CS3215 Proposal

SyncSharp: Just plug it in

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1. INTRODUCTION

1.1. Context of proposal

This proposal is written in response to develop a file synchronization tool for CS3215 - Software Engineering Project module.

1.2. Current situation

Currently, most of the sync tools that are available in the market required installation which may considered as a hassle to some users.

1.3. Problems and Needs

Users who work on multiple computers may need to sync files through an intermediate device such as a thumb drive. Installing a program on a PC is not allowed if users are not granted administrative rights, and this could be a problem when user needs to sync files and there is no sync tool installed on the PC or on his immediate device. As such, there is a need for a sync tool that does not required installation and is capable of performing synchronization like any other sync tools.

2. OUR PROPOSED PRODUCT

2.1. Product Description

In order to solve the above mentioned problems, our team is developing a sync tool called SyncSharp. It is a Windows based application that allows users to sync files between multiple computers through an immediate device with no installation required.

2.2. Our Target Audience

The target audience of our product is tertiary students who work with multiple computers and need to synchronize files that reside in different computers through an immediate device such as a USB drive.

2.3. Our Vision for SyncSharp

Our team vision for this project is to build a synchronization tool which is easy to use and supports all the basic features of a typical sync tool. In addition, the tool must be reasonably fast and efficient to use. Users will just need to download an executable file to run our tool with no installation required.

3. DOMAIN MODEL
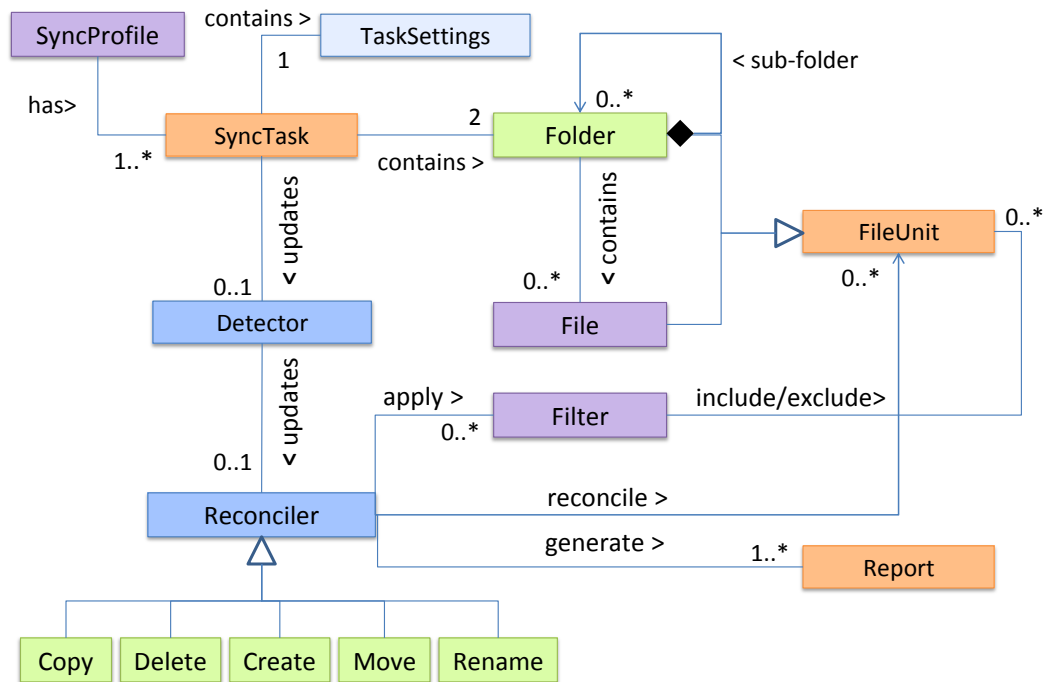
4. USE CASES

No.	Use Case(s)
1.	Import/export synchronization profiles
2.	Create synchronization tasks
3.	Edit synchronization tasks
4.	Delete synchronization tasks
5.	Compare source and target directories
6.	Perform 2 ways synchronization between the source and target directories.
7.	View log file
8.	Backup files
9.	Restore files
10.	Set Inclusion/exclusion filter
11.	Preview file contents
12.	Encrypt files
13.	Decrypt files
14.	Verify files after sync
15.	View help file

16. Sync folder pairs automatically upon USB plug-in

4.1.   Use Case Description

Use Case Number: 5	Use Case Name: Compare Folders
Pre-condition: Profile has been setup for the PC	
Post-condition: System displays the differences between the folders	
Actors: User, System	

Main Success Scenario:

1. **User selects a synchronization task.**
2. **User proceeds to compare the folders.**
3. **System validates the input for source & destination**
4. **System begins to compare the folders**
5. **System proceeds to retrieve the contents of the folders**
6. **System performs source & target files matching**
7. **System reports the differences found**

Extension(s):

3a. Player provides invalid source or destination directory
     3a1. System prompts an error message

Use case resumes from step 1.

