



**ACADEMICIA**  
**An International  
 Multidisciplinary  
 Research Journal**  
 (Double Blind Refereed & Peer Reviewed Journal)



**DOI: 10.5958/2249-7137.2021.00685.6**

## ANALYSIS OF THE ARCHITECTURE AND PROTOCOLS OF THE INTERNET OF THINGS NETWORKS

**Shuhrat Yuldashevich Djabbarov\***; **Rustam Khusanovich Djurayev\*\***;  
**Kim Kristina Ruslanovna\*\*\***; **Sohibjon Rustamovich Botirov\*\*\*\***

\*Tashkent University of Information Technologies named after Muhammad al-Khwarizmi,  
 Tashkent city, Republic of UZBEKISTAN  
 Email id: Shuhtat\_djabbarov@mail.ru,

\*\*Tashkent University of Information Technologies named after Muhammad al-Khwarizmi  
 Tashkent city, Republic of UZBEKISTAN

\*\*\*Tashkent University of Information Technologies named after Muhammad al-Khwarizmi  
 Tashkent city, Republic of UZBEKISTAN  
 Email id: Christinekim1303@gmail.com,

\*\*\*\*Tashkent University of Information Technologies named after Muhammad al-Khwarizmi  
 Tashkent city, Republic of UZBEKISTAN  
 Email id: cbatirov@mail.ru,

### ABSTRACT

*The article is devoted to the review of the concept of the Internet of Things. The reference model of the Internet of Things is illustrated and described. The architecture is shown, and the technologies and protocols of interaction within the framework of the Internet of Things concept are also described. The state of standardization of the Internet of Things is analyzed. Modern international standards for the Internet of Things platform are also provided. The paper considers the protocols used in the Internet of Things networks that provide interaction between the technology levels, analyzes their features based on the procedures performed with their help.*

**KEYWORDS:** *Internet Of Things, Internet Of Things Reference Model, Internet Of Things Architecture, Technologies, Protocols, Standardization, Qos, Quality Of Service.*

**REFERENCES:**

- Интернет вещей в промышленности: Обзор ключевых технологий и трендов/Ли Да Сюй, Сянчан Ли, 2017 с.1.
- ITU-T Rec. Y.2060: Overview of the Internet of things/2012 – с.1, с. 7-9.
- Росляков А. В., Ваняшин С. В., Гребешков А. Ю Стандартизация Интернет вещей- Самара 2015. - с. 10-12.
- Ding Y., Jin Y., Ren L., Hao K. An intelligent self-organization scheme for the internet of things // IEEE Comput. Intell. Mag. 2013. Vol. 8, No. 3., с. 41-53.
- IEEE Standards Association. Internet of Things related standards. 2016.URL: <<https://www.standardsuniversity.org/e-magazine/march-2016/security-and-iiot-in-ieee-standards/>> (дата обращения 01.06.2020 г.).
- IEEE Standards Association // IEEE Standards Activities in the Smart Grid Space (ICT Focus). 2015.URL: <<https://standards.ieee.org/content/dam/ieee-standards/standards/web/documents/other/smartgrid.pdf>> (дата обращения 02.08.2020 г.).
- ETSI Recommendation: TR 103 290 V1.1.1 / Machine-to-Machine communications (M2M) / European Telecommunications Standards Institute. 2015.URL: <[https://www.etsi.org/deliver/etsi\\_tr/103100\\_103199/103118/01.01.01\\_60/tr\\_103118v010101r.pdf](https://www.etsi.org/deliver/etsi_tr/103100_103199/103118/01.01.01_60/tr_103118v010101r.pdf)> (дата обращения 02.08.2020 г.).
- OASIS Standard: TOSCA Version 1.0 / Topology and Orchestration Specification for Cloud Applications TC. 2013. URL: <<http://docs.oasis-open.org/tosca/TOSCA/v1.0/TOSCA-v1.0.html>> (дата обращения 03.08.2020 г.).
- oneM2M // Standards for M2M and the Internet of Things. Published Specifications. 2016. URL: <<https://www.onem2m.org/97-newly-updated-global-iiot-standards-from-onem2m->> (дата обращения 17.07.2020 г.).
- Rahim Tafazolli / IERC Интернетвещей International Forum // European Research Cluster on the Internet of Things. Результатыфорумаиперспективы. 2012.URL: <[https://link.springer.com/chapter/10.1007/978-3-642-35576-9\\_20](https://link.springer.com/chapter/10.1007/978-3-642-35576-9_20)> (дата обращения 12.02.2020 г.).
- ISO / Identification cards – Contactless integrated circuit(s) cards – Vicinity cards14443 // International Organization for Standardization ISO/IEC. 2003.URL: <<https://www.iso.org/standard/31432.html#:~:text=ISO%2FIEC%207810%3A2003%20is,cards%20used%20for%20international%20interchange>> (дата обращения 23.03.2020 г.).
- Miorandi D., Sicari S., De Pellegrini F., Chlamtac I. Internet of things: Vision, applications and research challenges // Ad Hoc Netw. 2012. Vol. 10, No. 7., с. 421-422.
- IBM/ MQTT V3.1 Protocol Specification // International Business Machines Corporation Eurotech. 2015, с. 42.
- ITU-T/ The Constrained Application Protocol (CoAP) / RFC 7252 – Proposed Standard. 2014.URL: <<https://tools.ietf.org/html/rfc7252>> (дата обращения 01.04.2020 г.).

- Гойхам В., Савельева А. Аналитический обзор протоколов Интернета вещей // Технологии и средства связи 2016. - №4. URL: <<http://lib.tssonline.ru/articles2/reviews/analiticheskiy-obzor-protokolov-interneta-veschey>> (дата обращения 13.11.2020 г.).
- W3C/ Simple Object Access Protocol (SOAP) 1.1 / World Wide Web Consortium / Don Box, David Ehnebuske, Gopal Kakivaya. 2000.URL: <<https://www.w3.org/TR/2000/NOTE-SOAP-20000508/>> (дата обращения: 10.11.2020 г.).
- OMG/ DDS v1.4 – the DDS specification / Object Management Group. 2015.URL: <<https://www.dds-foundation.org/omg-dds-standard/>> (дата обращения 14.12.2020 г.).
- М.Кольцов. IT- и телеком-отрасль: итоги 2014 года // Технологии и средства связи. – 2014. – № 6, URL: <[https://www.d2k.ru/about\\_us/publications/it\\_i\\_telekom\\_otrasl\\_itogi\\_2014\\_goda/](https://www.d2k.ru/about_us/publications/it_i_telekom_otrasl_itogi_2014_goda/)> (дата обращения 08.07.2020 г.).
- Н. Соколов. Сценарии реализации концепции Интернет вещей // Первая миля. – 2016. – № 4, с.44 – 46.
- Three Internet of Things standards, Barnary Lewis, 2020.URL: <<https://www.iso.org/news/ref2529.html>> (дата обращения 09.09.2020 г.).