Multicast monitoring and visualization tools

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Extended Abstract

There is a need for effective and complete monitoring the multicast traffic in computer networks. Unfortunately, the number of existing tools is small. Network engineers usually exploit features embedded in operating systems which are provided by vendors in their devices (routers). The second group of monitoring tools is composed of dedicated monitoring applications. The already existing well-known, freely accessible applications are mtrace, MHealth, Mrinfo, RTPmon, MRTG, MultiMon. They offer valuable information about multicast traffic but do not come up to all expectations required from monitoring applications. In order to change that situation PSNC focuses on development of specialized multicast monitoring infrastructure.

This paper describes the approach for monitoring multicast network parameters, where **Multicast Beacon** and **MUVI** applications constitute the effective base solution.

Multicast Beacon was created in USA by NLANR/NCSA and University of Illinois. In its generic form it provides information about five traffic parameters: loss, delay, jitter, packet order and duplicate packets. They reflect the quality of service between nodes where Beacon clients are located.

In order to monitor the multicast network performance, Beacon clients have to be installed in each of monitored nodes. This architecture constitutes the grid and allows to form the traffic map which Beacon server can visualize on the web page.

PSNC has added new features enhancing the application, the list of them includes:

- storage of parameter values (history feature)

- statistics chart generation

- message trigger module (thresholds and events notification)

- mtrace module (now only in IPv4)

- IPv6 improvements

The article describes these enhancements in detail.

The big advantage of Multicast Beacon is the programming language used to create the application. Java^{TM} offers independence from operating system. It also provides ability to seamlessly adopt IPv6 technology - it means that applications written for IPv4 should also work in IPv6.

Multicast Beacon was tested in a few Network Operation Centers of various national academic operators. The application is considered valuable and one of the best among other multicast monitoring tools. PSNC version of Beacon is used by Dante for monitoring GEANT network (IPv4). The IPv6 network called 'm6bone' (6NET project) also uses this version of the software. Due to lack of other good multicast monitoring applications, Multicast Beacon is the main solution for IPv6 multicast network monitoring.

Multicast Beacon is already an appreciated tool and there are new areas of deployments becoming available. An example is the GRID research area - the application has naturally grid architecture (scattered clients communicating between themselves and a server showing the states of traffic between clients). With minor upgrade, GRID applications may obtain from Multicast Beacon information about the best routes in grid infrastructure and thus they may optimize their performance.

The second application we would like to present in this paper is Multicast Visualization Tool (MUVI). MUVI is a real-time administrative tool to monitor multicast routers. It uses the SNMP to communicate with network routers and retrieve important information.

The primary MUVI feature is multicast topology discovery. It is achieved by fetching data about neighbors from multicast routers. Basing on discovered topology data, the network monitoring is performed and traffic statistics are collected. The user can get information about the quality of service, existing multicast groups, speed of connections between host. Collected statistics serve as a base for reports and charts generation. The application includes a simple MIB browser, allowing the administrator to read the MIB values from routers and receive traps from multicast routers.

The main difference between MUVI and other multicast monitoring tools lies in fact that most of other applications are focused on one chosen issue of multicast monitoring. MUVI application integrates three basic functions: discovery, presenting and monitoring the multicast network, what makes it an ideal choice for multicast management.