



BalticGrid-II Project

SA2 - Network Provisioning

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Outline

- Overview
 - ❖ SA2 objective
 - ❖ SA2 tasks
 - ❖ SA2 deliverables
- Work performed P01-P12
- Future Work P12-P24
- Issues





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Overview





SA2 objective

The overall strategy of SA2 is to ensure reliable network connectivity for Grid infrastructure in the Baltic countries and Belarus, as well as to **ensure optimal network performance** for large file transfers and interactive traffic associated with Grid





SA2 Tasks

- **Task 1** Expanding BalticGrid infrastructure to new partners (P01-P6)
- **Task 2** Establishing and operation of CNCC, NNCCs, and BalticGrid-IRTs (P01-P24)
- **Task 3** - Policy development (P03-P09)
- **Task 4** - Network monitoring and cooperation with other projects (P01-P24)
- **Task 5** - Deployment of high-speed TCP and scalable TCP (P06-24)





SA2 Tasks

- Task 1 Expanding BalticGrid infrastructure to new partners (P01-P6)
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- **Task 5** - Deployment of high-speed TCP and scalable TCP (P06-24)





SA2 Deliverables

DSA2.1 – Report on the establishment and operation of CNCC and NNCCs, and BG-IRT (P04)

DSA2.2 – Grid Acceptable Use Policy (P05)

DSA2.3 – Report on the expansion of BalticGrid infrastructure (P06)

DSA2.4 – Security Policy (P08)

DSA2.5 – Incident Handling and Response Policy (P09)

DSA2.6 – Interim report on network performance (P12)





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Work performed





CNCC and NNCCs

- CNCC established in IMCS UL
- NNCCs established in Estonia, Latvia, Lithuania, and Belarus
- BG-IRTs in each NNCC appointed





Risk Analysis

- Network Risk analysis
- Grid Risks
- Network Security Incidents
- Data Center Risks





Policies

- Grid Acceptable Use Policy
- Security Policy
- Incident Handling and Response Policy





AIRT

<http://gridimon.balticgrid.org/airt>

A screenshot of the AIRT application login page. At the top center is the AIRT logo, which consists of a blue oval with the word "AIRT" in white, flanked by two crossed wrenches. Below the logo is the title "Application for Incident Response Teams" in bold black text, followed by "BG-IRT" in a smaller font. The main text reads: "Please enter your username and password or authenticate using your SSL [certificate](#)". There are two input fields: "Username:" and "Password:". Below the password field is a "Log in" button. At the bottom of the form area is a link for "[AIRT Tutorial](#)". The entire form is enclosed in a light blue border. At the bottom of the page, below the form, is the text "Copyright (C) AIRT Project".

AIRT

Application for Incident Response Teams
BG-IRT

Please enter your username and password
or authenticate using your SSL [certificate](#)

Username:

Password:

[AIRT Tutorial](#)

