



Characterization of the PetrSU main router on flow level

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A system called TCPConal was created by the efforts of specialists of our chair. It was designed to implement easy and flexible approach for network traffic analysis using idea of a flow. The processing of input data is fully controlled by user's C-style filter script.

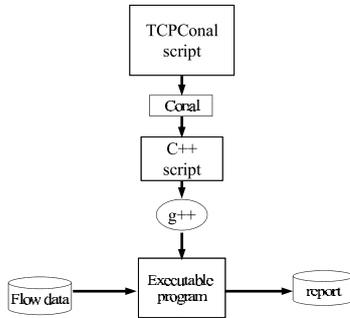


Figure 1: TCPConal translation scheme

A filter script is applied to each flow from the input data file. The script gathers and calculates parameters needed and after the input data are processed, a report section writes final information to the output file in text format.

On the basis of TCPConal flow data for three days was processed and the following characteristics of the router traffic were calculated:

Figure 2: Structure of federal Petrozavodsk RUNNet node

The formulas for calculating the characteristics are as follows:

$$D_n = ST_n - ET_n$$

$$V_n = S_n / D_n,$$

where V_n, S_n, D_n are speed, size and duration of the n-th flow respectively, ST_n and ET_n are start and end time of the n-th flow. Size, start time and end time can be obtained from NetFlow data directly, and number of flows increments as the filter script processes an ordinary flow. All characteristics (except for volume) are average values for each half an hour aggregation period of day. Each diagram embeds characteristics for ingress and egress flows through the given interface.

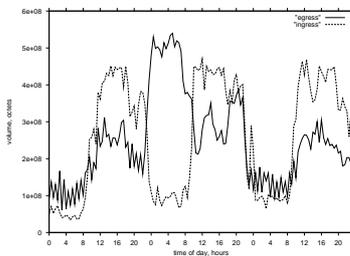


Figure 3: Volume of data vs time of day for "Saint-Petersburg" interface

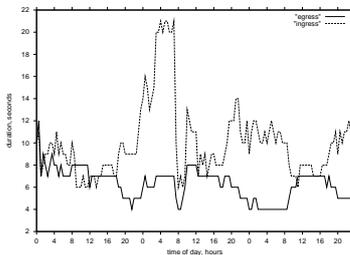


Figure 4: Flows duration vs time of day for "Saint-Petersburg" interface

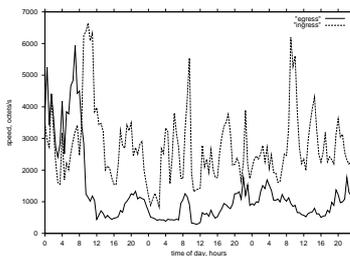


Figure 5: Flows speed vs time of day for "Saint-Petersburg" interface

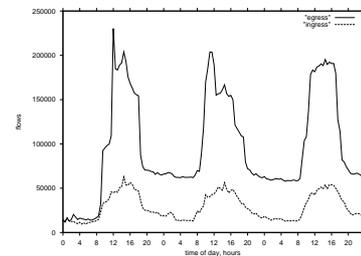


Figure 6: Number of flows vs time of day for "Saint-Petersburg" interface

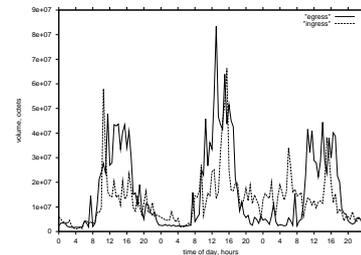


Figure 7: Volume of data vs time of day for "KarSC RAS" interface

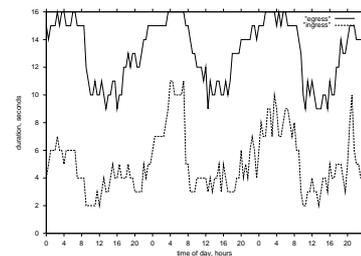


Figure 8: Flows duration vs time of day for "KarSC RAS" interface

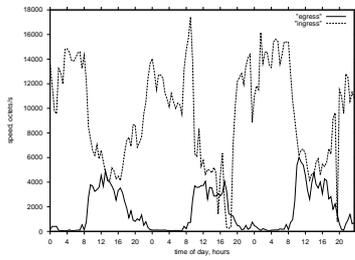


Figure 9: Flows speed vs time of day for "KarSC RAS" interface

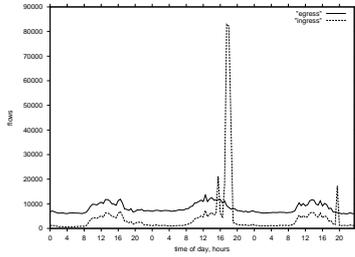


Figure 10: Number of flows vs time of day for "KarSC RAS" interface

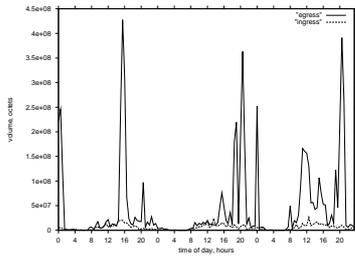


Figure 11: Volume of data vs time of day for "Elektrosvyaz" interface

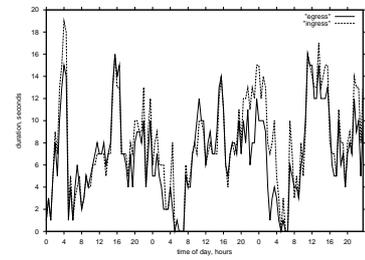


Figure 12: Flows duration vs time of day for "Elektrosvyaz" interface

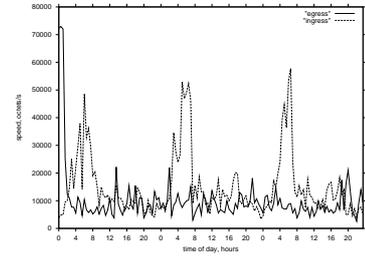


Figure 13: Flows speed vs time of day for "Elektrosvyaz" interface

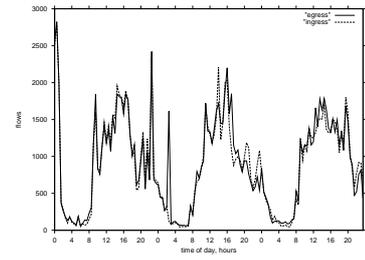


Figure 14: Number of flows vs time of day for "Elektrosvyaz" interface