Recent Advances in Electrical and Electronic Engineering
Volume 11, Issue 2, 2018, Pages 123-131

Micro search engine for IoT : An IoT search engine prototype for private networks (Article)

Habaebi, M.H. ✉, Al-Haddad, A. ✉, Zyoud, A. ✉, Hijazi, G. ✉

Department of Electrical and Computer Engineering, International Islamic University Malaysia, Kuala Lumpur, Malaysia

Abstract

View references (15)

Background: The Internet of Things (IoT) has been heralded as the “next big thing” waiting to be realized. IoT revolves around increased machine-to-machine communication and it encompasses various embedded sensorsand actuators that assist users in monitoring and controlling objects remotely in many fields and applications. Methods: IoT's special characteristics introduce challenges in the field of retrieval technology. These challenges constitute of real-time data retrieval with the huge amount of data that can be produced from the sensors. This paper explains the design concepts used to develop a search engine for IoT to tackle these issues. The developed search engine appears to be promising. The performance of the network proved very powerful under normal conditions, however, it could not sustain heavy load under the stress test due to the restricted build of the Z1 motes. Results: The searching capability proved to be quite strong in terms of searching speed and acceptable results; however more tests need to be implemented especially in terms of parallel searching. The GUI is simple and produces multiple features, but lacks interactivity. The security aspect ensures the security of the database with the partial prevention of SQL injection attacks. Conclusion: However, more security measures are required to protect against eavesdropping and unauthentic clients. © 2018 Bentham Science Publishers.

Author keywords

Computer networks | Data retrieval | Internet of things | Prototype | Search engine | Wireless sensor netwroks

Indexed keywords

Engineering controlled terms: Computer networks | Information retrieval | Internet of things | Machine-to-machine communication | Network security | Wireless sensor networks

Engineering uncontrolled terms: Data retrieval | Internet of thing (IOT) | Monitoring and controlling | Prototype | Retrieval technology | Searching capability | Sql injection attacks | Wireless sensor

Engineering main heading: Search engines

ISSN: 23520965
Source Type: Journal
Original language: English

DOI: 10.2174/2352096511666180117144450
Document Type: Article
Publisher: Bentham Science Publishers B.V.

References (15)

View in search results format >

1 Zhang, D., Yang, L.T., Huang, H.
Searching in Internet of Things: Vision and challenges

(2011) *Proceedings - 9th IEEE International Symposium on Parallel and Distributed Processing with Applications, ISPA 2011*, art. no. 5951906, pp. 201-206. Cited 45 times.
ISBN: 978-076954428-1
doi: 10.1109/ISPA.2011.53

View at Publisher

2 Jin, X., Zhang, D., Zou, Q., Ji, G., Qian, X.
(2011) *Where Searching Will Go in Internet of Things?*. Cited 3 times.
IFIP Wireless Days (WD), Niagara Falls, ON, Canada

3 Weber, R.H., Weber, R.
Internet of things: Legal perspectives

(2010) *Internet of Things: Legal Perspectives*, pp. 1-135. Cited 99 times.
http://www.springerlink.com/openurl.asp?genre=book&isbn=978-3-642-11709-1
ISBN: 978-364211709-1
doi: 10.1007/978-3-642-11710-7

View at Publisher

4 Asghar, M.H., Negi, A., Mohammadzadeh, N.
Principle application and vision in Internet of Things (IoT)

(2015) *International Conference on Computing, Communication and Automation, ICCCA 2015*, art. no. 7148413, pp. 427-431. Cited 21 times.
ISBN: 978-147998890-7
doi: 10.1109/CCAA.2015.7148413

View at Publisher

5 Hunkeler, U., Truong, H.L., Stanford-Clark, A.
MQTT-S-A publish/subscribe protocol for wireless sensor networks
(2008) *IEEE, Communication Systems Software and Middleware and Workshops, Comsware 3rd International Conference*
Bangalore, India

6 *MQTT Essentials: Part 1 – Introducing MQTT*. Cited 2 times.
HiveMQ, April-2015, Accessed: 01-Dec-2015
http://www.hivemq.com/blog/mqtt-essentials-part-1-introducing-mqtt

7 *MQTT Essentials Part 2: Publish & Subscribe*
HiveMQ, April-2015, Accessed: 01-Dec-2015
http://www.hivemq.com/blog/mqtt-essentials-part2-publish-subscribe

8 *MQTT Version 3.1.1, OASIS Standard*. Cited 2 times.
MQTT Version 3.1.1, Oct-2014, Accessed: 01-Dec-2015
http://docs.oasis-open.org/mqtt/mqtt/v3.1.1/mqtt-v3.1.1.html