



Chatter

CS5500 – Spring 19

Team Number: 212

Team Members:

Syed Aman Alam

Attinder Singh

Mitresh Pandya

Kumar Baibhav

Goal : To Build a Chat Application using Java

- User registration with unique user name
- User login
- User Search
- User to user chat
- Group creation
- Group chat
- Unread messages
- Wire tapping
- Profanity Filter
- Message translation to another language
- Chat Recall
- Follow users to check their online status

Technology Stack

- Programming Language: Java
- Database: MySQL
- CI/CD: Jenkins
- Server: AWS EC2, AWS RDS
- Quality Metrics: SonarQube, SonarLint
- IDE: IntelliJ, Eclipse
- Version Control: Git
- Project Management Tool: Jira

Stepping Stone



Communication protocol between client and server



Java sockets were used for communication channel



JSON message format for message exchange



Gson parser used for marshalling/unmarshalling messages



Messages were distinguished based on message type(enum)



Non blocking IO were used on both client and server

Design Patterns Used

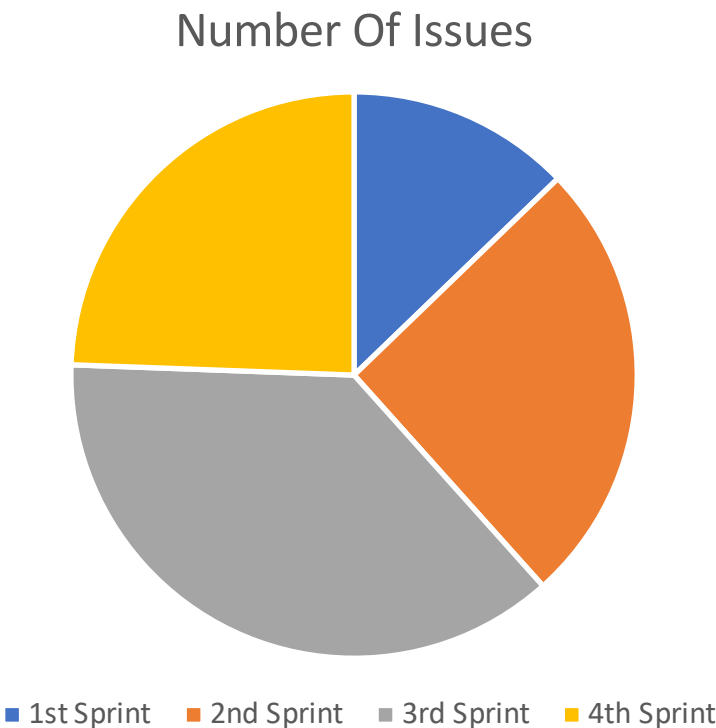
- Factory Pattern
- Command Pattern
- Singleton Pattern
- Observer Pattern
- Model View Controller (Architectural Pattern)

Takeaways:

- Did the team accomplish sufficient functionality?
 - We completed the main parts of the 4 major pillars of requirements namely
 - ☐ Users and Groups
 - ☐ Communication
 - ☐ The Government
 - ☐ Extras / Other Thoughts
- Did the team achieve what it was set out to do?
 - A product which is ready for end user is available to use.
 - EC2 link : ec2-13-59-164-30.us-east-2.compute.amazonaws.com
 - RDS link : team212instance.c1wqnkcqbuje.us-east-2.rds.amazonaws.com:3306
- Is it useful for the client?
 - This software provided functionality which is akin to the popular software Slack provided by Slack technologies and hence is very popular and useful to users.

Takeaways (continued)

- Is there any evidence to support these claims?



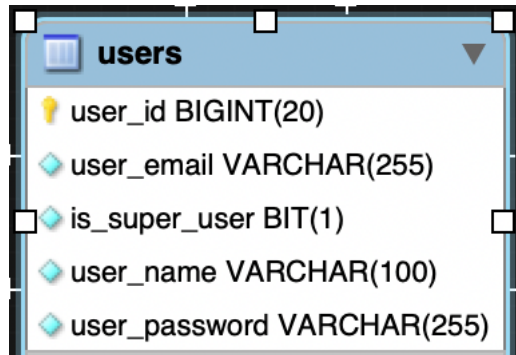
Stats taken from Jira

Sprint	Number Of Issues
Sprint 1	11
Sprint 2	22
Sprint 3	32
Sprint 4	21

Functionality

User Registration

- Every user needs to be registered with unique id in order to use chat application
- Message type: *CREATE_USER*
- Table structure:



