

IoT challenges

State of the art

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Outline

1. Introduction

2. First contribution

3. Conclusion

Context

What is IoT ?

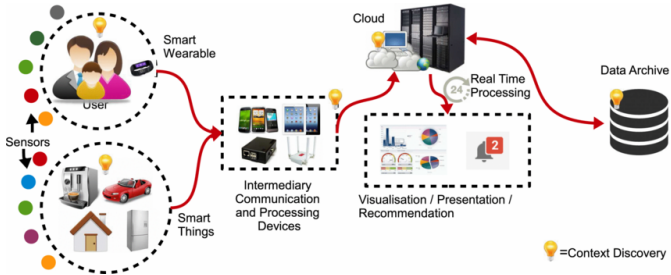


Figure 1: IoT platform.



Figure 2: IoT challenges.

Problematic

Where is the problem ?

1. How to Connect sensors to the best gateway?

- Decision and optimisation problem.
- Various network acces
- Various configuration of each network acces
- Lake of selection tools

2. How to connect sensors to this gateway with high Security level.

- Technical problem.
- Lake of selective tools
- How to select the **best** access point

3. How to extract knowledge from sensors data [2].

- a
- Lake of selective tools
- How to select the **best** access point



Figure 3: Key barriers to Industrial Internet of Things (IIoT) adoption

^a industrialinternetofthings

[2] Pascal Thubert, Maria Rita Palattella, and Thomas Engel. "6TiSCH Centralized Scheduling: When SDN Meet IoT". In: 2015 IEEE Conference on Standards for Communications and Networking (CSCN). 2015 IEEE Conference on Standards for Communications and Networking (CSCN). 00033. Tokyo, Japan: Oct. 2015, pp. 42–47.

Problematic

Where is the problem [3] ?

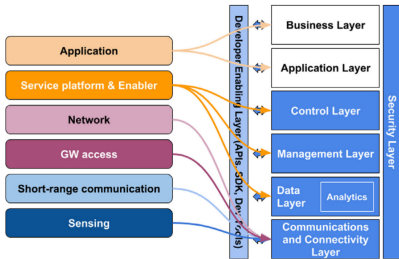


Figure 4: Intel view.

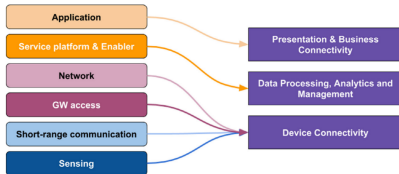


Figure 5: Microsoft view.

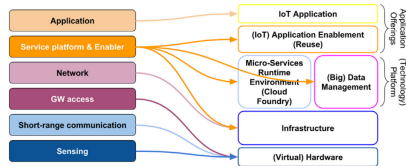


Figure 6: SAP view.

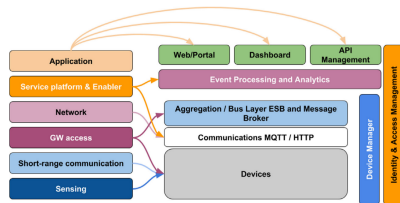


Figure 7: WS2O view.

Problematic

Where is the problem [3] ?

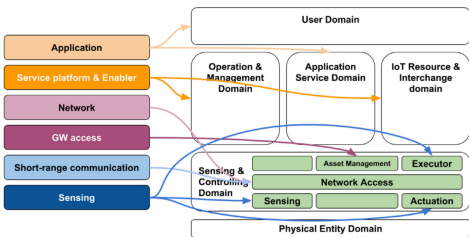


Figure 8: ISO view.

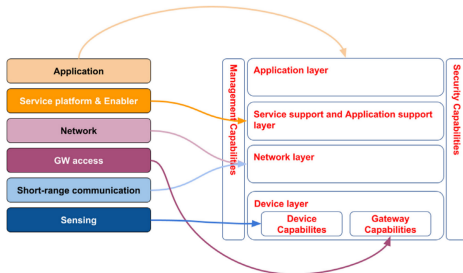


Figure 9: ITU-T view.

Motivations

Why should we deal with such problems

1. → a
→ Lake of selective tools
→ How to select the **best** access point

2. QoS Analysis

- a
- Lake of selective tools
- How to select the **best** access point

3. Threats

- a
- Lake of selective tools
- How to select the **best** access point



Figure 10: Communication diversity.

Goal

Is it specific, measurable, achievable, réalistic, for 3 years ?

- ➡ 1. Allow heterogeneous network to communicate
- 2. QoS Analysis
- 3. Threats
- ➡ How to select the **best** access point
 - 1. Allow heterogeneous network to communicate
 - 2. QoS Analysis
 - 3. Threats



Figure 11: wsn-IoT.

