A Novel Iot Protocol Architecture; Efficiency Through Data And Functionality Sharing Across Layers

Tech ID: 32818 / UC Case 2019-904-0

BACKGROUND

The Internet's TCP/IP protocol architecture is a layered system design. As such, the functions performed by the TCP/IP protocol suite are implemented at different protocol layers, where each layer provides a specific set of services to the layer above through a well-defined interface. Using this interface, data being received or sent is passed up or down the stack on its way through the network.

However, layered design approaches can increase overhead, as each layer incurs additional communication (e.g., additional header field) and processing costs. Furthermore, limiting the flow between layers to data plane information restricts the sharing of control information across layers and may lead to functions being duplicated at different layers.

TECHNOLOGY DESCRIPTION

The technology is referred to as the IoT Unified Services framework, or IoTUS for short.

The technology involves generating communication packets for use by IoT nodes. The packets are generated by presenting an API to each protocol in a protocol stack. A single packet buffer is configured to hold headers for all the protocols that are directed to a destination node. Then memory pointers are stored in tables maintained by the protocols. When a input from the first protocol reaches the API, the single packet buffer is updated, as is the table in the second protocol.

APPLICATIONS

- Internet of Things networks
- Layered System Designs

ADVANTAGES

- Promotes information sharing among layers of the network protocol stack
- Promotes functionality sharing among layers of the network protocol stack,
- Greater energy efficiency
- Greater storage efficiency

INTELLECTUAL PROPERTY INFORMATION

CONTACT

Marc Oettinger
marc.oettinger@ucsc.edu
tel: 831-502-0253.



INVENTORS

- Obraczka, Katia

OTHER INFORMATION

KEYWORDS

Internet of Things, IoT, Layered System Design, Cross-layer sharing, IoTUS

CATEGORIZED AS

- **Communications**
  - Internet
  - Networking
  - Wireless

RELATED CASES

2019-904-0

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	11,252,263	02/15/2022	2019-904

RELATED MATERIALS

- A Novel IoT Protocol Architecture: Efficiency through Data and Functionality Sharing across Layers - 09/26/2019

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- Decoder-Only Transformer Methods for Indoor Localization
- Robust Adversarial Attack Detection
- Patient Pressure Injury Prevention Methods and Software
- Platooning System and Methods
- Cross-Layer Device Fingerprinting System and Methods
- Smart Deployment of Nodes in a Network

© 2022, The Regents of the University of California
Terms of use
Privacy Notice