A screenshot of a database management tool showing the structure of a table named 'users'. The table has five columns: 'user_id' (BIGINT(20) with a primary key icon), 'user_email' (VARCHAR(255)), 'is_super_user' (BIT(1)), 'user_name' (VARCHAR(100)), and 'user_password' (VARCHAR(255)).

users	
user_id	BIGINT(20)
user_email	VARCHAR(255)
is_super_user	BIT(1)
user_name	VARCHAR(100)
user_password	VARCHAR(255)

- Passwords are stored in encrypted text
- is_super_user flag differentiates between normal user and admin user
- On successful registration, the user gets logged into the system

User Registration

Welcome to Chatter Application

1. Login

2. Registration

Or Enter \q to quit

INPUT: Enter From above Options:

2

INFO: Hi, Please Enter the following details to register.

INPUT: Enter User Name

kumar6

INPUT: Enter Password

kumar6

INPUT: Enter Password Again

kumar6

LOADING

DONE

SUCCESS: Account Created Successfully!

1. Unread Messages

2. Chat user

3. Group Options

4. Follow User options

Or Enter \q to quit

INPUT: Enter From above Options:

User login

- A registered user can login using the credentials created during registration

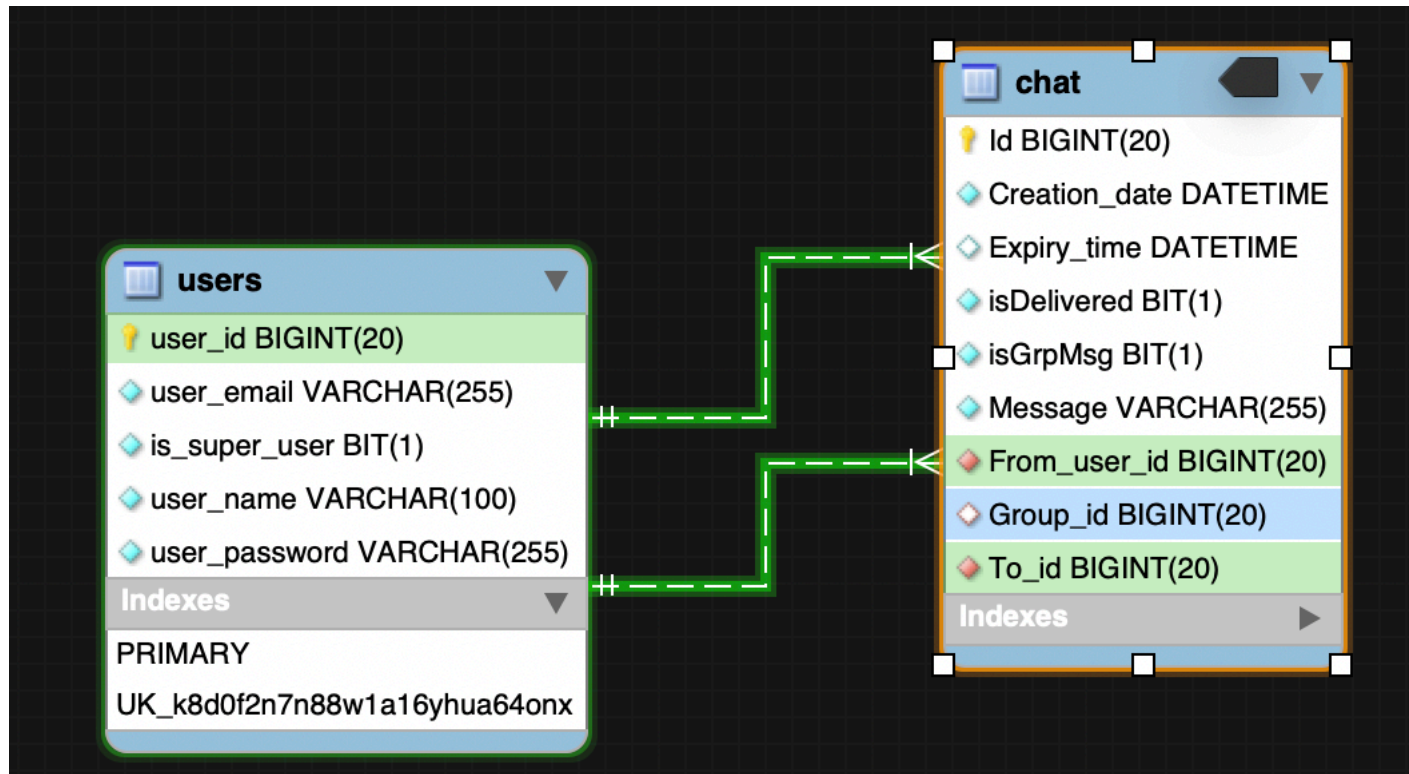
```
Welcome to Chatter Application
1. Login
2. Registration
Or Enter \q to quit
INPUT: Enter From above Options:
```

```
1
INPUT: Enter User Name
kumar6
INPUT: Enter password
kumar6
LOADING
DONE
```

```
WELCOME: kumar6
1. Unread Messages
2. Chat user
3. Group Options
4. Follow User options
Or Enter \q to quit
INPUT: Enter From above Options:
```

