Cassandra Browser Tool

Using Cassandra and Python

Overview

Create a Cassandra Browser tool using python which provides User Interface to access data from Cassandra server.

Functionalities

- **Keyspace Operations** : Create, Drop and Retrieve information about Keyspaces.
- **Column Family Operations** : Create, Index, Drop and Get Description about a Column family.
- **Rows and Columns Operations** : Insert, Delete and Alter.
- **Managing Cluster** : View details such as clusters, machine added to cluster, load on each machine.

Approach

- Create a web application that interacts with Cassandra (Database server) to retrieve information about Keyspaces, Column Family.
- Web Based Application so that user can access using Browser.
- Managing and monitoring backend server of Cassandra nodes.
- Allowing the user to insert into database without knowing about Cassandra Query Language.

Architecture

Backend

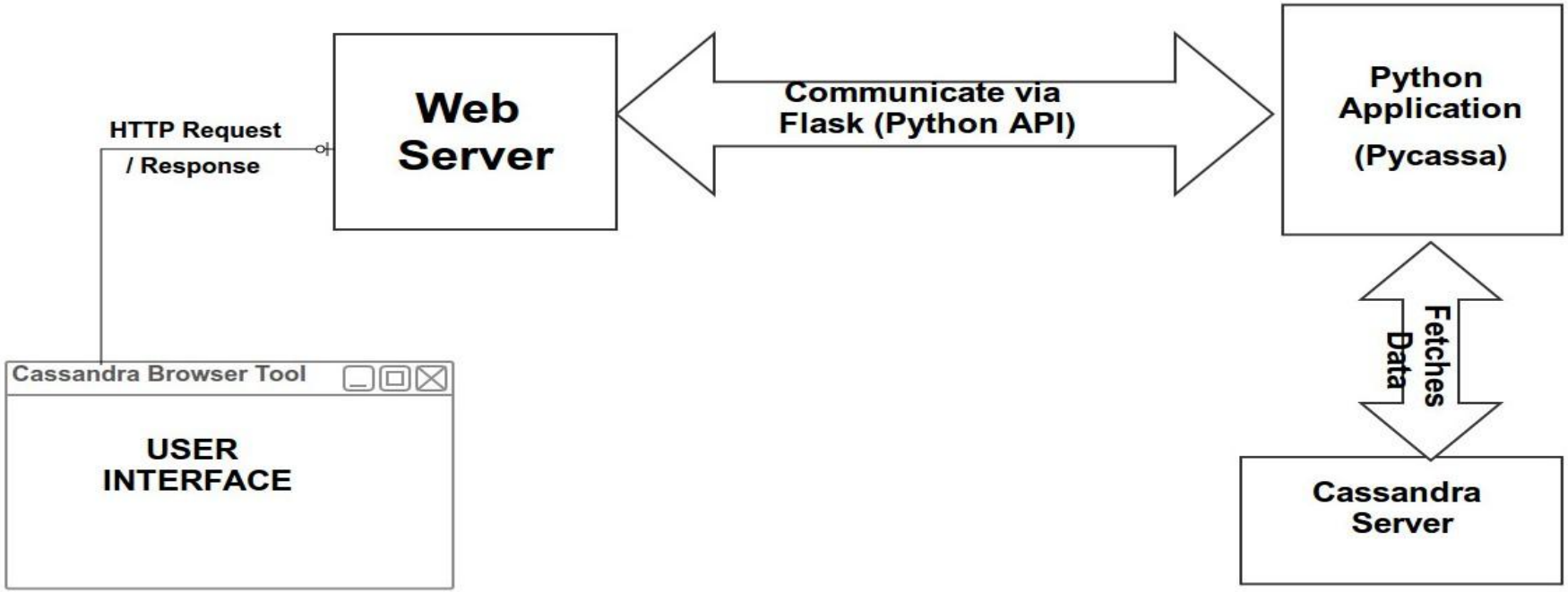
- Creating Cassandra cluster with two to three nodes.
- Use of Pycassa, a python application that will communicate with cassandra to execute queries.
- Use of Flask API in python to create a request and response object which is based on the WSGI (Web Server Gateway Interface).
- A python code which will receive request from the user, fetch result from the cassandra server, then generate Html pages using Jinja2 Templates which will be displayed to the user.

Architecture

Frontend

- Listing out all the functionalities of our application.
- Displaying the information retrieved from the Cassandra server.
- Use of Jinja2 templates for User Interface.
- Layout of our web application includes ::
  - Dashboard : Display of all the Functionalities.
  - Data Model : Structure/ Properties about Keyspace, Column Family and Cluster.
  - Data View : Information about Keyspace, Indexes, Column Family and Cluster.

Work Flow


HTTP Request
/ Response
Web Server
Communicate via Flask (Python API)
Python Application
(Pycassa)
Fetches Data
Cassandra Browser Tool
USER INTERFACE
Cassandra Server

Challenges

- Working of the Cassandra Server on different Clusters.
- When user requests for contents of column family, which is huge, we need to handle:
  - How many rows should we retrieve from the server (If we fetch too many rows, Cassandra server might over-allocate memory).
  - How do we make sure user is able to randomly access any content.
- How to display data specially if there are many columns related to keys.

Link to Code

Source code and Documentation of our project can be checked out at github link : https://github.com/CloudProjectWork/CassandraBrowserTool

Conclusion

- User Friendly web application where the user can fetch data from the Cassandra Server without knowing about Cassandra Query Language.
- Display of the data fetched from the Cassandra server in HTML format using Jinja2 templates.
- Working of cassandra server on different nodes for large database
- A Web Server running which communicates with the UI through HTTP requests and communicates with the python API (Pycassa).

Thank You !!