

# HIP

Hierarchical IOT Protocol

For more information, see  
<https://projects.eclipse.org/proposals/eclipse-hip>

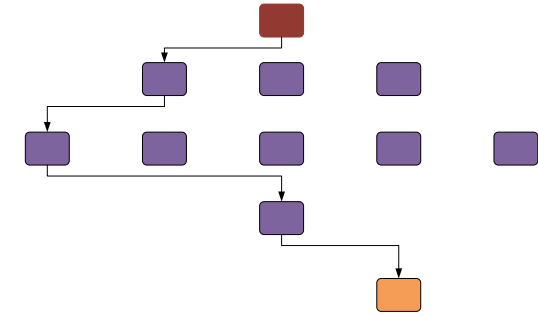
# What does HIP try to achieve?

- Reduce
  - Platform/Cloud side resource requirements
  - Bandwidth requirements between the deployment and the cloud
  - Overall Complexity in terms of interoperation and configuration
- Improve
  - Interoperability between devices and platforms
  - Scalability of deployments
- Enable
  - Offline operations
  - New functionality within deployments

# Why is HIP trying to do this?

- Balance load across deployment and platform devices and make better use of deployment-side resources
- Limit unnecessary data-flows and network (WAN, Internet) dependency and only push relevant data to the cloud
- Simplify adoption and rollout of IoT without limiting options or functionality
- Standardise communications without hampering progress
- Allow adopters to manage IoT deployments remotely and interact with them locally

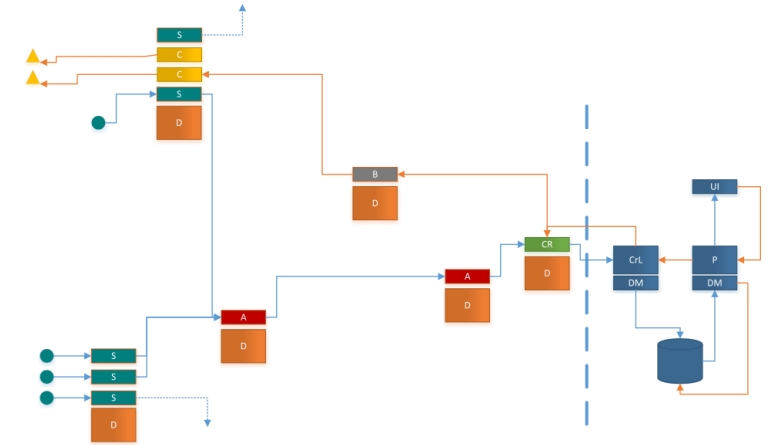
# How does HIP aim to achieve this?



- Proposes a Hierarchical structure for IoT deployments, much like the typical Organisational Structure of a large company
- Defines multiple deployment-side roles and responsibilities for devices/things
- Processes deployment data locally before sending to the cloud through the **Aggregator** role (e.g. calculate min, max and mean for a number of related sensors)
- Enables local interaction and integration via the **Broker** role and **Commanders**
- Implements a single point of contact between the cloud/platform and a deployment through the **Coordinator** role
- Enable new deployment-side functionality through the transfer of **handler** files from the platform

# How continued

- Use-case: Smart office building
- Aggregators used to calculate:
  - Min, max and mean temperatures, lighting levels etc. across large open-plan areas
  - Energy consumption across a number of areas (e.g. heating, lighting etc.)
- Local commanders used to control local environment (e.g. touch screen device for heating and lighting control at entrance to open plan area)
- Brokers used to group actuators (e.g. all HVAC units in a shared space controlled by a single command and set to the same temperature)
- Work to date utilises MQTT for messaging, but should be easily portable



# Current Status (Where is HIP now?)

- First draft of specification is work in Progress
  - Contains overview and definition of relevant terminology
  - Includes high level detail on each role and message topic
  - Some details on message structure has been included to date
  - Some relevant message flows have been completed
  - Based on Smart office use-case
  - Available on GitHub at <https://github.com/HIOTio/HIOTProto/blob/master/specification.md>
- Partial reference implementation developed in NodeJS
  - Multiple incomplete repositories available at: <https://github.com/HIOTio/>
  - These are out of date and may not reflect the current state

# Next steps (When will we see progress?)

- Actively working on completing draft specification
  - Looking for support in validating/challenging assumptions and propositions
  - Plan to have complete specification in draft form by end of Q2 2018
- Seeking support in evaluating Protocol against other IoT use cases
- Need to ensure Protocol doesn't "re-invent the wheel"
  - Identify other [iot.eclipse.org](http://iot.eclipse.org) projects which have comparable or better functionality (e.g. for device on-boarding and configuration)
  - Can concepts from HIP be implemented within established [iot.eclipse.org](http://iot.eclipse.org) projects?

# Who is behind HIP?

- Just me so far!  
Mark Healy (<https://www.linkedin.com/in/markhealymayo/>)
- Currently working as lead Solution Architect for an Irish Public sector organisation
- Started programming on a Commodore 64 at age 8
- First exposure to Open Source:
  - Installed Debian Linux on an Olivetti 386 PC in 1996
  - Degree thesis included customisation of Apache web server 1.3 in 2000
- Started working on HIP Q2 2017



# Thanks!

- Draft Proposal available at <https://projects.eclipse.org/proposals/eclipse-hip>
- Specification to date:
- <https://github.com/HIOTio/HIOTProto/blob/master/specification.md>