User Search and User Chat

- Table Structure:



User Search and User Chat

- After Login a user can chat with another user
 - Search for the user to chat with
 - Initiate chat

```
SEARCH: Enter Username of user you want to chat
kumar5
LOADING
DONE

RESULTS: Users found with name kumar5
1: kumar5
INPUT: Enter one of the user names from above

kumar5
INFO: Chat initiated.
INPUT: Enter Message or enter \q to quit
hello kumar5
```

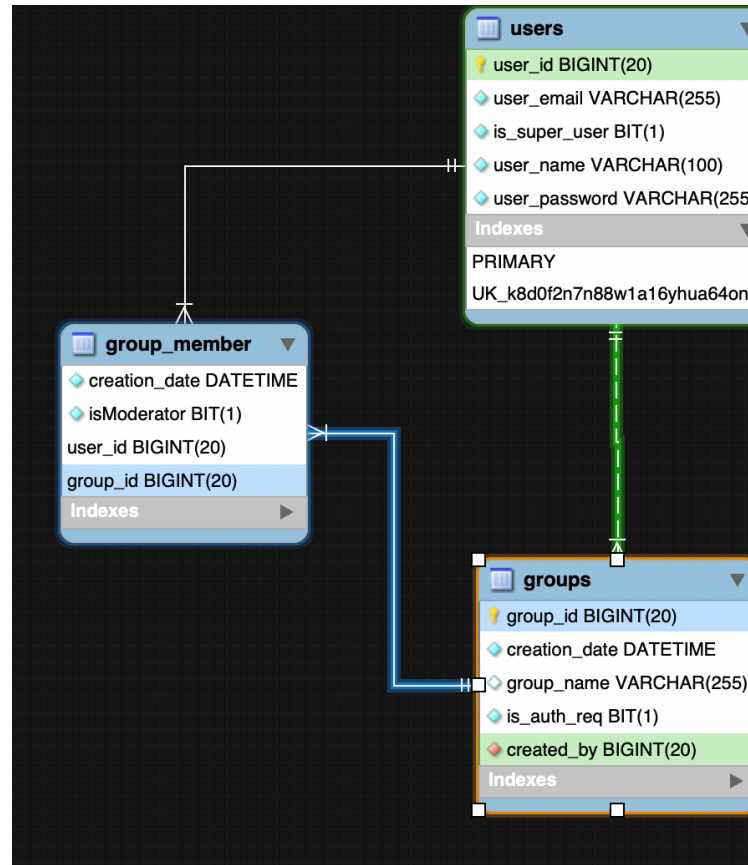
User 1

```
INFO: Chat initiated.
INPUT: Enter Message or enter \q to quit
USER_CHAT-kumar6: hello kumar5
```

User 2

Group Creation

- Groups can be created by a registered user
- Tables:



Group Creation

- By default the creator of the group becomes the moderator
- Group members can add other users to group
- Only moderator can remove any user from group

```
1. Create Group
2. Update Group
3. Group Chat
4. Delete Group
Or Enter \b to go back or \q to quit
INPUT: Enter From above Options:
1
INPUT: Enter Group name you want to create:
cssss
LOADING
DONE

SUCCESS: Group Added: cssss
1. Add Users
2. Delete Users
Or Enter \b to go back or \q to quit
INPUT: Enter From above Options:
1
INPUT: Enter name of users to be added split by ","
kumar1
LOADING.
DONE

SUCCESS: Users Added:
Following Users got added :["kumar1"]
```

Group Update

```
1. Create Group
2. Update Group
3. Group Chat
4. Delete Group
Or Enter \b to go back or \q to quit
INPUT: Enter From above Options:
2
INFO: Let's see how many groups you belong to; Fetching
LOADING.
DONE

INFO: You are part of following groups:
GROUP NAME:      abc      CAN MODIFY THIS:      YES
GROUP NAME:      \b      CAN MODIFY THIS:      YES
GROUP NAME:      kjh      CAN MODIFY THIS:      YES
GROUP NAME:      cssss    CAN MODIFY THIS:      YES
INPUT: Enter name of the group you want to modify from
```

```
INPUT: Enter name of the group you want to modify from above:
cssss

1. Add/delete Users.
2. Add/delete Moderators.
3. Rename Group
3
INPUT: Enter the new name of group: cssss
css
LOADING
DONE
```


Group Delete

1. Create Group
2. Update Group
3. Group Chat
4. Delete Group

Or Enter \b to go back or \q to quit

INPUT: Enter From above Options:

4

INFO: Let's see how many groups you belong to; Fetching all your groups that you can modify...