Copyright (C) AIRT Project





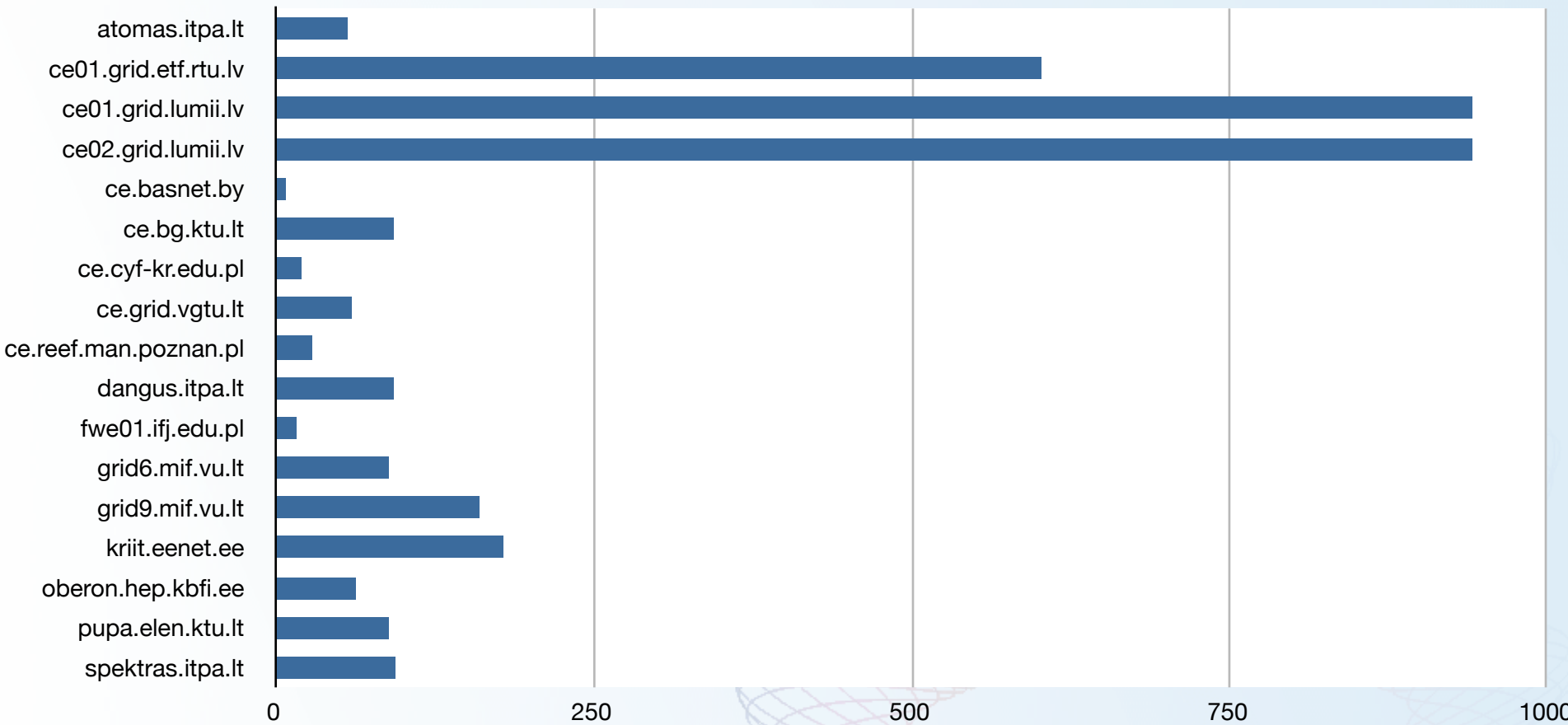
Problem: **SLOW** data transfer

- When measured real life performance for data transfer between SEs and WNs, fastest data transfer speeds are ~ **160Mbps** (~20MB/s), average speed is ~ **64Mbps** (~8MB/s)
- Turned out that single TCP session rarely is able to exceed **100-120Mbps!**
- Most links between sites - at least **1Gbps!**





