ENERGY AND MOBILITY CONSCIOUS MULTIPATH ROUTING PROTOCOL FOR ROUTE STABILITY AND LOAD BALANCING IN MANET-IoT NETWORKS

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PRODUCT BACKGROUND

- Internet of Things is the key technology and enabler of Industrial Revolution 4.0.
- The recent advances of smart devices with embedded sensors will enable global connectivity of MANET-IoT scenarios with heterogeneous devices in terms of energy resources and mobility.
- Routing protocols play crucial roles in providing effective and efficient communication for data transmission to successfully implement the IoT networks.

STATE OF THE ARTS /METHODS

- Efficient and reliable data routing between source-destination pairs is a critical issue due to:
  - Unbalanced load distribution among nodes
  - Nodes are battery-powered and have limited processing capabilities
  - Nodes mobility which causes frequent network topological changes and increases control overhead.

NEED TO PROPOSE A NEW ROUTING ALGORITHM

- Transmitting data over multiple paths to balance load and increase reliability
- Simultaneous consideration of energy, mobility, and QoS-related metrics
- Optimising topological information routing

NOVELTY / INVENTIVENESS

- IO-MBMA-OLSRv2 can rank the nodes based on their battery energy and mobility and assess links quality accordingly to select the nodes with the highest rank for constructing multiple routes to the destination as well as flooding topological information using a new EMA-MPR mechanism.

BENEFITS/USEFULNESS

- The IO-MBMA-OLSRv2 contributes towards IR4.0 by making the communication stack in the IoT more precise and energy-efficient towards Green IoT.
- A new, unified, and efficient GUI based Exata simulation model for analysing and investigating the energy consumption and QoS of routing protocols in the IoT.

MARKETABILITY

- The potential market for the developed scheme includes and not limited to IoT Networking Industry, Networks Simulator Developer, Smart City Applications.

COLLABORATORS

- Scalable favors
- Ericsson
- National Instruments
- Makers
- University Malaysia Pahang

PATENT

- Copyright: LY2018003170
- Filed: 20 APR 2018
- Copyright: LY2018007097
- Filed: 20 FEB 2018
- "METHOD: "Methods and Systems for Energy Efficient and QoS-Aware Multipath Data Routing in Convergence Scenarios of IoT Wireless Networks" (Applied and it is under processing).

PUBLICATIONS


ACHIEVEMENTS

- GOLD MEDAL in Creation, Innovation, Technology & Research Exposition (CITREx 2018) UMP.
- GOLD MEDAL in CITREx 2017, UMP.