BLEKINGE INSTITUTE OF TECHNOLOGY

P2P FILE SHARING

‘The Octopus’ Group

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Type of Document: Project specification

Version 1.1

Publication Date: May 1st ,2016

1. PREFACE:

Release v1.1 on 2016-05-01

-updated format of document

-updated timeplan

-updated project organization to describe our procedures

-clarified the numbers in risk management

-improved timelines in system release plan

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Release v1.0 on 2016-04-17

- Initial release

2 Glossary and abbrevations

Java - A general purpose object oriented programming language

Apache Maven - automated build tool for java code. Build the source code to a working ".Jar" file.

JUnit - Small explicit test to see that the code's functionality does what you think it does. For example 3+3 should generate 6 if it does it pass, if it generates another number it fails.

Git - A tool that keeps track of changes in the source code and lets people collaborate.

Gitlab - A program that has the Git functionality for the users and then uses a website with additional features. In order to let people collaborate with git it is needed to be run online on a server.

Dark Peer - The peers who first connected to the bootstrap server and get a list of peers from the bootstrap server. After its validity time, it doesn't talk to the bootstrap server anymore.

Dark Content - The file contents which exists on the dark peers

Swarm - The main file which each peer gets from the server at its first connection which includes the shared files, the list of peers who shares the file and the swarm metadata.

Swarm Metadata - Includes file names, file message digest

File Metadata - The set of headers together with the filename is the file metadata.

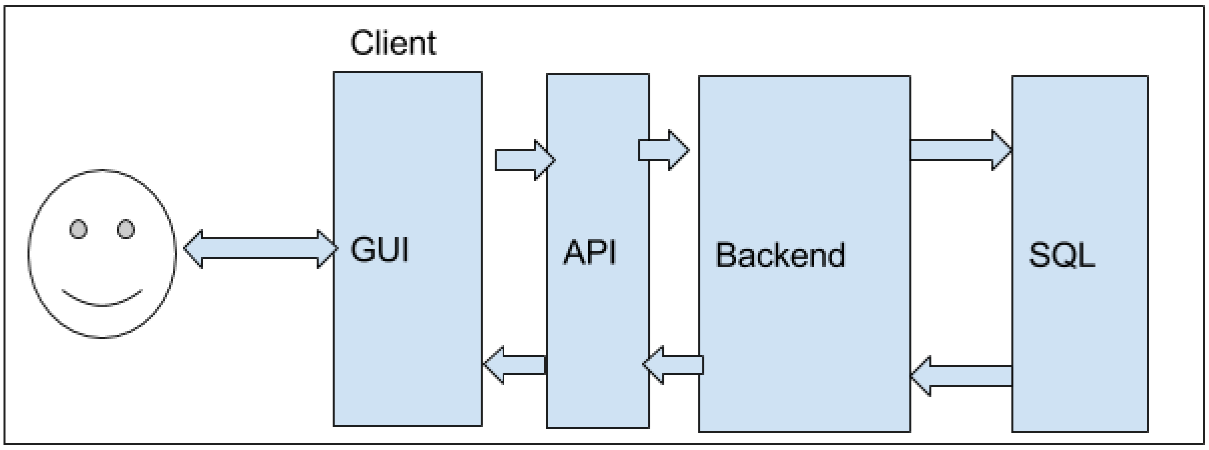
Bootstrap Server - the main server which new incoming peers connected to and get their swarm metadata from.

