

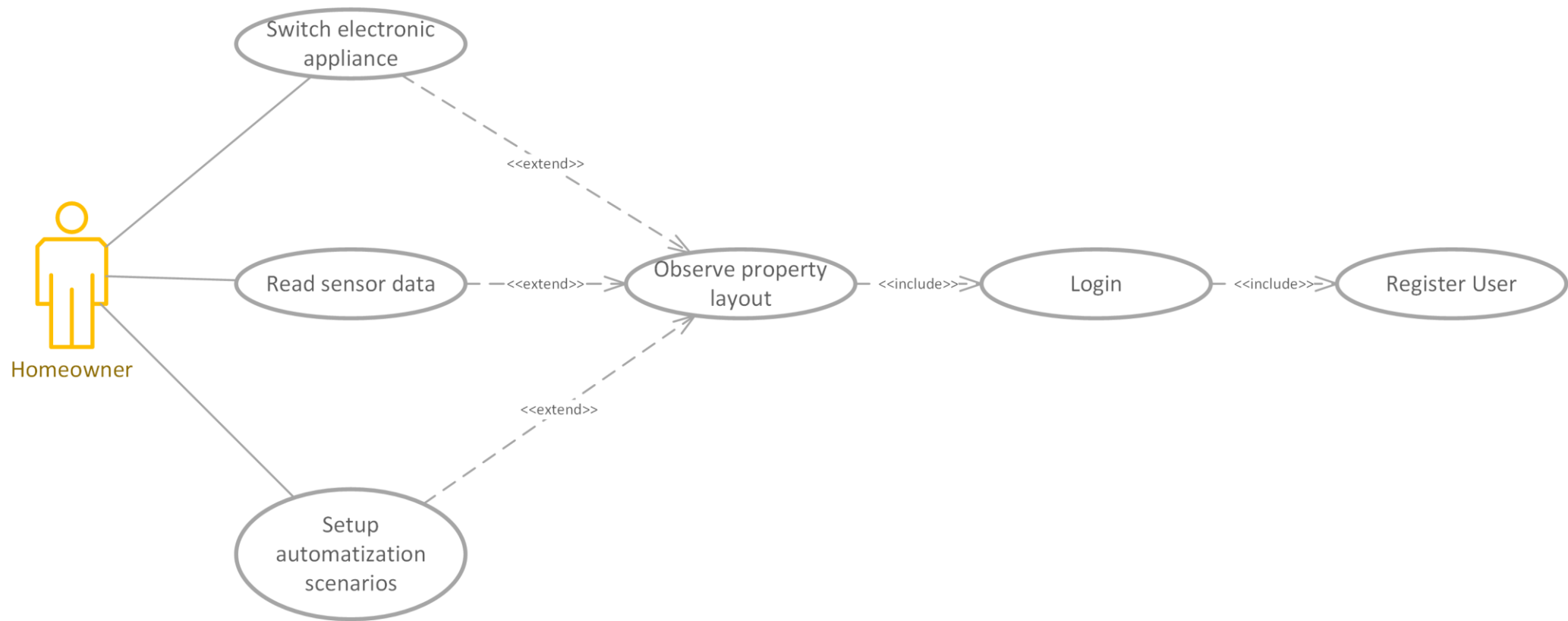
# Adaptation Concepts

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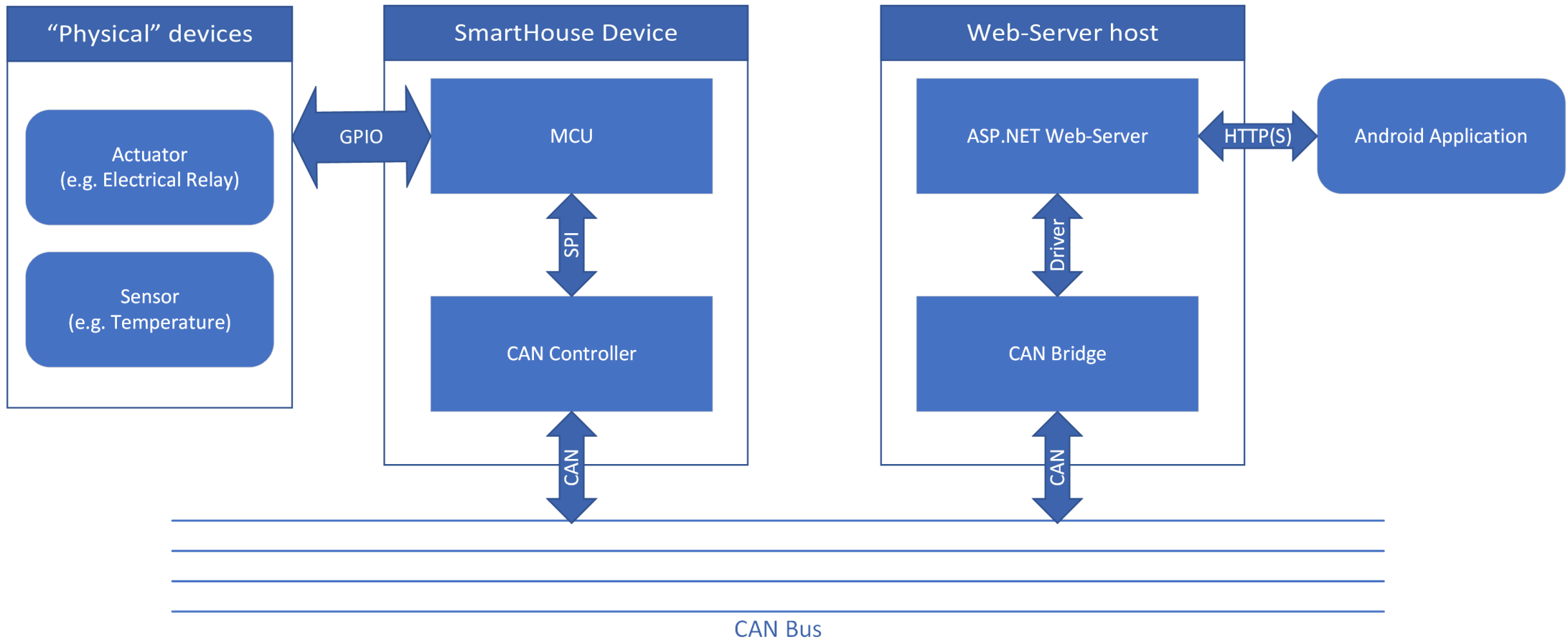
# Key functions

