# Integration of SeisComP Quality Control Data and Datalogger State of Health information in Zabbix

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## INTRODUCTION

IGEPN runs 150 stations across Ecuador, using SeisComP for data collection and quality control (QC). Dataloggers like Reftek and Quanterra also provide State of Health (SOH) metrics. We use Zabbix software to monitor station statuses, alert for issues, and preempt problems using QC and SOH.

## METHODS/DATA

We developed a Python module to link SeisComP and Zabbix, transmitting QC data, and another to extract and send SOH information from Reftek to Zabbix.
In Zabbix, we crafted a template featuring items, graphs, triggers, and alerts to monitor the 150 stations.
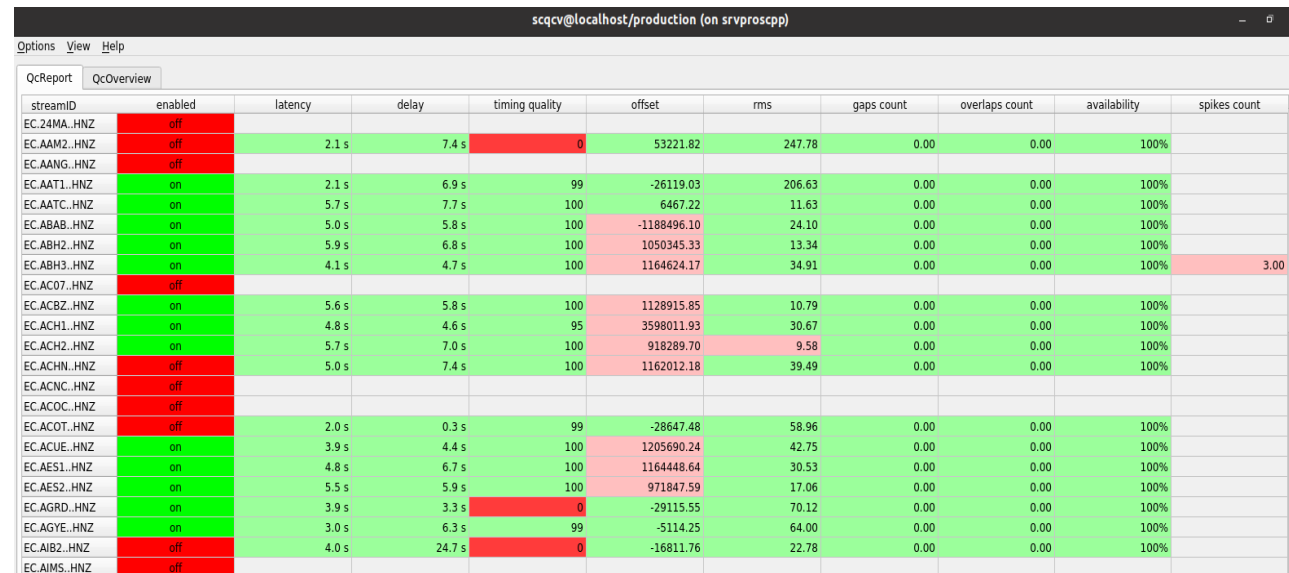
**START**

## RESULTS

The module SCZABBIX has been working at IGEPN since august 2020. It has stored around 100 GB of QC data.

## CONCLUSION

The main graphs used to monitor and troubleshoot are sc_ping_availability and sc_ping_response both useful to check if a station has connectivity issues.

New Zabbix trend functions are valuable to trigger long-term alerts.

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Geophysical Institute in Ecuador uses SeisComP for acquisition of the waveforms provided by the National Seismometer and Accelerometer Network. Everyday around 150 stations transmit their data to Centro Terras located at IGEPN building.

SeisComP has several modules like SCQC, SCQCV, QCLOG, etc. that allow the operator to check the quality of the waveforms acquired, nevertherles the module's interfaces could be difficult to use and not very interactive.

- Enhance quality control data accessibility.

- Use quality control data to automatically identify problems with the stations.

- Take advantage of the features available in Zabbix to perform quality control on the seismic station's waveforms.

