Heimdall

Responsibilities:

* Stores user IDs
* Validates login attempts. Sends a multicast event when a login occurs. \*
* Enrolls new users on command. Sends a multicast event when a new user is enrolled. \*
* Delete user IDs on command.
* Set LED state on command (WIFI, DUE)

\*Multicast not supported, so event is stored until the HeimdallControl client can retrieve it.

HeimdallController performs one task at a time. If a task is in progress, HeimdallController indicates that it is busy. Client interface says “Heimdall is busy. Call back later.”

HeimdallContoller is composed of one thread. The thread sends periodic status requests to Heimdall. Heimdall indicates its current state. If this state is new\_login, the response contains the ID for the last user to login. HeimdallController queries the ID in the database and updates the login time.

Use Cases:

Unregistered user registers fingerprint with device:

1. Types “enroll FirstName LastName” in client terminal. Client sends request to server.
2. Server validates name (case insensitive):
   1. If user already exists in database: Returns message indicating that the user is already registered. Stop.
3. Server sends quick status request to Heimdall.
   1. If Heimdall is online and not busy: Server sends immediate success response to client. Goto 4.
   2. If Heimdall is online but busy: Server sends immediate busy response to client. Stop.
   3. If Heimdall if offline: Server send immediate error response to client. Stop.
4. Server initiates asynchronous enrollment task via HeimdallController and acknowledges the client’s command immediately. HeimdallController sends new\_enrollment command to Heimdall.
5. Heimdall responds indicating that it has started the enrollment.
6. HeimdallController periodically requests new-enrollment events. The next new-enrollment event is assumed to be the requested enrollment.
   1. If timeout expires without receiving new-enrollment event: Stop.
   2. If new-enrollment event is received: Goto 7.
7. Heimdall new-enrollment event contains ID of newly enrolled user. ID is associated with the name specified by the client and inserted into the database.
8. Enrollment complete.

Registered user presses finger to reader:

1. Heimdall’s periodic check detects a finger touching the reader. (This will eventually be interrupt-driven with a button that wakes up the processor and finger print reader.)
2. Heimdall attempts to identify the print.
   1. If the print is unknown: Stop.
   2. If the print is identifiable: Activate the door and save the print ID for the next status response. Goto 3.
3. HeimdallController sends a periodic status request. Heimdall sends a new\_login response including the saved print ID.
4. HeimdallController looks up the ID received in the response.
   1. If the ID is found in the database: Update the user’s last activation timestamp.
   2. If the ID not found in the database: Log an error.
5. Identification complete.