

# Detail Analysis of BBB Source Code

## Contents

<b>1 Total Directories</b>	<b>2</b>
1.1 List of the Directories	2
<b>2 Platform used</b>	<b>2</b>
2.1 Programing language used	2
2.1.1 Java	2
2.1.2 Groovy	2
2.1.3 Scala	3
2.1.4 ActionScript	3
2.2 Framework used	3
2.2.1 Grails	3
2.2.2 FlexSDK	3
2.2.3 Zoolu	3
2.3 Compilation Build tools	4
2.3.1 ANT	4
2.3.2 Gradle	4
2.3.3 POM	4
2.3.4 Maven	4
2.4 Datastore tool	4
2.4.1 Redis	4
<b>3 Main Components</b>	<b>5</b>
3.1 bbb-client	5
3.1.1 Development Environment for bbb-client	5
3.1.1.1 Language used	5
3.1.1.2 Location of dir in dev environment & swf files	6
3.1.1.3 Compilation tool	6
3.1.1.4 Example for Compilation	6
3.1.2 Directory structure details of bbb-client	7
3.1.2.1 Compiled directory	7
3.1.2.2 Build Process	8
3.1.2.3 Source code	8
3.1.2.3.1 src	8
3.1.2.3.1.1 Assets	8
3.1.2.3.1.2 branding	8
3.1.2.3.1.3 conf	8

3.1.2.3.1.4	org	8
3.1.2.3.1.5	test	8
3.2	bbb-web	9

## Source Code Directoires details <sup>1</sup>

# 1 Total Directories

There are total 15 directoires in the source code of bbb in which 13 directories we have to explore, As most of the works is dependent on these directories.

## 1.1 List of the Directories

1. BBB-api-demo
2. bbb-common-message
3. bbb-video
4. bbb-voice
5. bbb-voice-conference
6. bigbluebutton-apps
7. bigbluebutton-client
8. bigbluebutton-config
9. bigbluebutton-web
10. deskshare
11. esl-client-bbb
12. labs
13. record-and-play

# 2 Platform used

The project used different platform for language,build process,frame work and database.

## 2.1 Programing language used

Most of the development in bbb is based on java. But it has also used some other languages for the development of other modules and all the languages are java platform based.

- [Java](#)
- [Groovy](#)
- [Scala](#)
- [ActionScript](#)

### 2.1.1 Java

Almost every module contain Java code.

### 2.1.2 Groovy

Its Oops java platform based language,It can be used as scripting language for java platform. In bbb most of the work of groovy is on bbb-web and bbb-common-message.In bbb-common-message it has used for the program to initiate the task of room, participant, Iroomlistner. Groovy 1.6.5 version is used in bbb.

```
room.groovy= Methods for user id join id etc
participant.groovy= Methods are called which are define in above program
IRoomparticipant.groovy= Interface of methods are define
To add new api one of the changes we need to do is in this .groovy files.
location in bbb--> /dev/bigbluebutton/bbb-common-message/src/./conference
```

In bbb-web it contains the program file for generate slie,api-controler,presentation controler. Groovyc is used to compile groovy script.

### 2.1.3 Scala

Its a object-functional programing and scripting language for general software application.In bbb Scala is use for deskshare application. Scala version 2.9.2 is use in bbb. For more info visit [site](#).

```
Location of scala in bbb ~/dev/bigbluebutton/deskshare/app/src/main/scala/org/bigbluebutton/deskshare/server$
```

### 2.1.4 ActionScript

Mainly used in bigbluebutton client development.

## 2.2 Framework used

Different frame work is used by bbb for various platform.

- [Grails](#)
- [FlexSDK](#)
- [Zoolu](#)

### 2.2.1 Grails

Its an open source web application frame work. It takes the advantage of groovy programing language.Most of the server components are based on the grails (groovy).

### 2.2.2 FlexSDK

Its a software development kit based on adobe flash, It is donated to Apache software foundation.Most of the work is on bbb-client as the bigbluebutton client is written in action script . Flex 4.5.0 is used in bbb. At the time of complation for the bigbluebutton-client using ANT,Flex is used to convert .as file in swf.

