



ESPRESSIF

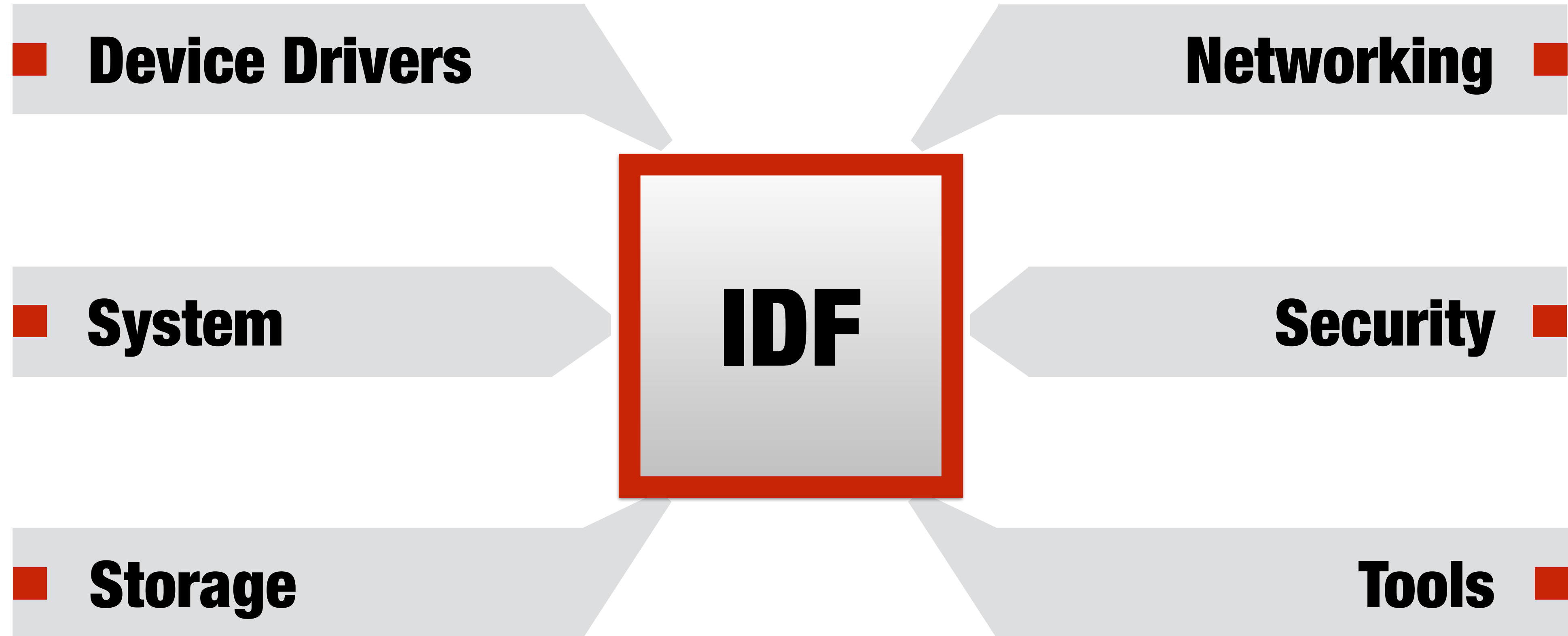
Application Frameworks



ESP-IDF



IDF Components





ESP Jumpstart

<https://github.com/espressif/esp-jumpstart>



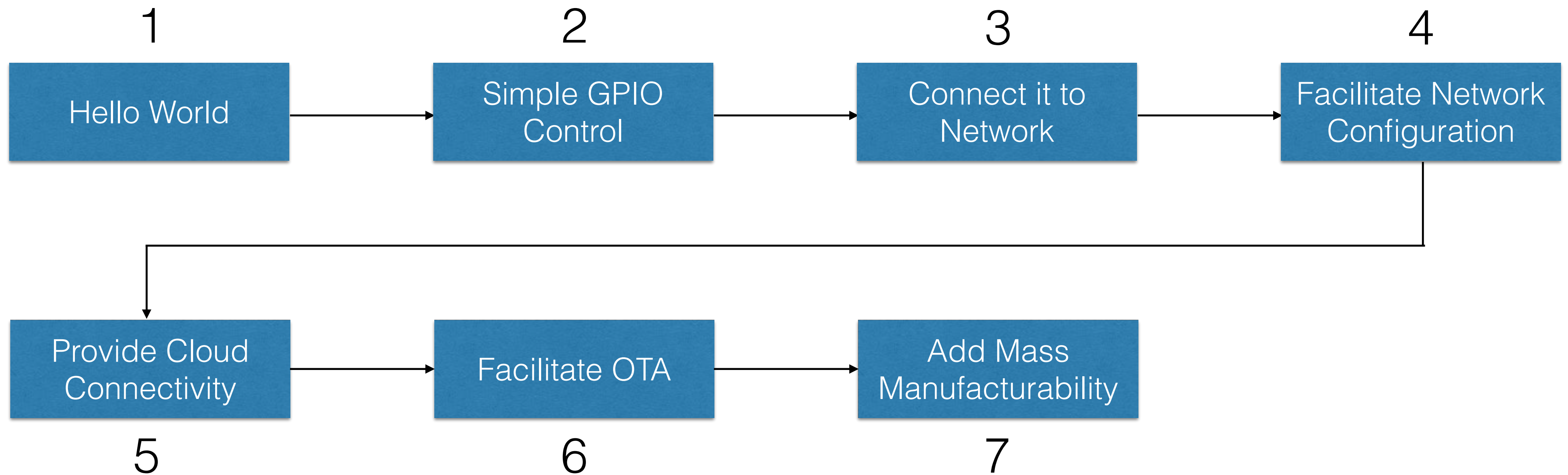
Why ESP-Jumpstart?

- All our customers need not reinvent the wheel when it comes to common product use-cases
- Building production ready firmware can be hard and requires multiple decisions to be taken
- Ready reference and boilerplate code can significantly simplify this
- However it can't be a black-box and step-by-step understanding is required for easy changes based on the use-cases



What is ESP-Jumpstart?

- ESP-Jumpstart provides a step-by-step tutorial with production quality boilerplate code for following steps:





