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Vilnius Gediminas Technical University

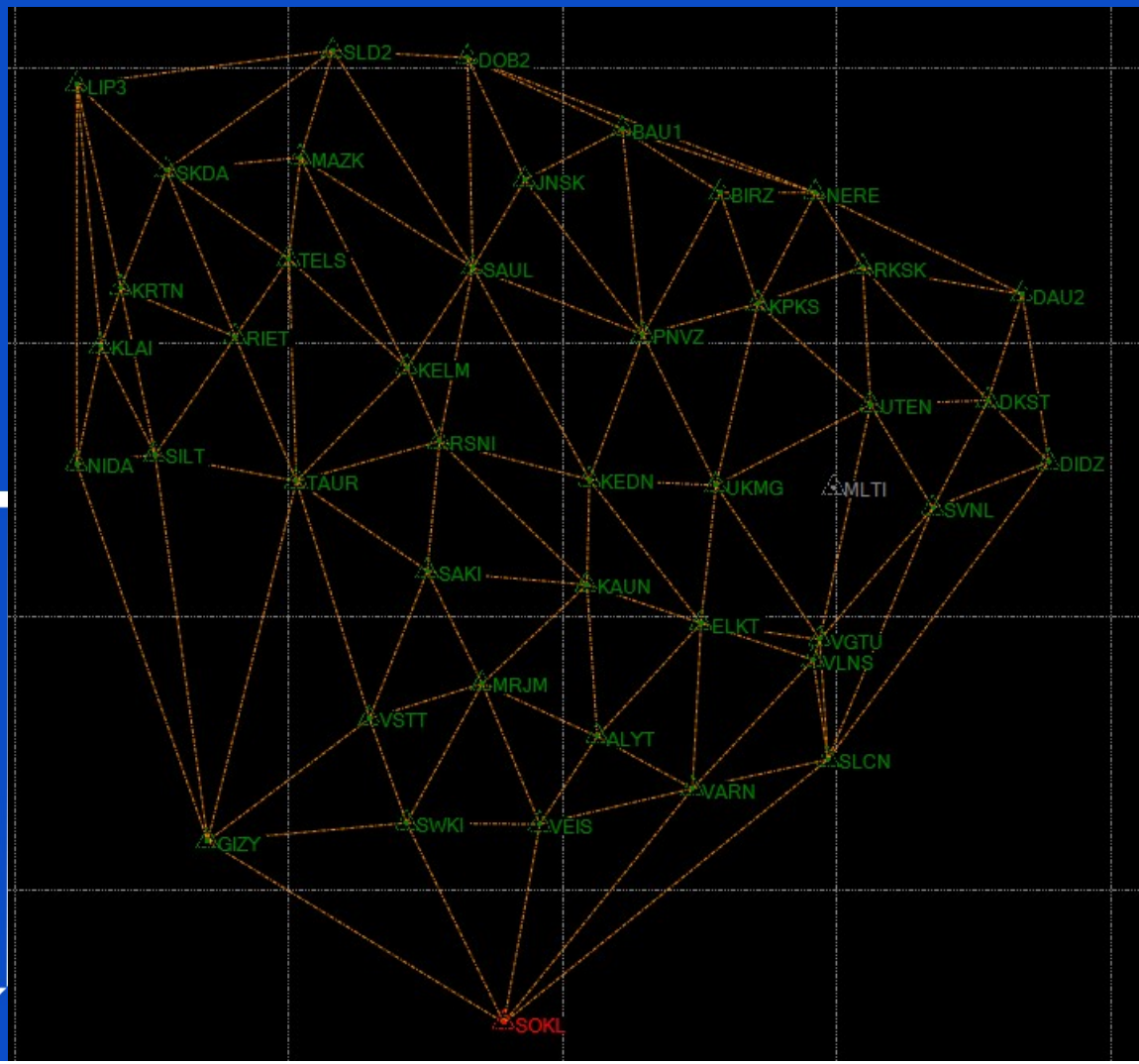
NKG Working Group for GNSS positioning

National report of Lithuania

2025

LitPOS stations

Currently there are 35 LitPOS stations, 6 LatPOS stations and 3 ASG-PL stations.
LitPOS service is free of charge.



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National CORS Network LitPOS

LitPOS services: DGPS, VRS and GPPS

Messages RTCM 2.3, RTCM 3.1, RTCM 3.4, CMR, CMR+, CMRx
DGPS RTCM 2.3, DGPS RTCM 2.4

GPS
CMR - Obs(1),Info(10),PrsInfo(11)
RTCM_23 - 3(6),22(6),23(5),24(5),18(1),19(1),59(9)
RTCM_30 - 4094,1005(5),1007+1033(5),1004(1)
DGPS - 1(1),3(6),22(6),23(5),24(5),59(9)

GPS+GLONASS
VRS_CMR_plus - Obs(1),Info(10),PrsInfo(11)
VRS_RTCM23 - 3(6),18(1),19(1),22(6),23(5),24(5),59(9)
VRS_RTCM31 - 4094,1005(5),1007+1033(5),1004(1),1012(1)
DGPS_RTCM24 - 1(1),3(6),22(6),23(5),24(5),31(1),59(9)

GPS+GALILEO
RTX_RTCM34_GPS_GALILEO - 4094,1005(5),1007+1033(5),MSM5(1)

GPS+GLONASS+GALILEO+BEIDOU (only 2nd generation satellites C6-C15)
VRS_CMRx - Obs(1),Info(8),PrsInfo(8)
RTX_RTCM34 - 4094,1005(5),1007+1033(5),MSM7(1)