5a. System does not have permission to access the file/folder
        5a1. System will skip the file/folder and update the log file

Use case resumes from step 5.

Use Case Number: 16	Use Case Name: PlugSync

Pre-condition: Sync profile (source & target folders) must be setup. Auto-sync mode chosen.

Post-condition: Folders contents are synchronized.

Actors: User, System

Main Success Scenario:

1. **User inserts his USB drive**
2. **System will initiate**
3. **System verifies sync profile to ensure folder pairs are available on the USB and on the correct computer**
4. **System will notify user that System is about to sync, countdown period starts**
5. **User chooses to wait through countdown period**
6. **System performs synchronization**
7. **System notifies user synchronization ends**
8. **User removes his USB drive**

Extension(s):

4a. User chooses to edit profile
   4a1. System launches profile settings menu
   4a2. User configures sync profile (auto or prompted)
   4a3. Return to application main screen.

Use case ends.

5. SEQUENCE DIAGRAM

The following is the sequence diagram for use case *PlugSync*:

6. SYSTEM ARCHITECTURE

```
┌─────────────────────┐     ┌─────────────────────┐
│         GUI         │     │         ATD         │
└─────────────────────┘     └─────────────────────┘
           │                           │
           ▼                           ▼
┌─────────────────────────────────────────────────┐
│               Application Layer                   │
│  ┌─────────────────────────────────────────────┐ │
│  │              SyncSharp Logic                 │ │
│  └─────────────────────────────────────────────┘ │
│  ┌───────────┐  ┌───────────┐  ┌───────────┐     │
│  │ Reconciler│  │  Detector │  │  Filter   │     │
│  └───────────┘  └───────────┘  └───────────┘     │
└─────────────────────────────────────────────────┘
           │                           │
           ▼                           ▼
┌───────────────────────┐   ┌───────────────────────┐
│     Storage Layer     │   │      Data Model       │
│ ┌─────────┐ ┌───────┐ │   │ ┌───────────────────┐ │
│ │SyncProf.│ │TaskSet│ │   │ │     FileUnit      │ │
│ └─────────┘ └───────┘ │   │ │ ┌──────┐ ┌──────┐ │ │
│ ┌─────────┐ ┌───────┐ │   │ │ │ File │ │Folder│ │ │
│ │SyncTask │ │Logger │ │   │ │ └──────┘ └──────┘ │ │
│ └─────────┘ └───────┘ │   │ └───────────────────┘ │
└───────────────────────┘   └───────────────────────┘
```
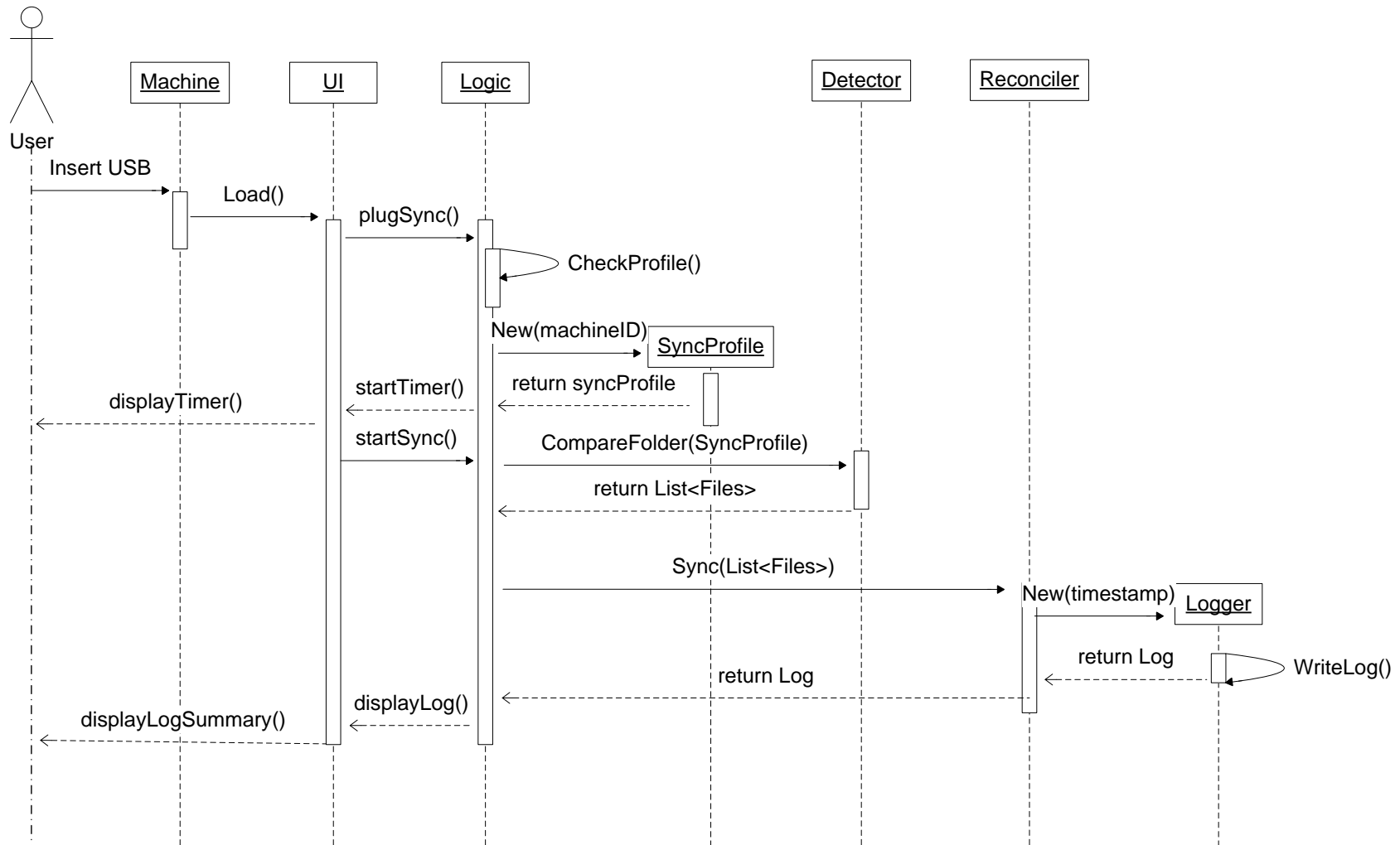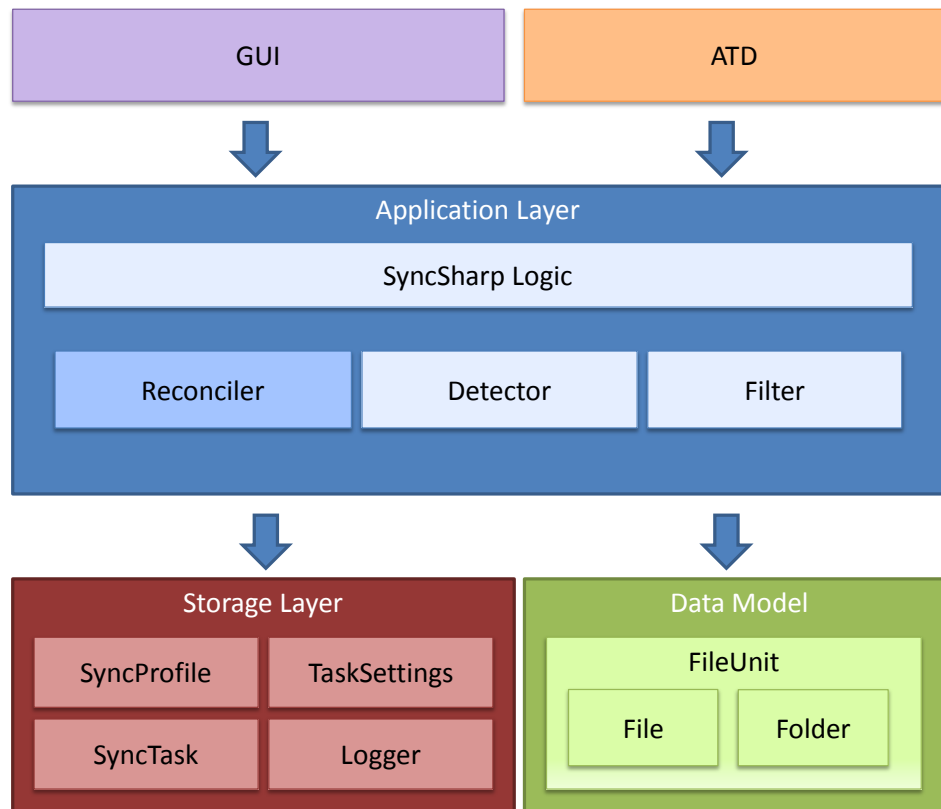
7. DELIVERY PLAN