ESP-AT



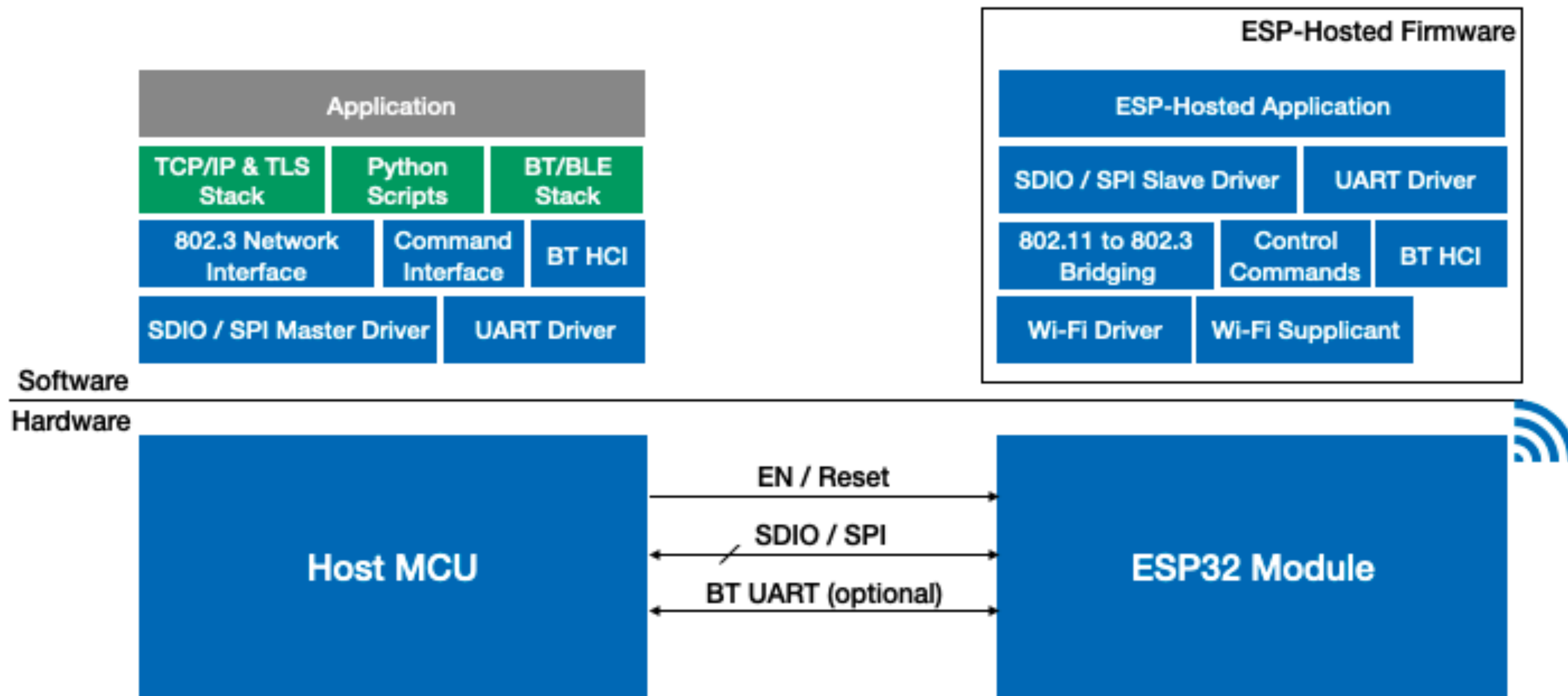
ESP-Hosted



ESP Hosted

- ❖ A solution to use ESP32 with a separate host MCU or MPU
- ❖ Solution includes ESP32 firmware, Linux Driver, STM32 reference implementation and host command library
- ❖ Supports SDIO and SPI based transport
- ❖ Data Path - 802.3 network interface on host side with packet bridging
- ❖ Control Path - Google Protobuf based command-response protocol over SDIO/SPI or separate UART
- ❖ BT/BLE HCI interface available over SDIO/SPI or separate UART

Hardware and Software





Additional Information

