THE POWER OF BUILDING AND
MANAGING NETWORKS

Provisioning

Contents

1 General

ERAMON Provisioning has been developed for medium to large-scale enterprises in all industries to simplify and improve the process for the roll out of new configurations, or configuration changes on extensive WAN/LAN infrastructures.

New technologies improving quality, security as well as performance, have to be integrated cost effectively and with the least operational disruption. Running wide area network infrastructures requires dynamic adjustments of affected components, such as routers, switches, firewalls and the like. Any changes or expansions to the infrastructures usually require considerable manpower and effort beyond regular office hours. A network-wide introduction of new services such as VoIP, Quality of Service (QoS), etc., would be an example of this. It is crucial to roll out QoS profiles simultaneously and reliably to all affected components in order to ensure the continued quality of the voice connections.

2 Master Data

As a first step, all data relevant for the provisioning process is written to ERAMON's Master Database. This includes information concerning new devices already in ERAMON, existing devices or individual ports.

For example, all device types (hardware) are specified that are to be selected when provisioning for the first time, at which point so-called Config templates have to be saved. You may define tokens within the templates, which will be replaced by real values during the actual provisioning job. A very helpful special feature is that the different token types can be automated and even assigned with interdependent links (script, free text, external data resources, etc.)

Multiple provisioning processes can be combined very flexibly as a product or service.

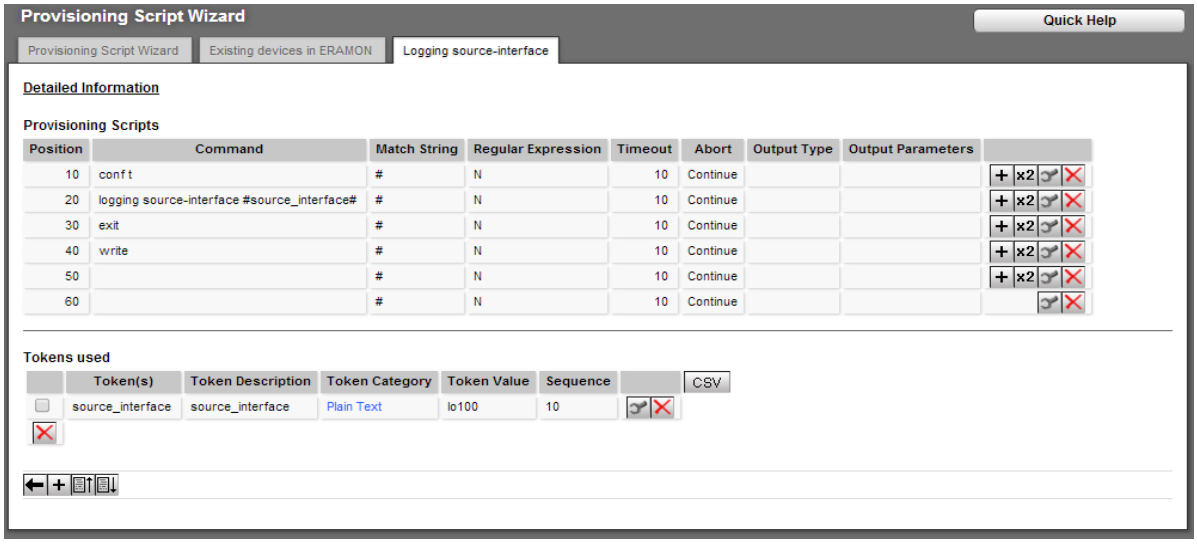
In addition, several hierarchical levels (CPE, PE or access layer) may be specified and taken into account.

Preparation work is thus centrally organized and processes to run provisionings are carried out automatically.