LOADING.

DONE

INFO: You are part of following groups:

GROUP NAME:	css	CAN MODIFY THIS:	YES
-------------	-----	------------------	-----

GROUP NAME:	abc	CAN MODIFY THIS:	YES
-------------	-----	------------------	-----

GROUP NAME:	\b	CAN MODIFY THIS:	YES
-------------	----	------------------	-----

GROUP NAME:	kjh	CAN MODIFY THIS:	YES
-------------	-----	------------------	-----

INPUT: Which of the above groups do you want to delete? Enter name of that group...

css

LOADING

DONE

Group Chat

Any user of a group can post and read group messages

```
SUCCESS: Successfully deleted group: css
1. Create Group
2. Update Group
3. Group Chat
4. Delete Group
Or Enter \b to go back or \q to quit
INPUT: Enter From above Options:
3
SEARCH: Enter Group you want to chat in
abc
LOADING
DONE

abc
INPUT: Enter one of the Group names from above

abc
INFO: Chat initiated.
INPUT: Enter Message or enter \q to quit
hello group members
```

Group user 1

```
1. Create Group
2. Update Group
3. Group Chat
4. Delete Group
Or Enter \b to go back or \q to quit
INPUT: Enter From above Options:
3
SEARCH: Enter Group you want to chat in
abc
LOADING
DONE

abc
INPUT: Enter one of the Group names from above

abc
INFO: Chat initiated.
INPUT: Enter Message or enter \q to quit
GROUP_CHAT-kumar6 : hello group members
```

Group user 2

Unread Messages

A user can view his/her unread messages from another user or group

```
WELCOME: kumar1
1. Unread Messages
2. Chat user
3. Group Options
4. Follow User options
Or Enter \q to quit
INPUT: Enter From above Options:
1
LOADING.
DONE
```

GROUP MESSAGES:

```
*****

FROM: kumar6 TIME: Sun Apr 21 13:56:26 EDT 2019 MESSAGE: where is the party tonight
FROM: kumar6 TIME: Sun Apr 21 13:56:30 EDT 2019 MESSAGE: lets rock
*****
```

CHAT MESSAGES:

```
*****

FROM: kumar6 TIME: Sun Apr 21 13:55:36 EDT 2019 MESSAGE: hello Kumar1
FROM: kumar6 TIME: Sun Apr 21 13:55:43 EDT 2019 MESSAGE: how are you doing today
*****
```

1. Unread Messages

Wire Tapping : User Chat

For compliance, wire tapping feature enables to tap chat

```
1. Get All Conversations for a particular User for user to user chat
2. Get All Conversations for a particular User for all group chats
3. Get All Conversations for a user for both user to user chat and group
4. Get All Conversations for a particular Group
1
Enter the name of user to tap into his/her user2user chats:
kumar6
Do you want to get requested chats for specific dates or do you want to get all dates of the requested types?
Press 1 to get all requested chats irrespective of dates
Press 2 to enter specific dates and get chats for those time frames
1
LOADING
DONE

Conversations for a particular User for user to user chat
FROM: kumar5 TIME: Sat Apr 20 23:27:54 EDT 2019 MESSAGE: \b
FROM: kumar1 TIME: Sun Apr 21 14:01:43 EDT 2019 MESSAGE: Are you there
FROM: kumar1 TIME: Sun Apr 21 14:01:54 EDT 2019 MESSAGE: Can we hjaave a quick call
```

Wire Tapping: Group Chat

Enter the group name for which you want to get all the conversations from:

abc

Do you want to get requested chats for specific dates or do you want to get all dates of the requested types?

