2019

MapDemoApp

QUICK TECHNICAL GUIDE

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REVISION HISTORY			
DATE	**VERSION**	**DESCRIPTION**	**AUTHOR**
26 March 2019	1.0	Initial Draft	Sachit Rajbhandari
15 April 2019	1.1	Added Amazon EC2 deployment modification	Sachit Rajbhandari

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1 INTRODUCTION

1.1 PURPOSE

The aim of this document is to provide the technical specification of the developed web application – **MapDemoApp,** specifically developed for demonstration purposes.

1.2 PROJECT SCOPE

The scope of this project is limited to demonstration of software development capabilities with geospatial data.

1.3 INTENDED AUDIENCE

The committee member of job interview panels.

2 DESCRIPTION

2.1 PRODUCT PERSPECTIVE

The product is designed to demonstrate the spatial data visualisation using OGC compliant web services as a web application.

2.2 FEATURES

The main feature of this web application is to visualise Local Government Areas (LGAs) in the map of Tasmania, Australia. Other features are list below:

- Ability to display different types of base maps (e.g. theList, USGS, OpenStreetMap).
- Ability to display different spatial layers (e.g. LGAs, Reserves, Water Bodies)
- Ability to show spatial information in map and tabular form.
- Ability to connect to GeoServer to extract map and features information using WMS (Web Map Service) and WFS (Web Feature Service) functionalities.

2.3 OPERATING ENVIRONMENT

The software is deployed as a web application using Tomcat as a web container.

2.4 CONSTRAINTS

This is a demo/prototype application developed with time constraints limited time to 4 days.

2.5 ASSUMPTIONS / DEPENDENCIES

The application is designed to visualise spatial information of LGAs of Tasmania. The application is not limited to show information of a particular place but can be used to visualise spatial information of any location in the map and tabular form.

3 SYSTEM OVERVIEW

3.1 SYSTEM ARCHITECTURE

The system architecture is depicted in Figure 1 to show the system workflow between different components.