3 Provisioning Methods

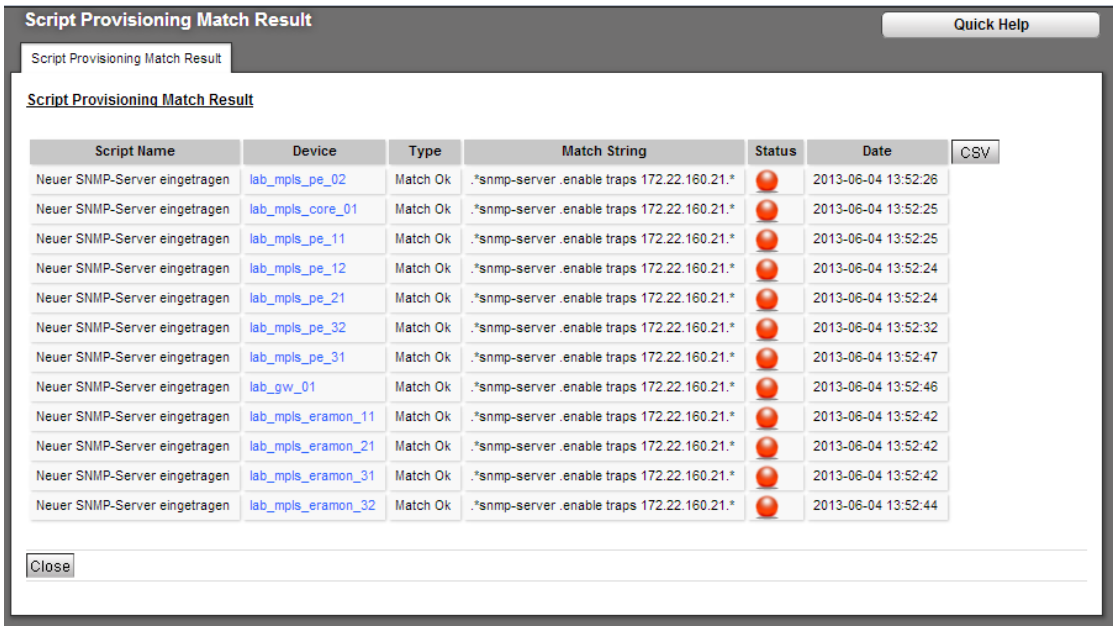
3.1 Script Provisioning

- Specification of the individual commands with abort conditions



Although many problems can be identified and eliminated in advance under laboratory conditions, but when problems in the course of system changes do occur in the field, it is essential to be able to limit the downtime of the affected components to a minimum with the help of equally automated disaster or config recovery procedures.

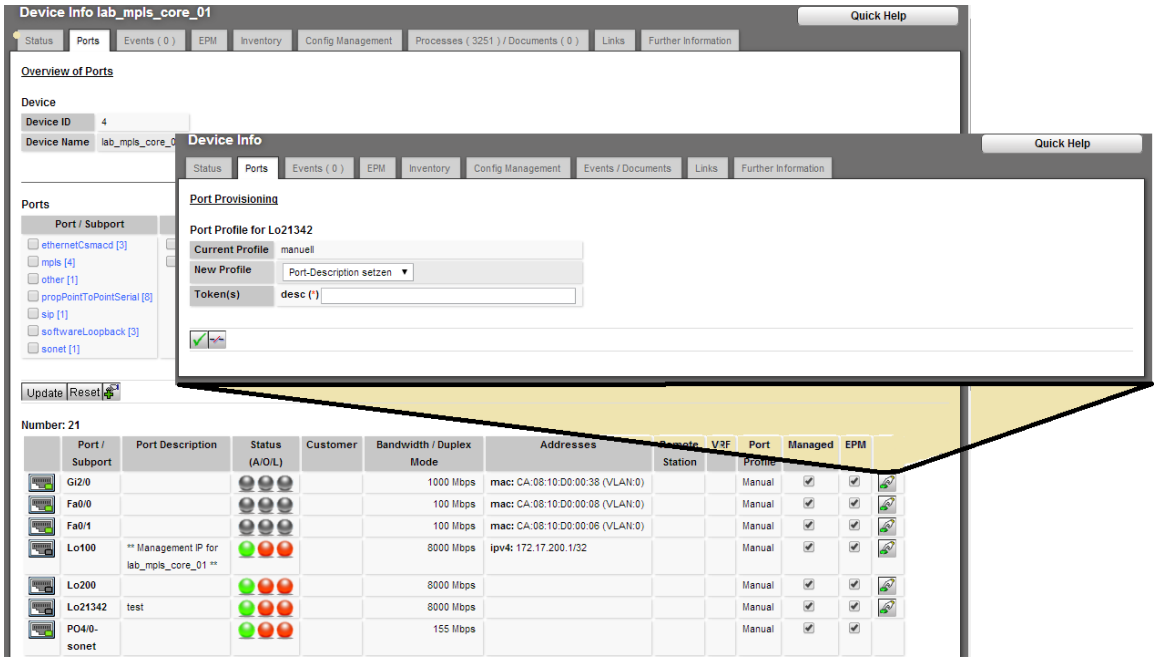
- Display when using match conditions;
- Function also possible with Config Compliance Check, however, no login on to devices with Config Compliance Check.