### 2.2.3 Zoolu

Its a content managment system (cms) for creating, editing and publishing of content in a website.It is use for bbb-voice in bigbluebutton.

```
Location for the Zoolu files /dev/bigbluebutton/bbb-voice/src/main/java/org/zoolu/
this is location is for development environement. Which mostly contain network related java files.
```

```
Compiled version has files inside /usr/share/red5/webapps/sip/WEB-INF/classes/org/zoolu/
```

## 2.3 Compilation Build tools

Compilation is the process to convert the source code files(.as,.java,.groovy) into compiled executable files (swf, class). Build tools used in bbb are.

- [ANT](#)
- [Gradle](#)
- [POM](#)
- [Maven](#)

### 2.3.1 ANT

Another neat tool (ANT) a build tool, and provide special support for java programming language. Its a platform independent and has the instruction in the form of xml. Its use to automate the repetitive task. This can be compiling the source code, running software test and creating files and documentation for the software development. ANT version 1.7.1 is used in bbb. ANT compilation is used by *bigbluebutton-client*, *bigbluebutton-web*, *deskshare-applet*.

```
swf files generated by the ANT are store in /bigbluebutton-client/bin directory
```

### 2.3.2 Gradle

It is a project automation tool, it is build upon the concept of ANT and Maven. It uses groovy based DSL domain specific language

```
Compiation using gradle is used in the bbb-api-demo,bbb-common-message,bbb-video,voice, bigbluebutton-apps ,bigbluebutton-web,deskshare/app/applet,els-client,labs.
```

```
Gradle version 0.8 is used in bbb
```

### 2.3.3 POM

Its a fundamental unit to work with Maven. Its an xml file contain the information about the project and configuration detials used by Maven to build the project.

```
pom.xml file is inside bbb-api-demo,bigbluebutton-web,esl-client-bbb. In the compile version it is inside /usr/share/maven-repo/
```

### 2.3.4 Maven

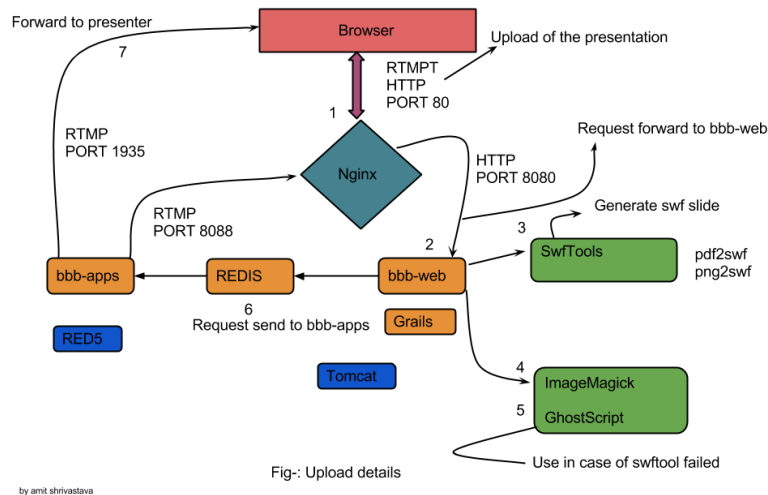
Apache Maven is a software project managment and comprehension tool. It is based on Pom.Maven can manage project build,reporting and documentation.

## 2.4 Datastore tool

BBB do not manage lots of data to store, So there is no mysql database tools. Most of the data it manages are in for of meeting id some other value which it needed to communicate between the bbb-web and bbb-apps.

### 2.4.1 Redis

Redis stand for REmote DIctionary Sever . It is a key-value store, often refferd as a NoSQL database. Key-value store the data called value inside a key. The data can be retrived with help of keys only.It is also term as in-memory<sup>2</sup> system.