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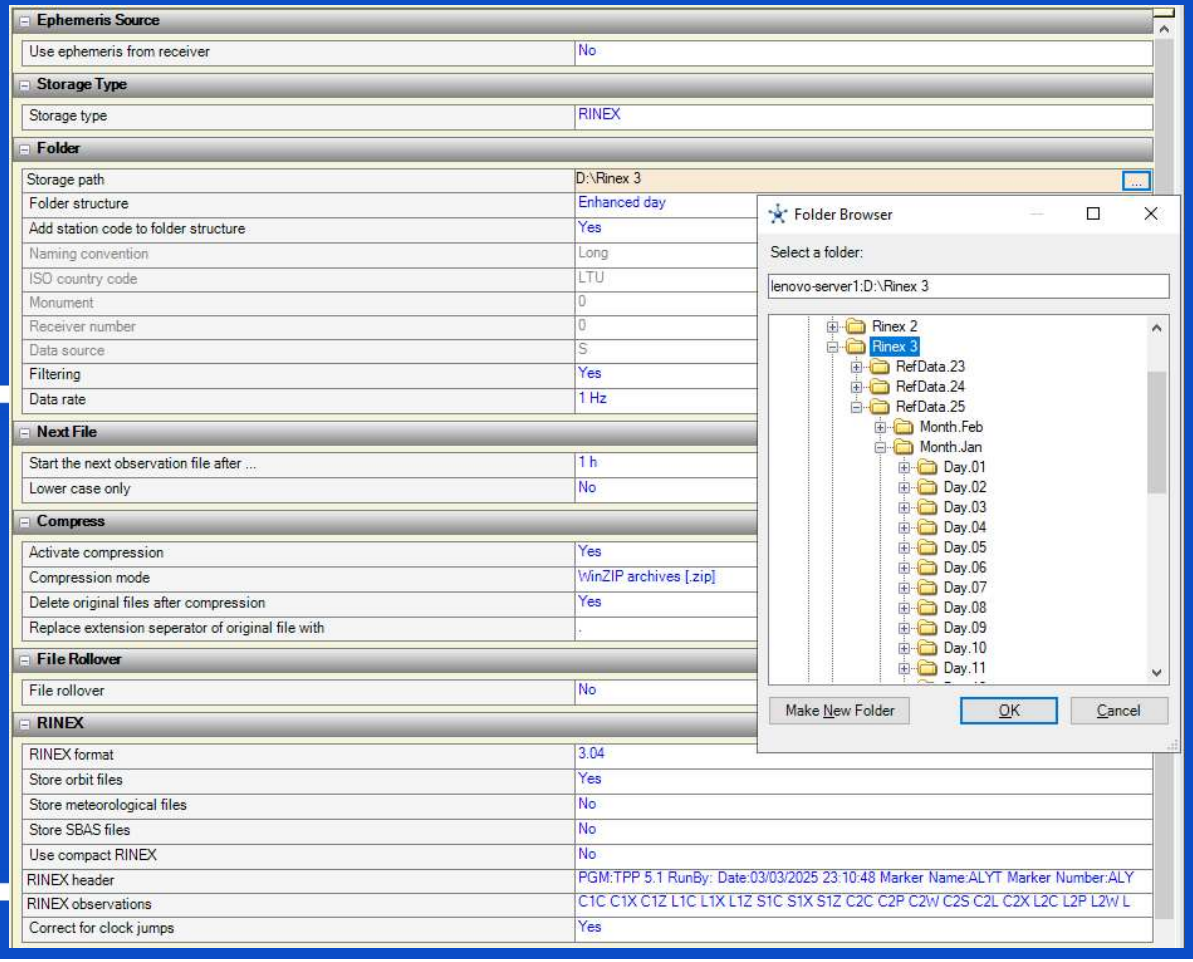
Data storage

LitPOS data stored on two servers. Amount of one month data:
Rinex 3.04 format – around 200 GB;
Rinex 2.11 format – 80 GB;
Other data– 200 GB.



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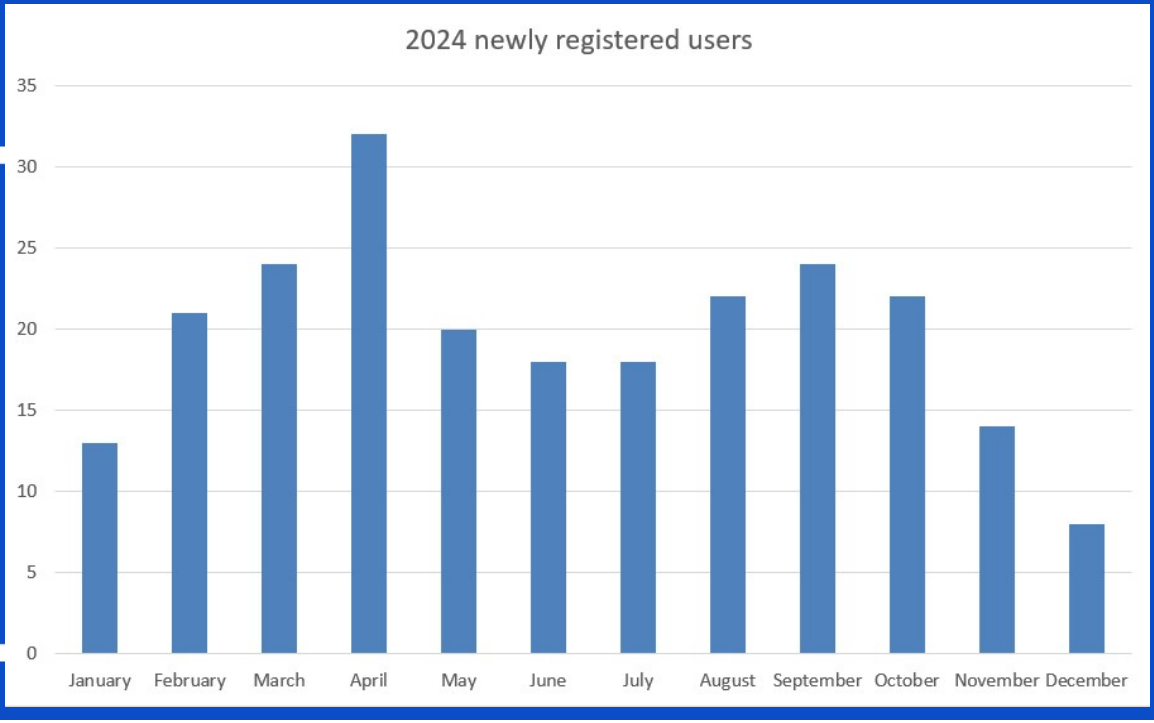
Number of users

Registered users 2626
Registered receivers 7843
Active distinct users in last three months about 1000

On average, each server receives around 600 000 requests from user receivers each month. These requests include failed connections.