3.2 Port Provisioning

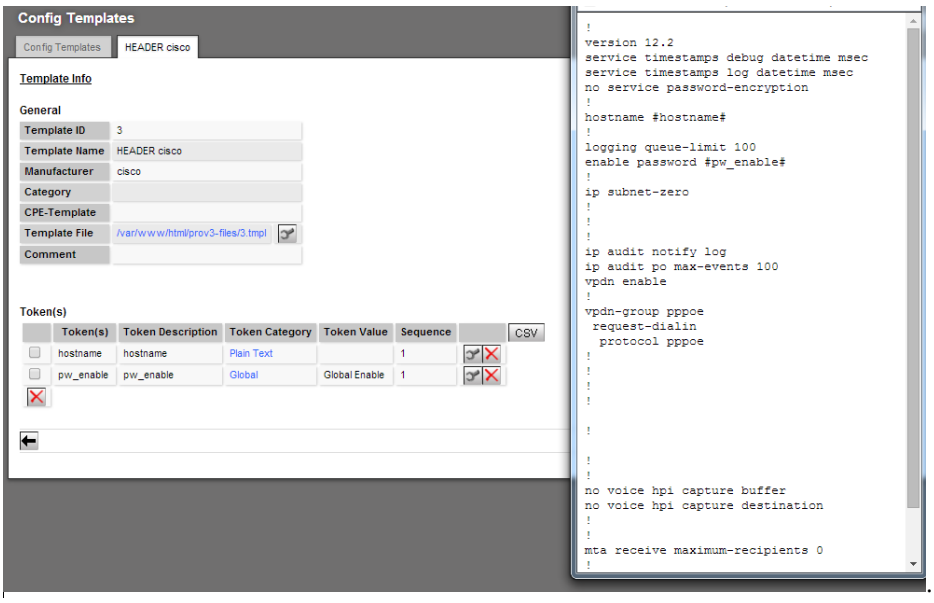
At this point, device ports can be assigned to the port profile templates that were previously specified in the master data menu. This can also be done for several ports on different devices, where the system will always display the appropriate selection masks for devices and ports in question.

If tokens were set up for the templates, these now have to be filled with actual values by polling for each port.



3.3 Bulk Provisioning

The commands are specified in a config template; which is transferred to the device with the copy command.



3.4 Token Categories

Templates can be specified with tokens as placeholders. These would then be filled when a job is set up.

- Plain Text — User enters a value
- Selection Pool — Custom field for selection fields
- Calculation — Calculations on MySQL level
- CMDB — Central Management Database
- Pool — ERAMON retrieves the next available value automatically from a pool (e.g. IP pool).
- Remote — Token is filled externally
- Script — Any script on OS level
- Global — Selection of appropriate global values
- Number Pool — ERAMON retrieves the next available value automatically from a pool (e.g. VLAN pool).

