CS3215 Proposal

SyncSharp: Plug and Sync

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EXECUTIVE SUMMARY

Users may need to synchronize files across multiple computers. Not all computers pre-installed with file synchronization software, and users may not be granted with administrative rights to install software, and this poses problems for users who need to perform file synchronization. SyncSharp overcomes these problems by providing the users with a streamline file synchronization operation and installation-free application. In addition, SyncSharp offers users with automated synchronization with minimal user interaction.

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 with 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. The file synchronization process is streamlined through a list of pre-determined user preferences.

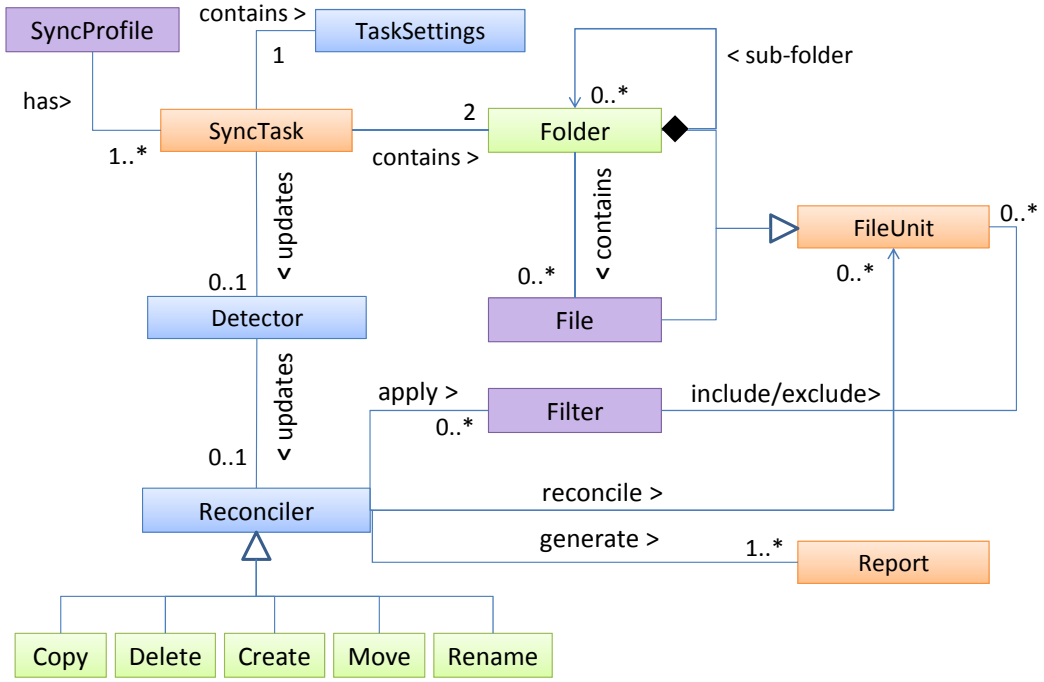
2.2. Our Target Audience

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 file synchronization process 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**