Overall picture

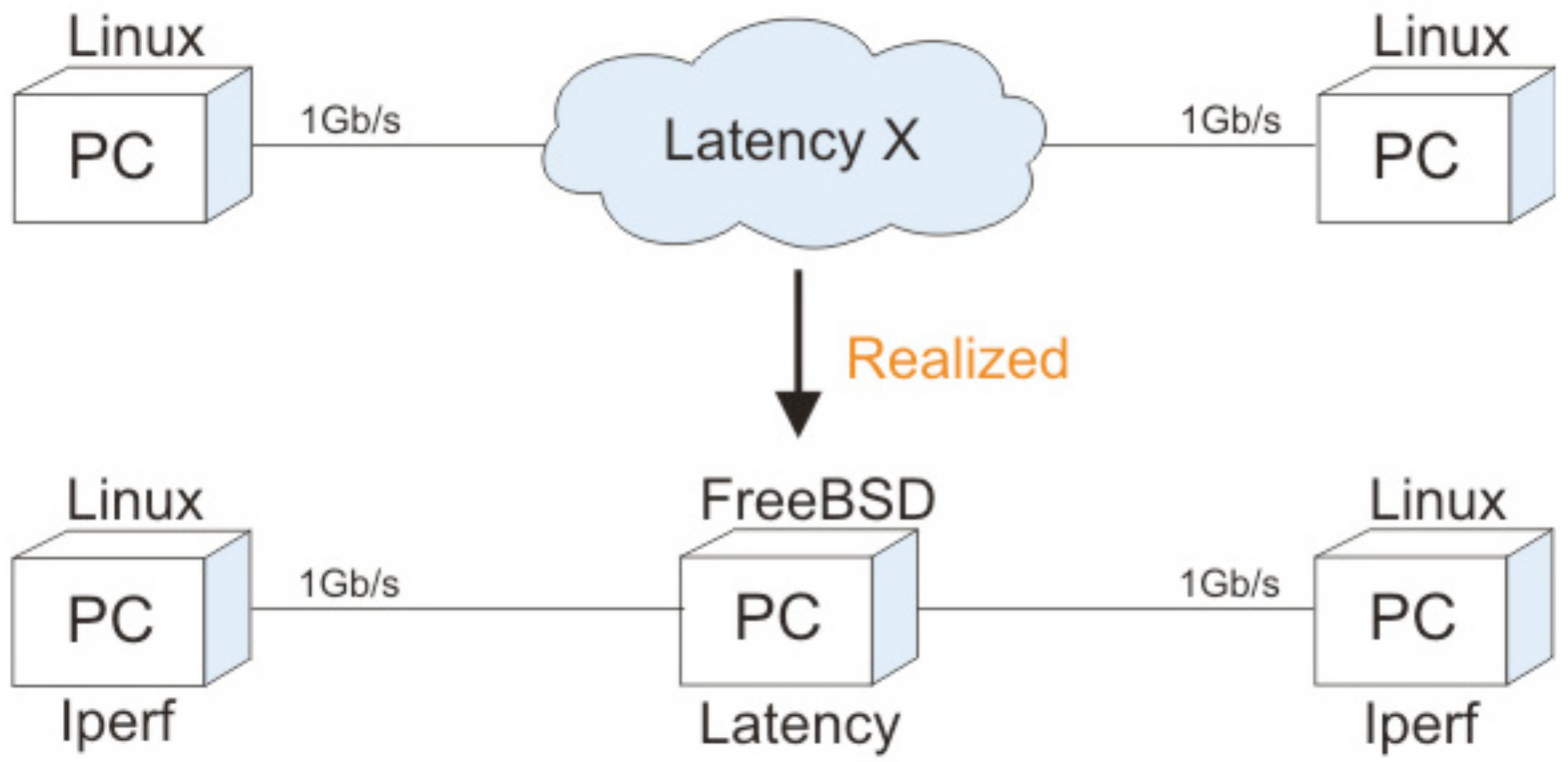




Measurement tool

- Iperf network performance measurement tool used to measure TCP data transfer speed for single IPv4 TCP stream