Press 1 to get all requested chats irrespective of dates

Press 2 to enter specific dates and get chats for those time frames

1

LOADING

DONE

Conversations for a particular Group irrespective of user

FROM: kumar6 TIME: Sun Apr 21 13:43:31 EDT 2019 MESSAGE: hello group members

FROM: kumar6 TIME: Sun Apr 21 13:43:31 EDT 2019 MESSAGE: hello group members

FROM: kumar6 TIME: Sun Apr 21 13:56:26 EDT 2019 MESSAGE: where is the party tonight

FROM: kumar6 TIME: Sun Apr 21 13:56:27 EDT 2019 MESSAGE: where is the party tonight

FROM: kumar6 TIME: Sun Apr 21 13:56:30 EDT 2019 MESSAGE: lets rock

FROM: kumar6 TIME: Sun Apr 21 13:56:31 EDT 2019 MESSAGE: lets rock

Profanity Filter

This feature filters out the obscene language.

```
kumar6  
INFO: Chat initiated.  
INPUT: Enter Message or enter \q to quit  
USER_CHAT-kumar6: hello  
USER_CHAT-kumar6: ***
```

```
kumar1  
INFO: Chat initiated.  
INPUT: Enter Message or enter \q to quit  
hello  
ass
```

Message Translation

This feature enables a user to translate the chat to different language

```
kumar1
INFO: Chat initiated.
INPUT: Enter Message or enter \q to quit
\t
INPUT: Enter the language you want to translate to, e.g en for english, es for spanish
es
INPUT: Enter the message
thank you
AUTH_ACK Translated Message Sent!
```

User 1

```
kumar6
INFO: Chat initiated.
INPUT: Enter Message or enter \q to quit
USER_CHAT-kumar6: gracias
```

User 2

Chat Recall

A user can recall last n chat messages, if they are undelivered

```
kumar6
INFO: Chat initiated.
INPUT: Enter Message or enter \q to quit
Are you there
Can we hhave a quick call
\r
INPUT: Enter Number of messages you want to unsend.
CAUTION: Only unseen messages can be unsend.
1
1
AUTH_ACK Messages recalled: 1
```

User 1

```
WELCOME: kumar6
1. Unread Messages
2. Chat user
3. Group Options
4. Follow User options
Or Enter \q to quit
INPUT: Enter From above Options:
```

```
1
LOADING.
DONE
```

GROUP MESSAGES:

```
*****
*****
```

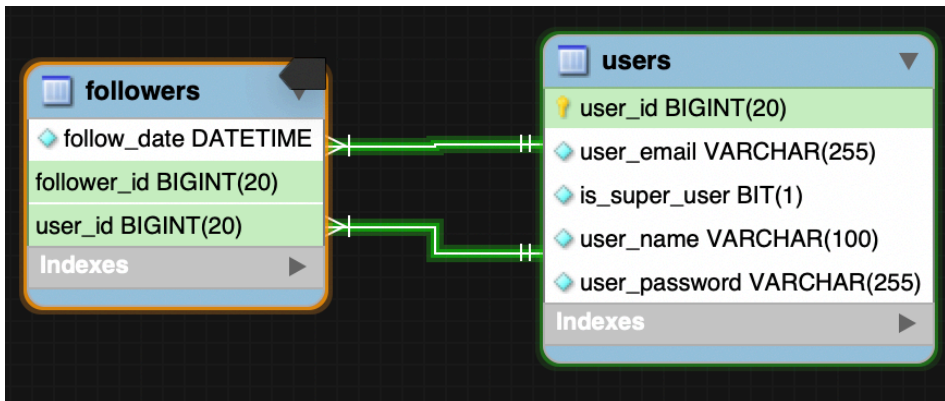
CHAT MESSAGES:

```
*****
FROM: kumar1 TIME: Sun Apr 21 14:01:43 EDT 2019 MESSAGE: Are you there
*****
```

User2

Follow Users and Online Status

- A User can follow any other user
- User can check the online status of the users that he/she is following
- Table Structure:



```
INPUT: Which user from above do you want to follow?
```

```
kumar1
```

```
You are now a follower of kumar1
```

```
1. Follow a User
```

```
2. List my followers
```

```
Or Enter \b to go back or \q to quit
```

```
INPUT: Enter From above Options:
```

```
1
```

```
INPUT: Enter User name you want to follow:
```

```
kumar
```

```
LOADING
```

```
DONE
```

```
kumar
```

```
kumar1
```

```
kumar5
```

```
INPUT: Which user from above do you want to follow?
```

```
kumar5
```

```
You are now a follower of kumar5
```

```
1. Follow a User
```

```
2. List my followers
```

```
Or Enter \b to go back or \q to quit
```

```
INPUT: Enter From above Options:
```

```
2
```

```
LOADING
```

```
DONE
```

```
RESULTS: Following are your followers.
```