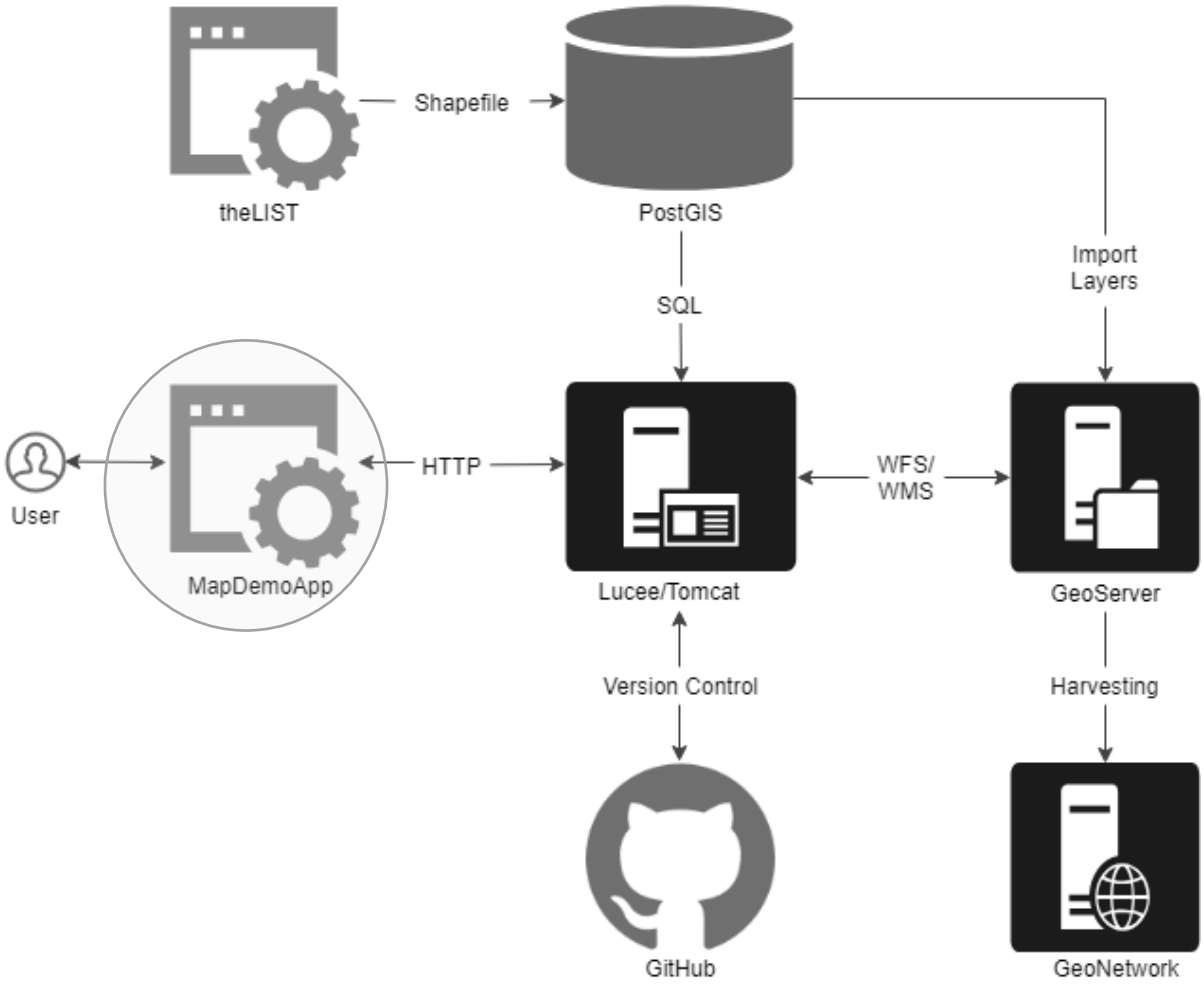

Figure 1: Overall system architecture of MapDemoApp

3.2 SYSTEM COMPONENTS

The system components are broken down as below.

- **MapDemoApp**

  This is the web application we developed in Lucee using CFML (ColdFusion Markup Language) scripting language. The application provides a map and tabular interface to view spatial information of LGAs of Tasmania

  Link: http://52.14.184.156/MapAppDemo/index.cfm

- **Tomcat**
  Apache Tomcat Server is an open-source Java Servlet Container developed by the Apache Software Foundation. We have used Tomcat as web container to serve web pages written in CFML.

  Link: http://tomcat.apache.org

- **theList - External Website**
  The LIST (Land Information System Tasmania) is a contemporary, online service that provides access to integrated land and property information and related services of Tasmania, Australia. In this project, we downloaded shapefile describing LGAs of Tasmania from theList website and exported to the PostGIS database.

  Link: https://www.thelist.tas.gov.au/

- **PostGIS - Database**
  PostGIS is an open source software program that adds support for geographic objects to the PostgreSQL object-relational database. The database server holds all the information populated in the web application.

  Link: https://postgis.net/

- **GeoServer**
  GeoServer is an open source server for sharing geospatial data. Designed for interoperability, it publishes data from any major spatial data source using open standards. We exported spatial data for data interoperability and easy access using WMS and WFS.

  Link: http://geoserver.org/

- **GeoNetwork**
  GeoNetwork is a cataloguing application to manage spatially referenced resources. It provides powerful metadata editing and search functions as well as an interactive web map viewer. We harvested the metadata of Tasmanian map webservice into the GeoNetwork server.

  Link: https://geonetwork-opensource.org/

- **GitHub**
  GitHub is a web-based hosting service for version control using Git. We used GitHub for a distributed version control and source code management.

  Link: https://github.com/

4 REQUIREMENTS OF EXTERNAL INTERFACE

4.1 USER INTERFACES

The user interface has been developed using two framework Calcite and Bootstrap. The screenshots of the application are listed below based on their functionalities.

