

Basic Technologies for Web Compliance Engineering.

My CQL Tool

Presented by:
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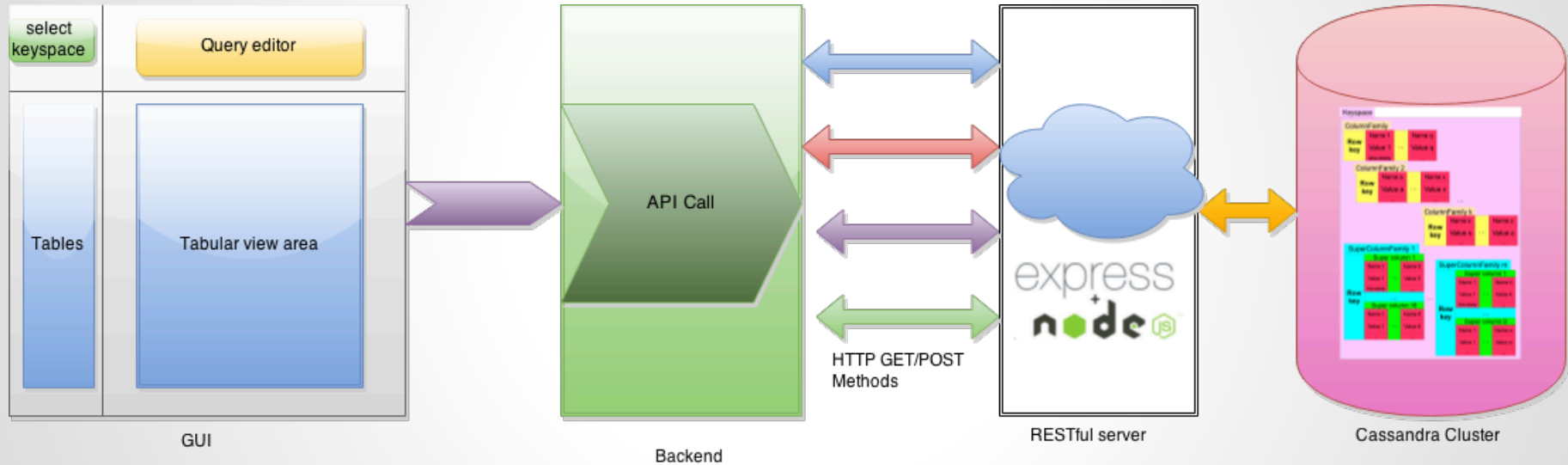
Outline

- Services
- Architecture
- Use Case
- Client App
- Special Features
- Application Server
- RESTful API
- Testing
- Other situations
- Future Development

Services

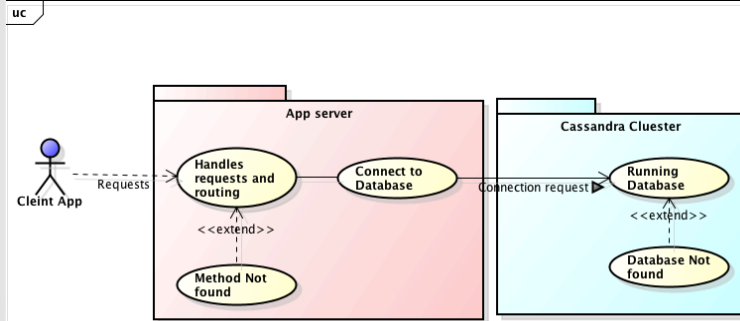
- Connect to Cassandra cluster server running on certain port
- Create and drop keyspaces
- Create and drop tables
- Overview of keyspaces and tables
- Run CQL Query and display results in tabular form.

Architecture

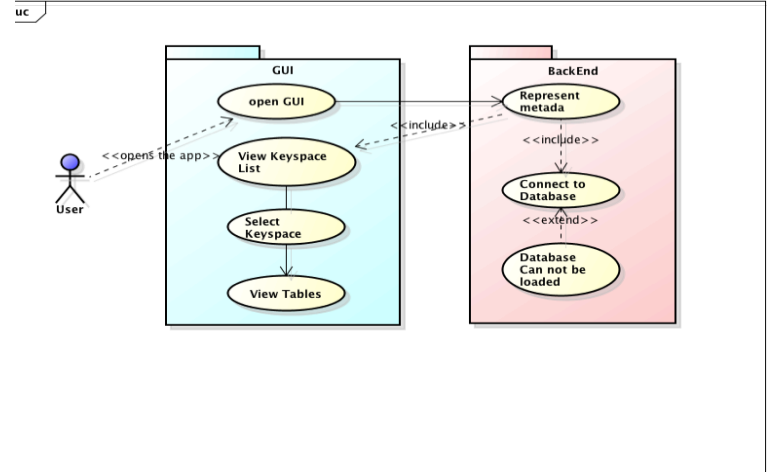


Use Cases:

Connect to DB

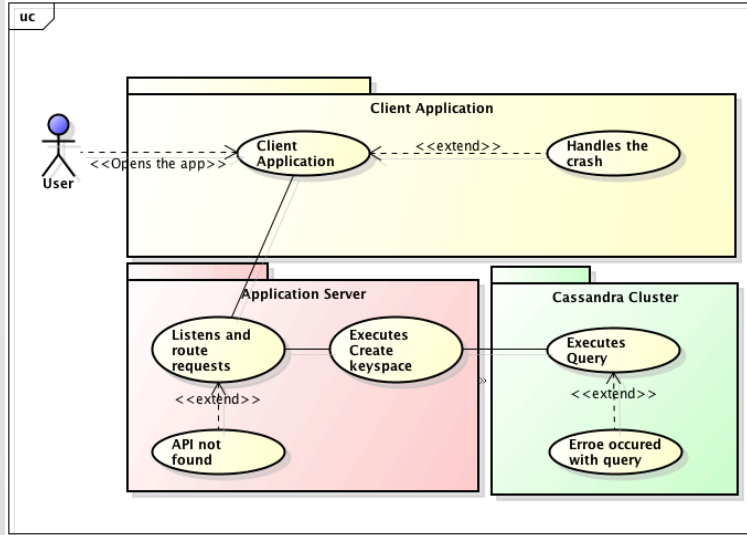


Represent Metadata

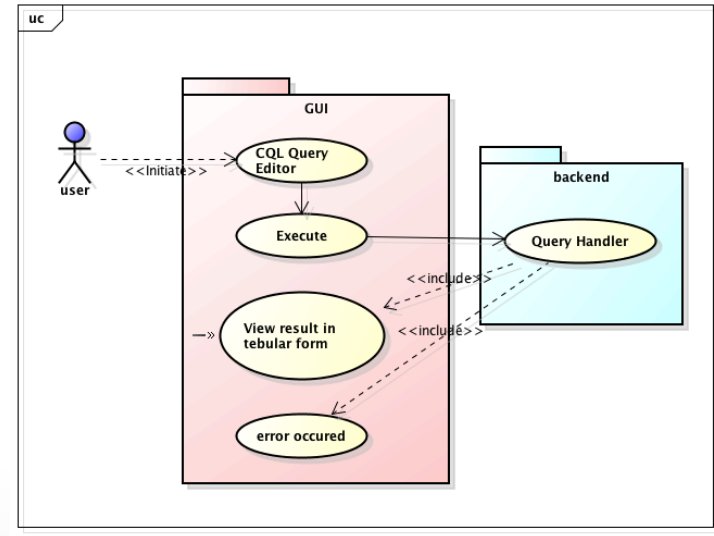


Use Cases:

Represent Keyspaces



CQL Editor



Client Application

User interface: browser-based app

- keyspaces selector

- tables overview

- CQL command line

- tabular results

- special features...

My CQL Tool

Keyspace

system

Tables:

[IndexInfo](#)
[batchlog](#)
[compaction_history](#)
[compactions_in_progress](#)
[hints](#)
[local](#)
[paxos](#)
[peer_events](#)
[peers](#)
[range_xfers](#)
[schema_aggregates](#)
[schema_columnfamilies](#)
[schema_columns](#)
[schema_functions](#)
[schema_keyspaces](#)
[schema_triggers](#)
[schema_usertypes](#)
[size_estimates](#)
[sstable_activity](#)

CQL statement:

type in CQL query

Run CQL »