4 Products

Products bundle individual provisioning processes into one. A product can consist of several steps; which can be interdependent. A step is specified on to a/an:

- existing device (Script, Port/Bulk Provisioning)
- new device (new provisioning via console)

Example:

- Step 1 — CPE provisioning (initial configuration via serial and Ethernet)
- Step 2 — Configuration of a backup port on the PE

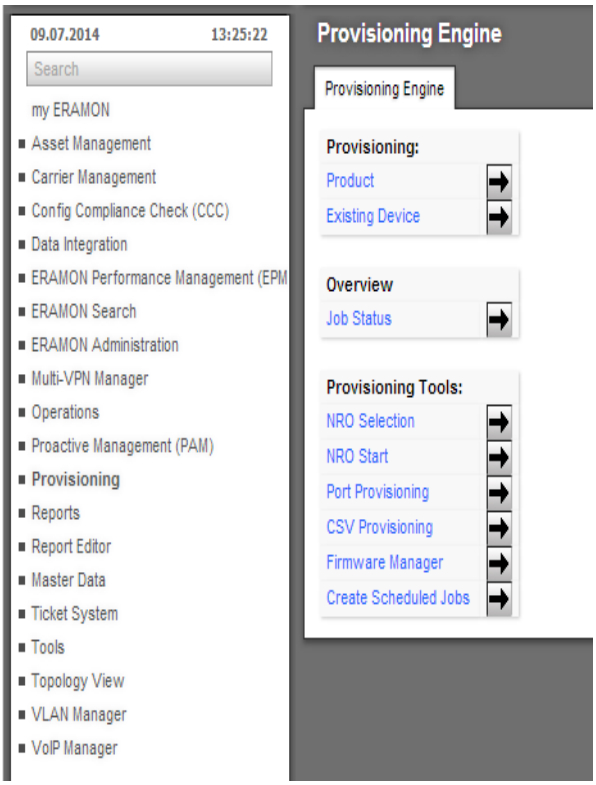
5 2-Person Rule (TPR)

Provisioning processes can be authorized using the 2-Person Rule (TPR). There are four different levels:

- Level 1 (without TPR)
- Level 2 (authorization through a different user)
- Level 3 (as for level 2, but completion date has to be within a specific time period)
- Level 4 (as for level 3, but only specific device group)
- Job Authorization
  - A user from a user group is specified during set up
  - Authorization is carried out from the job overview in the provisioning menu

6 Provisioning Engine

- Start and status of all jobs using a wizard
- Central control for new provisionings and already registered devices
- Overview of individual jobs and the status of the provisioning console
- Special provisioning applications
- NRO (Network Resource Optimizer)
- CSV Provisioning
- Firmware Manager
- Create scheduled jobs



6.1 Config Recovery

- Simultaneous recovery of multiple devices
- The device will provisioned with the most recent config
- Recovery can be scheduled

	Device ID	Device Name	Device IP	Device Type	Status	CSV
☐	3	lab_mpls_pe_02	172.17.200.2	cisco7206VXR	2014-06-13 02:20:22	
☐	4	lab_mpls_core_01	172.17.200.1	cisco7206VXR	2014-06-13 02:20:18	
☐	5	lab_mpls_pe_11	172.17.200.11	cisco7206VXR	2014-06-13 02:20:23	
☐	6	lab_mpls_pe_12	172.17.200.12	cisco7206VXR	2014-06-13 02:20:16	