### 3 Main Components

- bbb-client
- bbb-web
- bbb-app
- deskshare
- bbb-api

This component is use creating the client environment,When it join the conference room. bbb-client use application api like chat,participation,voice and ppt.

### 3.1.1 Development Environment for bbb-client

# ActionScript

### 3.1.1.2 Location of dir in dev environment & swf files

```
/dev/bigbluebutton/bigbluebutton-client/
```

After the compilation the swf executable file generated is store in ../../../../bin

### 3.1.1.3 Compilation tool

Ant is used for the compilation. Which contains build.xml file, which has the details of the project.

### 3.1.1.4 Example for Compilation

In the example I will change the css and the copy-right logo of bigblue button.

- Example 1. Changing the footer

1. Step: Change the environment to the development environment, using bbb-conf command.

```
bbb-conf --setup-dev client
```

2. Step: Change the directory to bigbluebutton-client inside the dev.

```
$ cd ../../src/org/bigbluebutton/main/views$
```

3. Step: Open the file MainApplicationShell.mxml

```
$ vim MainApplicationShell.mxml  
edit the line 311
```

```
<mx:Label text="{ResourceUtil.getInstance().getString('bbb.mainshell.copyrightLabel2',[appVersion]) + ' India-- Rocks!'}" id="copyrightLabel2"/>
```

4. Step: Compile the code using Ant

```
$ cd bigbluebutton-client  
$ ant
```

It will take 3-4 min to compile the code.

5. Step: Type the url in browser and you will the change at the footer of the client.

- Example 2. Changing the copyright

1. Step: Change the directory and open the file bbbResource.properties

```
$ cd bigbluebutton-client/locale/en_US$  
$ vim bbbResource.properties
```

2. Step: Make changes in line 6

```
which the variable for copyrightLable2  
and save the file
```

3. Step: move to the bigbluebutton-client directory and compile the code

```
new swf will be created in bin/  
open the browser and you will find the changes.2. Step: Make changes in line 6
```

```
which the variable for copyrightLable2  
and save the file
```

3. Step: move to the bigbluebutton-client directory and compile the code

```
$ ant locales  
new swf will be created in bin/  
open the browser and you will find the changes.
```

- Example 3. Changing the CSS

1. Step: Change the directory

```
$ cd src/branding/css
```

2. Step: open the file theme.css

```
$ vim theme.css  
and change the color code as per your requirement.
```

3. Step: Compile the code using ant<sup>3</sup>

```
ant branding -DthemeFile=theme.css
```

4. Step: Deploying the swf file to production server.

```
Create a directory in /var/www/bigbluebutton/client  
$ mkdir branding/css
```

```
Copy the swf file which is in bin/ on dev directories to new created directory
```

```
enable the branding in config file.  
$ vim /var/www/bigbluebutton/client/conf/config.xml  
  
<skinning enabled="true" url="branding/css/theme.css.swf" />
```

### 3.1.2 Directory structure details of bbb-client

It contains 3 type of directories.

- Compiled directories for production server
- Build process directory
- Source code file of ActionScript

#### 3.1.2.1 Compiled directory

- `bin`: It contains the swf file after compilation
- `client`: Contain BigBlueButton.html and swf files
- `libs`: libraries
- `locale`: Contain the languages
- `resource`:

### **3.1.2.2 Build Process**

- `build`: Contain jar file library for build.
- `build.xml`: Details of project.

### **3.1.2.3 Source code**

#### **3.1.2.3.1 src**

Contain all the source code file in ActionScript,mxml.

*Directory inside src*

#### **3.1.2.3.1.1 Assets**

js script to check the flash player.

#### **3.1.2.3.1.2 branding**

contain css to change the theme.