Conclusions

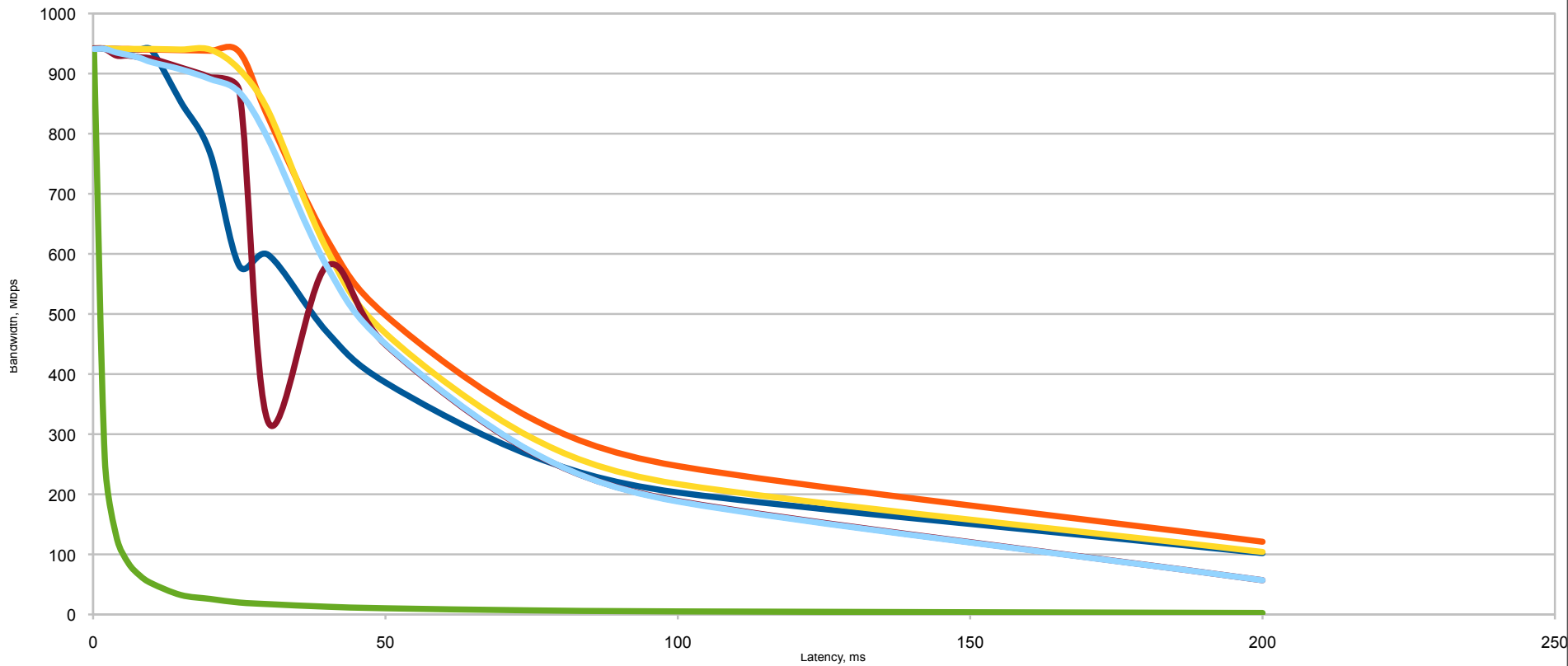
- Found that Scientific Linux 4, if used with default TCP stack settings, underperforms severely in TCP performance