6.2 Disaster Recovery

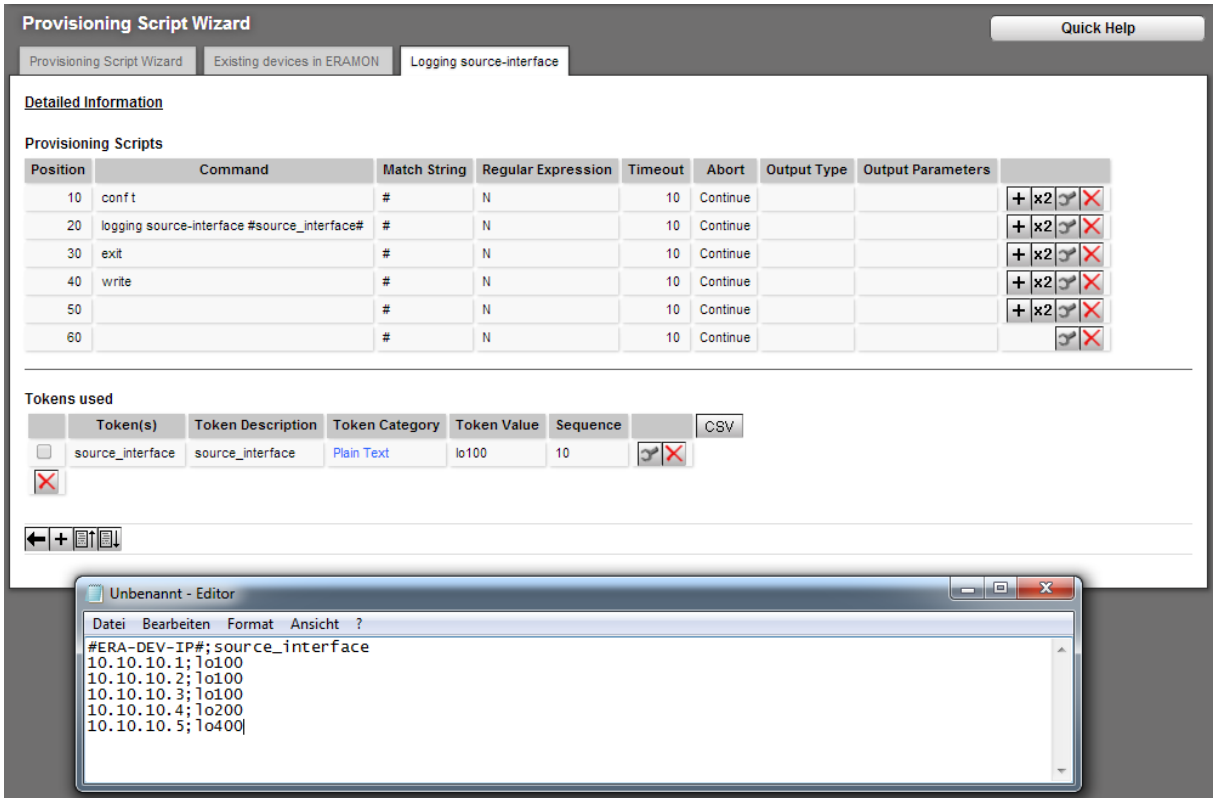
- Recovery of device with config and firmware
- The provisioning console and Ethernet must be able to reach the device

	Device ID	Device Name	Device IP	Device Type	Status	CSV
☐	3	lab_mpls_pe_02	172.17.200.2	cisco7206VXR	2014-06-13 02:20:22	
☐	4	lab_mpls_core_01	172.17.200.1	cisco7206VXR	2014-06-13 02:20:18	
☐	5	lab_mpls_pe_11	172.17.200.11	cisco7206VXR	2014-06-13 02:20:23	
☐	6	lab_mpls_pe_12	172.17.200.12	cisco7206VXR	2014-06-13 02:20:16	

