Release Date: March 22, 2024

Release Notes: Cygnus Reach

Summary

We are proud to present a new release of the Cygnus Reach stack for embedded systems written in C. The team continues to develop and deploy Reach. This release introduces enhancements to the embedded, mobile, and web systems that stem from customer requests from field usage.

Summary of changes:

- Updated protobuf specification file, version 0.0.21.
- Updated C stack, version 2.5.3
- Updated Thunderboard application, version 3.5.3
- Updated documentation on github in HTML format
    - Includes API references
- Updated web application
- Android mobile app updated to v1.3.2 (63)
- iOS mobile app updated to v1.3.1 (7)
- Nordic nRF example application
- Reach-utils repository

This version is compatible with previous versions.

GitHub Project Structure:

The root of the open source github project has changed. The following URL's are of interest:

- The reach-silabs project for the Silicon Labs Thunderboard: https://github.com/cygnus-technology/reach-silabs
- The reach-c-stack repository, holding the portable stack implementation of Reach with newly released HTML documentation. https://github.com/cygnus-technology/reach-c-stack
- The Cygnus-Technology github page: https://github.com/cygnus-technology
- The documentation page: https://docs.cygnustechnology.com/

Catalog of Changes

Project Structure and Documentation

Directory Structure Refactoring

The directory structure of the project has changed. The intent of these changes is primarily to make development work visible in the open source project.

- The top level project resides in a new repository.
    - https://github.com/cygnus-technology/reach-silabs replaces the previous "reach-firmware" project.
    - The "main" branch of this project is officially released, but watchers will be able to see active development branches.
- The repository contains a complete Simplicity Studio project ready to be imported.
    - There is no more need to patch up the BLE-empty project.
- The "reach-c-stack" is now a submodule.
    - This facilitates the sharing of this code.
    - The main branch likewise is officially release.
- Code is consolidated into src and include directories.

HTML Format Documentation

- Doxygen and Sphinx adopted to produce a documentation tree in HTML format. This is easily accessible on the github home page.
- The key parts of the public API have been carefully annotated to produce Doxygen comments.

Additional Project Examples

- The "reach-nrfc" example is now available on github. It demonstrates Reach running on a Nordic RFC board. It relies on the same reach-c-stack.
- The "reach-util" repository on github contains tools that can be used with Reach projects. First among these is a python script that generates the bulk of the params.c file from an excel sheet..
- Each of these projects contains a detailed readme.md which contains more useful background information about Reach.

C-Stack, Protocol, and Thunderboard Enhancements

Security Features

- BLE Encryption
    - The BLE interface has been adapted and tested to enable encryption with “level 2” and “level 4” quality.
    - The example as delivered does not encrypt the link.
        - Encryption can be enabled via #defines in reach-server.h.
            - Note: As of this release, the mobile apps are not fine-tuned to make this encryption easy, though it is on our roadmap.
- Access Control
    - A “challenge key” has also been added to the device info request. This allows an organization to grant more or less limited access to different users.
        - A user with basic access may only see a few parameters.
        - A user with full access might be able to change the system’s configuration in other ways.

Configurable memory usage for error report

- The cr_report_error() function can now be configured at compile time in reach-server.h in three modes:
    - ERROR_FORMAT_LOG_ONLY reports the occurrence of the error on the CLI console but does not send the message to the client.
    - ERROR_FORMAT_SHORT reports the error code to the remote client. This requires minimal memory on the server.
    - ERROR_FORMAT_FULL requires an extra 240 bytes of RAM in order to allow error reports to include explanatory text strings approaching this length.
- By default it is set for FULL reports and these are visible as pop ups when you use the remote support web page interface. There are demonstrations of the error report on the commands page.

Command Enhancements

- The system can now handle more than 6 commands.
- Commands now include a “description” that is displayed on the remote support page as a tooltip when hovering over a command button..
- Commands now include an optional “timeout” which makes it possible to support a command that takes a long time to complete.

Replaced number of objects with client_id

- The reach message header previously contained a “number_of_objects” member. This was renamed to “client_id”.
- Along with “endpoint_id”, this lays the groundwork for more sophisticated systems that might have more endpoints or be accessed by multiple clients. This should not be noticeable to most users.

WiFi service

- The C stack is prepared to support a WiFi service.
    - This is intended to provide reusable code for connecting a WiFi enabled embedded device, but no UI is yet prepared and the Thunderboard has no WiFi access.

Web Portal

General Enhancements

- The Reach Portal’s web-based remote support sessions now manage the state of pending requests to the device with more care, and report a wider variety of errors and warnings to the user.
- The web page’s debug pane can now issue read requests for non-existent parameters.
- The web portal now reports device errors as red pop-ups. This is demonstrated on the commands page.

Mobile Application Enhancements

Video Sharing - New Features:

- While sharing their video during a Cygnus support session, users now have the ability to take a screen shot of what their camera is showing and send it to a support agent in the web portal. This screenshot is saved to the session’s history and can be downloaded to a local machine or CRM.
- While sharing video during a Cygnus support session, users now have the ability to record a 30 second video snippet and send it to a support agent in the web portal. This video snippet is saved automatically to the session’s history and can be downloaded to a local machine or CRM.

Command Enhancements

- The mobile app supports the longer command list noted above.

Roadmap Preview - What's Next for Cygnus Reach

- Continued general bug fixing of issues reported in the field. Top known issues prioritized:
    - If a piece of hardware disconnects/reconnects to a mobile application, the mobile application will infrequently lock on the next attempt to read parameters from the device, requiring the app to be restarted.
- Planned enhancements to the Reach protobuf interface.
- Bringing the mobile applications up to feature parity with the web application.
    - The web interface is "ahead" of the mobile apps in terms of feature availability. The web interface supports a number of features that are not available in the mobile apps. These include the configuration of parameter notifications and the time service.
- Chrome remains the most tested usage pattern.
    - Users are advised to use Chrome to access the web portal.