FUNCTIONAL SPECIFICATION

Project Code:	SHS-01
Project Name:	Smart Home System

16-Feb-2012

Prepared by/Date | **Reviewed by/Date** | **Approved by/Date**

Revision History

Version (x.yy)	Date of Revision	Description of Change	Reason for Change	Affected Sections	Approved By
1.0	16-Feb-2012	Initial Draft			
1.1	14-June-2012	Change in requirements	Changes made for Unix App stream	3 and 6	
1.2	08-Nov-2013	Test script related requirements added.	Changes made for UCF 1.1	6	

Affected Groups

Development Engineering
Quality Assurance
ABC Software

List of Reference Documents

Name	Version No.
1. Request For Proposal	1.2
2.	
3.	
4.	

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1. Introduction

1.1 Background

ABC Software Systems provides software services in the field of Open Source, specializing in Unix Projects.

1.2 Purpose

It is proposed to develop a UNIX based system that helps residents of a flat to control appliances in their flat.

1.3 Scope

The scope of the Smart Home System (SHS) is to provide the functionality as described below. The system will be developed on a Linux box using C language and would provide a console-based user-interface.

2. Systems Overview

2.1 *System Description*

The Smart Home System should support the following users:

- Apartment Admin (A)
- Flat Owner (F)

The common functional requirements are explained below.

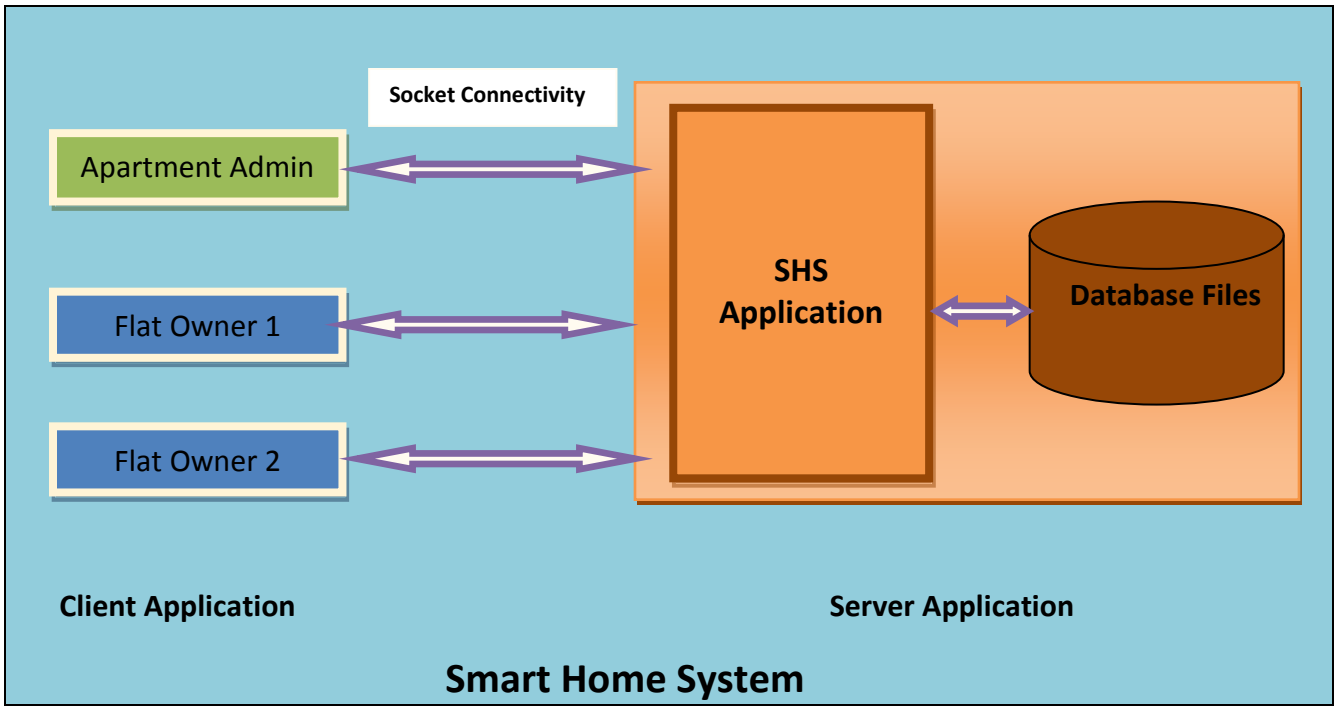
2.1.1 Authentication

Any end-user should be authenticated using a unique login ID and password.