6.3 CSV Provisioning

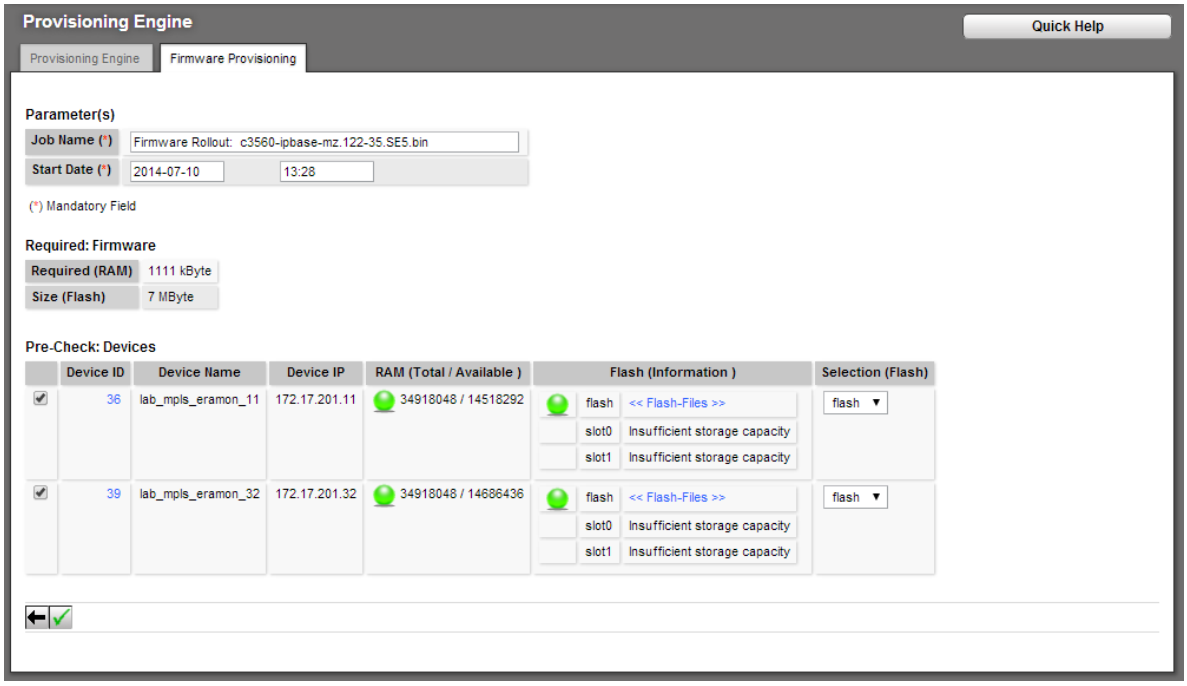
Requirements:

- The CSV file must contain the "ERA-DEV-IP" column
- All devices from the CSV file are on ERAMON
- The user has the necessary permission for the devices
- Any plain text tokens in the provisioning script also have to be in the CSV file (column name = token name)



6.4 Firmware Manager

- Definition of the requirements for each firmware
- Syntax for installing the firmware through provisioning scripts
- Firmware upgrade process:
  - Selection of devices via GUI
  - Pre-check (RAM and Flash) of the devices
  - Start of jobs



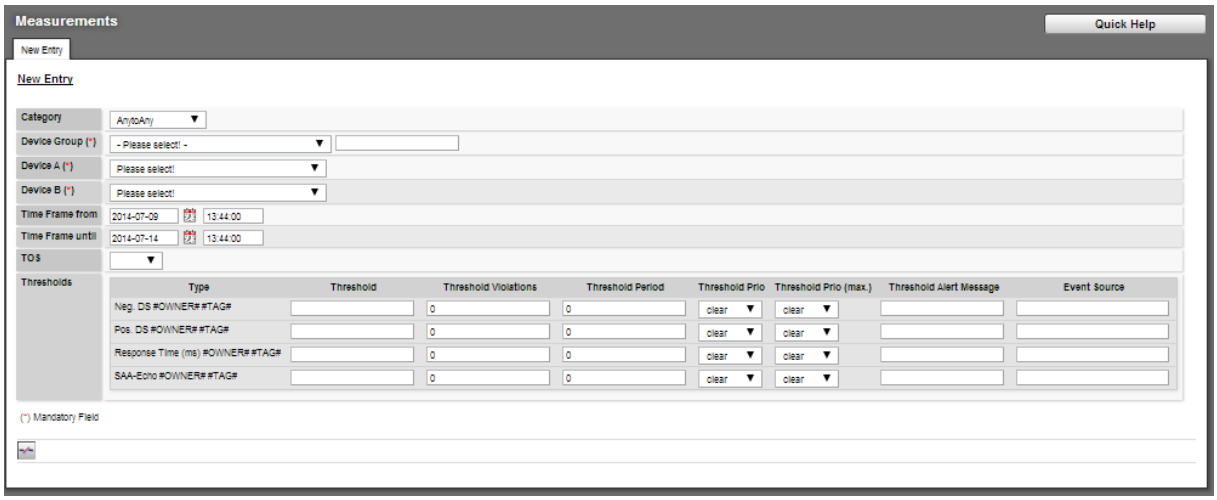
6.5 IP-SLA Manager

The IP-SLA Manager facilitates a comfortable management of IP-SLA measurements. The measurements are set up in the provisioning module; they are then analyzed with the performance measurements.