In 2024 we have registered 235 users
And 1270 total receivers (one user can have maximum 50 receivers)



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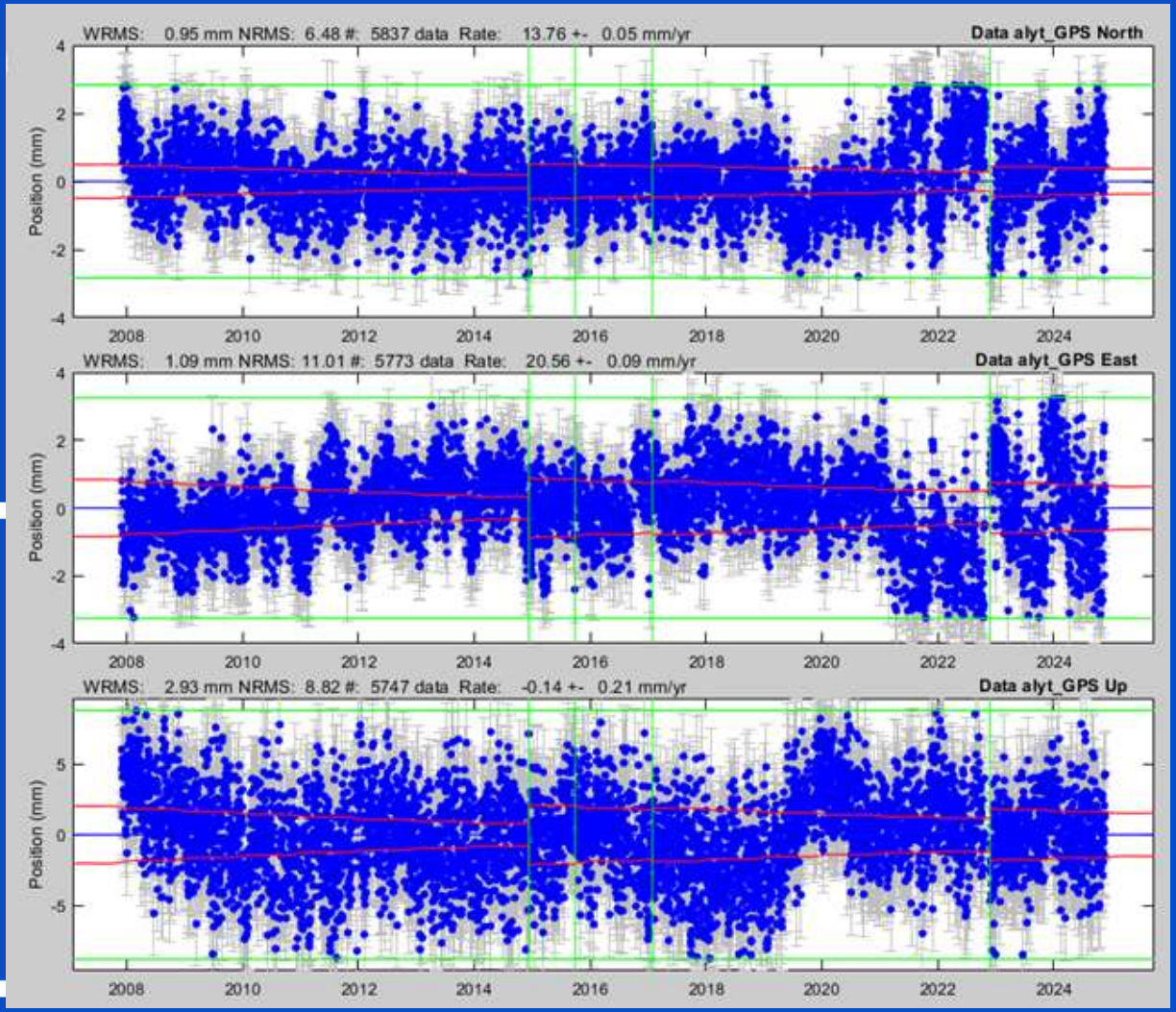
Time series analysis

Analysis of the time series of geodetic coordinate variations of the LitPOS network stations has been performed using BERNESE software.

Analysis is being done according EUREF “Guidelines for EPN Analysis Centres” ,



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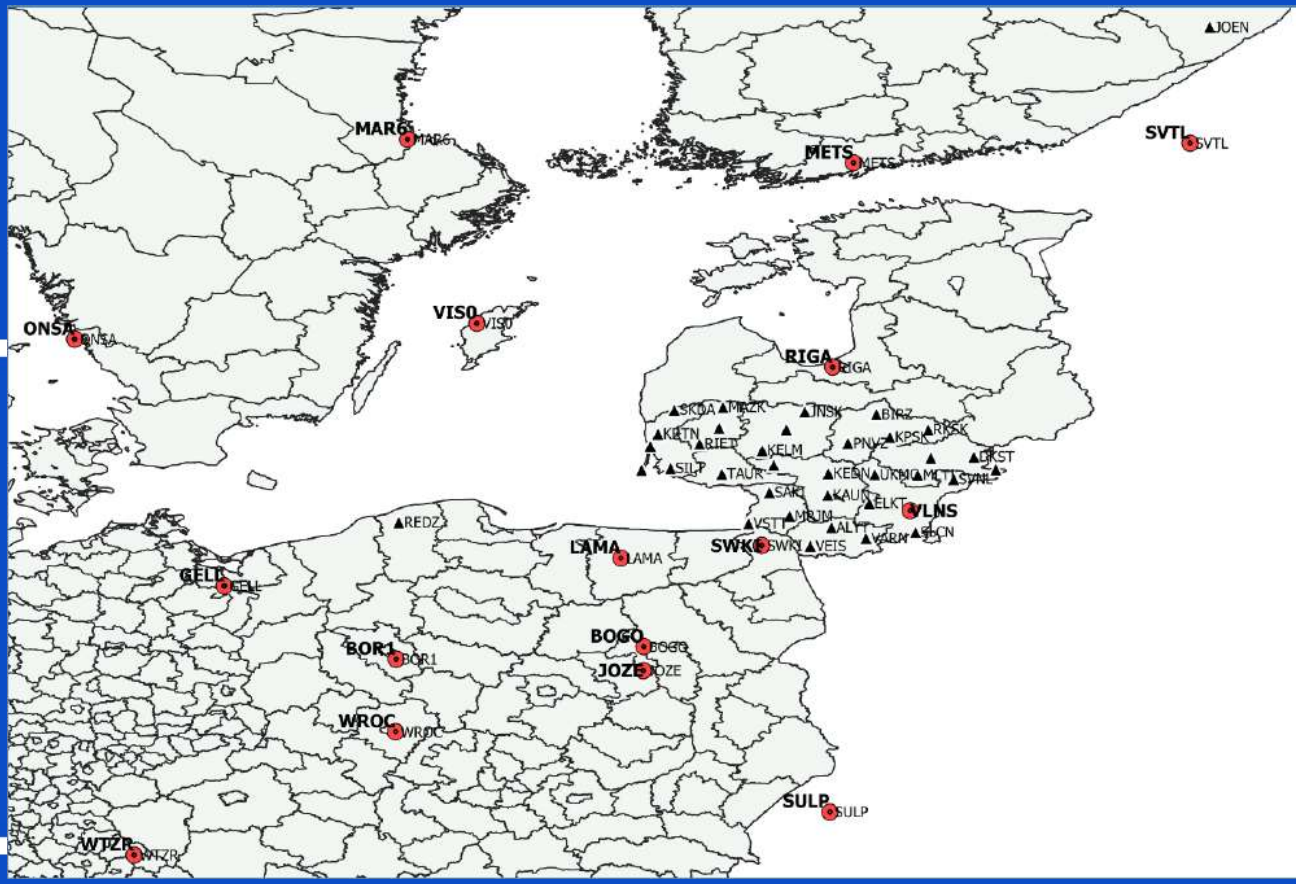
Time series analysis