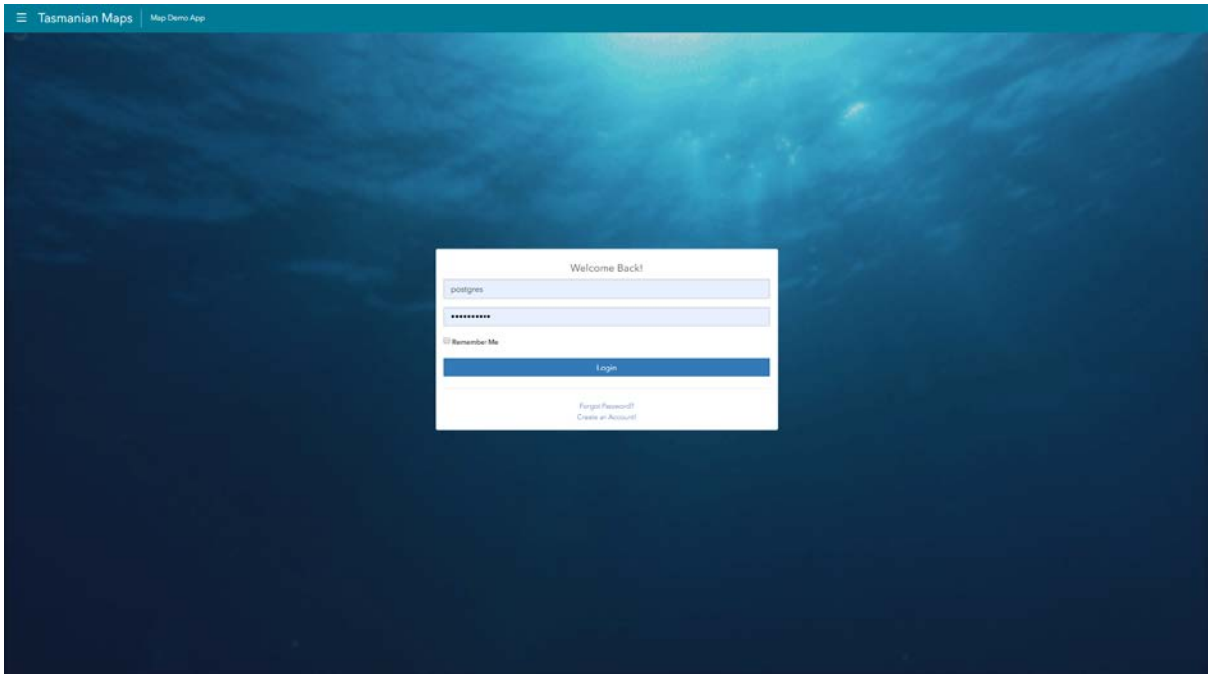

Figure 2: Application home page with a login interface

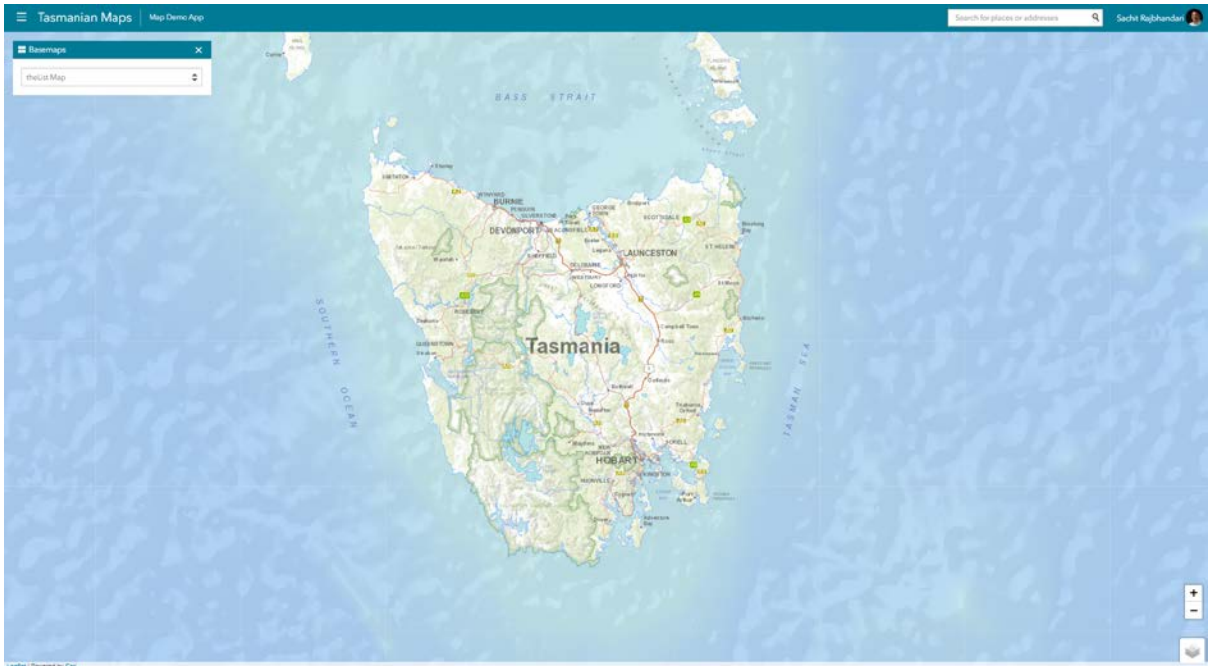

Figure 3: Application Map Viewer page

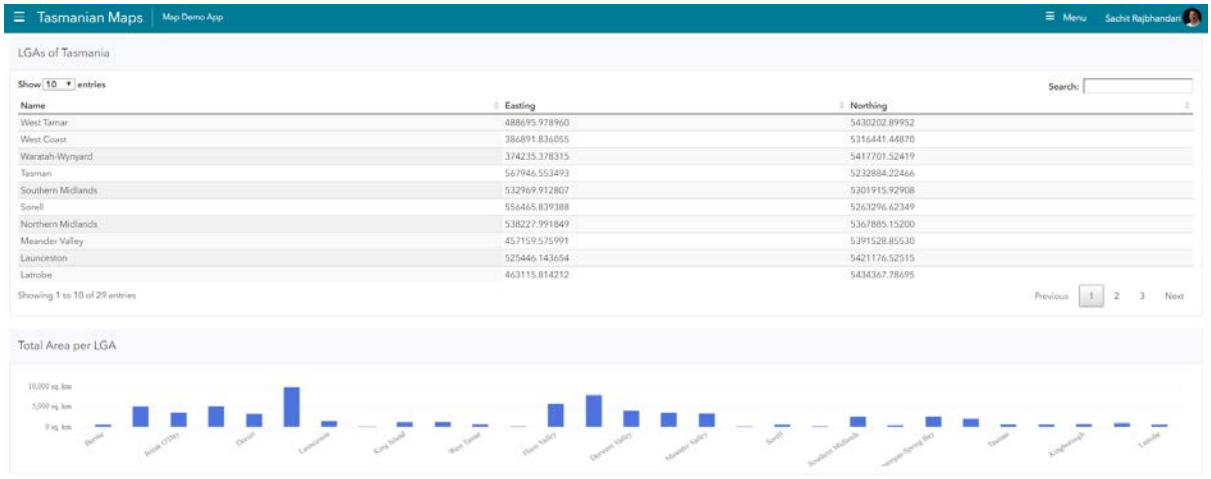

Figure 4: Application Data View Page

Figure 5: Application detail view page

4.2 SOFTWARE INTERFACES

The software is developed using a CFML scripting language and other web development frameworks.

- **Lucee**
  Lucee is the leading open-source CFML application server/engine. Lucee provides a lot of functionality (tags and functions) to deal with all kinds of web related actions.

  Link: https://lucee.org/

- **Calcite Web framework**
  Calcite Web is a branded CSS & JavaScript framework, web style guide, and visual design system for ESRI.

  Link: https://esri.github.io/calcite-web/

- **Bootstrap**
  Bootstrap is a free and open-source front-end web framework. It contains HTML and CSS-based design templates for typography, forms, buttons, navigation and other interface components, as well as optional JavaScript extensions

  Link: https://getbootstrap.com/

