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MP082 ‘2.4GHz Channel Management’

April 2022 Working Group – meeting summary

Attendees

Attendee	Organisation
Ali Beard	SECAS
Kev Duddy	SECAS
Anik Abdullah	SECAS
Joey Manners	SECAS
Khaleda Hussain	SECAS
Mike Fenn	SECAS
Tom Mudryk	SECAS
Rainer Lischetzki	SECAS
Elizabeth Woods	SECAS
David Walsh	DCC
David Rollason	DCC
Emma Johnson	British Gas
Alex Hurcombe	EDF Energy
Daniel Davies	ESG Global
Alastair Cobb	Landis+Gyr
Ralph Baxter	Octopus Energy
Mafs Rahman	Scottish Power
Gordon Hextall	Security Sub-Committee (SSC)
Matt Alexander	SSE Networks
Shuba Khatun	SSE Networks
Audrey Smith-Keary	SSE - OVO
Emslie Law	SSE - OVO
Robert Johnstone	Utilita
Kelly Kinsman	WPD

Overview

The Smart Energy Code Administrator and Secretariat (SECAS) provided an overview of the modification so far, the proposed solution, business requirements and the proposed next steps.

Issue

- The modification proposes to develop a mechanism to allow the CH to change the radio channel automatically or remotely after installation.
- Due to the increase rollout of Smart Meters more and more Devices will be co-located and competing for the same 2.4GHz channel which will cause congestion and traffic and have implications.
- The Zigbee 2.4GHz channel is selected at install and set for life unless there is manual intervention.
- Channel is changed via external intervention through site visit involving Communications Hub exchange.

Business Requirements

1. Where interference is deemed to be cause for HAN Devices to go “dark”, a channel frequency change shall be enabled and allow Parties the ability to trigger channel change remotely, or to allow automatic recovery (avoid site visit)
2. To preserve the battery life of battery powered HAN Devices, the absolute number of channel changes shall be limited
3. Any changes would need to consider pre-existing HAN Device to limit Devices from being stranded and inoperable

Solution Options

1. CH selects channel by continuously monitoring
2. 2.4GHz Frequency Agility aligned to Sub-GHz Frequency Agility solutions

Working Group Discussion

SECAS (KH) highlighted currently there is no solid evidence of the issue occurring at the present time, but this is something we anticipate may occur more in the future as Smart Metering rollout continues. SECAS (TM) elaborated on each of the business requirement in detail, highlighting the solution will closely follow the existing Sub-GHz functionality.

SECAS explained that as per the Sub-GHz implementation, Packet Error Rate (PER) is typically used to detect a potential problem with the current channel, whereas an energy scan is used when sampling to see if there is a better channel to move to. It is however easier to detect PER problems on Sub-GHz as the Communications Hub is the centre of a star network topology with all messages routing through the Communications Hub. A Working Group member (AC) highlighted this approach couldn't be used for nodes on the edge of a 2.4 GHz mesh network that are struggling to communicate with each other. SECAS (TM) suggested adding an additional Business Requirement that requires the Communications Hub to send some form of heartbeat message to each of the HAN Devices, which it can then use to perform PER calculations. This covers the example of a PPMID struggling to communicate directly with an ESME, as a Communications Hub would not necessarily talk directly to the PPMID and therefore not realise it was struggling.

For business requirement 2, Working Group member (AC) suggested that a channel change should happen within the wakeup cycle of a battery powered Devices but SECAS (TM) highlighted that despite being a good suggestion it would diverge too much from the current Sub-GHz implementation and was subsequently rejected by the Working Group. SECAS advised that in order to meet this business requirement any channel change will be limited to once per 24 hours as suggested by the ZigBee Smart Energy specification.

A Working Group member (MR) advised this modification was raised by Angel Oses De Leon from Scottish Power and asked if anyone from Alt HAN was at the Working Group. SECAS (KH) advised the modification, and the solution options were discussed in detail at the HAN WAN Working group and the solution options were put forward by HAN WAN Working Group members.

SECAS highlighted that the difference in effort between the two implementation options should be minimal. The only difference being if Suppliers want to retain the current Sub-GHz functionality to force a Frequency Agility event and therefore trigger a scan to look for a new channel. Suppliers were asked if they use this functionality today for Sub-GHz and if they want to retain it. No one responded with strong views either way.

The DCC (DW) advised this modification will impact the Communication memory space and this is something which will need to be considered. SECAS acknowledged this will need to be considered as part of DCC's Preliminary Assessment. The Working Group queried if this modification is something the industry will use and if it is needed. The Working Group advised it is worth further investigating the impact of the issue and how much this will benefit the industry.

It was asked whether MP082 should be considered for implementation in the 4G Communications Hub. SECAS suggested if this could be used as a trial to help understand if the Frequency Agility measures would trigger in real-world installations, which would help give evidence as to whether or not to implement the change across all Communications Hubs. The Working Group advised that the business case needs building further as currently there is not enough evidence of the issue despite it being welcomed as a practical robustness measure.

Next Steps

The following actions were recorded from the meeting:

- SECAS to add a business requirement to include a solution to detect if any nodes on the edge of a mesh network are having poor HAN connectivity.

SECAS to gather evidence of the issue to build the business case and bring back to a future Working Group meeting.