Poster

Bringing Context-awareness to wireless sensor networks

Shashank Gaur
Raghu R.
Eduardo Tovar

CISTER-TR-180407

2018/04/10
Bringing Context-awareness to wireless sensor networks

Shashank Gaur, Raghu R., Eduardo Tovar

*CISTER Research Centre
Polytechnic Institute of Porto (ISEP-IPP)
Rua Dr. António Bernardino de Almeida, 431
4200-072 Porto
Portugal
Tel.: +351.22.8340509, Fax: +351.22.8321159
E-mail: sgaur@isep.ipp.pt, raghu@isep.ipp.pt, emt@isep.ipp.pt
http://www.cister.isep.ipp.pt

Abstract
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 following:
  - 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 help 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

- 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