrieving patient information. The senior doctors would spend his precious time more in clinical activities than to put in clerical activities otherwise. Accounting sometimes becomes awfully pathetic and complex. This product will eliminate any such complexity. Very important for some, the reduced cost of the manpower would pay for the cost of this product within a short time after its implementation.

#### **CONCLUSION:**

AWS provides building blocks that you can gather quickly to support practically any workload. With AWS, you will find a complete set of highly available services that are designed to work together to build experienced scalable applications.

You have access to highly durable storage, low-cost compute, high-performance databases, management tools, and more. All this is available without up-front cost, and you pay for only what you use. These services develop organizations move faster, lower IT costs, and scale. AWS is beloved by the big enterprises and the hottest start-ups to power a wide variety of workloads, including web and mobile applications, game development, data processing and warehousing, storage, archive, and many others.

#### **FUTURE SCOPE**

The project Hospital Management System (HMS) is for computerizing the working in a hospital and it improves manual system. The computerization of the system has increase process speed. In the current system, the front office managing system was thoroughly checked and tested with dummy data thus is found to be very reliable. The software takes care of all the requirements of an average hospital and is efficient to provide easy and helpful storage of information related to patients that come up to the hospital. Several agents have been created using web services and inter agent communication is done. It also provides billing facility on the basis of patient's status whether it is an indoor or outdoor patient. The system also provides the facility of backup as per the requirement. Using this application, we can retrieve patient's history with a single click. Thus processing information will be faster. It guarantees accurate maintenance of Patient details. It easily reduces the book keeping task and thus reduces the human effort and increases accuracy speed.

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