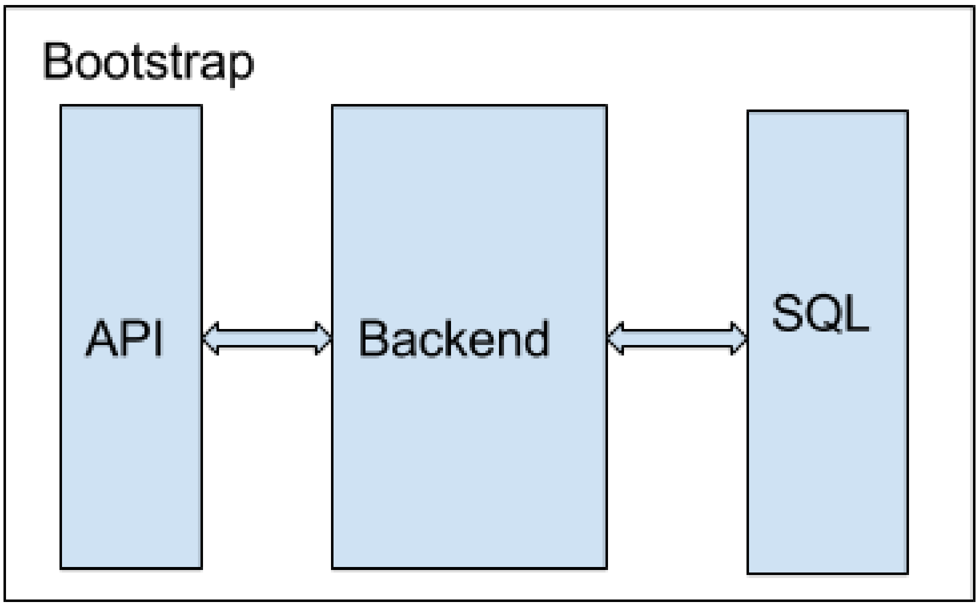
3: Background

The customer P2P4FUN requests to design a simple yet efficient P2P file sharing application which should satisfy its needs as follows:
Upon start, the peers connect to the bootstrap server and they receive a list of published swarms and a list whit banned IP addresses are which they should refuse to communicate with.
Each peer is responsible to refresh the validity time for its IP address; IP addresses that exceed the expiration date are removed from the bootstrap server.
There will be at least one backup bootstrap server. If no bootstrap server is available, the peers use the current data they have and will receive a message telling them about no bootstrap server where available.
Each peer must maintain a maximum of 3 connections to other peers.
the P2P application must have a friendly graphical user interface (GUI) providing all necessities to create, list, and delete swarms, and to search, upload and download files.
In addition, there should be a way to select if a peer goes dark or becomes visible again.
Progress of uploads and downloads must be shown together with estimated time to complete. The GUI must also show the IP addresses associated with a swarm and the IP addresses of the connected peers.
The application must also keep track of upload and download bandwidth and show this as live time-series plots.
P2P4fun insists that all communication must be encrypted. Plus, It should be

possible to restart the system with encryption disabled for debugging purposes. Finally, P2P4fun requests that all interaction user-to-user and user-to-server be based on a RESTful API with JSON data encoding.
 your product supports at least 3 peers.

4: Proposed solution





In order to make the software flexibility for changes it will have loose couplings between frontend and backend. The frontend is the GUI (Graphical user interface) and the backend is where all the calculations and program logic is. The communication between the backend and the front end will be through a simple API which will make it as lego bricks, easy to change and replace as long as the format is followed.

Communication between the client and the bootstrap server will be through REST - calls over HTTPS where the data will be encoded in JSON. Also the communication between client and client will be with REST and encoded in JSON (peer to peer traffic). The communication will be from the API on the client to the API on the bootstrap, the “API” is the face outward for the program.

Java programming languages will be used for the client and bootstrap server.

We connected our bootstrap to our API, to define swarm metadata or file metadata like our peer lists (as whitelist or blacklist) and other functionalities which can be managed easily from the API.

A database will be used to store the swarms created by peers, the file metadata and the servers metadata.

5: Limitations

The bootstrap server won’t allow peers to download the file from the server just the metadata that is needed for downloading from peers.

The client will be platform dependent and run on windows and if possible also Ubuntu.

The client will support 3 peers using the service and if possible even more.

There will only be one Bootstrap server as backup.

The service will not be available all the time.

The client and Bootstrap server will be in English only.

6: Time plan

We will be having 6 sprints which are exactly based on the deadlines of our assignments. First sprint will end this sunday and we are going to submit our project specification and software requirement specification. It will be exactly the same for the next sprints. We are going to break down our project to smaller tasks and by using ProjectLibre (or at the same time using a Kanban board) we will choose tasks, analyse, develop and test them accordingly!

7: Project organization

We will be using agile development model:

-workload will be divided between 6 sprints.

-tasks will be written to complete each sprints work.

-weekly meetings to report between teams, discuss progress, decide on next sprints work, and solve problems we currently have in project.

-During the project, we will simultaneously work with coding, testing, documentation and management. We will split the group up into several sub-teams.

-All project documents will be updated during each sprint, these include Project specification, Software requirement specification(start sprintt2), Design specification(start sprint3) and Acceptance test plan(starting from sprint 4)

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WORK	TEAM MEMBER
1. Programming: A. Frontend:	ALIPOURSIMAKANI, KAMRAN NYHLÉN, JESPER ROUTHU, VENKATA SAI KALYAN KUKKAPALLI, NAGA VYSHNAVI

	IQBAL, NAYYAR
B. Database:	AHMAD, FARHAN CHADALAPAKA, GAYATRI IQBAL, NAYYAR
C. Backend:	BERNTSSON, FREDRIK ZAREI, KAMBIZ ANDERSSON EKSTRÖM, MAX SHAD MANFEAT, SEYEDEH MERSEDEH
2. Management:	BERNTSSON, FREDRIK ALIPOURSIMAKANI, KAMRAN ZAREI, KAMBIZ NYHLÉN, JESPER
3. Testing:	BERNTSSON, FREDRIK ANDERSSON EKSTRÖM, MAX ALIPOURSIMAKANI, KAMRAN NYHLÉN, JESPER ZAREI, KAMBIZ
4. Documentation:	ROUTHU, VENKATA SAI KALYAN NYHLÉN, JESPER GHASEMI REZAEE, AMIN KUKKAPALLI, NAGA VYSHNAVI

8: Configuration management

8.1 Version management

For version management of our coding, Git will be used on a Gitlab server. The reason that we choose Git is in order for everyone in the team to be able to access and share the latest code easy. Also Git will keep track of the code history and who has written which part of the code.

