

# Home & Office Automation with WordPress

via existing Plugins

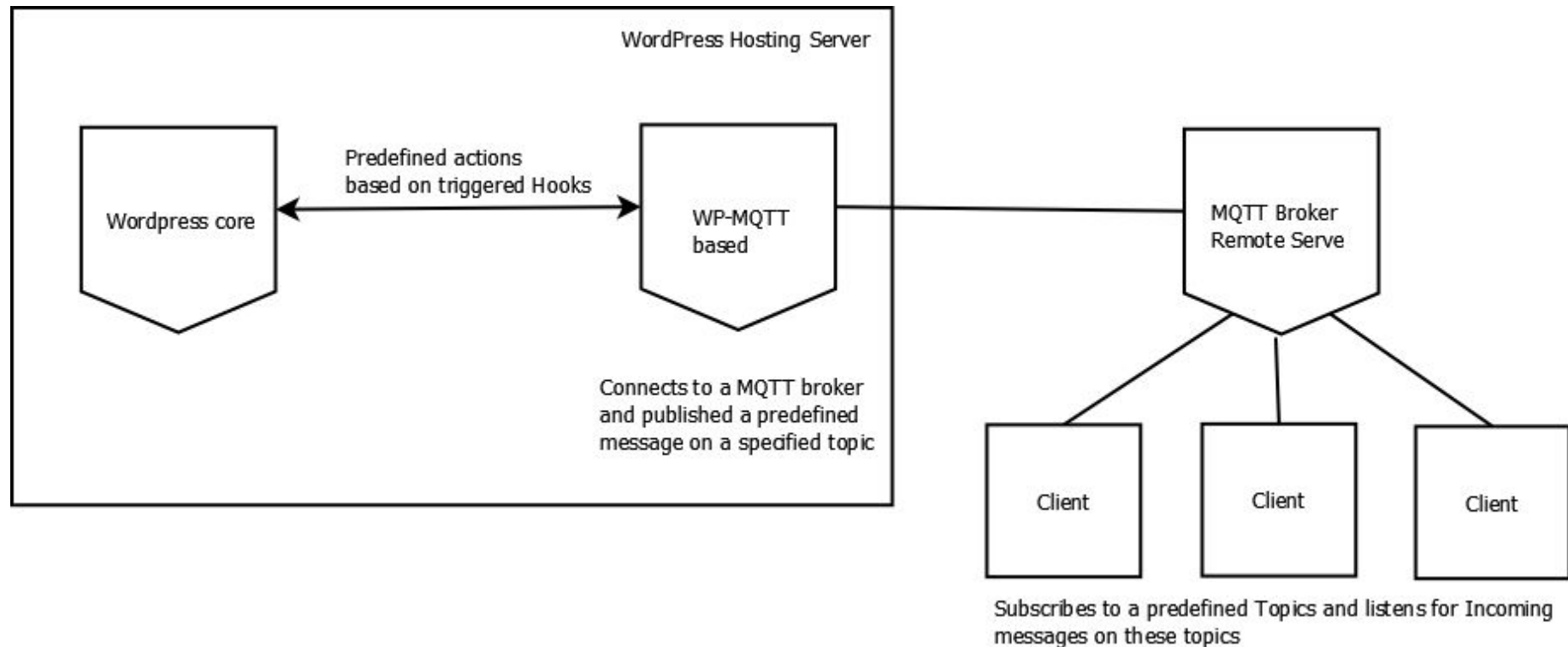
by Georgi Bakalski

# The Standards

---

- Home / Office Automation is not NEW, the idea exists since the ERA of Pravez computers where there were promises that the users will control their washing machines using Pravez:).
- MQTT Protocol became a standard for the IoT connected devices
- MQTT stands for MQ Telemetry Transport. It is a publish/subscribe, extremely simple and lightweight messaging protocol
- MQTT was invented by Dr Andy Stanford-Clark of IBM, and Arlen Nipper of Arcom (now Eurotech), in 1999.
- Free and Open Source Plugin that “talks” MQTT is available for WordPress