- Make the code open-source and available in the following GitHub repositories:

  - SCZABBIX: https://gitlab.com/wacero/sczabbix.git

  - SOH_ZABBIX: https://gitlab.com/wacero/soh_zabbix

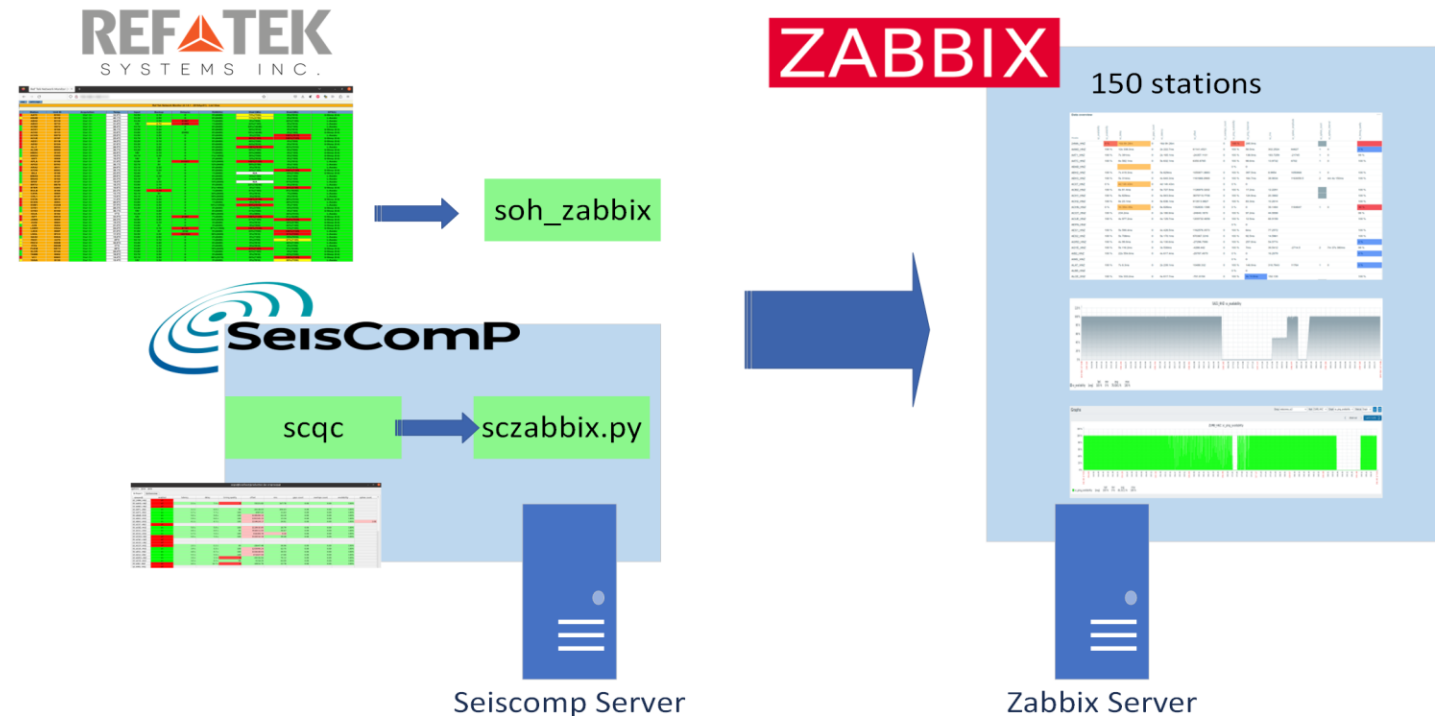INTRODUCTION

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We used Python to create a module, sczabbix.py, that connects to SeisComP message system, capture QC messages and send them to Zabbix.

Another module, soh_zabbix.py, extract SOH information from Reftek SOH web page and also send this information to Zabbix.

We created a Zabbix template with items, graphs, triggers and alerts.

This template was used to create 150 hosts (stations).