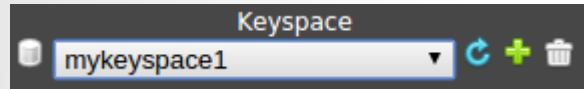
Overview of table size estimates

Number of Records: 3328

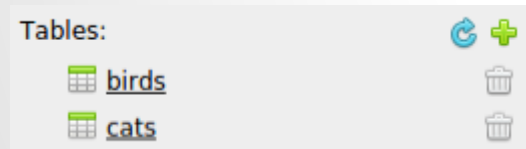
keyspace_name (PK)	mean_partition_size	partitions_count	range_end (CK)	range_start (CK)	table_name (CK)
system_auth	[object Object]	[object Object]	-990219552907357567	-1103457967010078166	resource_role_permissions_index
system_auth	[object Object]	[object Object]	-1103457967010078166	-1103992242597111486	resource_role_permissions_index
system_auth	[object Object]	[object Object]	-1103992242597111486	-1144641328944410969	resource_role_permissions_index
system_auth	[object Object]	[object Object]	-41319359936443052	-116751166315239679	resource_role_permissions_index
system_auth	[object Object]	[object Object]	-1144641328944410969	-1171372384824296801	resource_role_permissions_index
system_auth	[object Object]	[object Object]	-1171372384824296801	-1201742660918417900	resource_role_permissions_index
system_auth	[object Object]	[object Object]	-1201742660918417900	-1207785835897666962	resource_role_permissions_index
system_auth	[object Object]	[object Object]	-1207785835897666962	-1305316423443225218	resource_role_permissions_index
system_auth	[object Object]	[object Object]	-1305316423443225218	-1311165689598858537	resource_role_permissions_index
system_auth	[object Object]	[object Object]	-1311165689598858537	-1527991239444340190	resource_role_permissions_index
system_auth	[object Object]	[object Object]	-1527991239444340190	-1661031014154940661	resource_role_permissions_index
system_auth	[object Object]	[object Object]	-1661031014154940661	-1734924651970579622	resource_role_permissions_index
system_auth	[object Object]	[object Object]	-1734924651970579622	-1763923718308128642	resource_role_permissions_index
system_auth	[object Object]	[object Object]	-1763923718308128642	-1781996774838622898	resource_role_permissions_index
system_auth	[object Object]	[object Object]	-1781996774838622898	-1852940623819439191	resource_role_permissions_index
system_auth	[object Object]	[object Object]	-1852940623819439191	-1967254877214537277	resource_role_permissions_index
system_auth	[object Object]	[object Object]	-1967254877214537277	-2061571480698597288	resource_role_permissions_index
system_auth	[object Object]	[object Object]	-2061571480698597288	-2083846874503565746	resource_role_permissions_index
system_auth	[object Object]	[object Object]	-2083846874503565746	-2088580870486707763	resource_role_permissions_index
system_auth	[object Object]	[object Object]	-2088580870486707763	-2097374578081574995	resource_role_permissions_index
system_auth	[object Object]	[object Object]	-2097374578081574995	-2106123296480884157	resource_role_permissions_index
system_auth	[object Object]	[object Object]	-2106123296480884157	-2126384047235759735	resource_role_permissions_index
system_auth	[object Object]	[object Object]	-2126384047235759735	-2302044148409793017	resource_role_permissions_index
system_auth	[object Object]	[object Object]	-2302044148409793017	-2331072623181859021	resource_role_permissions_index
system_auth	[object Object]	[object Object]	-2331072623181859021	-2338142728768663675	resource_role_permissions_index
system_auth	[object Object]	[object Object]	-2338142728768663675	-2348438692368287559	resource_role_permissions_index

Special Features

shortcut to create/drop/refresh keyspaces



shortcut to create/drop/refresh tables



```
CREATE TABLE table_name (  
    clmn1_name_type PRIMARY KEY,  
    clmn2_name type  
);
```

Special Features

overview of table columns

including partition keys and clustering keys

Overview of table *dogs*

Number of Records: 3 (+)

block_id (PK)	breed (PK)	color (CK)	short_hair
e1b3a06c-c133-11e4-8dfc-aa07a5b093db	labrador	blond	true
9fcd6a40-c13b-11e4-8dfc-aa07a5b093db	labrador	silver	true
9fcd6608-c13b-11e4-8dfc-aa07a5b093db	german shepherd	mixed	true

template to insert into tables

Overview of table *dogs*

Number of Records: 3 (+)

```
INSERT INTO dogs(block_id,breed,color,short_hair)
VALUES ( ... );
```

Special Features

multiple queries at one submit

CQL statement:

```
CREATE TABLE users ( id INT PRIMARY KEY, name TEXT );  
INSERT INTO users ( id, name ) VALUES ( 1, 'diandian' );  
INSERT INTO users ( id, name ) VALUES ( 2, 'mohammad' );  
SELECT * FROM users;
```

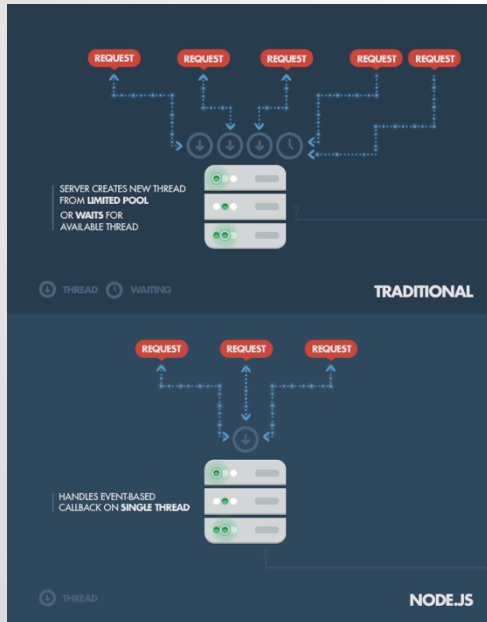
Run CQL »

error message

UI block when executing on server

Application Server

Express server running node.js framework. But why?