# The Big Picture



# Why using WordPress?

— — —

- Big Potencial in using WordPress for providing a complete solution for corporate customers in addition to their corporate websites.
- Core User / Customer management already built-in. Easy user/access management, Existing user tracking logging Plugins (Track who is doing what on the system).
- You can design a corporate website with a built-in user / employee area, where every employee gets access to the corporate offices (Access control, Lighting Control, TV/Projector Remote control all built in one solution, Last but not least, because WordPress is Cool :)

# MQTT In WordPress

---

- WP-MQTT - a Plugin that implements a MQTT client and can publish messages to a MQTT Broker, you can select what message / text to publish depending on a predefined WordPress hook, for example if a new user is registered, if an order has been paid.
- Custom Hooks can be defined in the theme functions.php and in your custom plugins, these custom Hooks can trigger sending valuable analysis and/or other useful data, based on the website / user actions ( Example - login failures etc. ).
- MQTT Publish functionality (Subscribe NOT available at the moment)

# WP-MQTT Triggers

---

- WP-MQTT provides some built-in actions that will be triggered and a predefined MQTT message will be sent to the configured MQTT Broker
  - Page View
  - User Login
  - User Failed Login
  - Page Published
  - Post Published
  - New Comment
- WP-MQTT will allow us to specify custom hook names, that will be configured to trigger a specific action and send MQTT message to the Broker and respectively to the client device.

# Used Plugins

---

- WP-MQTT - Implements a PHP MQTT Client that can send / **publish** MQTT messages to a remote MQTT broker, based on triggered Hooks in WordPress (via the FREE Plugin)
- User Specific Content Plugin - select specific users by username, or by role name who can view a specific post content or page content (we use this as our custom hooks are triggered when a user visits the **control page** ). ( FREE Plugin )
- User Activity **Tracking** and Log - To see and record Who is doing What on the System. (FREE Plugin)

# Custom Action Hooks

---

We have three Custom Action Hooks that will trigger sending our MQTT commands toward the client device:

- Door Open/Close Action (common commands for opening/closing the gate/roller shutters)
- Lights On action (it will trigger lights on command)
- Lights Off action (it will trigger lights off command)

Once triggered these Hooks will make the WP-MQTT Plugin, connect to the remote MQTT Broker and send the relevant command



# Action/Hook triggering mechanism

---

- In our case our action hooks are triggered, once the logged in user, access a specific page in case the user has rights to do so.
- To avoid confusion we have added a confirmation popups on the main page, to avoid miss-triggers
- We have modified the Plugin User-Specific-Content with our custom action hooks in order to be able to trigger the action hooks based on the page accessed by the user.

# Security

---

- SSL at All System Levels
- Use SSL in WordPress (Browser to Web Server encryption); User Authentication
- Use SSL encrypted connection between the WordPress WP-MQTT and the Remote Broker ( WP-MQTT Allows us to use a User/Password authentication )
- Use SSL between the Broker and the target MQTT client Device (Most Broker and MQTT IoT Devices are using SSL but there are significant amount that are NOT which is unsafe)

# Possible System Variations

---

- Allow users to register their MQTT enabled devices and Brokers and provide a centralized service for Home & Office Automation per User (A Dashboard for their Brokers / MQTT Devices).
- Provide a possibility to Subscribe and read data from a MQTT Broker / A Possibility for a NEW WordPress Plugin which is currently NOT Available /

# WP-MQTT in Action

— — —

The Demo is specially made for this presentation in the premises of Hardware Group Ltd, where the Roller Shutters and the Lighting system are controlled using a MQTT enabled client device (Irdroid IoT SmartHub) that can control Roller Shutters and the Office lighting systems.

# Resources & Questions

— — —

- <https://github.com/irdroid/wpmqtt>
- <https://wordpress.org/plugins/wp-mqtt/>
- <https://wordpress.org/plugins/user-specific-content/>
- <https://wordpress.org/plugins/user-activity-tracking-and-log/>



— — —

**Thank you!**