- ❖ Open-source release available - <https://github.com/espressif/esp-hosted>



ESP-RainMaker

A Typical IoT Product

A Typical IoT Product Requires 3 Software Development Efforts

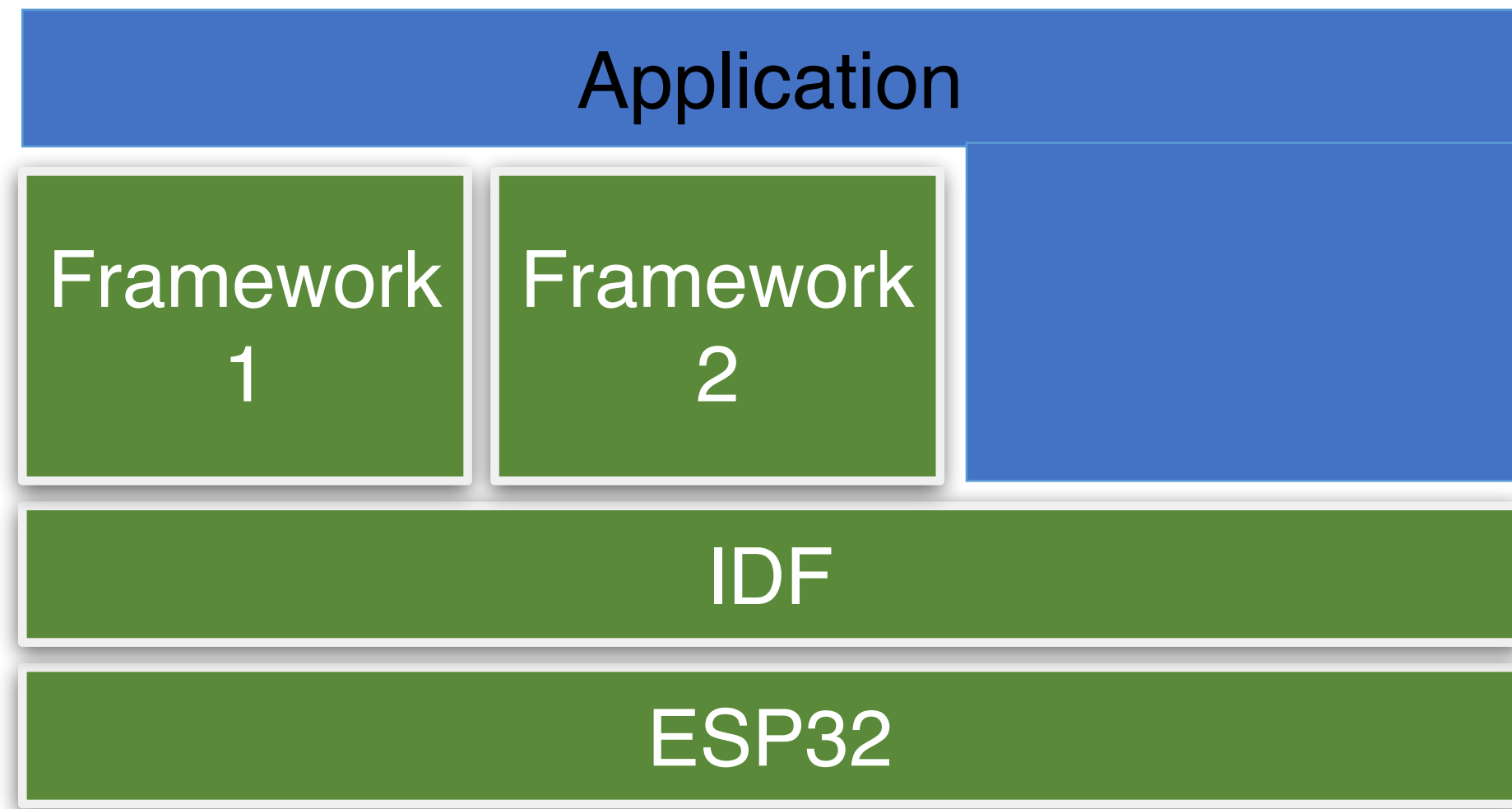
- ❖ Device Firmware - A device side business logic, peripheral control, cloud connectivity
- ❖ Phone Apps - Initial Wi-Fi configuration, user account creation, device control and monitoring
- ❖ Cloud Application - A conduit for device data for control and monitoring, voice assistants integration, data logging, cloud side business logic



