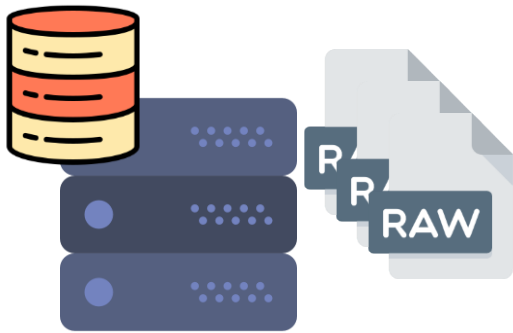


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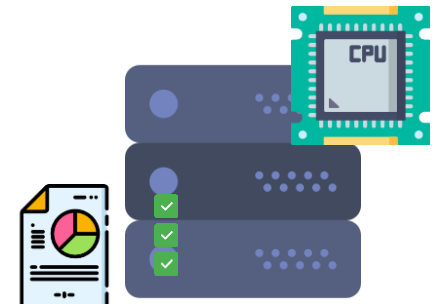
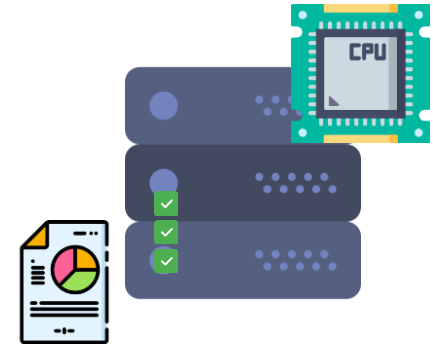
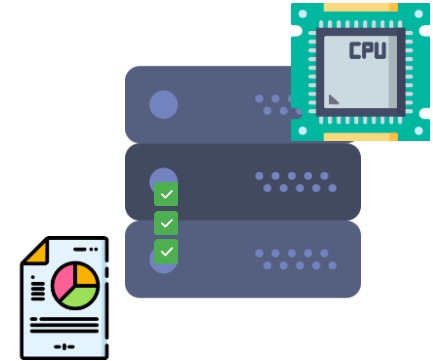
# Measuring total download speed from EOS by grid jobs

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# Preamble



root protocol



# Great question

How much data may I  
simultaneously download?

The answer determines amount of jobs I should send to the computing elements.