For our project documents, we'll use google drive. This makes it easy to instantly see each others changes and work simultaneously on the same document.This also makes sure there will be no conflicts and everyone can see the progress of the documents.

8.2 System building

Apache Maven will be used for system building, the reasons for this is that the code will be in Java and Maven will automate the building process and with a POM file it will fix all the dependencies. A big pro with Maven is that in order to build the project it has to pass the JUnit test (See section code quality), this will make sure that the code uploaded to the git is not broken.

8.3 Release management

Our release management begins in the development cycle.If our customer request us for some new features or changes for instance. If the request is approved, the new release is planned and designed. The new design enters the testing or quality assurance phase, in which the release is built, reviewed, tested and tweaked until it is ultimately accepted as a release candidate. The release then enters the deployment phase. There will be changelog for every release which will contain bugs fixed, new features and things that were improved.

9: Progress tracking

After creating the baseline schedule, it's important to track the progress of work on the project. Since different sub-groups will be created and tasks will be assigned to each group. So for tracking purpose, all members use some sort of tracking tool which is ProjectLibre. We show our progress using it. In order to ensure that our project delivery meets the deadline.

10: Quality control

In order to have a high quality of the code there will be regularly code reviews especially on complex functions. Commenting will be in english and common code standards will be followed. There will be task for each user requirement due to milestones that will be tested. Junit testing will be made where it is possible to make sure that functionality is working as expected.

11: Risk management

Risks will be measured from 1-3, where 1 is low, 2 medium and 3 high.

Risk	**Likelihood (1-3)**	**Significance (1-3)**
1. Management	**3**	**3**
2. Group room	**3**	**2**
3. Communication	**2**	**2**
4. Lack of knowledge	**2**	**2**
5. Sickness	**2**	**1**
6. Moral	**1**	**3**

1. **Management is the key to success, we are twelve persons so if not everyone has something to do all the time we will lose lots of time. In order to avoid losing time we will use kanban board with tasks that each member can grab.**

2. **Group room will be a big problem because it will makes the communication harder. But also that it’s hard to have a real schedule for work and working home is not as efficient. We will minimize the risk with using task tracking tool (Taiga) and time tracking tool and use a centralized repository for the code, Gitlab.**

3. **Communication, The team has many nationalities and not the same mother tongue. The communication will be done in english and it is easy for misunderstandings. To minimize the risk we will have many face to face meetings.**

4. **Lack of knowledge, the area we are working in is new for many in the team and not everyone is comfortable with the practical part of programming. The security part is new for almost everyone and also working in this large groups.**

5. **Sickness with team will make us lose valuable time and knowledge. To minimize the risk we will have meetings to keep track of what each person does and two people that should know about the areas.**

6. **Moral will be a problem if the team get stuck. In order to minimize the moral troubles we will bring fika if the moral goes down and talk about it.**

12: System release plan

Sprint 4: Alpha release

Sprint 5: Beta release

Sprint 6: Final release

12.1: Testing plan

Code testing: Junit will be used to test our code, which will give a clear overview of the test results every time you build the system.
System testing: System testing phase will begin during sprint 5 and end sprint 6.
Integration tests: Integration testing will start in beginning of sprint 5.
Acceptance testing: We will be doing acceptance testing starting from sprint 5 to ensure that our product meets the requirements.

12.2: Packaging plan

A compressed tar.gz archive is available to the user which includes the code, library files, related documentation and tools.

12.3 Installation Documentation

Installation documents will be delivered in PDF format and contain information on how to install and configure our software. This will be done for the alpha-release of the software, and updated if changes occur to the installation process in future releases.

12.4: User Documentation

The PDF format is used to release User documentation. It includes the scope of the tool, tool functionality, linking different modules in the tool, process of supplying inputs to the tool, generation of output and various scripts. The user documentation will be worked on during sprint 6.

12.5: Developer documenation

This Developer document includes about the scope of the project in future. This helps to develop the sources code and necessary information about the GUI's used in this project. Javadoc will be used to provide a html documentation of our java code. An initial version of this will be provided in sprint 4, this version will be improved during sprint 5 and 6.

13: REFERENCES

[1] Requirements Document v1.0