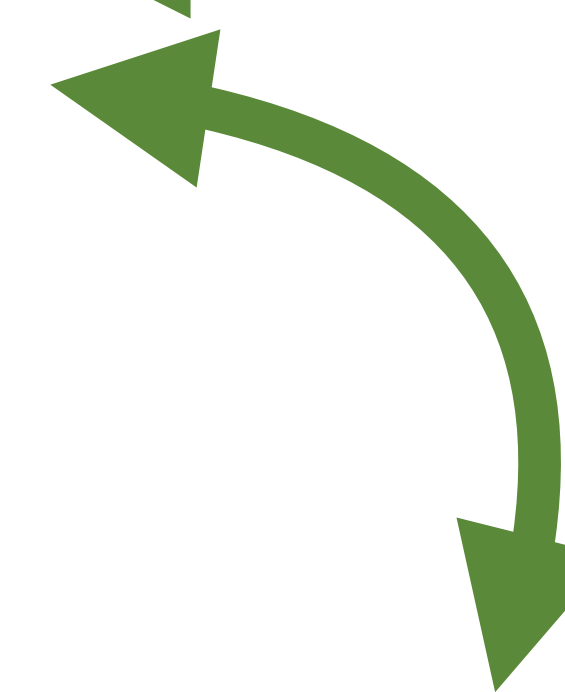
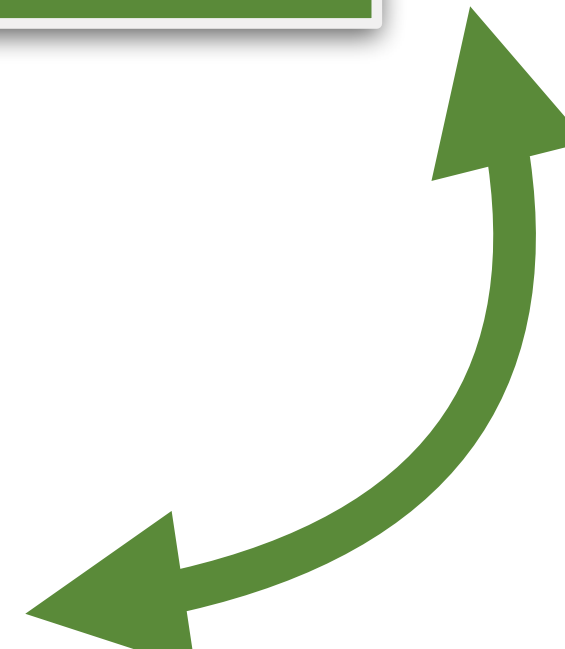
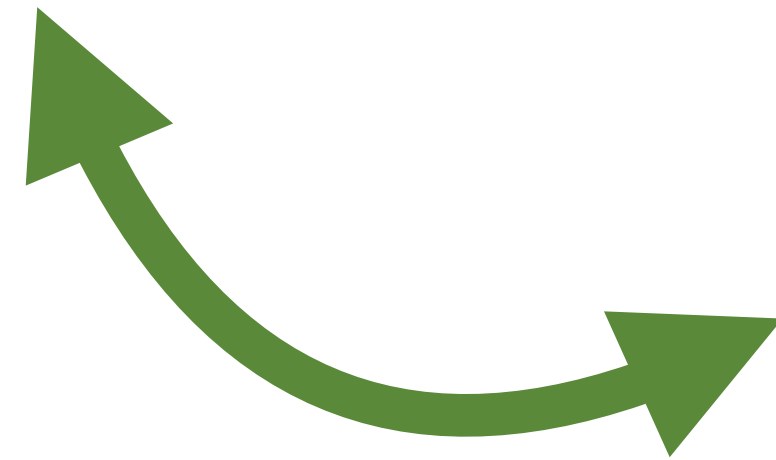
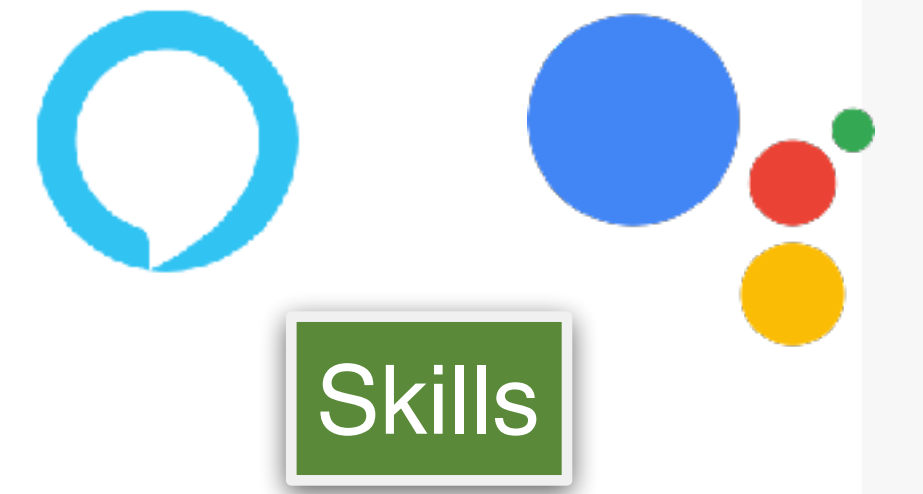
ESP RAINMAKER