Challenges

Where is the difficulty ?

1. Challenge 1

- 6720 possible settings
- Lack of selective tools
- How to select the **best** configuration

2. Challenge 2

- a
- Lack of selective tools
- How to select the **best** access point

3. Challenge 3

- a
- Lack of selective tools
- How to select the **best** access point

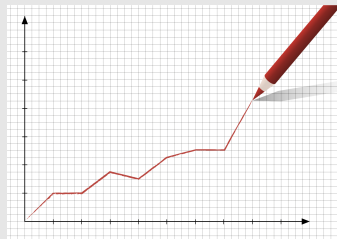


Figure 12: tets.

Contributions

How could be addressed ?

1. Contribution 1

- a
- Lake of selective tools
- How to select the **best** access point

2. Contribution 2

- a
- Lake of selective tools
- How to select the **best** access point

3. Contribution 3

- a
- Lake of selective tools
- How to select the **best** access point

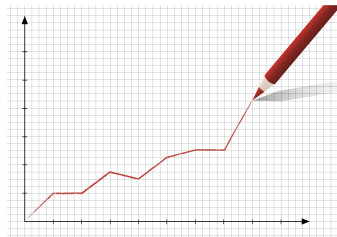


Figure 13: tets.

Outline

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1. Related work

2. Contagion process

3. Experimentation

4. Results exploitation

5. Conclusion

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Related work

Comparison

Paper	A1	A2	A3	A4

Table 1: An example table.

Related work

Comparison

Paper	A1	A2	A3	A4

Table 2: An example table.

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... (step 1)

Methods

➡ S = SF12, BW125, 4/8, 17 dBm

➡ Input:

➡ Problem: $f(x) = \max(x^2)$, $x \in [0,32]$

* $x_1 : 01101_b$

* $x_2 : 11000_b$

* $x_3 : 01000_b$

* $x_4 : 10011_b$

➡ Method: Genetic algorithm

➡ Generate a set of random possible solution

➡ Test each solution and see how good it is (ranking)

1. Remove some bad solutions

2. Duplicate some good solutions

3. Make small changes to some of them (Crossover, Mutation)

➡ Output:

➡ $x_1 : 01101$ (169) (14.4)

➡ $x_2 : 11000$ (576) (49.2)

➡ $x_3 : 01000$ (64) (5.5)

➡ $x_4 : 10011$ (361) (30.9)

... (step 2)

Methods



... (step 3)

Methods



... (step 4)

Methods



Results

Comparison

Table 3

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Experimentation

Experimentation

➡ a

➡ b

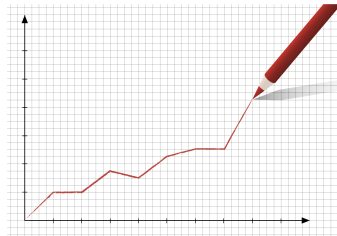


Figure 14: .

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Results

Comparison

➡ a

➡ b

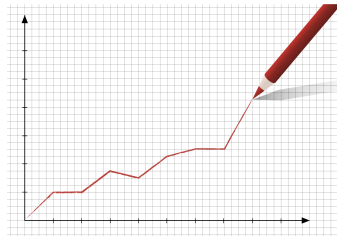


Figure 15: .

Outline

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Conclusion

➡ a

➡ b

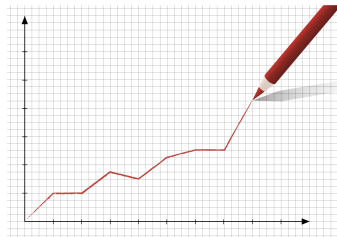


Figure 16: .

Outline

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Conclusion

Our main goal was



Our main contribution was



Our main results was



Future Challenges

Conclusion

Our future goal was



Future Challenges

Conclusion

Our future goal was



Thank you !

References

- [1] Musa Ndiaye, Gerhard Hancke, and Adnan Abu-Mahfouz. " Software Defined Networking for Improved Wireless Sensor Network Management: A Survey ". In: 17.5 (May 4, 2017). 00053, p. 1031.
- [2] Pascal Thubert, Maria Rita Palattella, and Thomas Engel. " 6TiSCH Centralized Scheduling: When SDN Meet IoT ". In: *2015 IEEE Conference on Standards for Communications and Networking (CSCN)*. 2015 IEEE Conference on Standards for Communications and Networking (CSCN). 00033. Tokyo, Japan: Oct. 2015, pp. 42–47 (p. 4).
- [3] B. Di Martino et al. " Internet of Things Reference Architectures, Security and Interoperability: A Survey ". In: *Internet of Things 1-2* (Sept. 2018). 00006, pp. 99–112 (p. 5, 6).