The Home Network Traffic Models Investigation

Ruslan Kirichek*, Margarita Golubeva*, Vyacheslav Kulik*, Andrey Koucheryavy*

* Department of Telecommunication Networks and Data Transmission, St.Petersburg State University of Telecommunication, Russia

kirichek@sut.ru, golubevarita20@gmail.com, vaklicr@gmail.com, akouch@mail.ru

***Abstract*— The paper presents the results of the traffic investigation on the home networks for BitTorrent, Skype and M2M services. The traffic features are investigated on the test beds. One of them is created for Skype and BitTorrent traffic investigation. Another test bed is created for M2M traffic investigation. The related works on the teletraffic investigation area are analysed. The Poisson and self-similar traffic models are considered, including Skype and BitTorrent traffic models. The anti-persistent traffic models for M2M traffic in case of mass events is discussed. The anti-persistent traffic can mainly affect the traffic service. So, the most important task of the paper investigation is the detection of anti-persistent traffic on the home networks. The Hurst parameter is calculated by the analysis of change in dispersion method. The obtained results have shown that outcoming and incoming BitTorrent and M2M traffic have the anti-persistent features on the home network. It should be counted at the home network planning. The traffic control methods can be used on the home networks, for example traffic scheduling.**

***Keywords*— Home network, traffic, bittorrent, Skype, M2M, anti-persistent**

Dr. Ruslan Kirichek working in St.Petersburg University of Telecommunication as Associate Professor Department of Communications Networks. He was born in 1982 in Tartu (Estonia). He graduated Military-Space Academy A.F. Mozhaiskogo and St.Petersburg University of Telecommunication in 2004 and 2007 respectively. R.Kirichek received Ph.D from St.Petersburg University of Telecommunication in 2012. Since 2004 he worked at IT-department of the Air Force as a senior engineer. Since 2008 worked as a senior researcher at the Federal State Unitary Enterprise "Center-Inform". Supervised research testing communication networks in terms of destructive influences. Since 2012 worked as the Head of the Internet of Things Laboratory at St.Petersburg University of Telecommunication.

Margarita Golubeva has a master's degree of St. Petersburg University of Telecommunications. She graduated with honors St. Petersburg University of Telecommunications majoring in "Multichannel telecommunication systems" on the profile of fiber-optic communication

Viacheslav Kulik working in St.Petersburg University of Telecommunication as Engineer of Department of Communications Networks. He was born in 1994 in Stavropol (Russia). He graduated St.Petersburg University of Telecommunication in 2015 as bachelor of Softwere Engineering. Now he studing in St.Petersburg University of Telecommunication as master student. Since 2015 he worked as a engineer of the Internet of Things Laboratory.

Dr. Sc. Andrey Koucheryavy was born in Leningrad 02.02.1952. After graduated from Leningrad University of Telecommunication in 1974 he going to Telecommunication Research Institute named LONIIS, where A.Koucheryavy working up to October 2003 (from 1986 up to 2003 as the First Deputy Director). He became the Ph.D. and D.Sc. in 1982 and 1994 respectively. A.Koucheryavy is the St. Petersburg State University of Telecommunication (SUT) professor from 1998. He is Chaired professor of the department “Telecommunication Networks and Data Transmission” from 2011. He is honorary member of A.S.Popov’s society. Prof. A.Koucheryavy was the vice-chairman Study Group 11 ITU-T (Study periods 2005-2008, 2009-2012). His scientific areas of interest are the network planning, teletraffic theory, IoT and its enablers.