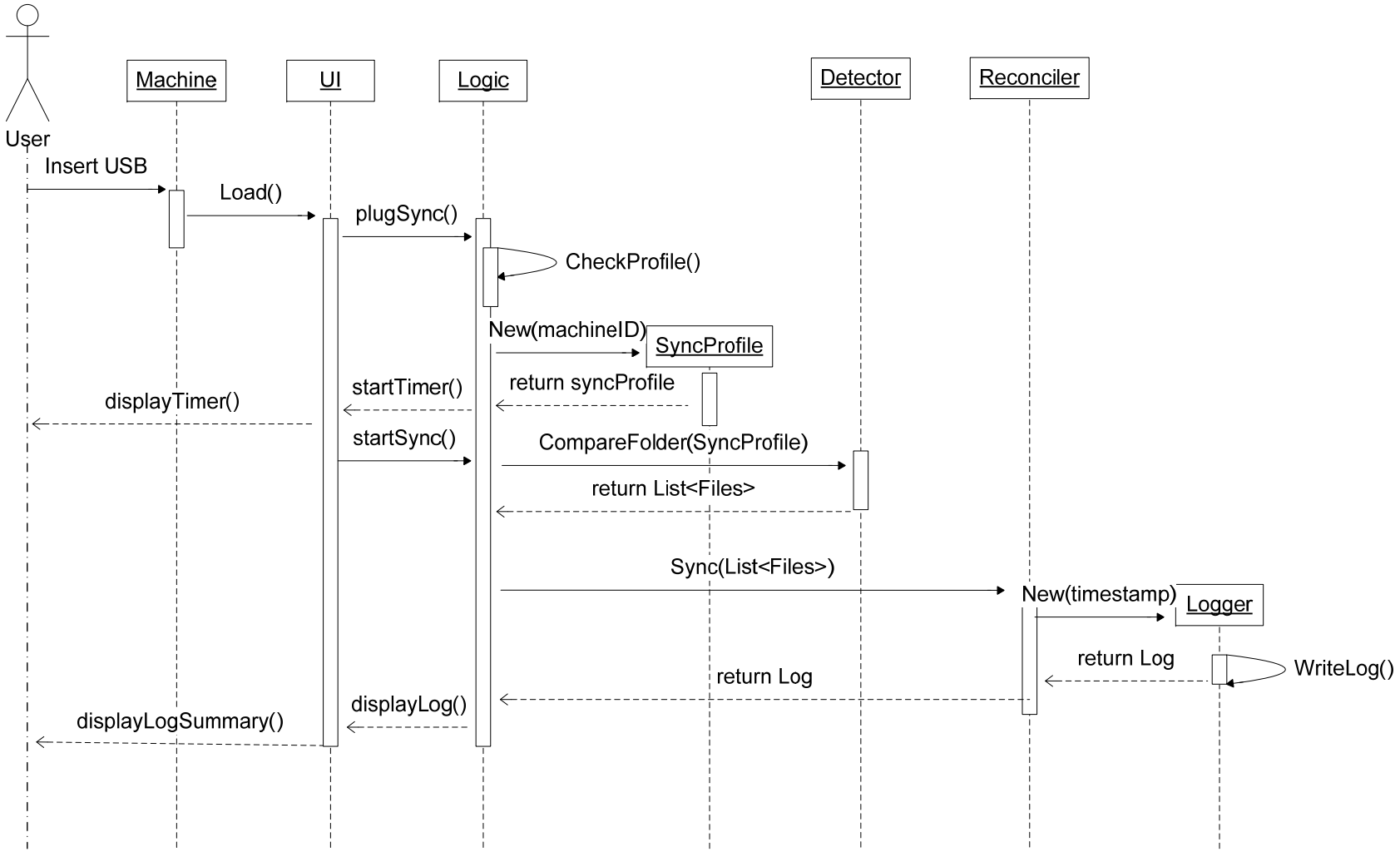
Extension(s):

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.

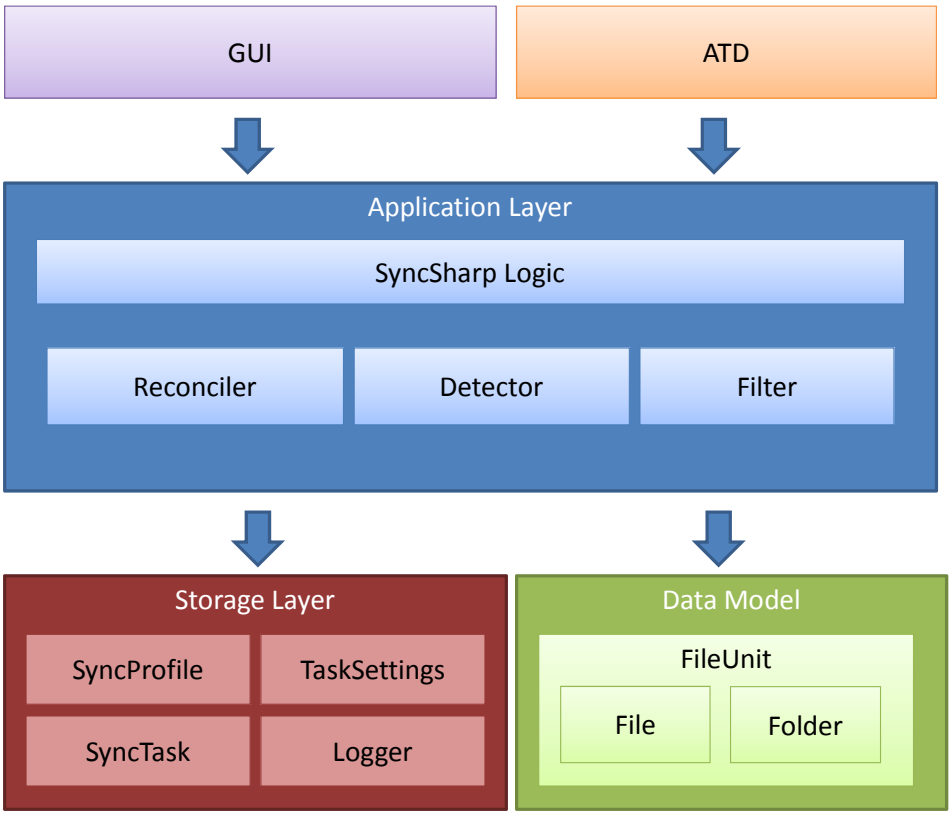
Use case ends.

