

COMPX527 – Technology Assessment Report

Total Marks: 20

Due: 11 October 2023 Objectives

The main objectives of this assignment are as follows:

- Gain experience preparing a technology assessment report
- Understand cloud data security and cloud application security requirements
- Understand legal and compliance concerns of cloud computing

Scenario

You have joined a company that has a nationwide chain of national health centres in New Zealand called NZHealth. The company runs health centres across the country and provides all kind of health related services for their customers. At the time of your appointment, the company was going through the process of evaluating cloud computing and has decided to move their technology infrastructure, platforms, data, and software applications to the cloud. The decision on the modalities and architecture of such a move, however, is yet to be made.

As your first job assignment with the team, you are asked to prepare a report for the company. This is a management level report that discusses the pros and cons of different architectures that the company can opt for. This document will be pivotal in deciding the type of NZHealth services (like doctor's appointment and online medical records etc.) the company would like to move to the cloud environment and any liabilities they would have to accept. Before you begin working on the document, you need to understand their current technology architecture, what they want to do in the near future and their long-term plans.

Current Situation

The organisation's present information technology (IT) infrastructure is on premise. They have developed a specialised application for managing the patient records (i.e. electronic medical record or EMR), doctor's appointments, prescription records, and staff attendance. Individual patients have to call the health centre to book an appointment and a staff member assists them in doing so. A good portion of their customers are of old age and might not be that familiar with computers.

Individual health centres do not share their patient information with other health centres until the patient requests to do so. This in most cases is carried out when patients move their residences and want to register to the health centre near their new residences. Such a move is performed securely using strong cryptographic mechanisms and offline chain of trust courier. The mechanisms require the patients' data to be encrypted and copied onto USB sticks that are then couriered to the destination health centres.

Short Term Plan

NZHealth wants to move some of their services to the cloud environment. These services include:

1. A secure and fully centralised database that holds the records of all the patients their health centres serve. However, only the health centre the patient is registered with can access the patient records.
2. A secure and fully centralised database of patient bookings, doctor's and staff attendance.
3. A fully managed website that provides their customers with following services:
 - Patient can book an appointment online.
 - Patient can view his/her medical record online.
 - Patient can get in touch with his/her doctor (using an email style communication).
 - Patient can pay for doctor's appointments, and prescriptions etc.

Long Term Plan

NZHealth has seen phenomenal growth in past five years and their projections show this trend being maintained for next five years. Therefore, to remain the market leader the company has an ambitious long term technology road map. In the long term they would like to provide:

1. Online appointments between doctors and patients using Software-as-a-Service applications (e.g. online calendar and instant messaging services, video conferencing etc.).
2. Wearable medical device for monitoring a patient's health-related data (such as body temperature and electrocardiogram). An individual patient can purchase this device to monitor and track his/her personal health. The tracker will store the monitored data in a secure and fully centralised database. Doctors can then use this information to better understand the patient's healthcare needs and concerns.
3. NZHealth will implement healthcare data analytics software to analyse patients' medical records (including scanned medical images and health-related data monitored by medical wearable devices) for public health informatics. This software will be operated by a Platform-as-a-Service provider.
4. As more patient data is moved to the cloud, NZHealth wants to be able to share patient data securely, with proper access control and seamlessly between health centres without the hassle of physical delivery. This will of course still be only done if requested by the patient.
5. NZHealth will expand their business to Australia.

Report

Based on the information provided above, prepare a report that includes the following:

1. [5 marks] A discussion of different cloud service delivery architectures (i.e. Software-as-a-Service, Platform-as-a-Service, and Infrastructure-as-a-Service) and their relevance to NZHealth.
2. [5 marks] A discussion of cloud data security and application security issues and potential solutions in the context of NZHealth.
3. [5 marks] A discussion on how scalability, availability, and flexibility can be achieved in your chosen architecture. Keep in mind NZHealth's long term plan.

4. [5 marks] A discussion on legal and compliance issues concerning the NZHealth's plans for the cloud deployment.

Report Requirements

This is an individual assignment. You must provide valid references for all materials you source your information from. The report should be self-contained – readers should not be required to read additional material to understand it. The report should not exceed 6 pages (excluding references and figures).

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