

# IoT challenges

State of the art

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# Outline

1. Introduction

2. First contribution

3. Conclusion

# Context

What is IoT ?

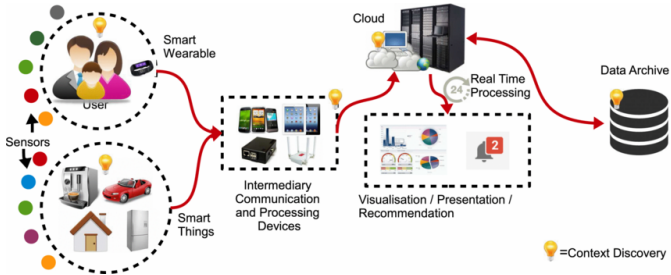


Figure 1: IoT platform.



Figure 2: IoT challenges.

# Context

What is IoT ?

## ➡ 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 (rank them)

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)

# Problematic

Where is the problem ?

## 1. How to Connect sensors to the best gateway with high QoS [1].

- 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

[#industrialinternetofthings](#)

[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.

# Problematic

Where is the problem [3] ?

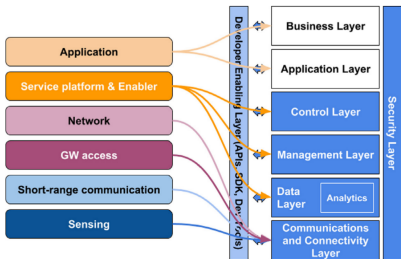


Figure 4: Intel view.

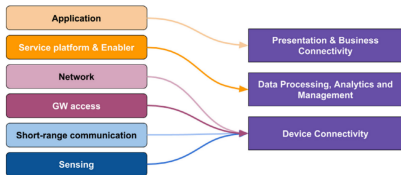


Figure 5: Microsoft view.

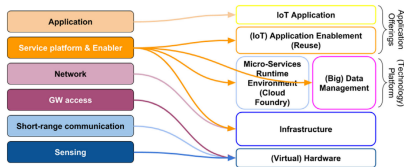


Figure 6: SAP view.

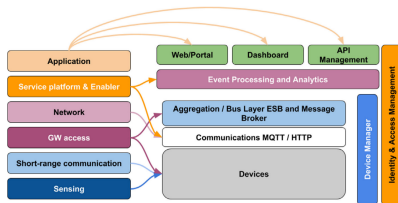


Figure 7: WS2O view.

# Problematic

Where is the problem [3] ?

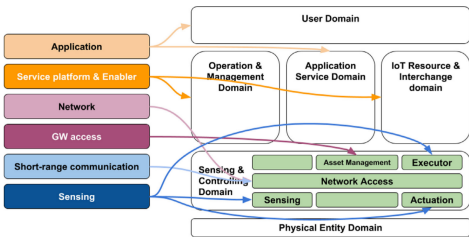


Figure 8: ISO view.

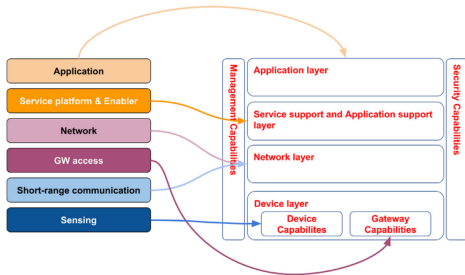


Figure 9: ITU-T view.

# Motivations

Why should we deal with search problems

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

## 2. QoS Analysis

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

## 3. Threats

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

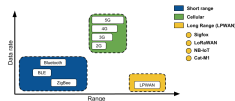


Figure 10: Communication diversity.



# 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

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

## 2. Challenge 2

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

## 3. Challenge 3

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

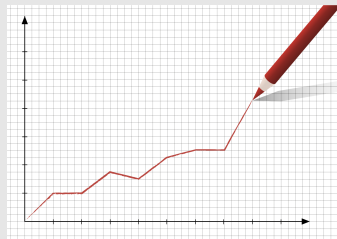


Figure 12: tets.

# 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

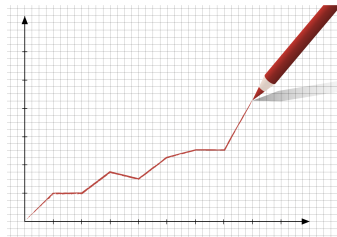


Figure 13: tets.

# Outline

1. Introduction

2. First contribution

3. Conclusion

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1. Introduction

2. First contribution

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1. Related work

2. Contagion process

3. Experimentation

4. Results exploitation

5. Conclusion

# Outline

1. Introduction

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1. **Related work**

2. Contagion process

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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



# ... (step 2)

Methods



## ... (step 3)

Methods



# ... (step 4)

Methods



# Results

## Comparison


Table 3

# Outline

1. Introduction

2. First contribution

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**3. Experimentation**

4. Results exploitation

5. Conclusion

# Experimentation

## Experimentation

➡ a

➡ b

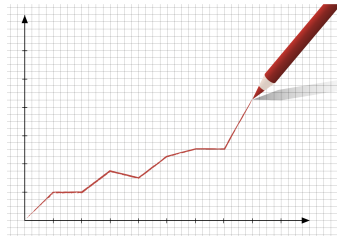


Figure 14: .



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# Results

## Comparison

➡ a

➡ b

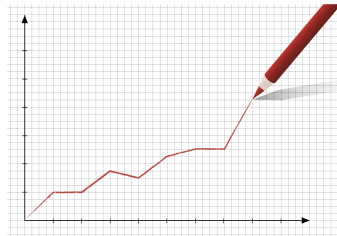


Figure 15: .

# Outline

1. Introduction

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# Conclusion

➡ a

➡ b

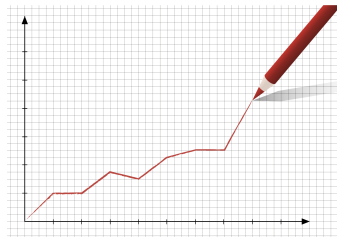


Figure 16: .

# Outline

1. Introduction
2. First contribution
- 3. Conclusion**

# 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 (p. 5).
- [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. 5).
- [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. 6, 7).