- Light control
- Reading Appliance state
- Remote control of appliance
- Automation scenarios
- Authorization. Separation of roles
- Reading sensor data

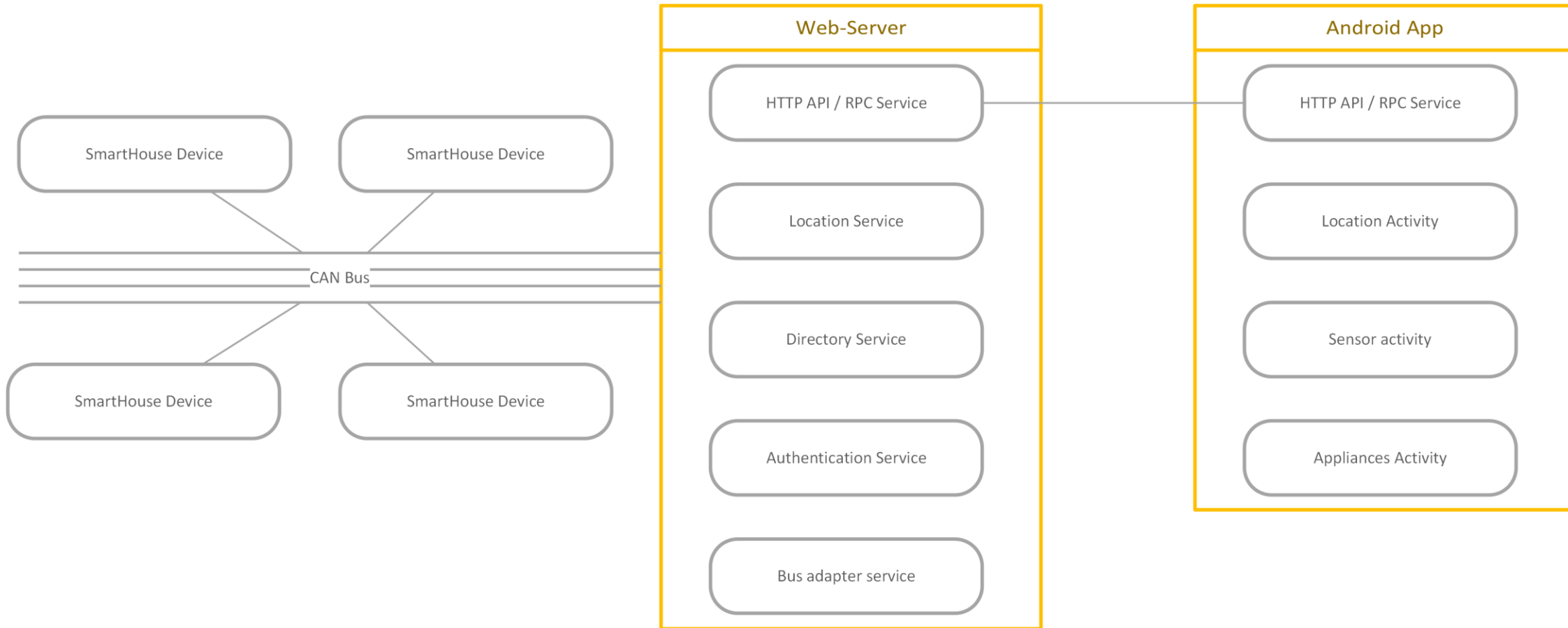
# Use Cases



# Hardware Structure diagram



# Software Component Structure diagram



# Adaptation – Wi-Fi location tracking

- Get network state
- Check if Wi-Fi SSID is in location tracking Data Base
- Measure signal strength and determine the current room
- Adaptation: select active room and update screen info depending on location