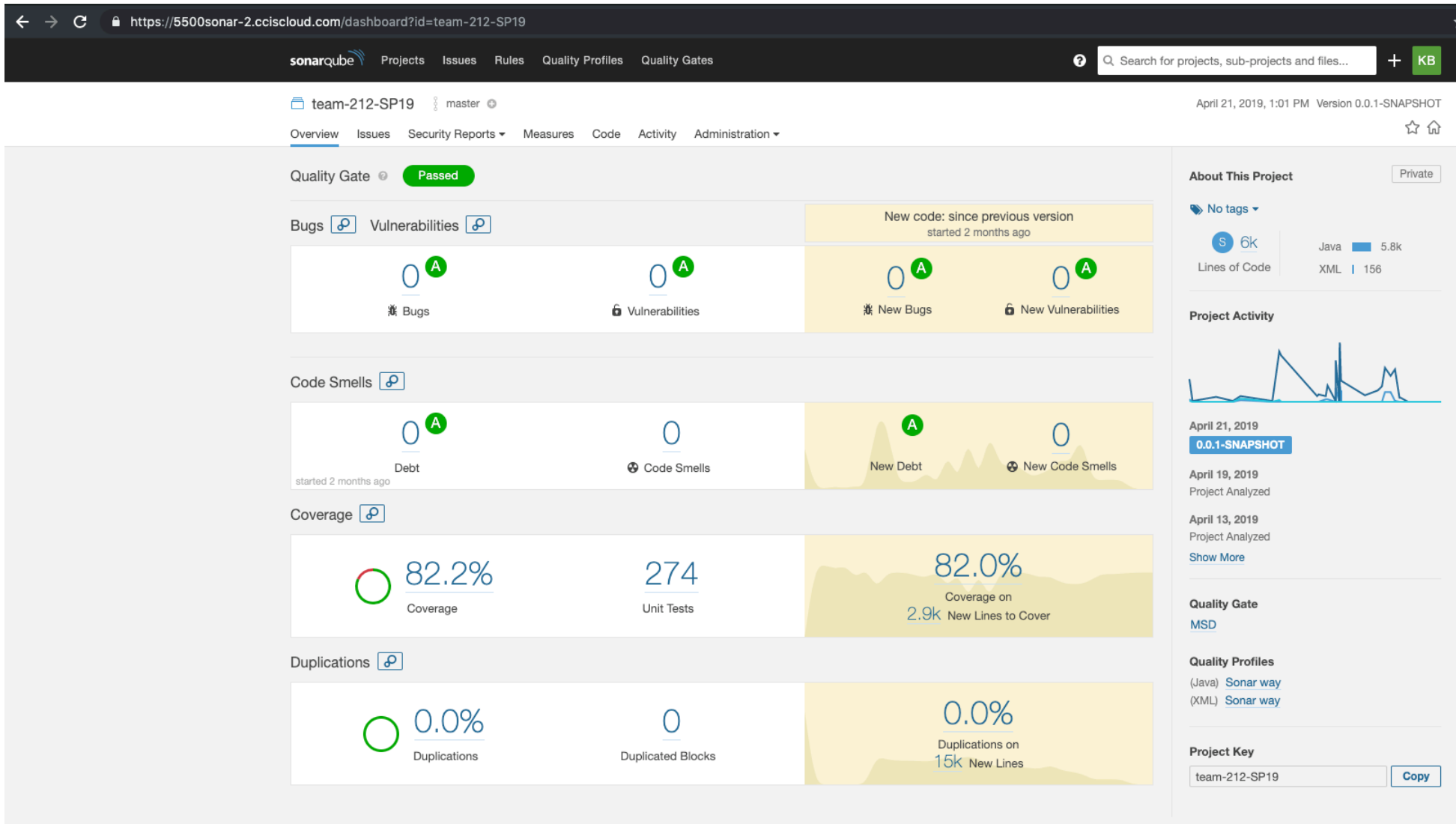
```
1: kumar1 --- Online
```

```
2: kumar5 --- Offline
```

