Google Cloud

Enterprise Database Migration Case Study - Rio Health Systems, Inc.

Module 2

About

Rio Health Systems is a worldwide manufacturer and distributor of healthcare-related equipment and supplies. They are based in the United States and have offices around the world. They have three manufacturing facilities, one in Texas, one in Mexico, and the third in India. Their home office is in Dallas, as is their largest distribution center.

Goals

Rio operates two data centers, the main one in Dallas and a second in North Carolina that is primarily used for backups, testing, and disaster recovery. Management would like to retire these data centers and move all operations to Google Cloud. The lease on the North Carolina facility is expiring next year and in three years on the Dallas facility. They want to move completely to the cloud before having to renew the leases on each.

Systems

The following systems have been identified; some are mission-critical and/or customer-facing, others are less critical. Like all big companies, there are many different technologies and databases used in the organization.

SAP

Rio has an SAP implementation that is its main back-office ERP system. It is used for accounting, human resource management, order management, business intelligence reporting, and so on. Hundreds of users access this system daily. The backend database is an Oracle 18c database that has gone through multiple upgrades over many years. The database has grown to around 5 TBs. The database is also accessed by various other programs including a custom web-based reporting application and a number of different batch processes that export data to a data warehouse that is used for analytics.

The Oracle database is replicated in the test facility in North Carolina. This replicated database is used for testing upgrades and changes to the SAP system during development. Backups are stored in both the Dallas and North Carolina data centers.

B-to-B eCommerce Application

Rio partners with a number of third-party healthcare manufacturers and suppliers who leverage their extensive customer network to sell their own products. This is a homegrown system. Partners use it to manage their own inventory and also track sales. The system was written in Java and uses a MySQL backend database. The database is surprisingly large and grows rapidly. The application went live only a couple years ago and is already 2 TB in size.

Marketing Web Application

Like many websites, this started simple and has evolved into a very complex, mission-critical application. The application originated in 1998 and was sponsored by the marketing department. It was first written by a contractor in ASP. Later, it was taken over by the IT department and rewritten using ASP.NET with a SQL Server backend. Features have constantly been added over time. These days customers can manage their catalogs, place orders, and see their order histories. Customers can pay their invoices online and view all of their account information. New customers can sign up.

Today, there is a Web-based frontend application written in Angular and JavaScript. There are also iOS and Android apps. The backend is made available using a number of REST services written in C#.

This application maintains nearly 20 years of sales and customer data. The data is maintained in replicated SQL Server databases in a failover cluster. Backups are taken nightly and copied to the North Carolina data center for disaster recovery. A second smaller copy of the database is maintained in North Carolina for testing and development. The main database is about 10 TB large. The test database is about 1 TB. There is also integration with the SAP system for accounting-related functions.

CRM System

The sales team runs an internal CRM system. The system was developed about 10 years ago based on the open-source Sugar CRM platform. Since then, the system has been highly customized by Rio's internal IT team. The system is written in PHP and uses a MySQL database on the backend. There is about 100 GB of data stored. The sales team of about 500 people worldwide use the system via the Web. There is talk about moving this application to a SaaS platform like Salesforce or Microsoft Dynamics CRM. However, that has not been decided. In the near term, the application has to be moved.

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Logistics Database

The distribution centers rely on an internally developed application to manage inventory and shipping. This application was written in Java and has an Oracle database on the backend that is about 100 GB. There aren't a lot of users, maybe only 50, but it is important and keeps shipments running smoothly.

Data Warehouse

A number of batch processing jobs pull data from SAP, the B2B system, the Marketing Web application, Google Analytics, and other sources. All this data is dumped into a data warehouse which is used by the data science team for analytics and other research projects like machine learning. The data warehouse uses a cluster of PostgreSQL database servers along with a SAN and an HDFS cluster. The data warehouse has grown very large, well over 100 TB. The data warehouse is in the North Carolina data center which is designated for research, testing, backups, and disaster recovery.

Recruiting Database

This is a small application used by some recruiters in HR. It is a simple Ruby on Rails app with a MySQL database that is less than a GB.

Conference Room Scheduler

This is an ASP.NET website with the SQL Server Express database that is used to schedule conference and training rooms. It's not hugely important, but lots of employees use it daily. It would be chaos without it.

Company News and Events

The company runs an internal news and events blog site. The application uses an internal Wordpress site with a relatively small MySQL database. It runs on a single server and is made available to all internal employees. There are about 20 contributors who post information regularly about news, events, job openings, new products, etc.