2.1.2 Authorization

The operations supported and allowed would be based on the user type.

The functional flow of the messages across different application components is shown below.



2.2 Environment

The system will be developed on a Linux box using C language and would provide a console-based user-interface.

- Intel hardware machine (PC P4-2.26 GHz, 512 MB RAM, 40 GB HDD)
- Linux 2.6 or higher
- Compilers – gcc or g++

3. Sub-system Details

3.1 Apartment Admin

The Apartment Admin should be able to do the following operations once he has logged in with his unique user id and password:

- Create a new flat account
- View the appliance status for a specific flat
- Delete a specific flat account
- Get the details of the number of users logging into the system on a monthly basis
- Quit Application

Create a new flat account:

As part of this operation, the apartment admin should have the ability to enter all the details of a flat and the flat owner.

A flat account has the following details:

- Flat Number
- Flat Owner's Name
- Flat Owner's contact phone number
- Residing From date
- Number of members residing in the flat

(Refer to section 4. Data organization –> Table1: Flat Account and section 4.Data organization -> Table2: Login Credentials)

On creating the Flat account, the SHS should generate a user name and password which the flat owner would use to log into the SHS.

View the appliance status of a specific flat:
As part of this operation, the apartment admin should be able to view the status of the appliances of a specific flat in the apartment. Here the apartment admin will not be able to control the appliance.

Delete a specific flat account:
As part of this operation the apartment admin should have the ability to delete the account of a specific flat from the SHS.

(Refer to section 4. Data organization –> Table1: Flat Account and section 4.Data organization -> Table2: Login Credentials)

Get the details of the number of users logging into the system on a monthly basis:
As part of this operation the apartment admin must be able to get the details of the number of users logging into the system on a monthly basis.

Quit Application:
As part of this operation the apartment admin should have the ability to quit the application completely.

3.2 Flat Owner

The Flat Owner should be able to do the following operations once he has logged in with his unique user id and password:

- Register appliances to control in his/her flat
- Modify appliances to control in his/her flat
- View the status of the appliances in his/her flat
- Control a specific appliance in his/her flat
- Add family members as users to the system.
- Change his/her login credentials
- Quit Application

Register appliances to control in his/her flat:
As part of this operation, the flat owner should have the ability to register appliances he/she would like to control in the flat.
The flat owner has the option of registering appliances only from the following list.

- Lights – Maximum of 5
- Geyser – Maximum of 2
- Fridge – Maximum of 1
- AC – Maximum of 2

In total the SHS allows the flat owner to register only a maximum of 7 appliances for his/her flat.

(Refer to section 4. Data organization –> Table 3: Registered Appliances)

Modify appliances to control in his/her flat:
As part of this operation, the flat owner should have the ability to modify the appliance to control in his flat, that is remove a specific appliance and add new appliances.

(Refer to section 4. Data organization –> Table 3: Registered Appliances)

Control a specific appliance in his/her flat:
As part of this operation, the flat owner should have the ability to control a specific appliance in his/her flat.
Control an appliance refers to Switching ON or Switching OFF a specific appliance.
The flat owner can only control the appliances that are registered with the SHS for his flat.

(Refer to section 4. Data organization –> Table 3: Registered Appliances and section 4. Data organization –> Table 4: Appliance Status)

View the status of the appliances in his/her flat:
As part of this operation, the flat owner should be able to view the status of the appliances in his house. Here status refers to the state of the appliance, "**ON**" or "**OFF**" states.
The flat owner can only view the status of appliances that are registered with the SHS for his flat.

(Refer to section 4. Data organization –> Table 4: Appliance Status)

Add family members as users to the system:
As part of this operation, the flat owner should be able to add his family members as users to the SHS.
The flat owner can add a maximum of 2 family members to the SHS.