From 2024 onwards, the number of reference stations has been increased and the closest IGS and EPN stations to LitPOS have been adopted as geodetic starting points: BOGO, BOR1, GELL, JOZE, LAMA, MAR6, MDVJ, METS, ONSA, RIGA, SULP, SVTL, SWKI, VIS0, VLNS, WROC and WTZR. From 2024 onwards, the additional stations JOEN and REDZ are counted



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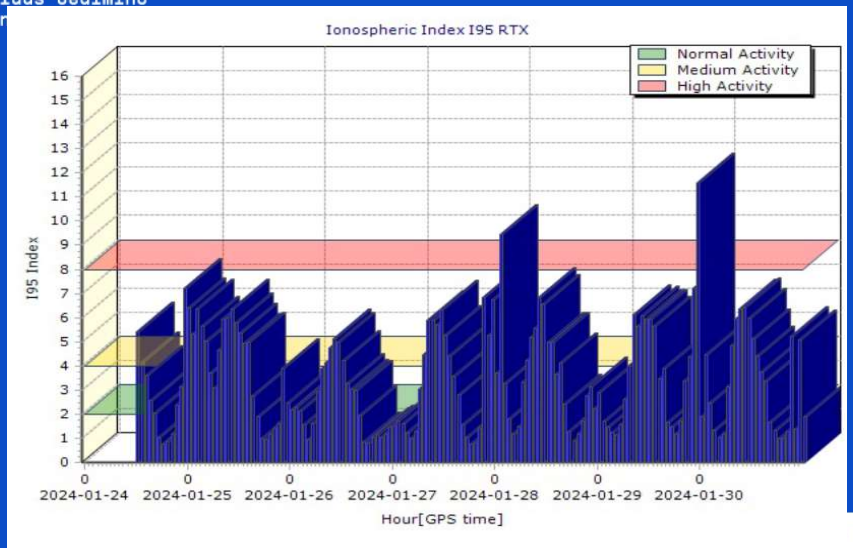
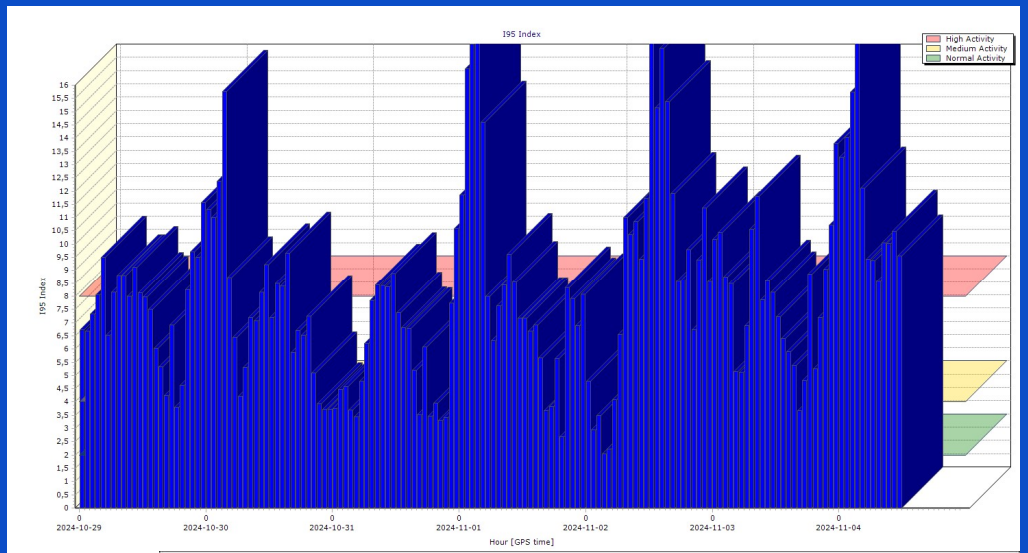
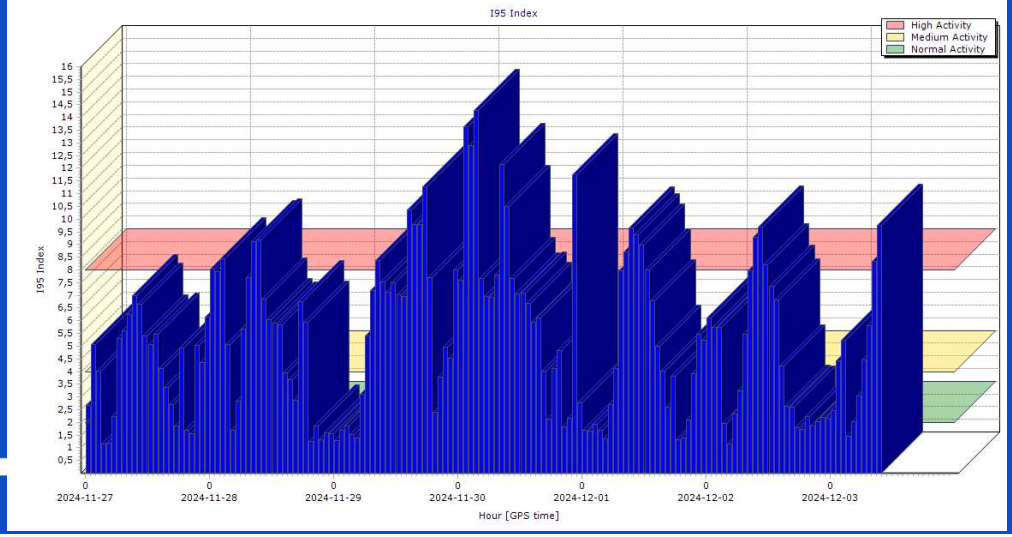
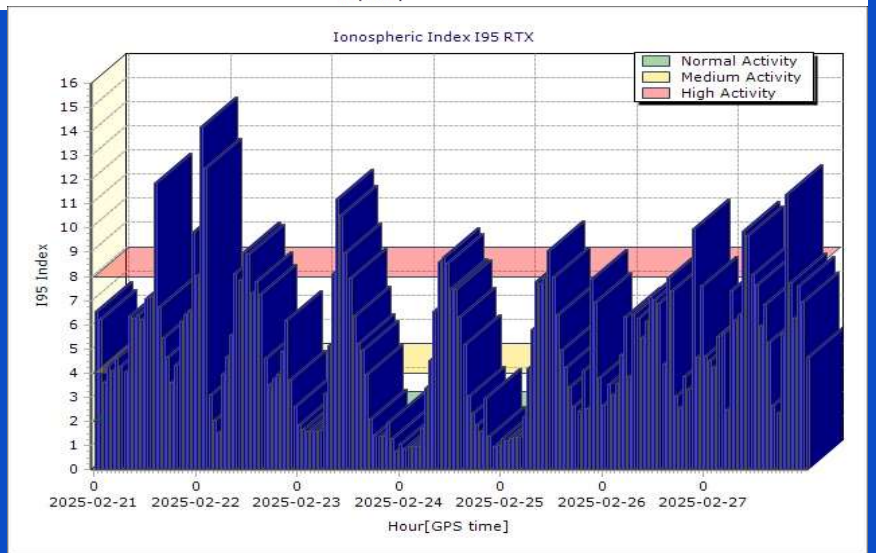
Ionospheric Index Monitoring









