



Genomics Data Network

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GDN

- Initiative to establish high speed data connection between Universities and Research facilities
- Make big-data transfer possible via high speed data network rather than transferring data using legacy methods (by regular transportation)

Gene information acquisition and processing

- Biological sample (hospitals, biobanks, research centers, historical samples)
- Sequencing (MGI, BMC)
- Data storage (research centers, RTU)
- Data analysis (RTU)
- Results (research centers, hospitals)

Genome data transfer

- Single genome data takes up about 100-400GB
- Data must be transferred from the sequencing facility to the research and data processing facilities
- Until now, private transport has been used because the available Internet connection was too slow
- GDN would improve genome data transmission rate so that the whole process could be finished in minutes

Working group

- Jānis Kloviņš, Director of LU BMC
- Lauris Cikovskis, Director of RTU HPC
- John Tully, CEO of SIA Mikrotīkls (MikroTik)
- Jānis Grēviņš, Director of RBS, Board member of TET
- Ingmārs Pūķis, Board member of LMT
- Rolands Lappuķe, External Smart Technology Adviser to the President of Latvia
- Zigmunds Zitmanis, Director of IT at RSU
- Aleksandrs Mārtiņš Blūms, Government representative (Department of Higher Education, Science and Innovation)

Timeline

- December 11, 2019
 - The first meeting with representatives of MGI, RTU, RSU, BKUS, LU, IZM, MikroTik and other institutions.
- December 2019
 - MikroTik delivers equipment for BMC-RTU local area network improvement
- February 2020
 - A study was carried out to find out the options to improve the Internet connection of MGI Latvia.
- April 2020
 - MikroTik delivers equipment for RSU local area network improvement
 - LMT conducts research on data connections between RTU, BMC, MGI, BKUS
- May 2020
 - A GDN working group has been established
 - MikroTik delivers equipment for BKUS local area network improvement
 - The LMT Board approves the establishment of the GDN pilot project connection
- June 29, 2020
 - LMT connection BMC-RTU, BKUS-RTU activated
- July 3, 2020
 - LMT connection MGI-RTU activated
- September 2020
 - LMT connection LU-RTU activated
 - RSU connection to RTU activated





The structure of GDN

- LMT provides fiber connections
- MikroTik provides switches and routers
- The working group evaluates current and future plans
- MikroTik provides Internet access to GDN

GDN performance

- 5Gbps connection between MGI and RTU
- 10Gbps connection between all other institutions
- 100Gbps upgrade in progress
- 1Gbps connection to the Internet
- Genomic data transfer can be done within few minutes

GDN future plans

- Establish connection with “Latvian National Library”, “Silava” and “BIOR” institutions
- Establishing an interconnection with the Estonian EENET - connection with the Tartu Research Center
- Connect to the Finnish HPC center in Kajaani via the Estonian EENET
- Establish connection to GEANT (up to 40-10Gbps) for specific projects
- Establish connection to Latvian Academic Network
- Increase the performance of GDN internal network to 25G / 40G / 100G

Benefits of joining GDN

- Use current 10Gbps data transfer between the institutions
 - Upgrading some links already to 100Gbps
- Access to multiple data storage servers locations
- Copy/synchronize the data over GDN between multiple locations
- Create virtual networks with specific institutions
- Access to 1Gbps Internet connection

How to join GDN

- Send application information to emails:
 - tully@mikrotik.com
 - uldis@mikrotik.com
- Technical detail query to email:
 - uldis@mikrotik.com