



Open Architectures for Intelligent Solid State Lighting Systems

OpenAIS Symposium:

Conclusions and outlook

Eindhoven, May 23rd 2018

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ZUMTOBEL



TU/e ARM

TRIDONIC
enlightening your ideas

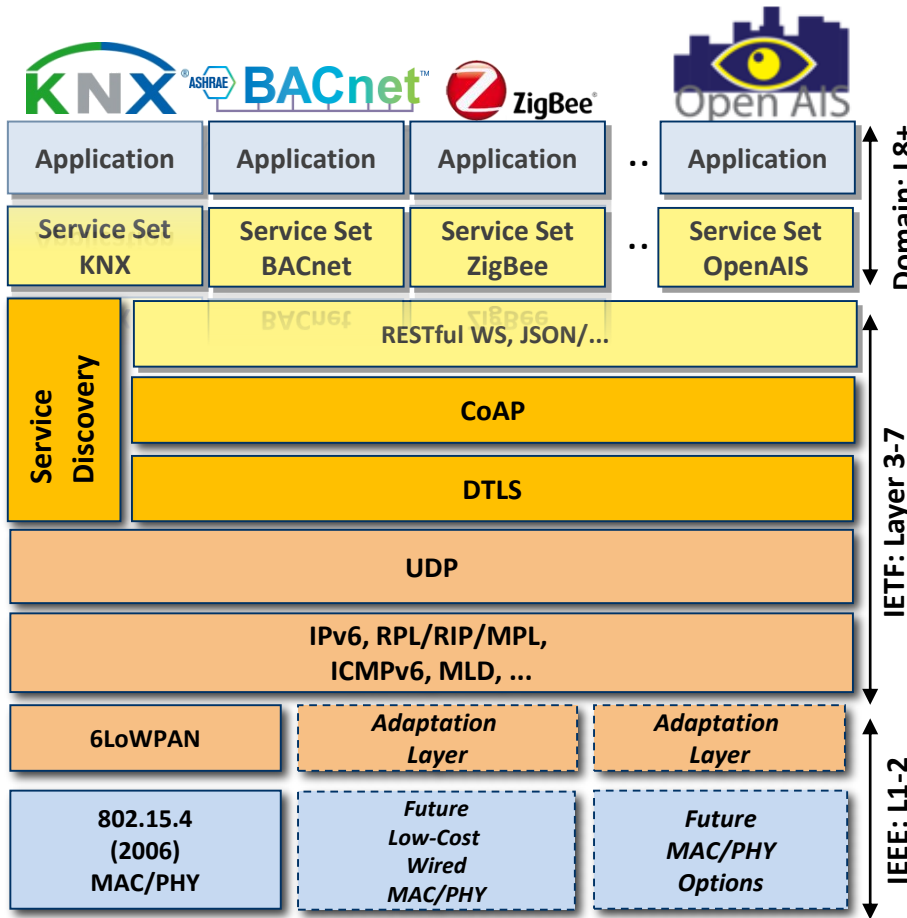
PHILIPS

// Summary



- **User and system requirements** for future offices are identified.
- A **System Architecture**, with solutions for the identified IoT gaps:
 - **OGC: Secure Group communication**
 - **Object models for professional lighting**
- First of an kind pilot implementation realized of an **multi-vendor IoT lighting system over wired and wireless networks**
- The **Pilot installation** was successfully validated.
-
- **Standardization** with SDO's ongoing: alignment with Fairhair for unified application services/middleware specification and registration of the Object model at IPSO ongoing
- **Open Source reference implementation** is under investigation

// Prepare standardizations



Application layer: IPSO/OMA registration done and publication ongoing.



Middleware layer: liaison with Fairhair to align OpenAIS Reference Architecture to create a common layer 3-7 IT solution for Lighting and Building Automation.



Network layer: Aligned with Thread, use Ethernet (UPoE/PoE+)



DiiA: The option that Partners bring the results to DiiA is under discussion



DEVELOPING THE INTERNET OF LIGHTS



Following the trends of the creation of the "The Internet of Things" (IoT) and the rapid penetration of SSL based lighting, it is very advantageous to connect the luminaires in buildings to the Internet. OpenAIS aims at setting the leading standard for inclusion of lighting for professional applications in to IoT, with a focus on office lighting. This will enable a transition from the currently existing closed and command oriented lighting control systems to an open and service oriented system architecture.

Openness and service orientation will create an eco-system of suppliers of interoperable components and a market for apps that exploit the lighting system to add value beyond the lighting function. Added value can e.g. be related to more efficient use of the building, reduction of carbon footprint and increased comfort and wellbeing. In addition, IoT will facilitate smooth and effective interaction of the lighting system with other functions in a building such as e.g. HVAC, security and access control. Extensibility and security of the system architecture are important aspects and will be guaranteed.