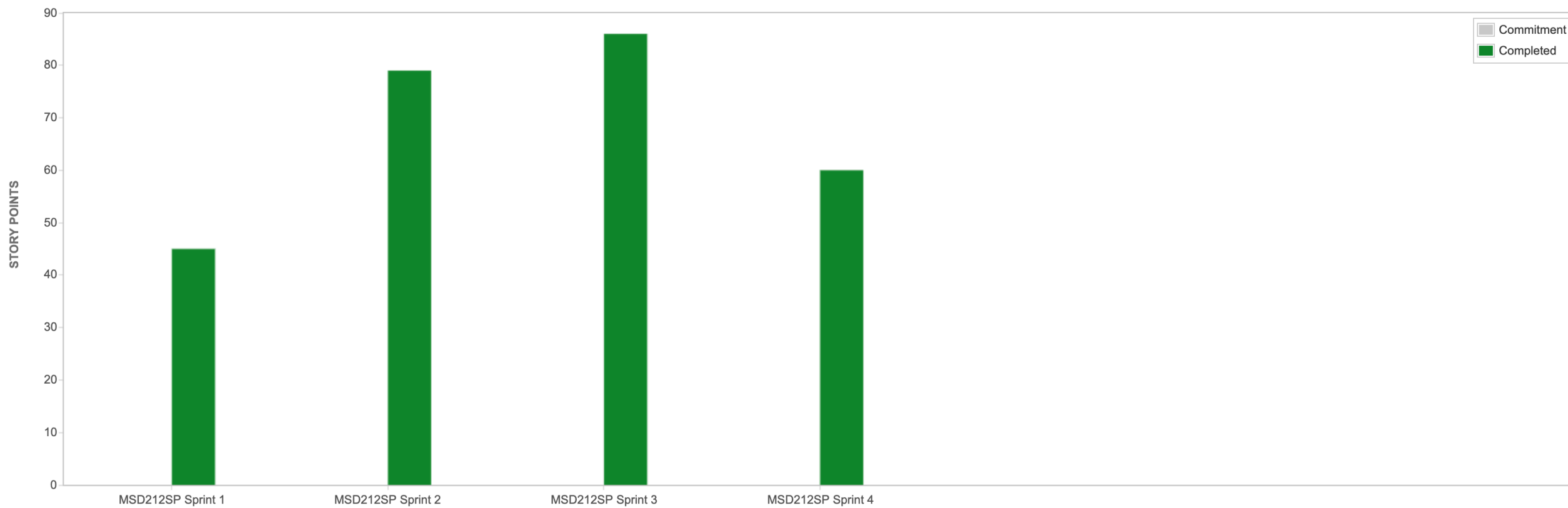
```
=====
```

Job Quality

Product Quality



Team Progress Across 4 Sprints



Sprint	Commitment	Completed
MSD212SP Sprint 1	0	45
MSD212SP Sprint 2	0	79
MSD212SP Sprint 3	0	86
MSD212SP Sprint 4	0	60

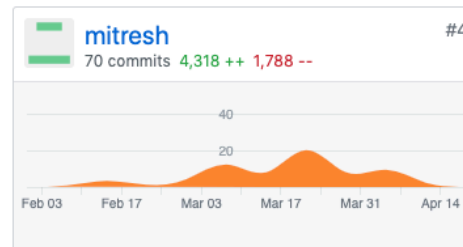
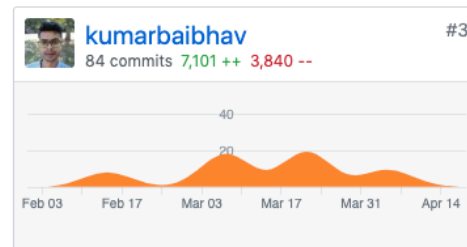
Process and Teamwork

Team Contribution

Feb 3, 2019 – Apr 21, 2019

Contributions: Commits ▾


Contributions to master, excluding merge commits








Automatic Build, Test And Deploy

```
Last login: Sun Apr 21 22:20:10 2019 from 155.33.133.12
ubuntu@ip-172-31-9-173:~$ ls
Chatter-0.0.1-SNAPSHOT-jar-with-dependencies.jar  edu.northeastern.ccs.im.ChatLogger.log  edu.northeastern.ccs.im.ChatLogger.log.lck  nohup.out
ubuntu@ip-172-31-9-173:~$ sudo lsof -i -P -n | grep 4545
java      12121      ubuntu    5u  IPv6 490912      0t0  TCP *:4545 (LISTEN)
ubuntu@ip-172-31-9-173:~$
```