# Adaptation – energy saving

- Get battery state
- If battery has low charge, then disable server polling for SmartHouse states
- User can still update SmartHouse states manually and push updates manually

# Problem – user leaves the apartment

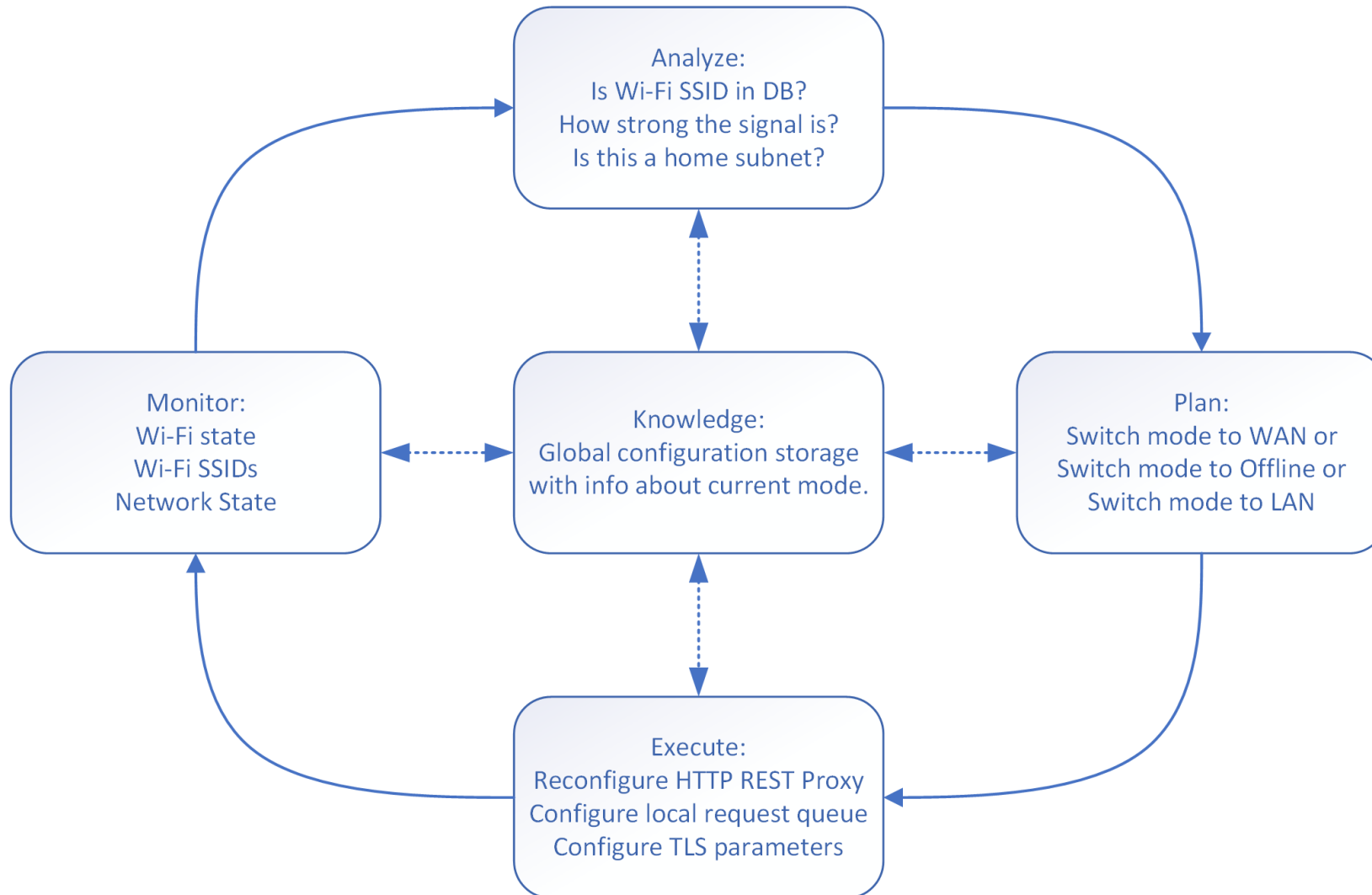
- We can detect that user is not at home via checking Wi-Fi state
- If it is the case, we should switch to WAN connection mode or to offline mode
- If we are using WAN mode, the app cannot use adaptation mechanism of location monitoring, but still provided the main features of SmartHouse
- If we are using offline mode, the app can only show last known states of SmartHouse equipment and queue user commands for future pushing to the server
- When user enters the apartment again, we switch to LAN mode



# Problem – battery low

- By default, the mobile app periodically polls the server for updates
- This requires a permanent connection, which uses lots of battery energy
- If the battery is low, we should switch polling off and make the user update state information manually
- We also can use Push-notifications, but this technology depends on Google services and thus is unavailable on some devices

# MAPE-K for Connectivity and Offline Challenge



# MAPE-K for Energy Challenge