# Total Download Speed Test

## **TDST Job**

**start\_time:** 15:45

**file\_name:**

EOS\_3GB\_test.rand

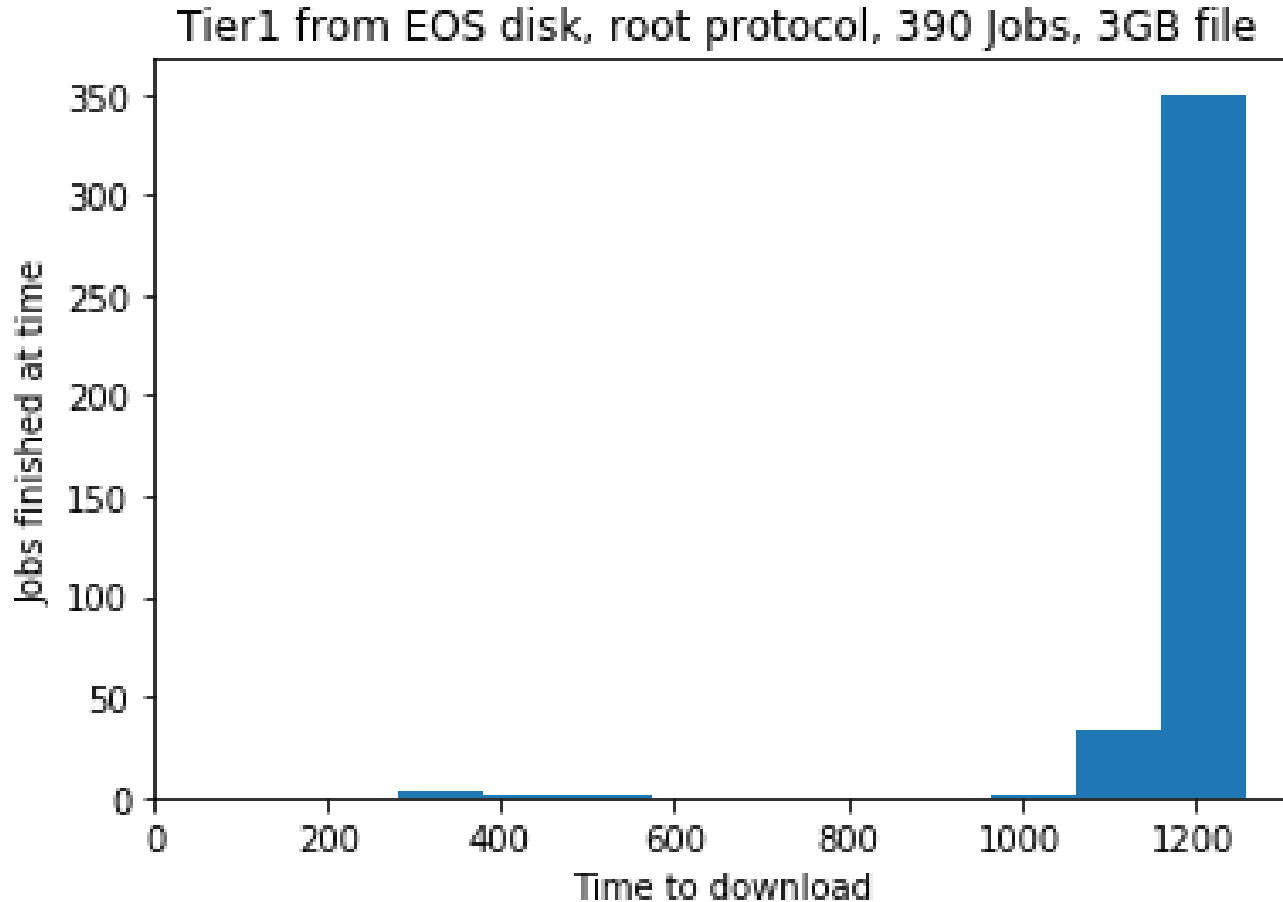
1. Wait until start time
2. Download file
3. Send report(duration)
4. Clear directory

- The unique **file\_name** test file should be placed on the SE in advance.
- Total download speed test jobs submitted in bulk to a particular computing resource.
- They suppose to start and be ready before **start\_time**.
- Precisely at the **start\_time** the download of **file\_name** begins.
- When **file\_name** is downloaded the report is sent to SE(small JSON file).
- JSONs are analyzed separately.

# Transfer speed formula

$$\textit{Transfer speed} = \frac{\textit{Jobs amount} * \textit{File size}}{\textit{Slows download time}}$$

