

ndsLTA - One-NDS Load & Traffic Analyzer

Product sheet



One-NDS Load & Traffic Analyzer (ndsLTA)

One-NDS is an indispensable part of the telecommunication infrastructure and therefore needs special attention when it comes to maintenance and care. As a central directory service, it manages the subscriber data, their services and interfaces with other applications, e.g. HLR¹ (Home Location Register) or HSS² (Home Subscriber Server) of the operator. A failure of the One-NDS - or already a limited availability or functionality – may cause service outage as the access to the subscriber data may be limited or not available at all. The provisioning system of the network operator is also dependent on One-NDS and would also be affected by such a failure.

ndsLTA provides a real-time observation of One-NDS traffic based on One-NDS performance and log data. The data are collected in real-time from the One-NDS nodes and stored into a time-series database. With a minimal delay the raw data is available for visualization and further analysis.

ndsLTA continuously performs traffic data analysis by using statistical methods.

With the “Short-term Forecast” a prediction of the next minutes incoming traffic will be calculated based on the traffic data of the past weeks. The “Anomaly Detection” will detect, mark and alert (E-Mail, SNMP) deviations from short-term prediction data. The “Long-term Forecast” estimates the date, when the One-NDS eventually reaches its currently engineered capacity limit, defined by the RateControl-Settings. This information is useful for capacity expansion planning should the actual traffic be growing over time.

The visualization of all processed data is done by a user friendly and very flexible Web-GUI based on Grafana, an Open Source platform for analysis and visualization of time-series metrics.

ndsLTA automates and optimizes the operational activities of the One-NDS system with the following advantages:

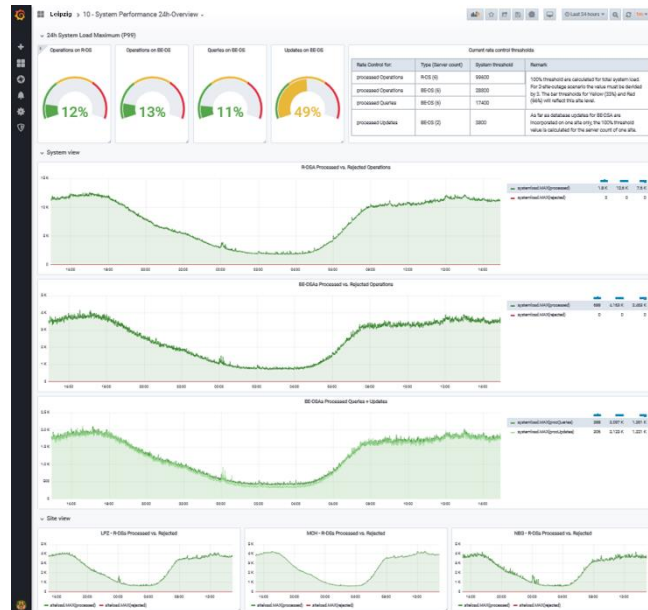
- Autonomous monitoring and analysis of the One-NDS traffic
 - Traffic data will be continuously evaluated in the background.
 - Analysis understands and respects the One-NDS architecture and deployment.
 - Predicting trends and correlating them with the incoming traffic.
- Notification and automatic report generation
 - Visual traffic observation is not needed (but always possible).
 - Periodic summary of the past day with selected statistics and events.
 - Notifications about thresholds limits reached and deviations (alarming via NetAct external interface and/or E-Mail-Report).
- Short reaction time
 - Early detection of traffic pattern changes by statistical analysis of incoming data with maximum interval granularity (1s).
 - No loss of information, which occurs due to value averages, if greater interval granularity is used.
 - Delay in data visualization is in lower single digit second range value.
- Dashboards for detailed analysis in case of incidents
 - Prepared dashboards for quick overview to identify problems faster and initiate the corrective action as fast as possible.
- Planning confidence and preventive actions
 - Visualization of One-NDS system load over time and its capacity utilization prediction (trend analysis)

PRODUCT OVERVIEW

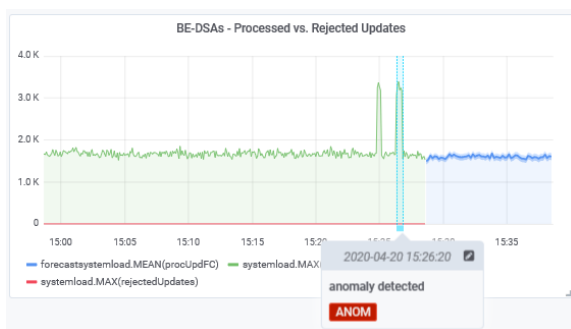
ndsLTA provides the following functionality:

Performance data import	Import of NDS load data from all R-DS and BE-DS, Import of online provisioning request logs from all Provisioning Gateways, Automatic Import-Recovery in case of connectivity issues of one or more One-NDS Nodes
Storage with maximum granularity	Data retention time 100 days (configurable), Original data per node and aggregated data (e.g. per DSA, Site or Type)
Storage with reduced granularity	Data retention time 1 year (configurable), Long-term forecast
Data analysis	Short-term forecast on per system and per DSA base, Anomaly detection on per system and per DSA base, Long-term forecast on per system and per DSA base, Top5 DSA utilization
Data visualization	Variety of predefined dashboards: <ul style="list-style-type: none"> - 24h System performance overview - Realtime system load with short-term forecast - R-DS and BE-DS System overview - BE-DSA Statistic - BE-DSA Realtime DSA load with short-term forecast - BE-DS Server statistics - R-DS Server statistics - TOP5-BE-DSA Statistics - Provisioning overview - Long-term forecast - ndsLTA Monitoring Modification of existing Dashboards and creation of new Dashboards is possible
Report & Alarming	Periodic E-Mail reports, Alarming of anomalies via E-Mail, Alarming via SNMP to NetAct
Backup & Restore / Redundancy	Periodic backup of database, Restore of database, Redundancy as Cold-Standby solution
User management	User restriction by roles (Administrator, Editor, Viewer), Configuration as per customer needs
Support	Support for installation and operation, Support for adaption and creation of dashboards

The graphical visualization of the traffic data provides you with a quick overview about the system behavior of the last minutes, hours or days. The selection of the time range can be done directly within the graph or via the time range dialog. The panels of a dashboard will always be consistent with the selected time range so that a correlation between the panels is always possible. Single values will be shown as mouse-over popup directly in the graph. The predefined dashboards and panels can be adapted to your needs resp. can be the basis for your customized dashboards.



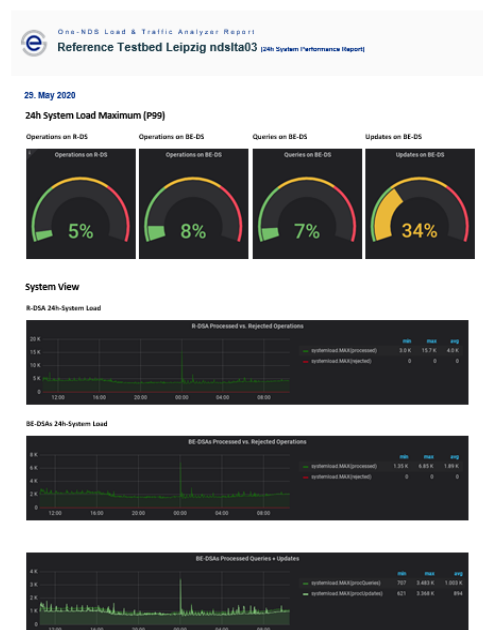
A strength of *ndsLTA* is the statistical analysis of the data. It gives the possibility to predict the system behavior for the next minutes and based on that, a detection and notification of anomalies.



For the “Short-term Forecast” the historical data will be analyzed by STFL to forecast the next 10 minutes (blue part of the graph). In parallel to the actual incoming data deviations from the expected resp. predicted data will be checked. As soon as a significant deviation (duration and peak value) was detected, it will be marked in the chart and can be alarmed by E-Mail and/or SNMP.

ndsLTA can keep you informed by sending periodic E-Mail reports about the One-NDS traffic situation. The content of these reports can be configured using templates and can be customized if needed. It is possible to define different reports for different users (report specific mailing list).

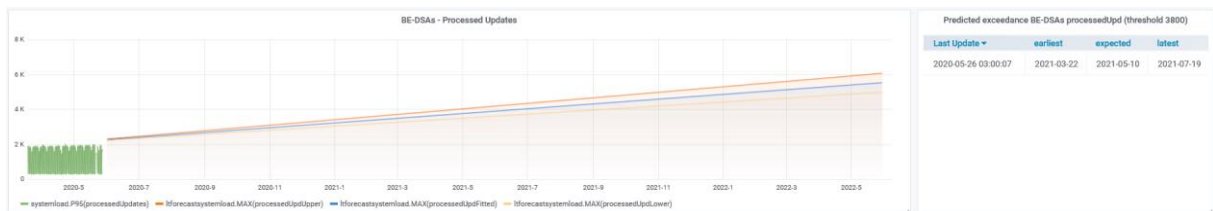
Anomalies can also be notified via an E-Mail report (in addition to the Grafana annotation and SNMP notification).



Another function of *ndsLTA* is the analysis of log data, that are created during the online provisioning via the SPML-Interface. *ndsLTA* extracts traffic related data of the executed requests and presents the data in different dimensions in a dashboard (host specific, by operation, by error code, by user and execution time). This provides a quick overview about the activities and eventual problems without the need of manually checking the logs and/or different provisioning tools.



To support the One-NDS capacity expansion planning and monitoring *ndsLTA* calculates - based on the historical data and the configured RateControl-Thresholds - the date, when the system eventually reaches the engineered capacity. The calculation utilizes the average system load during the business hours and is interpolated by linear regression to the point, where it reaches the configured RateControl limits.



REQUIREMENTS

ndsLTA requires two servers per One-NDS deployment. The hardware requirements are dependent on the size of the One-NDS deployment. We recommend using virtual machines as the performance of *ndsLTA* can be adapted as needed. For a system with 50 nodes two virtual machines (for redundancy with Master and Cold-Standby), each with 8 vCPUs, 250GB SSD and 1Gb/s network interface is needed.

For more information, please contact us:

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¹ HLR Home Location Register

² Home Subscriber Server