

Surveillance of NTP-servers in customer's network

Kenneth Jaldehag¹, Carsten Rieck¹, Jan Backefeldt², and Per Olof Hedekvist¹

¹Department of Measurement Technologies, SP Technical Research Institute of Sweden, Borås, Sweden

²Transmission department, TeliaSonera AB, Gothenburg, Sweden

Email: per.olof.hedekvist@sp.se

From a user's perspective, it has been apparent that even in applications where Network Time Protocol, NTP, delivers sufficient accuracy there is a need for a documented traceability of the provided time data, including an archive of past data. This traceability should be referenced to UTC, and could be logged from a close or distant client position in the network, taking both the server behavior and the network performance into account.

UTC(SP) is operated by SP Technical Research Institute of Sweden and is the official UTC realization of Sweden. The equipment in the laboratories is thereby traceable to UTC(SP). Since 2011, the Time and Frequency Lab at SP is connected to the management network of TeliaSonera, which is a main Internet Service Provider in Sweden (ISP). The customer's NTP servers are regularly polled by the local reference NTP server at SP and the time offset, in addition to uncertainty estimations, are presented on a custom-website.

The presented surveillance includes regular NTP data as well as time difference measurements with corresponding uncertainties based, among other uncertainty contributions, on the round-trip delay time of the data request. Alarm-levels are set in collaboration with the customer inducing color-coding of the relevant cells in the table, as well as an automated email to the customer.

For TeliaSonera, the technical setup has increased the quality of service for the ISP connections. The data of the server time offset and round trip time delay is useful, both in view of present and future legal requirements on transmission logs of data traffic, and from a network health perspective. The NTP-surveillance has shown segments of the backbone network that has been overloaded and upgrades have been issued.

Log: gatekeeper.sptime.se Ref: 193.11.166.2														
Server	IP	St	RefID	%	Delay	Disp	RTD	Asym	Off	u_a	u_b	U	UTC(SP) Offset [ms]	
ntp1-gbg	192.36.133.17	1	PPS	100.0	0.000	1.816	17.282	F 0.050	-0.026	0.003	0.581	1.161		
ntp2-gbg	192.36.133.25	1	PPS	100.0	0.000	1.877	17.255	F 0.033	-0.017	0.002	0.581	1.161		
ntp1-mmo	192.36.134.17	1	PPS	100.0	0.000	1.785	22.268	B -0.117	0.058	0.003	0.581	1.161		
ntp2-mmo	192.36.134.25	1	PPS	100.0	0.000	1.846	22.240	B -0.141	0.070	0.004	0.581	1.161		
ntp1-sth	192.36.144.22	1	PPS	100.0	0.000	1.877	9.450	-0.079	0.039	0.875	0.581	2.101		
ntp2-sth	192.36.144.23	1	PPS	100.0	0.000	1.846	9.449	B -0.075	0.037	0.001	0.581	1.161		
ntp1-sp	62.119.40.98	1	PPS	100.0	0.000	1.785	19.479	-0.050	0.024	6.567	0.581	13.185		
ntp2-sp	62.119.40.99	1	PPS	100.0	0.000	1.877	19.724	0.100	-0.051	3.341	0.581	6.781		
ntp3-sp	62.119.40.100	1	PPS	100.0	0.000	1.846	19.546	-0.079	0.039	5.526	0.581	11.113		
ntp4-sp	62.119.40.101	1	DAGP	100.0	0.000	0.000	19.548	-0.001	0.000	2.884	0.062	5.770		
ntp1-sptime	193.11.166.2	1	DAGP	100.0	0.000	0.000	0.079	-0.001	0	0	0.058	0.115		
ntp2-sptime	193.11.166.18	1	DAGP	100.0	0.000	0.000	0.096	B -0.032	0.015	0.004	0.062	0.124		
ntp3-sptime	193.11.166.36	1	DAGP	100.0	0.000	0.000	9.478	B -0.081	0.040	0.004	0.062	0.124		
ntp4-sptime	193.11.166.52	1	DAGP	100.0	0.000	0.000	9.211	B -0.047	0.023	0.003	0.062	0.124		
Last updated: Tue Nov 22 00:02:44 2011														
Disturbance Disturbance 3.0 h Worst-Case Unc Uptime 6d20h300s/6d1243s GroupOffsetRMS 0.037														

Fig. 1: Example of published website, presenting data of surveilled NTP-servers. Presented are data of the public NTP servers operated by SP.