Branch: master ▾ team-212-SP19 / config.json Find file Copy path

 attinder added changes 3b7d6b2 on Mar 19

2 contributors  

11 lines (11 sloc) | 226 Bytes Raw Blame History   

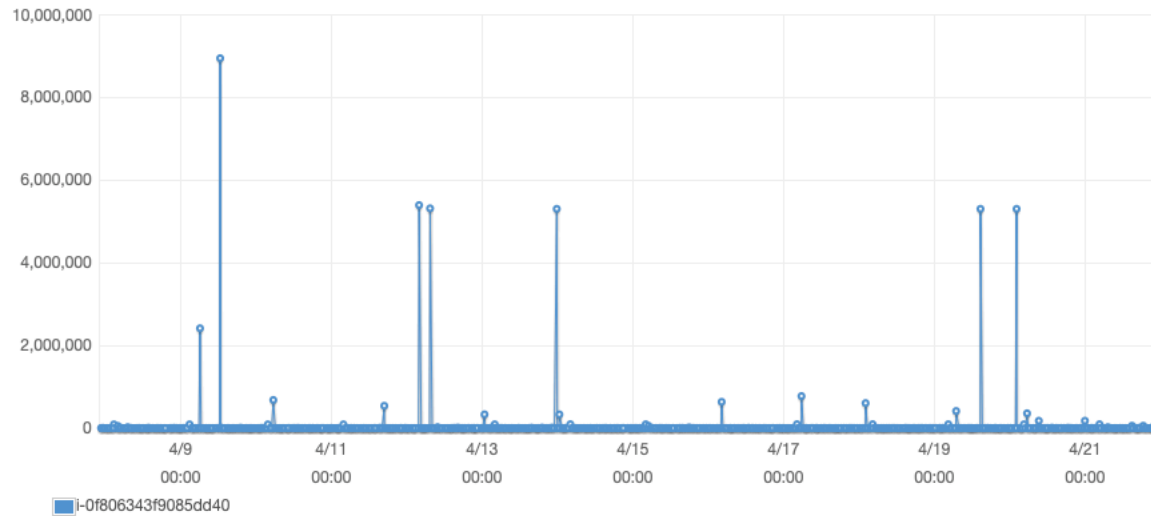
```
1  {
2  "server": [
3  {
4    "DNS": "ec2-13-59-164-30.us-east-2.compute.amazonaws.com",
5    "user": "ubuntu",
6    "directory": "/home/ubuntu",
7    "JARNAME": "Chatter-0.0.1-SNAPSHOT-jar-with-dependencies.jar",
8    "PEM": "auth.pem"
9  }
10 ]
11 }
```

CloudWatch Monitoring Details



Network In (Bytes)

Statistic: Average Time Range: Last 2 Weeks Period: 5 Minutes

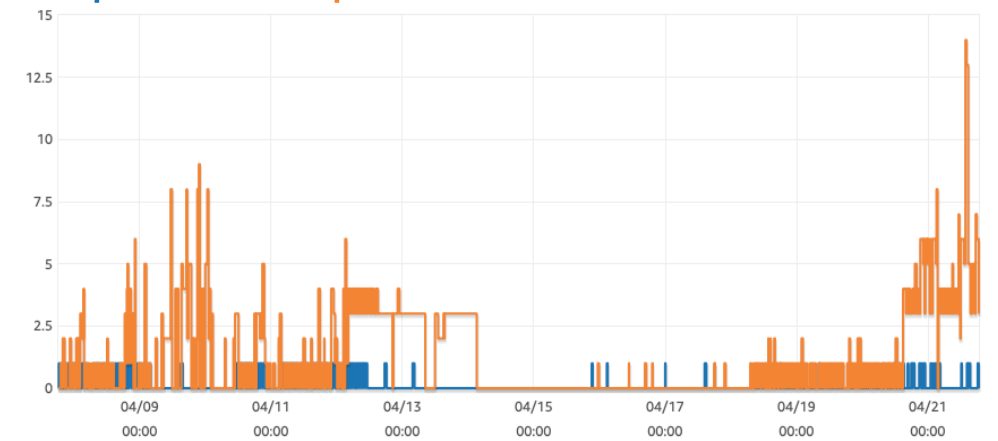


Close

Metrics

Metric: DB Connec... Statistic: Average Time Range: Last 2 Weeks Period: 1 Minute

Legend: team212instance-us-east-2b team212instance



Team Shortcomings and How We Overcome



We identified the skills of each members and allotted stories accordingly



We had scrum meeting everyday to discuss any issues or blockers



We split the functionality among team members and followed the same for all sprints



Every team member helped each other to overcome any issues, so as to achieve the sprint progress



For any clarifications about product, we communicated with product owner

Technology Transfer

Can be handed over to the client?

- In terms of end user, our jar is already deployed on AWS (as shown by graphs before).
- We also have our client side jar which end user can run without any change.
- In terms of handing code to client, we have our code pushed on Github which can be downloaded and used to do any modifications if required.
 - Code is well structured and easy to extend as we have followed SOLID principles.
 - Documentation is standardized using JavaDoc.

Next Steps:

- We can use modern and dynamic Front Ends over Command Line which can give a better user experience.
- We can give even more functionality like file transfer as well.
- We can include different kinds of features like
 - Creating Events and its RSVP
 - Conducting Polls
- We can make our code open source and ask interested users to contribute to existing code.

Ending Notes:

- We want to thank our product manager (TA Srijit).
- We would like to thank Professor Weintraub and other course staff for making this course a great learning experience.