ESP-Rainmaker is a platform that allows developers to build connected devices with ESP32 and ESP32-S2 without requiring any cloud or phone application side development

The end-to-end Platform



Phone Apps



Rainmaker Agent

- ❖ Rainmaker Device Agent is an SDK component
- ❖ It allows device description to the cloud, define different characteristics, their types, limits and assign UI elements
- ❖ The complexity of cloud communication is hidden from the application
- ❖ Rainmaker Agent also abstracts out workflows such as Wi-Fi configuration, user-to-device association.

Rainmaker Agent

```
/* Create a device and add the relevant parameters to it */
esp_ra_create_device("Light", common_callback);
esp_ra_device_add_type("Light", "esp.device.lightbulb");

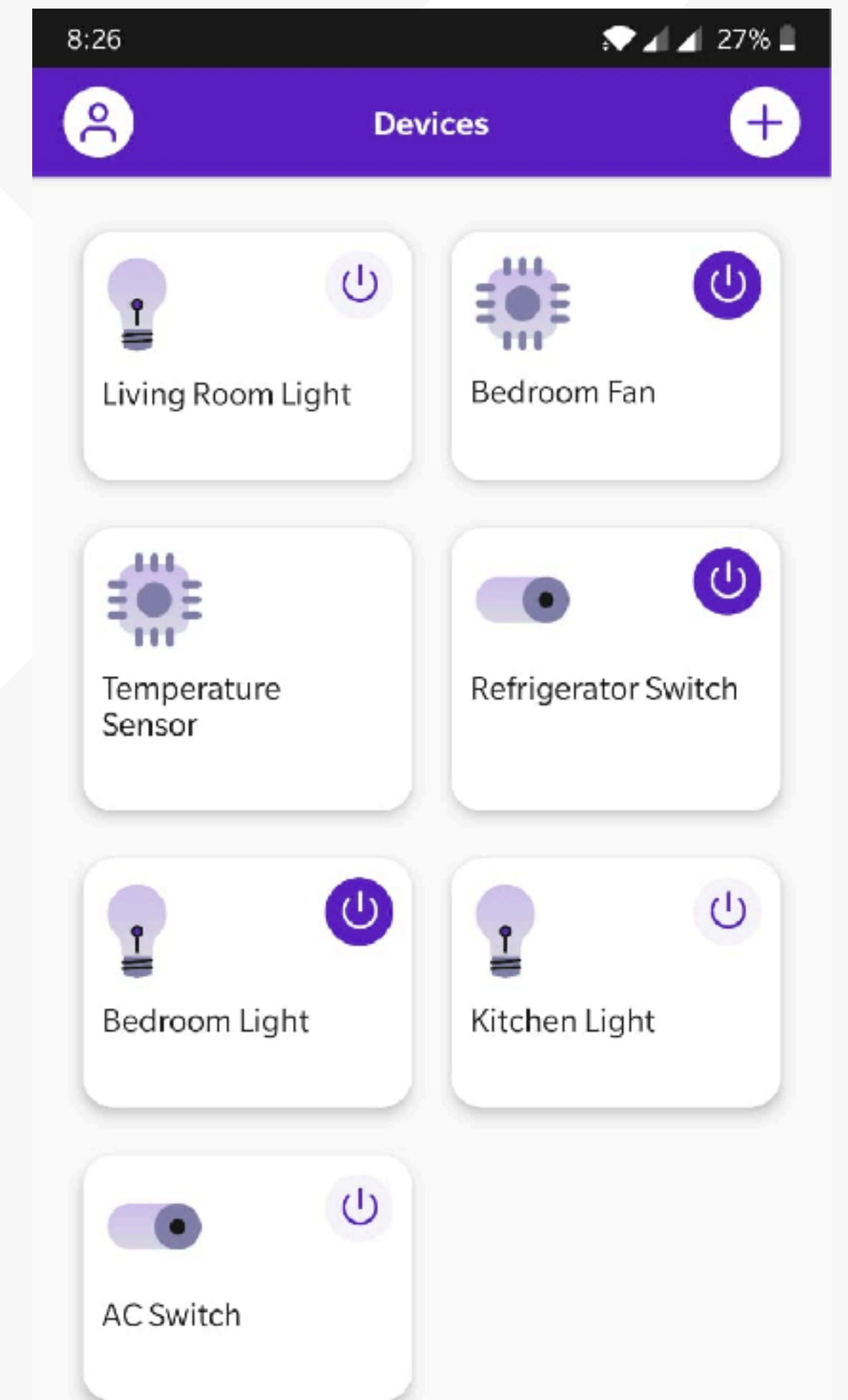
esp_ra_device_add_param("Light", "output", esp_ra_bool(false), NULL, PROP_FLAG_READ | PROP_FLAG_WRITE);
esp_ra_param_add_ui_type("Light", "output", "esp-ui-toggle");

esp_ra_device_add_param("Light", "brightness", esp_ra_int(50), NULL, PROP_FLAG_READ | PROP_FLAG_WRITE);
esp_ra_param_add_ui_type("Light", "brightness", "esp-ui-slider");
esp_ra_param_add_bounds("Light", "brightness", esp_ra_int(0), esp_ra_int(100), esp_ra_int(0));

/* Start the ESP RainMaker Agent */
esp_ra_start();
```

Rainmaker Phone Apps

- ❖ Rainmaker Phone Apps are self-adapting to display device defined parameters
- ❖ They support User sign-up, login, Wi-Fi configuration, user-device association and device control
- ❖ Both iOS and Android apps available in full source format





Rainmaker Cloud

- ❖ Rainmaker cloud is built using AWS Serverless architecture
- ❖ Users strong X.509 based mutual authentication with devices
- ❖ It is completely transparent for device to phone apps and device to voice assistant skills communication
- ❖ With Serverless architecture and careful design it provides high levels of scalability, security and availability at low cost
- ❖ The service is free for makers and can be deployed in customers' AWS accounts for production



Additional Information

- ❖ Cloud RESTful APIs and Python bindings for third-party service integration available
- ❖ Amazon Alexa integration and Google Assistant integration available
- ❖ Website: <http://rainmaker.espressif.com>
- ❖ Available on GitHub: <https://github.com/espressif/esp-rainmaker>



Amazon:FreeRTOS

<https://github.com/aws/amazon-freertos/>



ESP-HomeKit



ESP-Mesh



ESP-Audio



ESP-Who

<https://github.com/espressif/esp-who>



ESP-Skainet

<https://github.com/espressif/esp-skainet>