Measurements are set up with their status as inactive. As soon as the relevant SAT was able to poll IP-SLA data, the status will be changed to active.

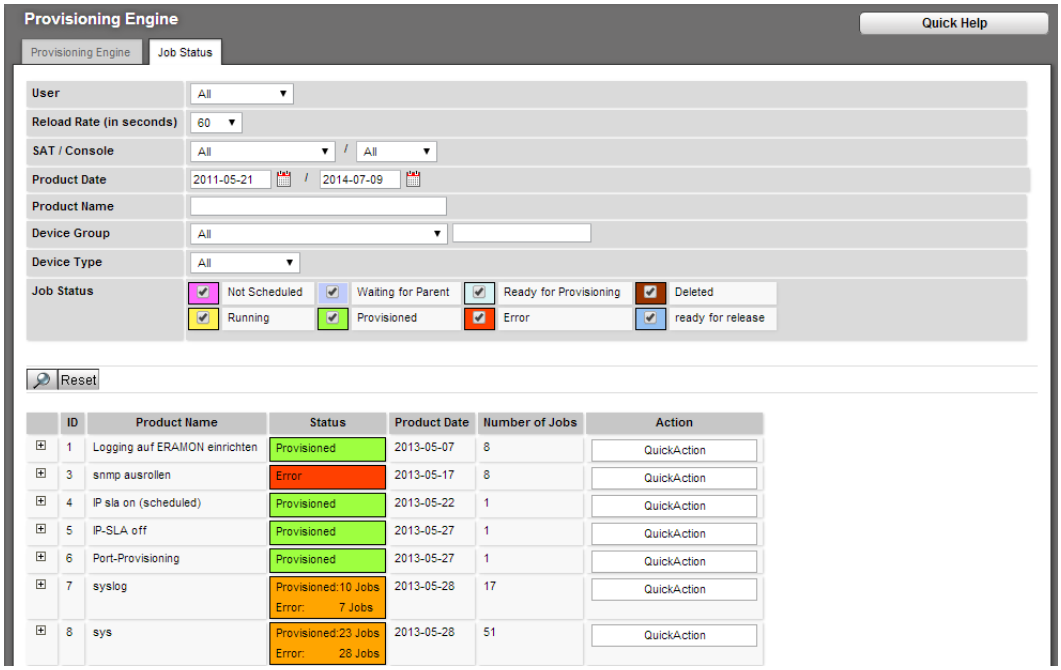
Parameters when setting up a measurement:

- Category
- Device A/B
- Time Frame from/Time Frame until (depending on category)
- ToS
- Thresholds for the measurement that was set up



6.6 Overview of Jobs

The user will be provided with an overview of the statuses of the current and already completed provisioning jobs, including the details – such as: who, when, what, …



7 Practical Examples

- Due to security requirements, for example security risks which have become apparent in the current firmware, this firmware, with 90 switches at 9 locations, needs to be updated. Using ERAMON's Provisioning module, the firmware transfer is completed within the hour, taking about 3 to 4 minutes for each switch. For this task multiple parallel processes will be initiated on the relevant ERAMON Satellite Systems. The process is controlled remotely and centrally for all locations. It is essential to prepare for this process through an extensive test of the update mechanisms.
- A global configuration change (i.e. change password) on 90 switches will take 10 minutes when carried out with ERAMON Provisioning.
- The automatic configuration of a brand new switch (e.g. Cisco) will take about 5 minutes (including firmware update). Agreed SLAs for replacing defective network components are easily met when compared to the effort required for manual updates of a switch – which normally takes about 30 to 45 minutes. ERAMON's Provisioning also enables the homogenization of network switches resulting in a standardized base configuration.
- The power supply of an access switch fails at a location (e.g. the branch of a bank) where no technicians are available; resulting in the failure of the entire switch. Once delivered, the replacement device will be connected as per instructions to a console server at that site, where it is then connected and returned to its original state in around 10 minutes by centrally located administration staff – same as for a new provisioning including the disaster recovery. Local, on-site staff can then render the device operational.