(Refer to section 4.Data organization -> Table2: Login Credentials)

Change his/her login credentials:
As part of this operation, the flat owner should be able to change his/her login credentials.

(Refer to section 4.Data organization -> Table2: Login Credentials)

Quit Application:
As part of this operation, the flat owner should have the ability to quit the application completely, saving any active data as necessary.

4. Data Organization

This section explains the data storage requirements of the Smart Home System application and ***indicative*** table (file) structure. The following sections explain few of the tables required for the application and the other tables will have to be designed accordingly.

4.1 Table: Flat Account

The flat account specific details should be kept in one or more tables, as necessary and applicable.

Table 1: Flat Account

Field Name	Data Type	Description
FlatNo	int	Flat Number
FlatOwner	char[25]	Name of the flat owner
ContactNo	long	Flat owners contact number
ResidingDate	char[15]	Residing from date
NoofMembers	int	Number of members residing in the flat

4.2 Table: Login Credentials

The Login Credentials specific to a flat is kept as part of this table.

Table 2: Login Credentials

Field Name	Data Type	Description
FlatNo	int	Flat Number
FlatOwner	char[25]	Name of the flat owner
LoginName	char[10]	The login name
LoginPwd	char[15]	The login password
AltUser1LoginName	char[10]	Alternate User1/Family member 1's login name
AltUser1LoginPwd	char[15]	Alternate User1/Family member 1's login password
AltUser2LoginName	char[10]	Alternate User2/Family member 2's login name
AltUser2LoginPwd	char[15]	Alternate User2/Family member 2's login password

4.3 Table: Registered Appliances

The appliances registered by the flat owner specific to a flat are kept as part of this table.

Table 3: Registered Appliances

Field Name	Data Type	Description
FlatNo	int	Flat Number
FlatOwner	char[25]	Name of the flat owner
Appliance1	char[25]	Appliance 1
Appliance2	char[25]	Appliance 2
Appliance3	char[25]	Appliance 3
Appliance4	char[25]	Appliance 4
Appliance5	char[25]	Appliance 5
Appliance6	char[25]	Appliance 6
Appliance7	char[25]	Appliance 7

4.4 Table: Appliance Status

The appliances status is kept as part of this table.

Table 4: Appliance Status

Field Name	Data Type	Description
FlatNo	int	Flat Number
Appliance1State	bool	Status of Appliance 1
Appliance2State	bool	Status of Appliance 2
Appliance3State	bool	Status of Appliance 3
Appliance4State	bool	Status of Appliance 4
Appliance5State	bool	Status of Appliance 5
Appliance6State	bool	Status of Appliance 6
Appliance7State	bool	Status of Appliance 7

Note: Similarly, create other necessary normalized tables.

5. Assumptions

- User Interface: The type of client interface (front-end) to be supported is – console based. The console based application will support character based user interface

6. Expectations

- The application should be designed using client server architecture
- The server should be a concurrent server servicing multiple clients
- Compilation and Build should be done using makefile
- Database can be implemented using RDBMS/flat text files
- Source-code and all documents must be maintained (checked-in) in configuration management system (subversion)
- Wipro's coding standards (for C/C++) should be followed
- Deliverables should include use-case diagrams, design document, compiled and tested source code, system test scripts, test-plans, test-cases documents, test-results and release note

7. Acceptance Criteria

All P1 requirements have to be mandatorily implemented.

8. Traceability to Requirements

Document Reference ID & Description: (Doc ID from which this document is derived)		
Sl. No.	**Reference document: RS Requirement/Feature (Section ID/Name)**	**Current document: FS Location (Section ID/Name)**
1.	Requirements as mentioned in Section 2.1	Section 3.1, 4.1, 4.2
2.	Requirements as mentioned in Section 2.2	Section 3.2, 4.1, 4.2, 4.3, 4.4
3.	Requirements as mentioned in Section 2.3	Section 2.1.1, 2.1.2, 3.1
4.	Requirements as mentioned in Section 2.6	Section 3.1, 3.2, 4.1

9. Acronyms and Glossary

Abbreviation	**Remark**
SHS	Smart Home System
RS	Requirement Specification
FS	Functional Specification