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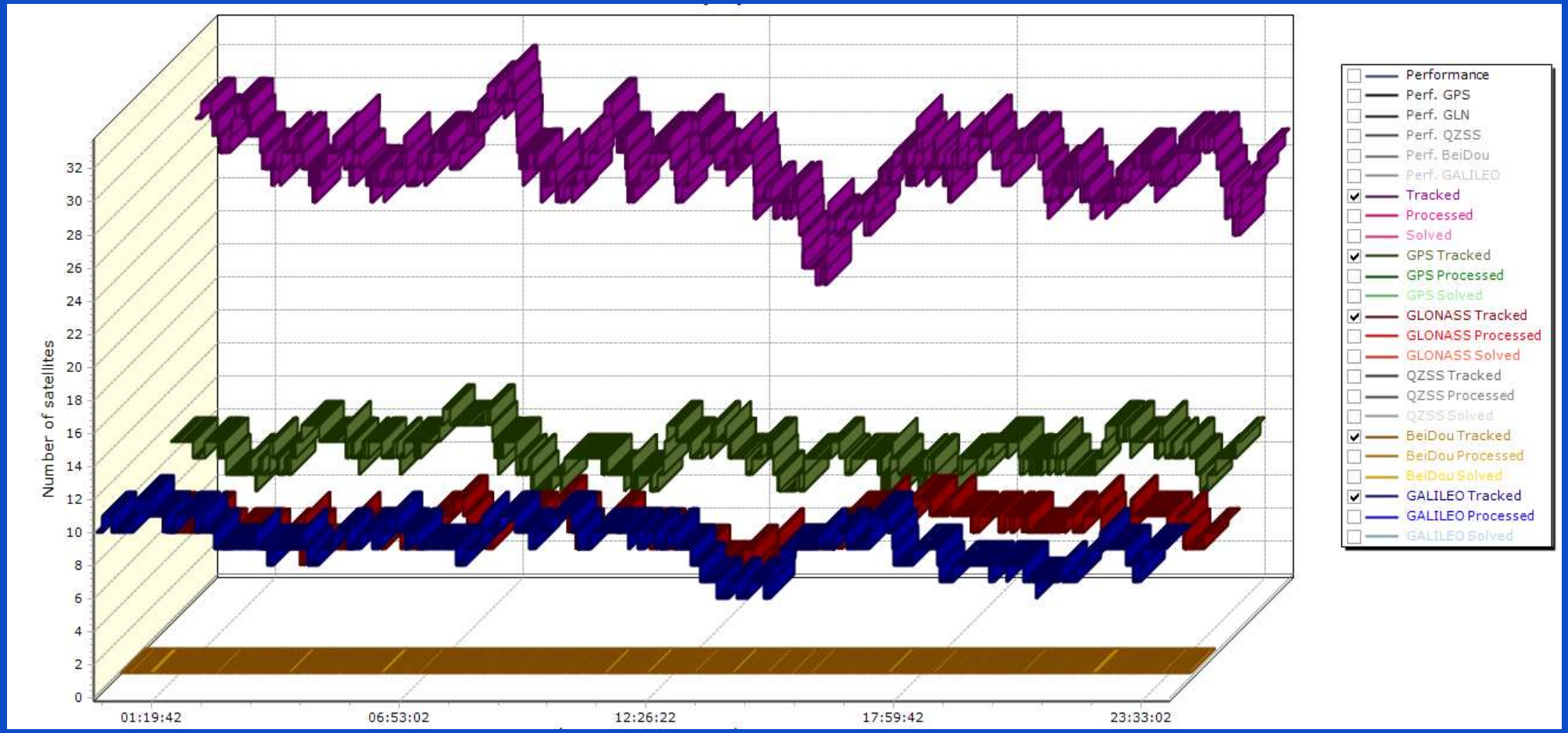
RTXnet processor

