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Poster

Bringing Context-awareness to wireless sensor networks

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Abstract

Bringing Context-awareness to Wireless Sensor Networks

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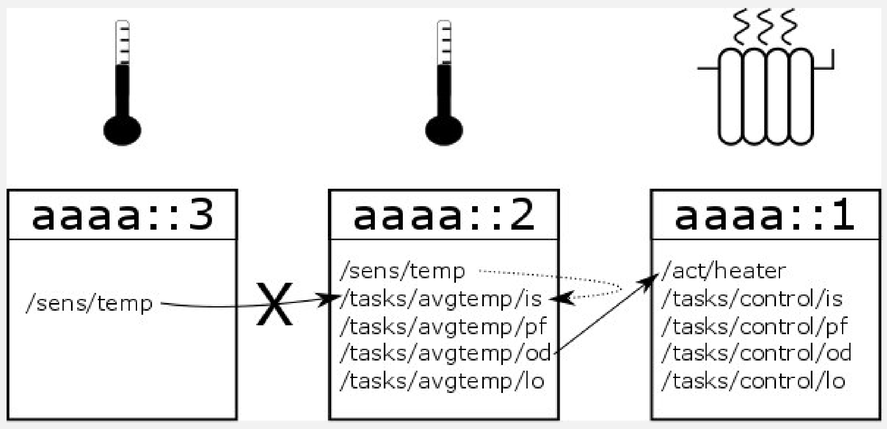
Programming Approach

- Programming abstraction has been a major focus of research in WSN
- With IoT, heterogeneous devices with different capabilities brings in new issues.
- Essential features for systems to support these changes and user to write applications are as follwoing:
    - Abstraction, Mobility and Modularity

T-Res

- T-Res attempts to provide support for IoT devices
- Tasks are divided into 4 parts: Input Source(is), Output Device(od), Processing Function(pf) and Last Output(lo)
- It uses CoAP and IPv6 addresses to assign tasks to resources
    - Put, Post, Get, Observe
- User inputs via CoAP agent for Firefox, Copper.



mT-Res: Mobility in T-Res

- mT-Res extends T-Res with helpf of automated CoAP operations
- Simple applications such as
    - node failure
    - Change of host node
    - New application for each node

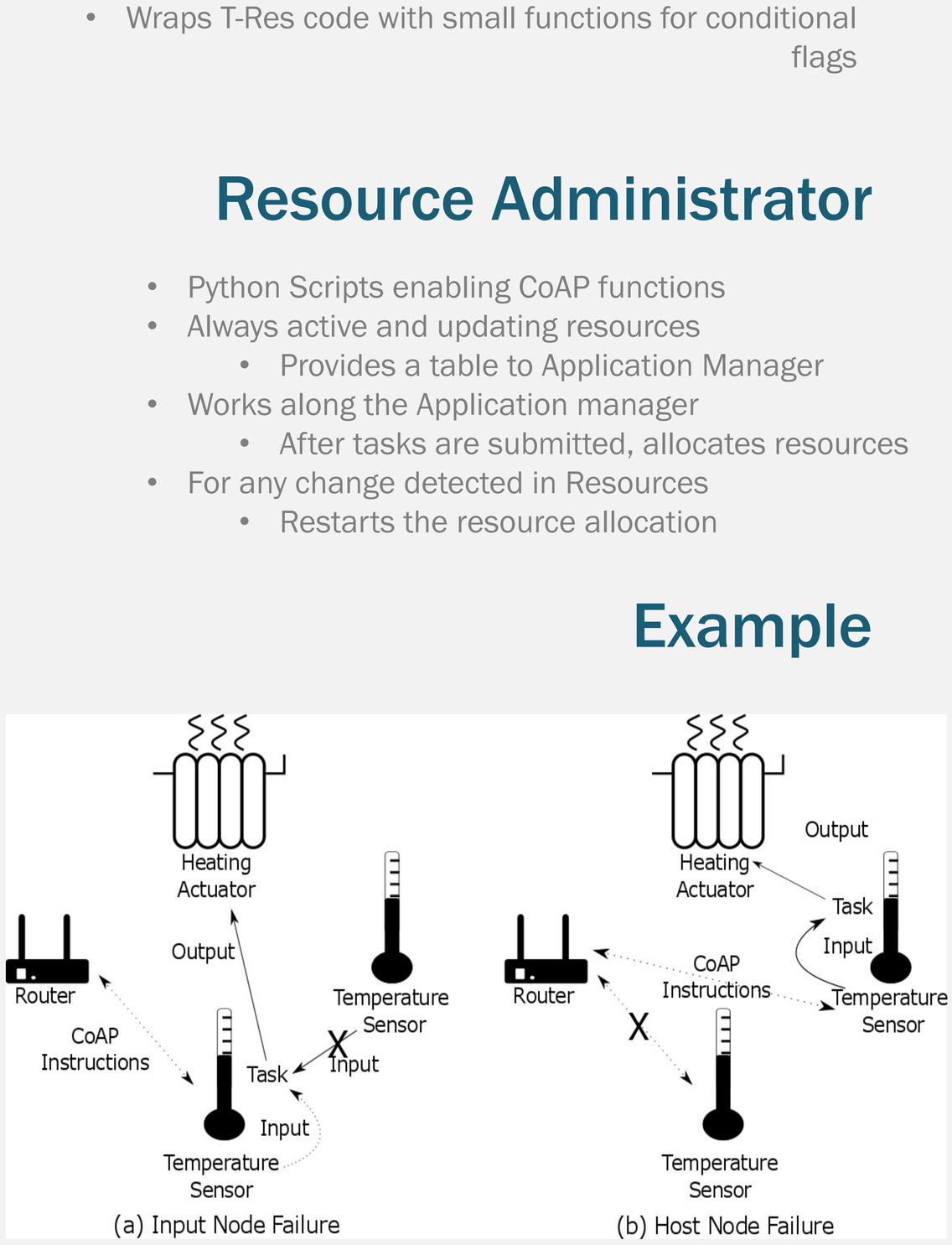
Application Manager

- Web framework in Django
- For user to submit tasks in 4 parts: Input Type, Output Type, Host (Fixed or Any), and Code.
- Wraps T-Res code with small functions for conditional flags

Resource Administrator

- Python Scripts enabling CoAP functions
- Always active and updating resources
    - Provides a table to Application Manager
- Works along the Application manager
    - After tasks are submitted, allocates resources
- For any change detected in Resources
    - Restarts the resource allocation

Example



Conclusion

In this demo, we extend capabilities of T-Res to provide autonomous resource allocations for IoT applications. In addition, mT-Res provides a web-interface for user(s) to input applications independent of specific resources. This extension is an effort to support context-aware IoT[3]

References

[1] Daniele Alessandrelli, Matteo Petraccay and Paolo Pagano, «T-res: Enabling reconfigurable in-network processing in iot-based wsns", DCOSS 2013

[2] Shashank Gaur, mt-res, https://bitbucket.org/shashankgaur_/tres_extension, 2016

[3] Shashank Gaur, Raghuraman Rangarajan and Eduardo Tovar, "Extending T-Res with mobility for context-aware IoT", 1st International Workshop on Interoperability, Integration, and Interconnection of Internet of Things Systems 2016

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