Zabbix API allowed to automate this process.

The module SCZABBIX has been working at IGEPN since august 2020. It has stored around 125 GB of QC data.

The status of all IG stations can be efficiently evaluated through Zabbix's comprehensive overview dashboard.

The main graphs and triggers used to monitor and troubleshoot stations are:
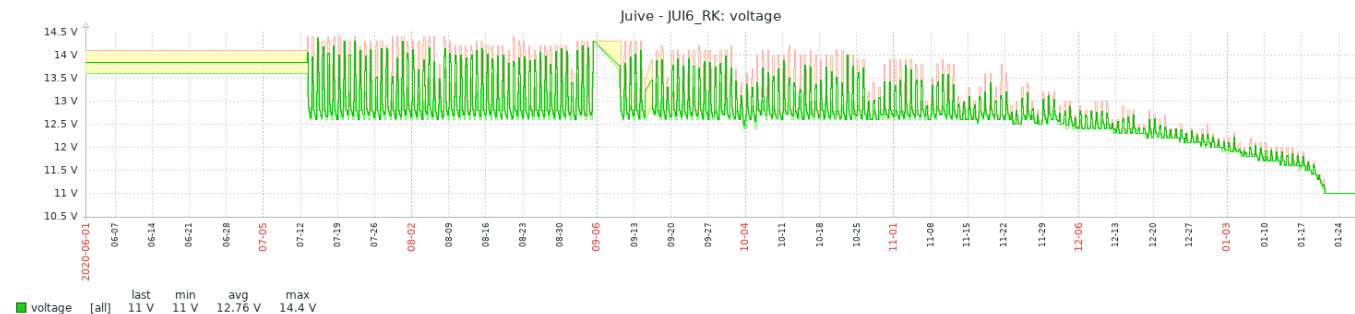
sc_availability:
completeness of the data.


APLA_HNZ: sc_availability
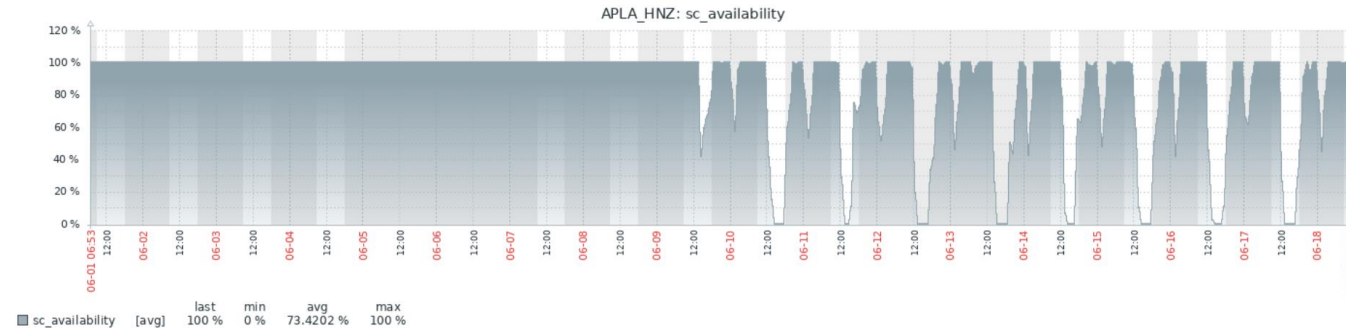
sc_ping_availability and sc_ping_response: useful to check if a station has connectivity issues.

sc_timing_quality: if this value is different that 100% over a long period of time, it may indicate problems with the station GPS, as it has been the case with GURALP dataloggers.

• Zabbix trend functions allow the creation of triggers and alerts based on long-term analysis.


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- Source code of the SCZABBIX module, https://gitlab.com/wacero/sczabbix

- Source code of the SOH_ZABBIX: https://gitlab.com/wacero/soh_zabbix

- SeisComP documentation, https://www.seiscomp.de/doc/

- Zabbix web page, https://www.zabbix.com/

- SCQC module documentation, https://www.seiscomp.de/doc/apps/scqc.html

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