Total tracked satellites from 18 to 32



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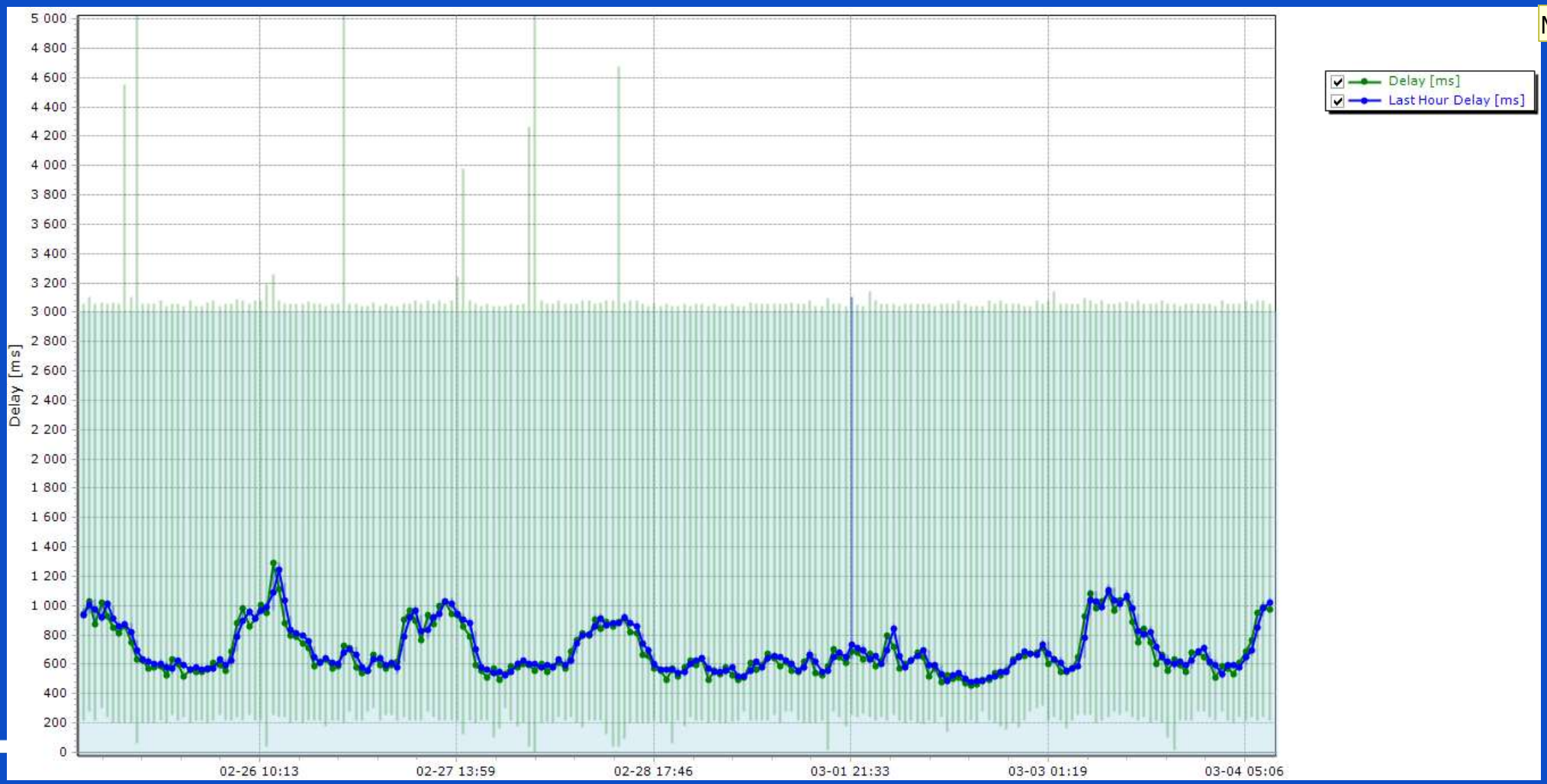
Station Delay Chart



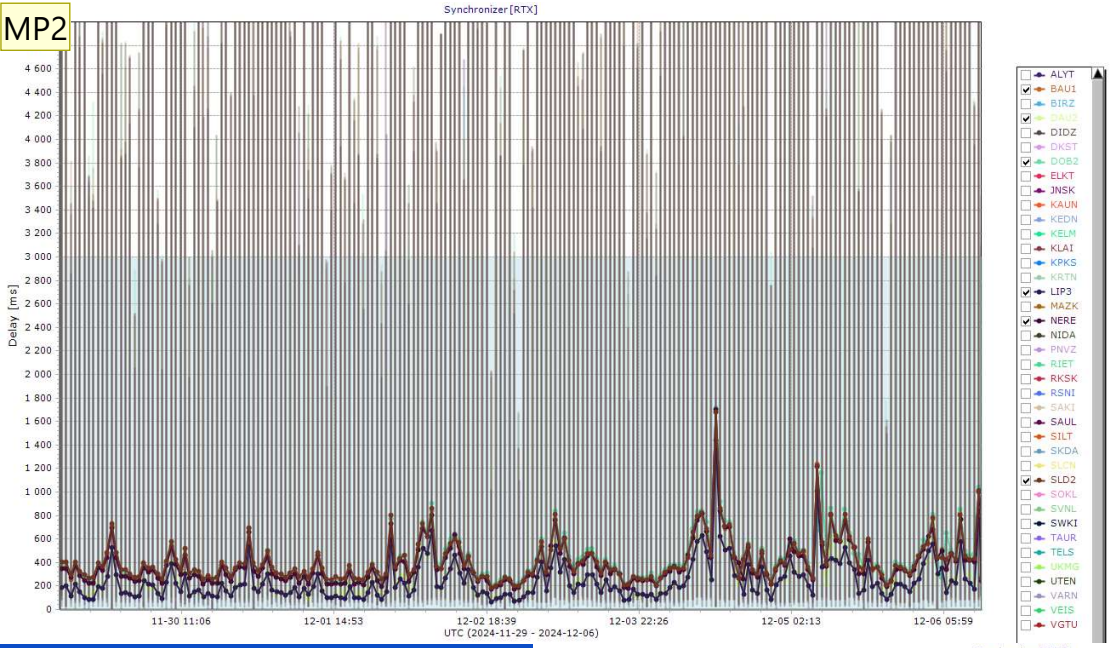
Slide nummer 10

MP1 The Synchronizer Station Delay Chart view graphically displays the average delay per hour for Synchronizer module.

The diagram displays in form of a line graph for the Synchronizer module the average delays per hour
with the horizontal axis as time and the vertical axis as the delay time in milliseconds.
The values refer to the module's delay in forwarding the epochs to the dependent modules.
Delays are relative to the first station sending a specific epoch.
Vertical bars can additionally indicate the minimum and the maximum delay value that contributed to the mean value of each data point.
The delay time section between no delay (0 milliseconds) and a delay of 3000 milliseconds is colored in a light blue,
while the section of higher delay times has a white background.
Any station with delay times in the white sector is too late