# Tier1 – EOS – root



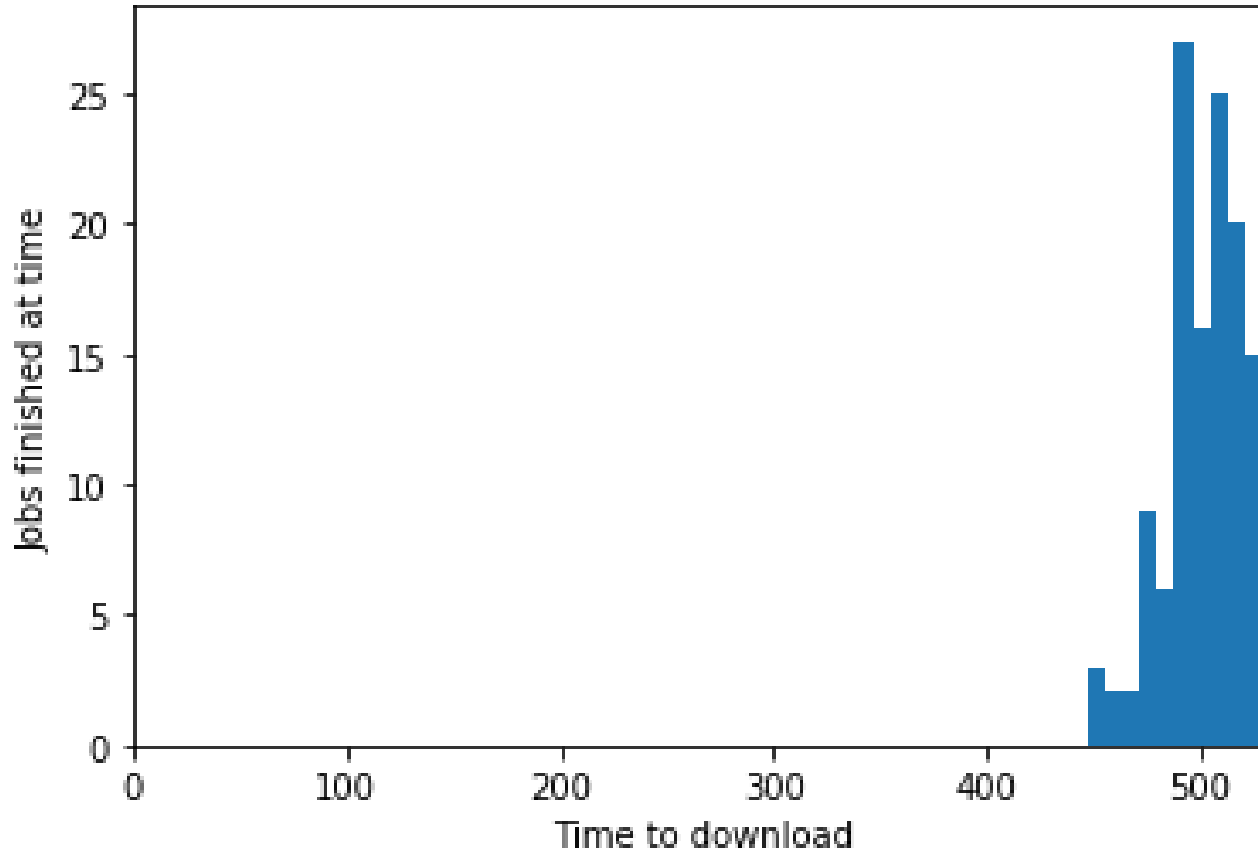
Jobs: 390

Transferred: 1170.0GB

Transfer speed: 927.1MB/s

# Cloud – EOS – root

JINR-EOS-MPD, root protocol, 125 Jobs, 3GB file



Jobs: 125

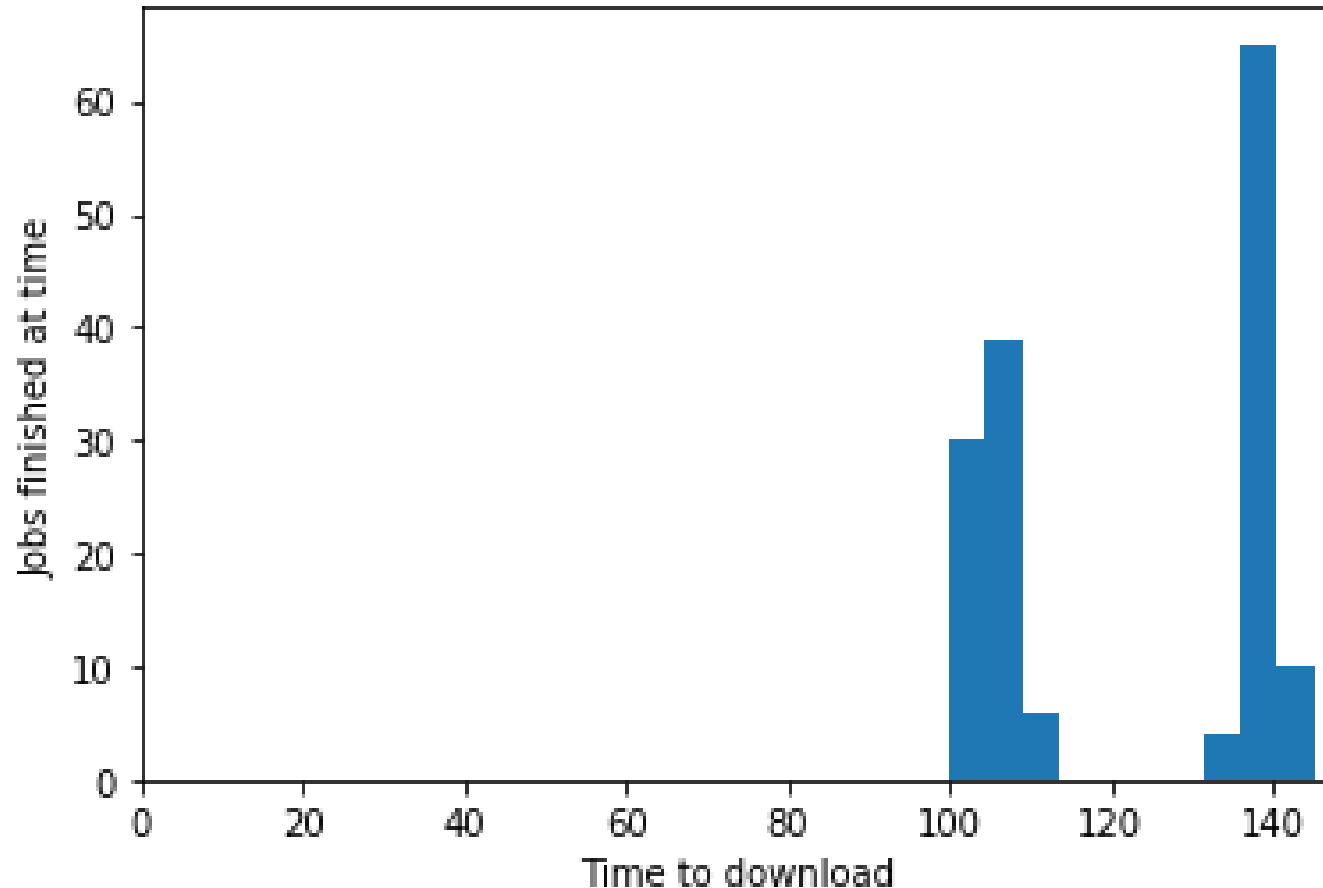
Transferred: 375.0GB

Transfer speed: 708.9MB/s



# Tier2 – EOS – local access

EOS, direct access, 154 Jobs, 3GB file



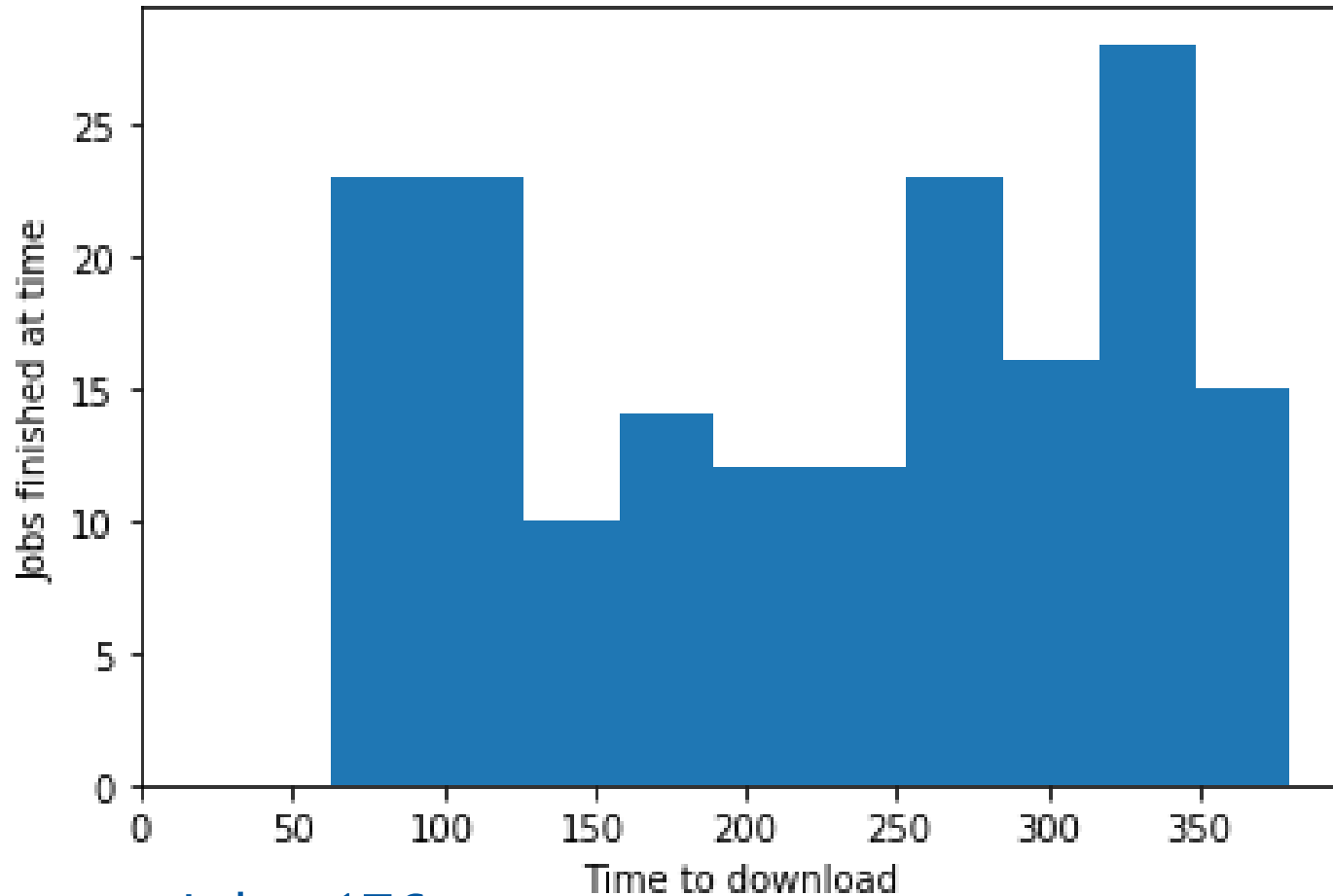
Jobs: 154

Transferred: 462.0GB

Transfer speed: 3186.2MB/s