Our team plans to deliver the following features for product versions 0.0, 0.9 and 2.0:

5.1.   SyncSharp v0.0

- Create, edit and delete synchronization profiles
- Import / export synchronization profiles
- Ability to use environment variables in folder paths
- Compare source and target directories
- Preview file contents
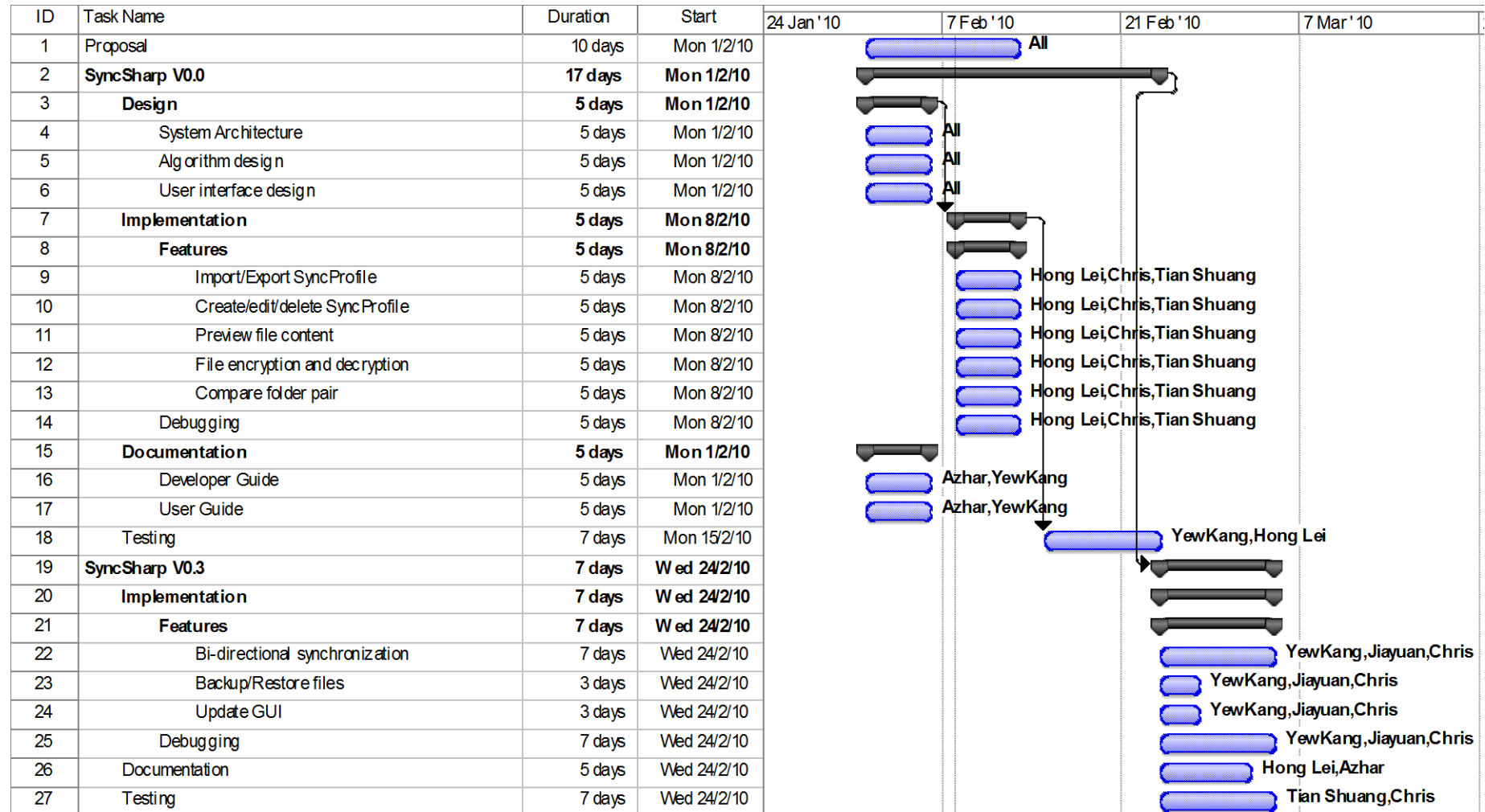- Perform 2 ways synchronization between the folder pairs