Marius Petniunas; 04-03-2025

MP2


Synchronizer [RTX]
Delay [ms]
11-30 11:06
12-01 14:53
12-02 18:39
12-03 22:26
12-05 02:13
12-06 05:59
UTC (2024-11-29 - 2024-12-06)
ALYT
BAU1
BIRZ
DAU2
DIDZ
DKST
DOB2
ELKT
JNSK
KAUN
KEDN
KELM
KLAI
KPKS
KRTN
LIP3
MAZK
NERE
NIDA
PNVZ
RIET
RKSK
RSNI
SAKI
SAUL
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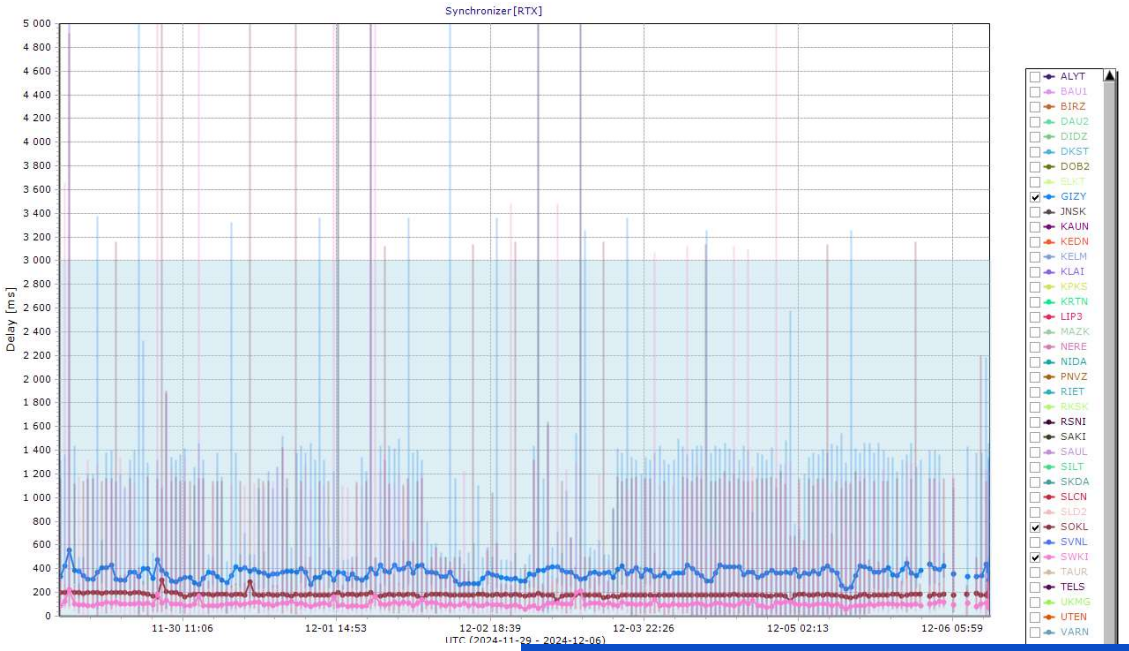
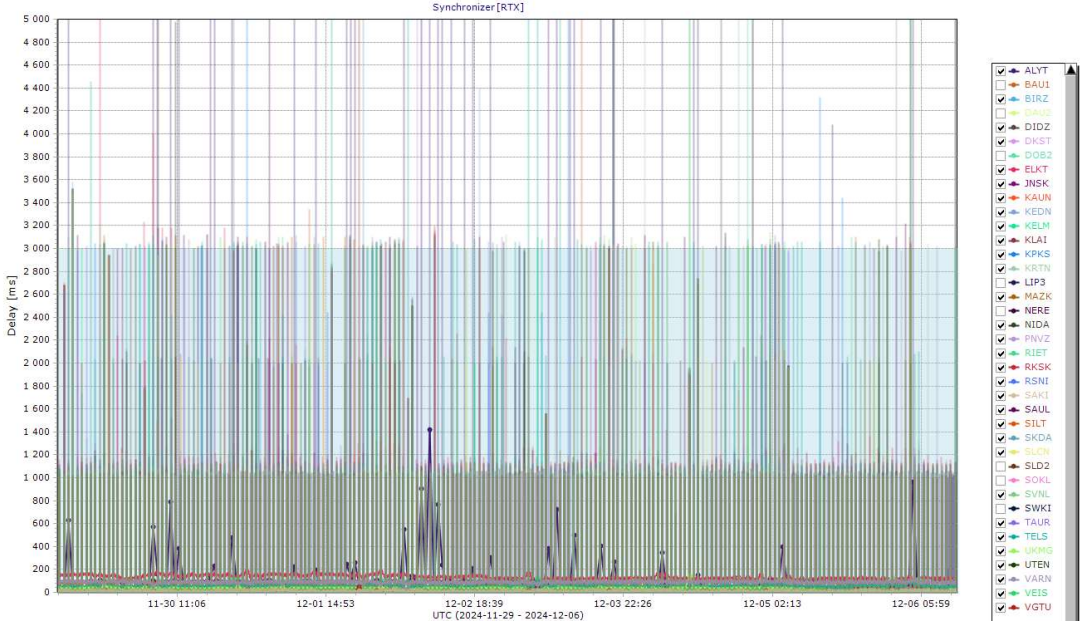
TAUR
TELS
UKMG
UTEN
VARN
VEIS
VGTU


Synchronizer [RTX]
Delay [ms]
11-30 11:06
12-01 14:53
12-02 18:39
12-03 22:26
12-05 02:13
12-06 05:59
ALYT
BAU1
BIRZ
DAU2
DIDZ
DKST
DOB2
GIZY
JNSK
KAUN
KEDN
KELM
KLAI
KPKS
KRTN
LIP3
MAZK
NERE
NIDA
PNVZ
RIET
RKSK
RSNI
SAKI
SAUL
SILT
SKDA
SLCN
SLD2
SOKL
SVNL
SWKI
TAUR
TELS
UKMG
UTEN
VARN


Synchronizer [RTX]
Delay [ms]
11-30 11:06
12-01 14:53
12-02 18:39
12-03 22:26
12-05 02:13
12-06 05:59
UTC (2024-11-29 - 2024-12-06)
ALYT
BAU1
BIRZ
DAU2
DIDZ
DKST
DOB2
ELKT
JNSK
KAUN
KEDN
KELM
KLAI
KPKS
KRTN
LIP3
MAZK
NERE
NIDA
PNVZ
RIET
RKSK
RSNI
SAKI
SAUL
SILT
SKDA
SLCN
SLD2
SOKL
SVNL
SWKI
TAUR
TELS
UKMG
UTEN
VARN
VEIS
VGTU

Slide nummer 11

MP2 The Synchronizer Station Delay Chart view graphically displays the average delay per minute for each selected station.

The diagram displays for the selected stations the average delay per minute in form of a line graph
with the horizontal axis as time and the vertical axis as the delay time in milliseconds.
Vertical additionally indicate the minimum and the maximum delay value that contributed to the mean value of each data point.

The delay time section between no delay (0 milliseconds) and a delay of 3000 milliseconds is colored in a light blue,
while the section of higher delay times has a white background.
Any station with delay times in the white sector is too late.