5. SEQUENCE DIAGRAM

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



6. SYSTEM ARCHITECTURE



6.1 Components description and responsibilities

GUI	Provides the interface between users and application.
ATD	Provides automated testing of the application functionalities during development.
SyncSharp Logic	Receives input from GUI component and initiates a response by making function calls to various sub-components.
Detector	Evaluates the changes on the designated folders / files based on the last synchronization operation which stores a small amount of information (called metadata). Metadata captures a snapshot of every file and folders' state. Detector then passes a list of files to the reconciler to perform synchronization.
Reconciler	Performs file synchronization on the list of files obtained from the Detector. The file synchronization operation is based on the analyzed results. In the rise of conflicting updates, pre-determined users' preferences will be used to resolve the updating conflicts. The summary of the updates will be passed to the Logger. Reconciler then updates the metadata of the replica.
Filter	Provides a list of filter rules that will be used by Detector for files retrieval.

Sync Profile	Stores the machine identity and contains a list of SyncTask associated with the profile.
SyncTask	Defines the pair of folders to be used for synchronization
TaskSettings	Stores all the configuration settings for each SyncTask.
Logger	Generates the summary of the file synchronization tasks.
FileUnit	Abstract representation of a file or folder.

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

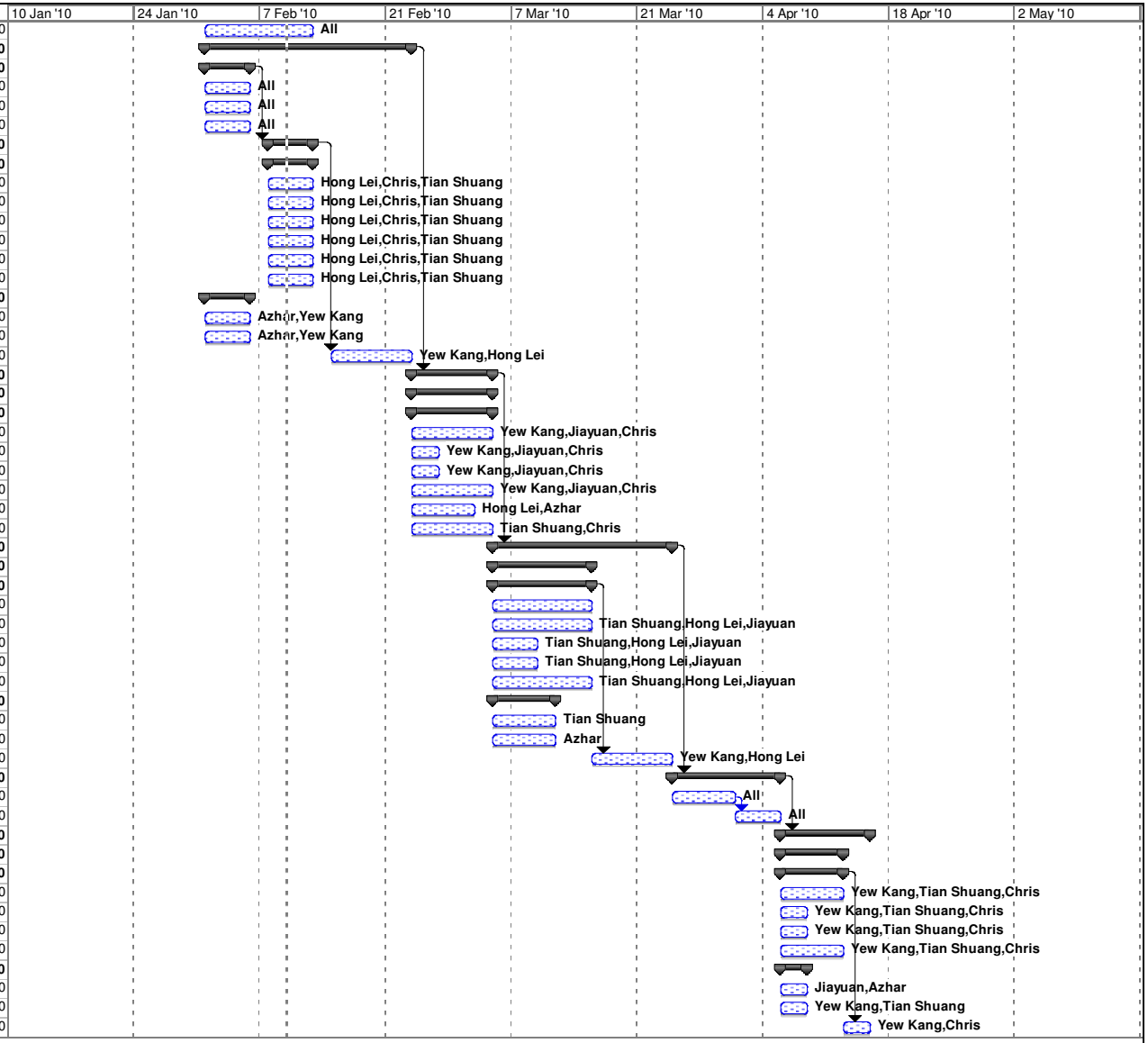
5.2. SyncSharp v0.9

- 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

ID	Task Name	Duration	Start
1	Proposal	10 days	Mon 1/2/10
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
5	Algorithm design	5 days	Mon 1/2/10
6	User interface design	5 days	Mon 1/2/10