# Tier2 – dCache – GridFTP

dCache disk, GridFTP protocol, 176 Jobs, 3GB file



Jobs: 176

Transferred: 528.0GB

Transfer speed: 1389.5MB/s

# Results of Download Data Test

- All tests were performed on the working infrastructure, which could cause interference.
- Total transfer speed from JINR storage elements (EOS, dCache disk, dCache tape) was approximately 1 GB/s.
- Local access to EOS on Tier2 showed remarkable 3 GB/s but probably it is a caching's achievement.
- JINR Cloud showed slightly smaller transfer speed, which may be related to external factors.

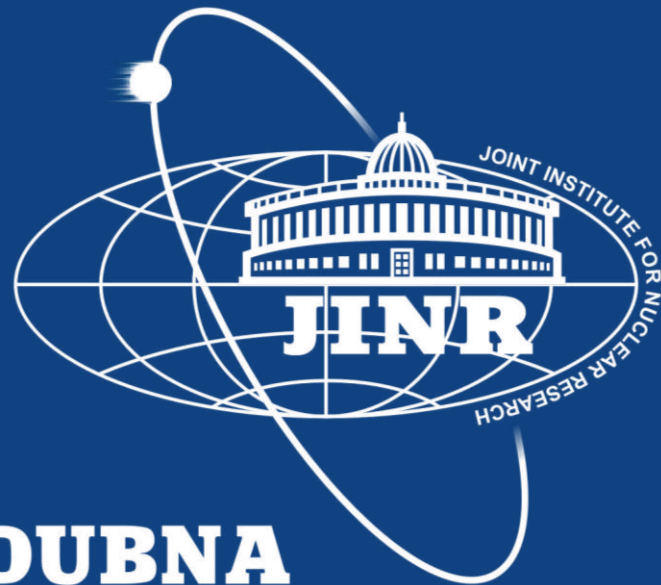
# Our questions

1. Can these tests show *smaller* of **higher** speed that it is actually available?
  2. Can we break the EOS installation with this kind of load?
  3. How about upload speed test? Why should not we do that?
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Thanks for attention!

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Your questions,  
comments, answers?



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