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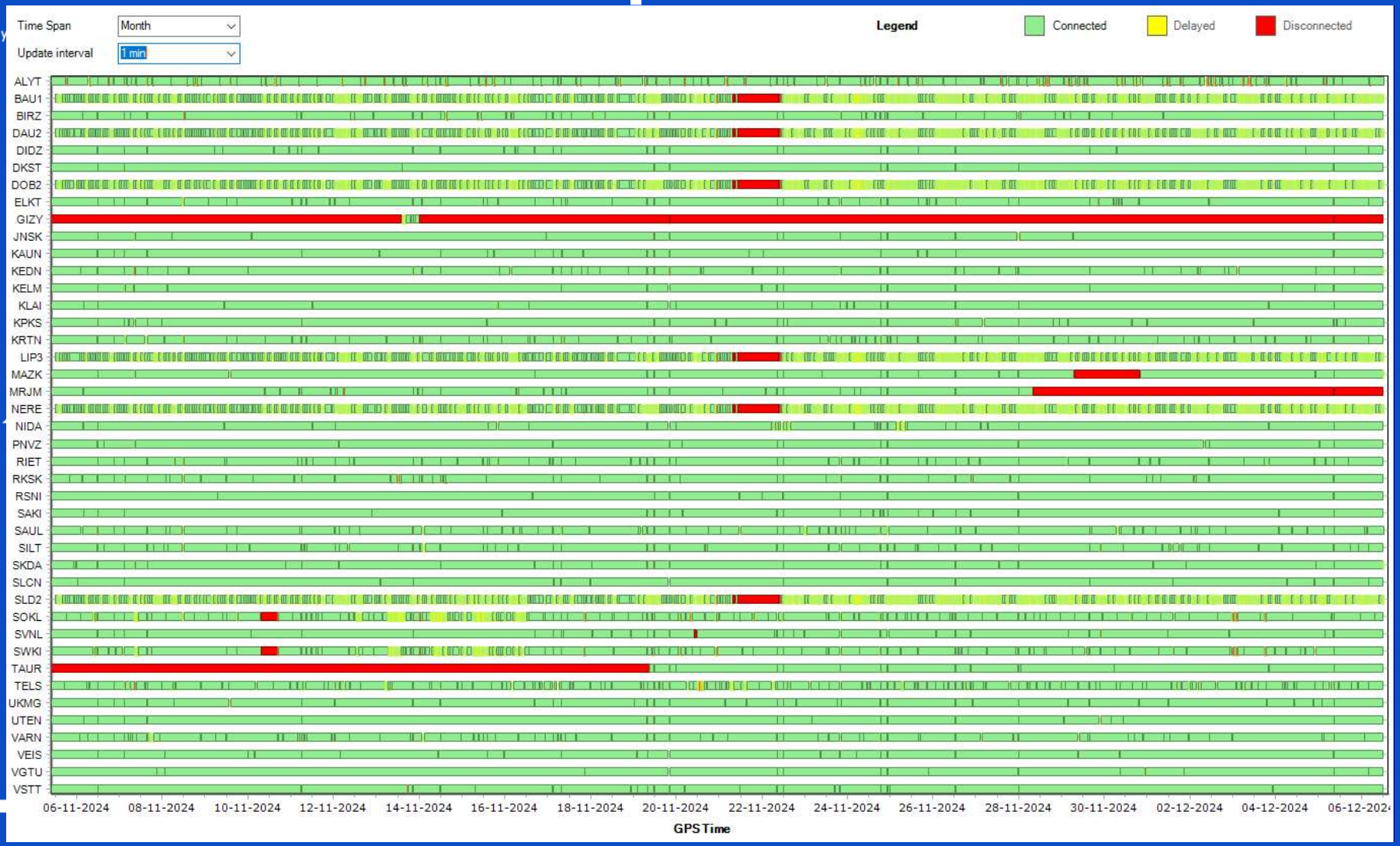
Station Status History



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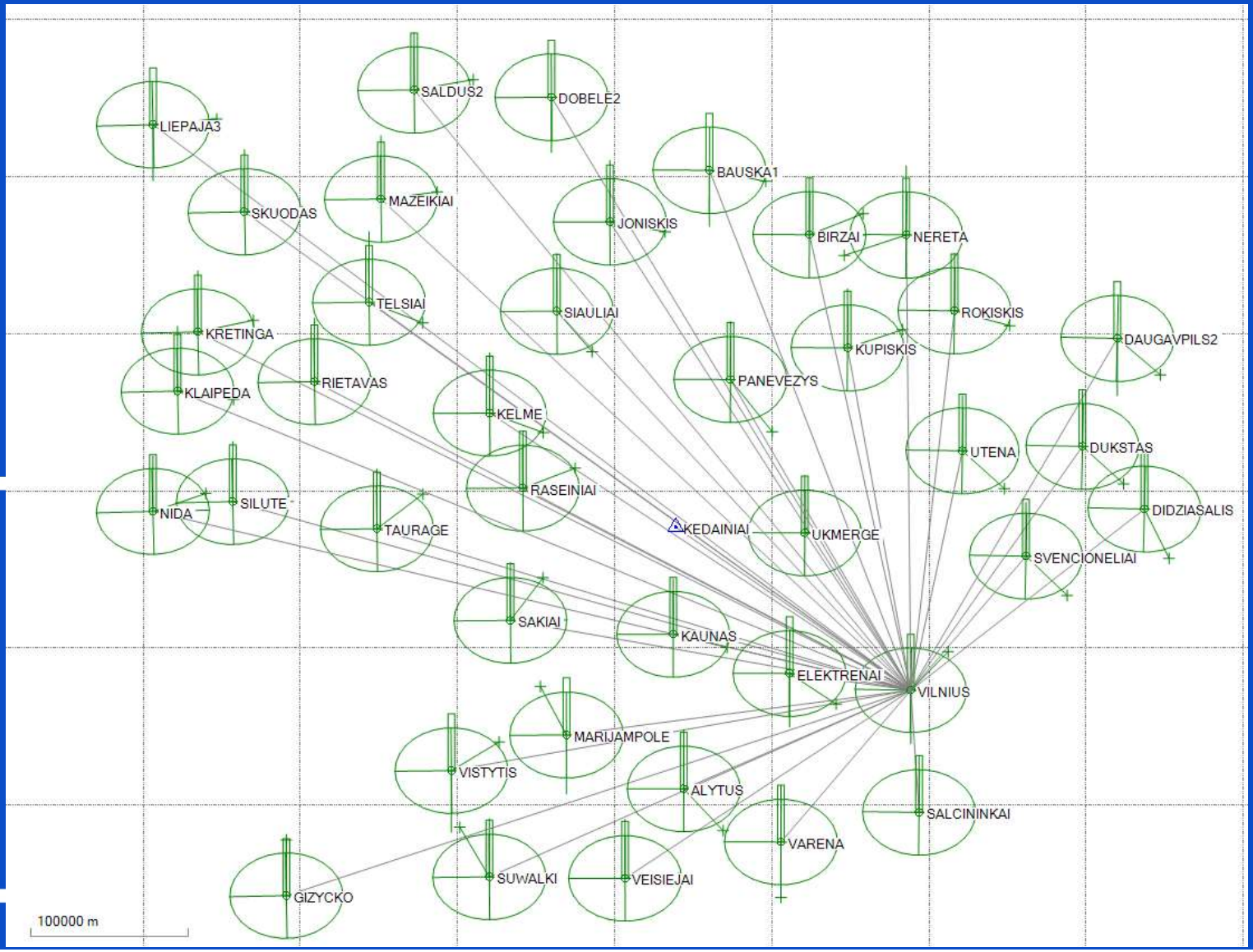
Integrity Monitor



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Thank you