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
10	Create/edit/delete SyncProfile	5 days	Mon 8/2/10
11	Preview file content	5 days	Mon 8/2/10
12	File encryption and decryption	5 days	Mon 8/2/10
13	Compare folder pair	5 days	Mon 8/2/10
14	Debugging	5 days	Mon 8/2/10
15	**Documentation**	**5 days**	**Mon 1/2/10**
16	Developer Guide	5 days	Mon 1/2/10
17	User Guide	5 days	Mon 1/2/10
18	Testing	7 days	Mon 15/2/10
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
23	Backup/Restore files	3 days	Wed 24/2/10
24	Update GUI	3 days	Wed 24/2/10
25	Debugging	7 days	Wed 24/2/10
26	Documentation	5 days	Wed 24/2/10
27	Testing	7 days	Wed 24/2/10
28	**SyncSharp V0.9**	**14 days**	**Fri 5/3/10**
29	**Implementation**	**7 days**	**Fri 5/3/10**
30	**Features**	**7 days**	**Fri 5/3/10**
31	Exclude/include filters	7 days	Fri 5/3/10
32	Automated Test Driver	7 days	Fri 5/3/10
33	Generate log files	3 days	Fri 5/3/10
34	Update GUI	3 days	Fri 5/3/10
35	Debugging	7 days	Fri 5/3/10
36	**Documentation**	**5 days**	**Fri 5/3/10**
37	Developer Guide	5 days	Fri 5/3/10
38	User Guide	5 days	Fri 5/3/10
39	Testing	7 days	Tue 16/3/10
40	**SyncSharp V1.0**	**8 days**	**Thu 25/3/10**
41	Discover and fix bugs reported in V0.9	5 days	Thu 25/3/10
42	Testing	3 days	Thu 1/4/10
43	**SyncSharp V2.0**	**8 days**	**Tue 6/4/10**
44	**Implementation**	**5 days**	**Tue 6/4/10**
45	**Features**	**5 days**	**Tue 6/4/10**
46	PlugSync	5 days	Tue 6/4/10
47	Byte by byte verification after sync	3 days	Tue 6/4/10
48	Run synchronization in simulation mode	3 days	Tue 6/4/10
49	Debugging	5 days	Tue 6/4/10
50	**Documentation**	**3 days**	**Tue 6/4/10**
51	Developer Guide	3 days	Tue 6/4/10
52	User Guide	3 days	Tue 6/4/10
53	Testing	3 days	Tue 13/4/10



Project: CS3215_new
Date: Wed 10/2/10

Task | Summary | Rolled Up Progress | Project Summary
Progress | Rolled Up Task | Split | Group By Summary
Milestone | Rolled Up Milestone | External Tasks | Deadline

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