Success in Simulations

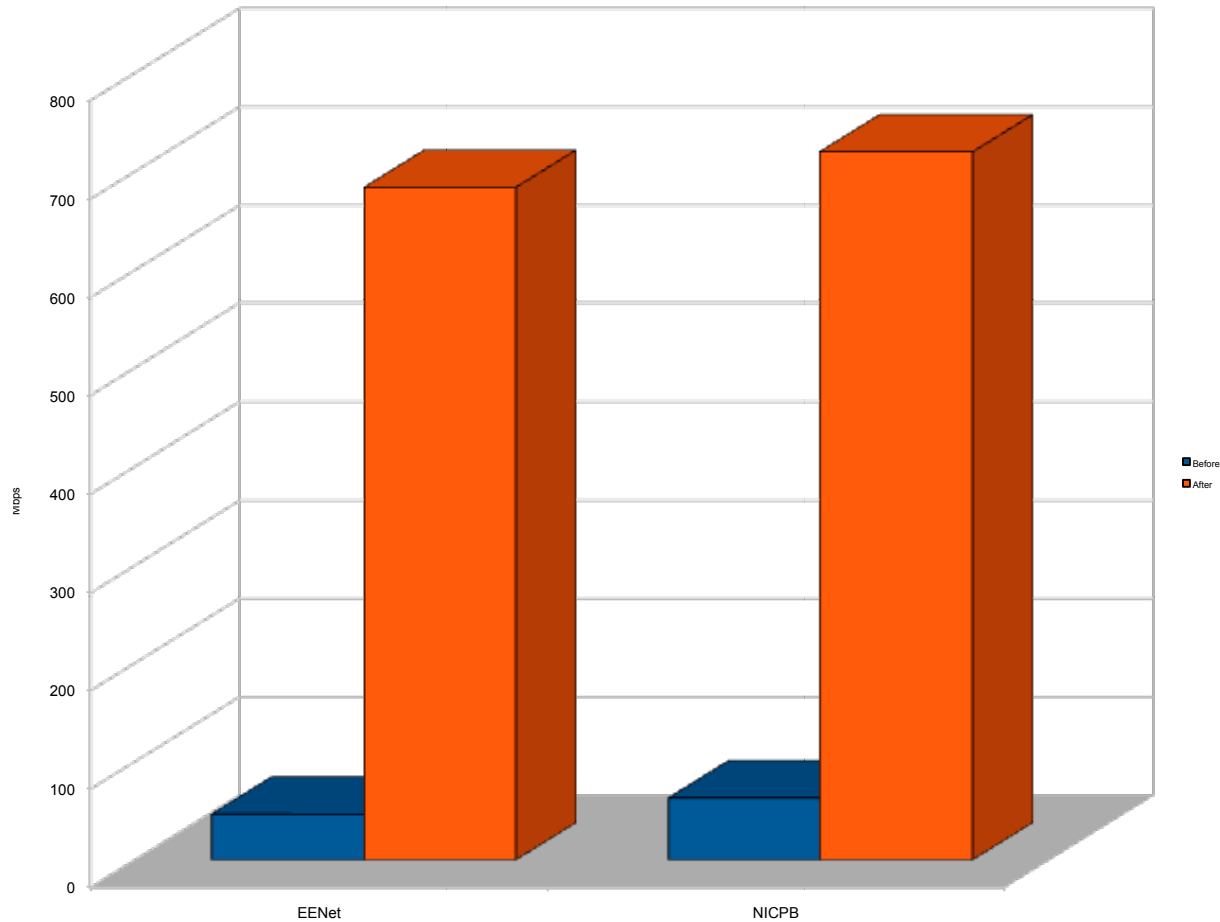
ICP bandwidth depending on latency





Improvements on real sites

I CP performance improvements





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Still to do





Just a few lines...

```
net/core/rmem_max = 8738000
```

```
net/core/wmem_max = 8738000
```

```
net/ipv4/tcp_rmem = 8192 4369000 8738000
```

```
net/ipv4/tcp_wmem = 8192 4369000 8738000
```





SA1 - SA2 collaboration

Tune the TCP stack

Get 10x-20x increase in network performance!





SA2 Task 4

Task 4 - Network monitoring and cooperation with other projects

- Investigation of requirements for joining the global European monitoring infrastructures of the GN2 project;
- Obtaining and installation of software and hardware to participate in these infrastructures;
- Liason with GN2 and EGEE project respective activities.





SA2 Task 5

Task 5 - Deployment of high-speed TCP and scalable TCP:

- Deployment and testing of new approaches to data transfer;
- Suggestions to standards and policies;
- CNCC and NNCC ensure that the modified high-performance TCP data transfer sessions do not interfere with the traffic of other users;
- Optimal alternatives for the Grid storage element middleware considered and tested





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Issues...





- Economical crisis
- Highly possible 'huge' downgrade of GEANT bandwidth for Latvia





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THANK YOU!
Questions?