5.2.   SyncSharp v0.9

- Set inclusion/exclusion filters
- Backup files
- Restore files
- Encrypt files
- Decrypt files
- Generate log file after each sync operation

5.3.   SyncSharp v2.0

- Plug Sync - perform auto synchronization upon USB plug-in
- Byte by byte verification after sync
- Run synchronization and backup in simulation mode

8. GANTT CHART

ID	Task Name	Duration	Start	
1	Proposal	10 days	Mon 1/2/10	All
2	**SyncSharp V0.0**	**17 days**	**Mon 1/2/10**	
3	**Design**	**5 days**	**Mon 1/2/10**	
4	System Architecture	5 days	Mon 1/2/10	All
5	Algorithm design	5 days	Mon 1/2/10	All
6	User interface design	5 days	Mon 1/2/10	All
7	**Implementation**	**5 days**	**Mon 8/2/10**	
8	**Features**	**5 days**	**Mon 8/2/10**	
9	Import/Export SyncProfile	5 days	Mon 8/2/10	Hong Lei,Chris,Tian Shuang
10	Create/edit/delete SyncProfile	5 days	Mon 8/2/10	Hong Lei,Chris,Tian Shuang
11	Preview file content	5 days	Mon 8/2/10	Hong Lei,Chris,Tian Shuang
12	File encryption and decryption	5 days	Mon 8/2/10	Hong Lei,Chris,Tian Shuang
13	Compare folder pair	5 days	Mon 8/2/10	Hong Lei,Chris,Tian Shuang
14	Debugging	5 days	Mon 8/2/10	Hong Lei,Chris,Tian Shuang
15	**Documentation**	**5 days**	**Mon 1/2/10**	
16	Developer Guide	5 days	Mon 1/2/10	Azhar,YewKang
17	User Guide	5 days	Mon 1/2/10	Azhar,YewKang
18	Testing	7 days	Mon 15/2/10	YewKang,Hong Lei
19	**SyncSharp V0.3**	**7 days**	**Wed 24/2/10**	
20	**Implementation**	**7 days**	**Wed 24/2/10**	
21	**Features**	**7 days**	**Wed 24/2/10**	
22	Bi-directional synchronization	7 days	Wed 24/2/10	YewKang,Jiayuan,Chris
23	Backup/Restore files	3 days	Wed 24/2/10	YewKang,Jiayuan,Chris
24	Update GUI	3 days	Wed 24/2/10	YewKang,Jiayuan,Chris
25	Debugging	7 days	Wed 24/2/10	YewKang,Jiayuan,Chris
26	Documentation	5 days	Wed 24/2/10	Hong Lei,Azhar
27	Testing	7 days	Wed 24/2/10	Tian Shuang,Chris

9. GLOSSARY

Term	Definition
SyncSharp	The name of our sync tool
SyncTask	Configuration file that contains source & target information to be synchronized
SyncProfile	Contains list of SyncTasks for the particular machine
FileUnit	Abstract representation of a file or folder
PlugSync	Performs auto-synchronization when USB is inserted into a PC
1 way sync	Update destination directory to have the same state as source directory
2 ways sync	Update source and destination directories to have the same state
Report/Logger	Log file that records the operations perform in the synchronization process
Target	The destination directory to be sync or compared
Detector	The sub-system that detect changes from the source or destination directory
Reconciler	The sub-system that resolves conflicts between the source & destination directories
TaskSettings	Contains configuration settings made for each SyncTask