5 DEPLOYMENT TO AMAZON WEB SERVICES (AWS) SERVER

The application has been hosted in Amazon AWS Server. In the Free Tier instance, the following services are installed:

- **Amazon EC Elastic Compute Cloud (Amazon EC2)**
  The Tomcat server in a Linux environment has been installed in EC2 Free tier instance.
- **Amazon RDS (Relational Database Service)**
  PostgreSQL has been installed via Amazon RDS. The PostgreSQL has two tables (LGAs and Reserves) imported from the shape file downloaded from theList website.

6 APPENDICES

6.1 APPENDIX A: WEB APPLICATION RELATED LINKS

- **MapAppDemo**: http://52.14.184.156/MapAppDemo/index.cfm
- **GeoServer**: http://52.14.184.156/geoserver/
- **GeoNetwork**: http://localhost:8888/geonetwork/
- **GitHub**: https://github.com/sachitrajbhandari/MapDemoApp

6.2 APPENDIX B: GLOSSARY OF TERMS

AWS	Amazon Web Services
CFML	ColdFusion Markup Language
EC2	Elastic Compute 2
LGA	Local Government Areas
LIST	Land Information System Tasmania
RDS	Relational Database Service
USGS	United States Geological Survey
WFS	Web Feature Service
WMS	Web Map Service