#### **3.1.2.3.1.3 conf**

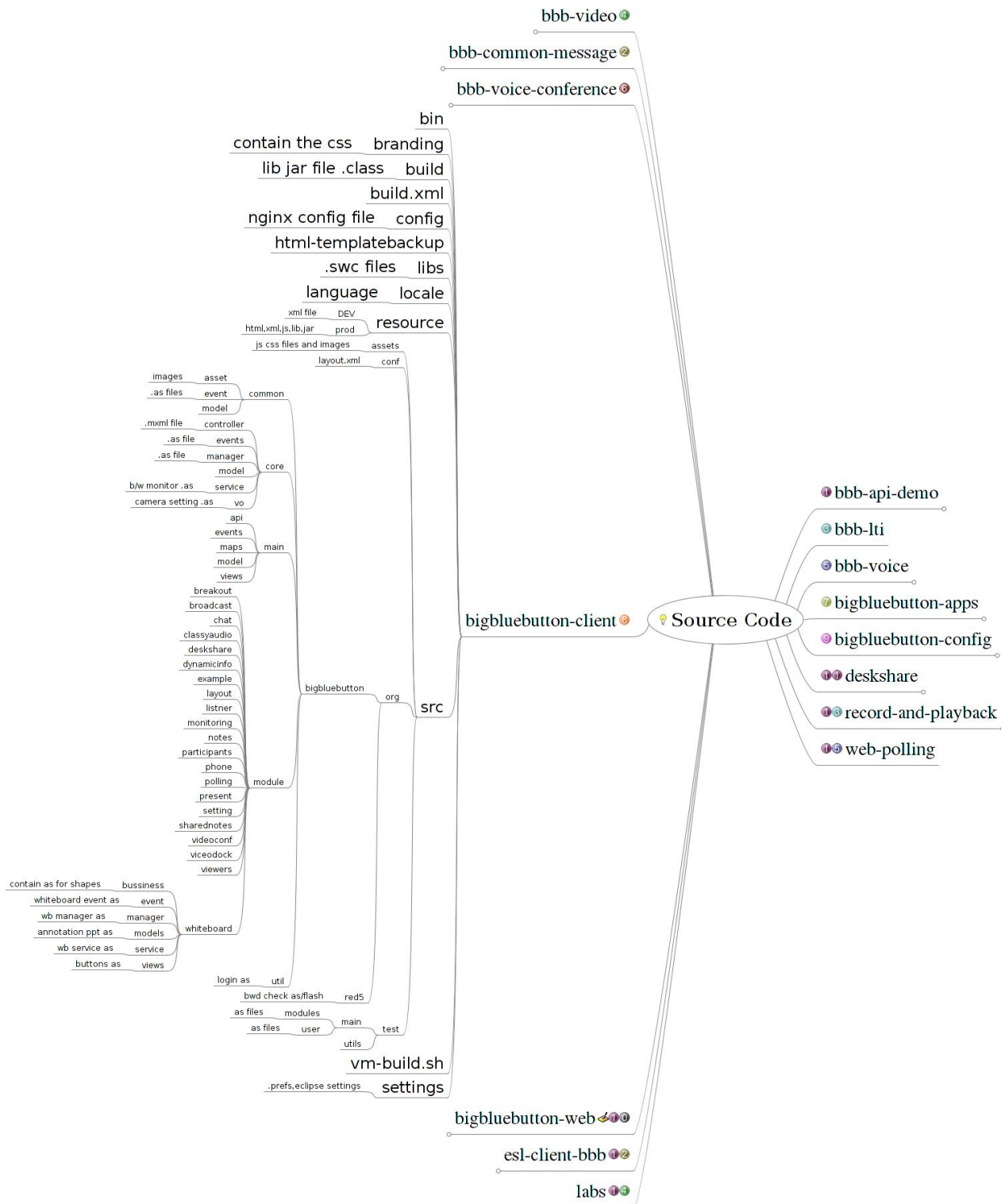
Contain .xml file to add the modules.

#### **3.1.2.3.1.4 org**

Contain ActionScript and many dir

#### **3.1.2.3.1.5 test**





## 3.2 bbb-web

---

1  
2  
3

In memory database system (IMDB) is the database management system which primarily relay on the main memory.  
while compiling dir should be bigbluebutton-client/