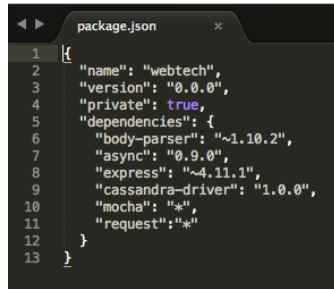


- Faster: uses the V8 engine compiles JavaScript into native machine code.
 - Real-Time Made Easy.
 - Queued Input
- API on top of an Object of DB
 - Data Streaming:
 - Package Managing: NPM
- Gives developers a tool for working in the non-blocking, event-driven I/O paradigm

Application Server

Express server running node.js framework.

Typical View of
package.json file



```
1 {  
2   "name": "webtech",  
3   "version": "0.0.0",  
4   "private": true,  
5   "dependencies": {  
6     "body-parser": "~1.10.2",  
7     "async": "0.9.0",  
8     "express": "~4.11.1",  
9     "cassandra-driver": "1.0.0",  
10    "mocha": "*",  
11    "request": "*"   
12  }  
13 }
```

Basic server

```
var server = app.listen(3000, function() {  
  console.log('Express Server Listening on port %d',  
    server.address().port);  
});
```

Connection to the cluster

```
var client = new cassandra.Client( { contactPoints : [ '127.0.0.1' ] } );  
client.connect(function(err, result) {  
  if (err) {  
    console.log(err);  
  } else {  
    console.log('Cassandra: Connected To the Database.');  }  
});
```

Run Server

```
vessilliii: ~/repos/web2.0project/server  
→ node server.js  
Express Server Listening on port 3000  
Cassandra: Connected to the Database.
```

RESTful API

method	url	description
GET	/keyspaces	get list of keyspaces in the database
GET	/tables	get list of tables in a certain keyspace
GET	/columns	get list of columns and their type of a table in a keyspace
GET	/select	execute SELECT CQL command (safe)
POST	/query	execute an arbitrary CQL command (dangerous!)
POST	/create/keyspace	create a keyspace with a certain name
POST	/create/table	create a table with a certain name in a certain keyspace
POST	/drop/keyspace	drop a certain keyspace
POST	/drop/table	drop a certain table in a certain keyspace

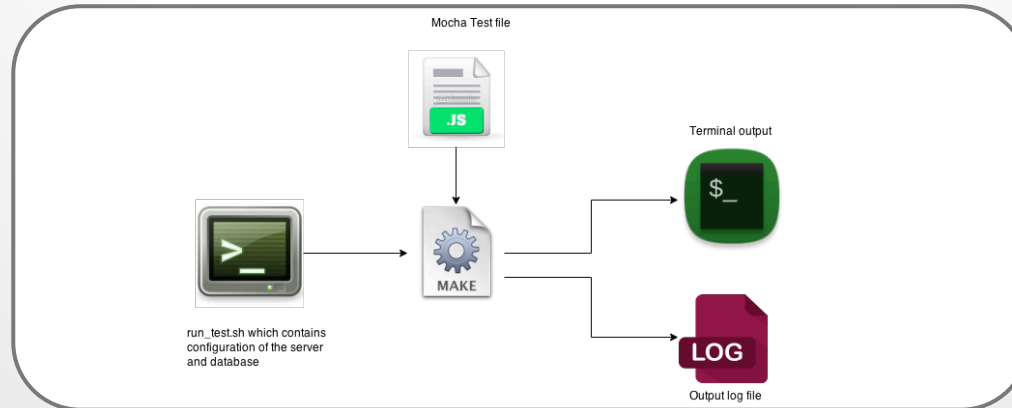
Testing

Unit Testing Frameworks for Nodejs:

- Mocha
- Should JS
- Sinon JS
- Nock
- Supertest
- Istanbul

Why Mocha:

- Easy to Setup
- Keep test file small which makes possible to focus on particular unit of code.
- Makes asynchronous testing simple.



Other situations

Enable CORS:

```
app.use(function(req, res, next) {  
  res.header("Access-Control-Allow-Origin", "*");  
  res.header("Access-Control-Allow-Headers", "Origin, X-Requested-With, Content-Type, Accept");  
  next();  
});
```

We have Used git to manage our source code hosted at BitBucket.

Future Development

- Improve the CQL editor with auto suggestion, code highlighting.
- Validate CQL query string on the client side.
- Provide menu options to Drop Keyspace, tables.
- Improve GUI with contextual menu items, Drag and drop.

Thank you