The OpenAIS project will define the requirements and use cases for offices in 2020, define the best open system architecture, identify existing ICT components to be used and develop additional components. The system will be validated by a pilot installation in a real office setting.

After the OpenAIS project, the Consortium will pursue standardization of the system architecture, aiming at the creation of the leading standard for Internet connected lighting. The project brings together a strong collaboration of the leading lighting companies Zumtobel, Tridonic, and Philips and

News & Events

▪ May 16, 2018 LED Professional Review #67
OpenAIS Integrating Lighting in the Internet of Things in LED Profes... [learn more](#)

▪ Mar 15, 2018 Invitation to OpenAIS Symposium, May 23rd in Eindhoven
Over the past three years a consortium of leading European companies... [learn more](#)

▪ Dec 19, 2017 Pilot Specification Report published
The Pilot Specification Report (D5.1) charts the development of the ... [learn more](#)

▪ Nov 23, 2017 VDI-Fachtagung: Lighting & IoT, Duesseldorf
Eine offene Architektur für Lichtsteuerungen in professionellen... [learn more](#)

▪ Nov 10, 2017 Lightshow during the Eindhoven GLOW Lightfestival
During the OpenAIS pilot installation of an open IoT Lighting system... [learn more](#)

[News & events overview >](#)

Available results:

- Requirements:
 - Scenarios & use cases
 - Value chain analysis
- Architecture:
 - Reference Architecture
- System integration
- Pilot Specification
- Validation reports (soon)

<http://www.openais.eu/en/results>

Your feedback is welcome at feedback@openais.eu

// Recent publications



Papers

Integrating Lighting in the Internet of Things By Ben Pronk and Frank van Tuijl (Philips Lighting)
Published in LED Professional Magazine #67, **May 16, 2018**

The Internet of Lighting: download and play! Walter Werner interviewed by Michiel de Boer of Moesasji
Published in ILI GLOW magazine (TU/e), Novem..., **Nov 8, 2017**

OpenAIS Pilot in De Wite Dame By Thomas van der Werff and Harm van Essen (TU/e).
Published in ILI GLOW magazine, Novem..., **Nov 8, 2017**



Presentations

Eine offene Architektur für Lichtsteuerungen in professionellen Gebäuden auf der Basis von IoT By Dr. Walter Werner, Werner Management Services (AT), VDI-Fachtagung: Lighting & IoT, Nov 2..., **Nov 23, 2017**

How OpenAIS embeds Lighting Controls into the IoT world. By Dr. Walter Werner, Werner Management Services (AT), ZVEI Connected Lighting Day 2017, Oct 26,..., **Oct 26, 2017**

IoT System architectures of BMS, LMS & BIM By John A. Sayer, Johnson Controls (UK), LED Professional Symposium 2017, Sept 26-28, 2017, Br..., **Sep 27, 2017**

How the OpenAIS Group Communication allows secure and low latency interoperable IoT based lighting controls designs By Giulio Borsoi, Zumtobel Group at LED Professional Symposium 2017, Sept 26-28, 2017, Bregenz, Aust..., **Sep 27, 2017**

The architecture of IP connected lights can be the blueprint for connected buildings By Thomas Moder, Tridonic (AT) at LED Professional Symposium 2017, Sept 26-28, 2017, Bregenz, Austri..., **Sep 26, 2017**

IoT standardization needs and multiple connectivity for lighting controls By Dr. Walter Werner, Werner Mgt Services at LED Professional Symposium 2017, Sept 26-28, 2017, Breg..., **Sep 26, 2017**

Open Architecture for IoT connected Lighting for Professional Buildings By Henk Stevens, Philips Lighting, Arm Research Summit 2017, 11-13 September 2017, Cambridge, UK, **Sep 13, 2017**

Open Architecture for IoT connected Lighting for Professional Buildings, **Sep 13, 2017**

<http://www.openais.eu/en/publications>

Evaluation Form

Was the OpenAIS Symposium interesting and relevant for you?

Please provide your comments on this form



1

2

3

4

5

Not interesting

Interesting

Very interesting

1

2

3

4

5

Not Relevant

Relevant

Very Relevant

Comments

Poll

When do you expect the Tipping Point of IoT connected lighting?

Tipping Point means: >50% of new built and refurbished offices have IP connected lighting



2020

Indicate why you think it's 2020
What needs to happen until then?

2023

Indicate why you think it's 2023. Indicate what needs to happen when?

2028

Indicate why you think it's 2028. Indicate what needs to happen when?

2018

2019

2020

2021

2022

2023

2024

2025

2026

2027

2028

End

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