

RUNNING TESTS OF PULSE SHAPE ANALYSIS AND γ -RAY TRACKING ON THE GRID

M. KACI, IFIC – VALENCIA – SPAIN

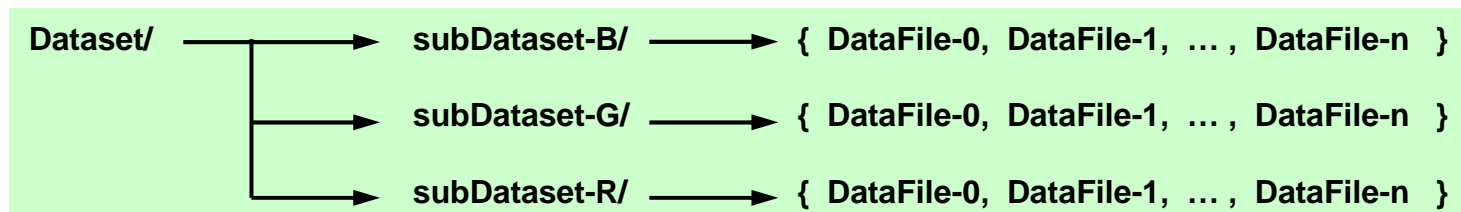


DATA FROM COMMISSIONING EXPERIMENT

Week-12 Experiment :

- Reaction $^{30}\text{Si} (70\text{MeV}) + ^{12}\text{C}$
- 1 triple cluster (ATC1) used with complete electronic chain
- Original traces written on disk for off-line preprocessing, Pulse Shape Analysis and γ -ray Tracking
- Data transferred to Bologna CNAF-INFN-TIER1 Tape

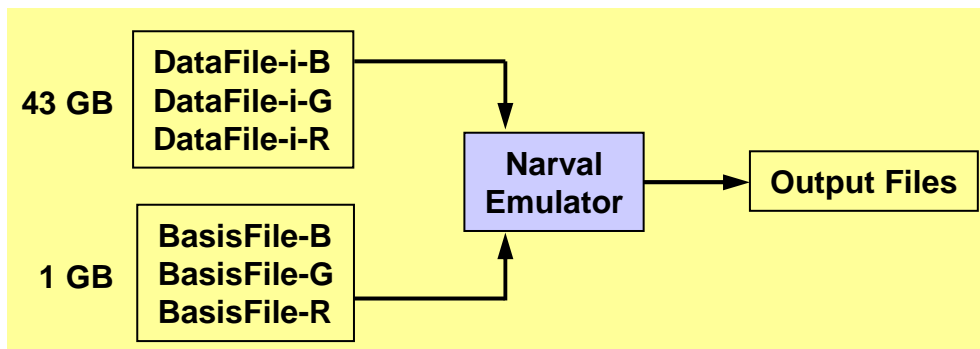
Organization of the Data :



36 Datasets, 302 DataFiles of 14.336 GB each, per Crystal
 30 DataFiles of 1.4336 BG each, per Crystal

Total amount of Data : 13 TB

PSA processing for One set of DataFiles with Narval emulator:



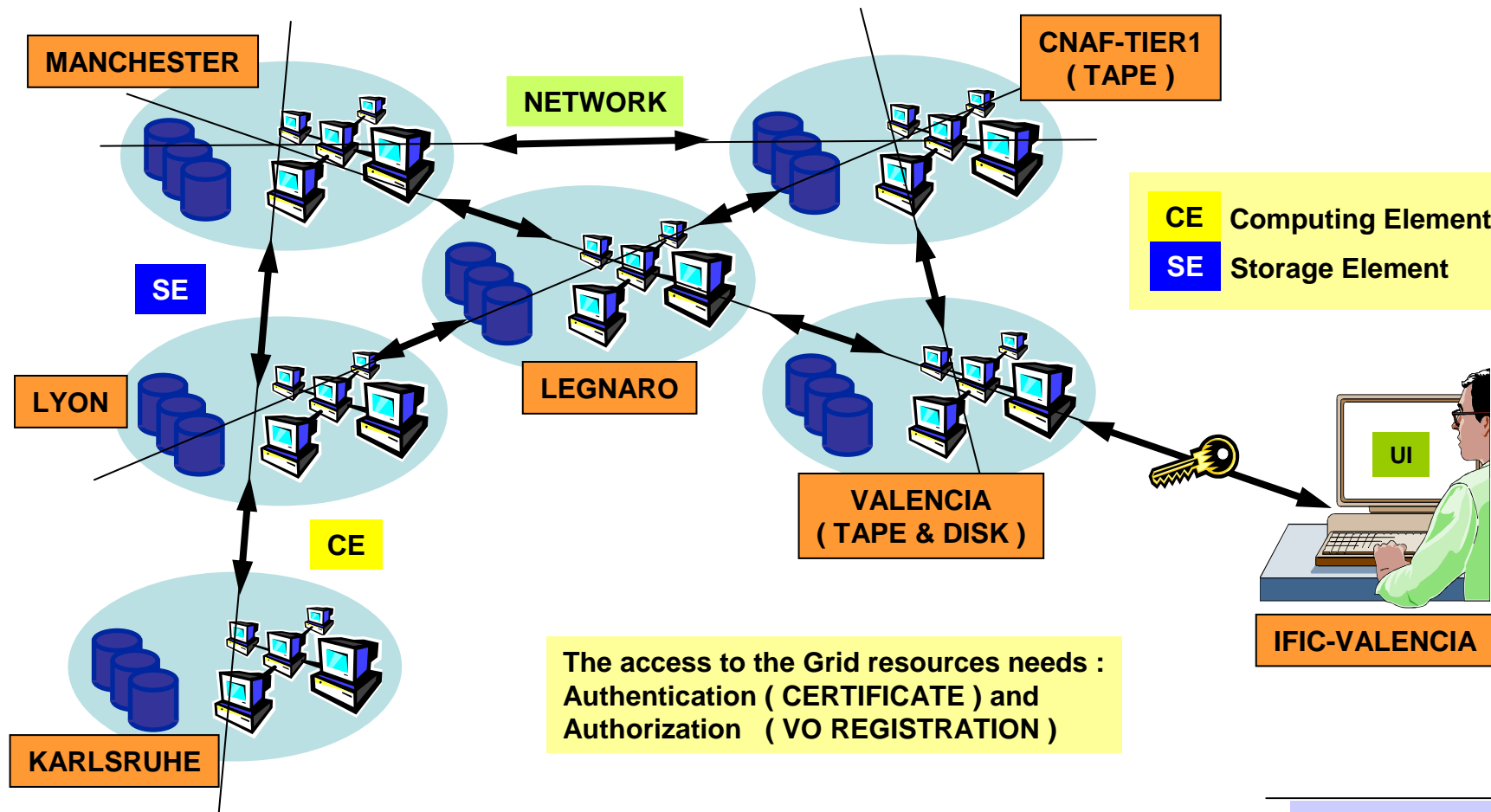
It takes **68.5** minutes to run Narval Emulator (Pulse Shape Analysis and γ -ray Tracking) with this Data on a 2.8 GHz processor, 16 GB

It is expect about 2 weeks running 24 / 7 in order to process the 13 TB Data.

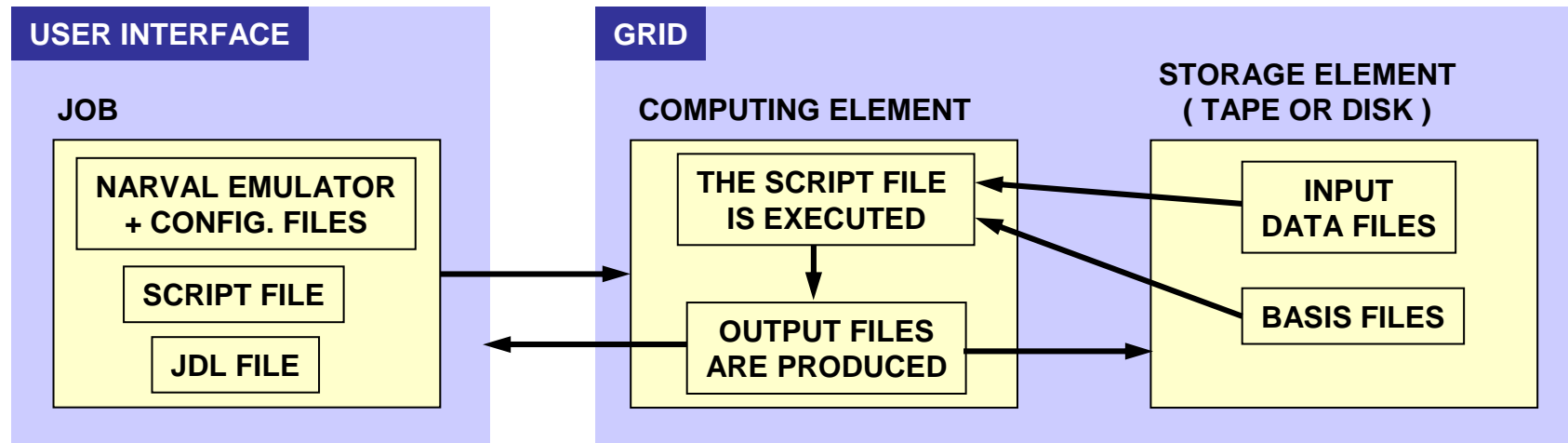
Tests using Grid...

GRID RESOURCES USED FOR AGATA PSA TESTS

Grid allow that computers share trough Internet computing power and storage capacity
GRID : DISTANT RESOURCES BUILD ON FAST AND RELIABLE CONNECTION



RUNNING NARVAL EMULATOR ON GRID



THIS IS DONE FOR EACH SET OF 3 DATA-FILES (B, G, R)

RESOURCES USED FOR THESE TESTS :

STORAGE SITES :

- CNAF-INFN TAPE : DATA
- IFIC TAPE : DATA, Basis-Files and Ouput-Files
- IFIC DISK : DATA, Basis-Files and Output-Files

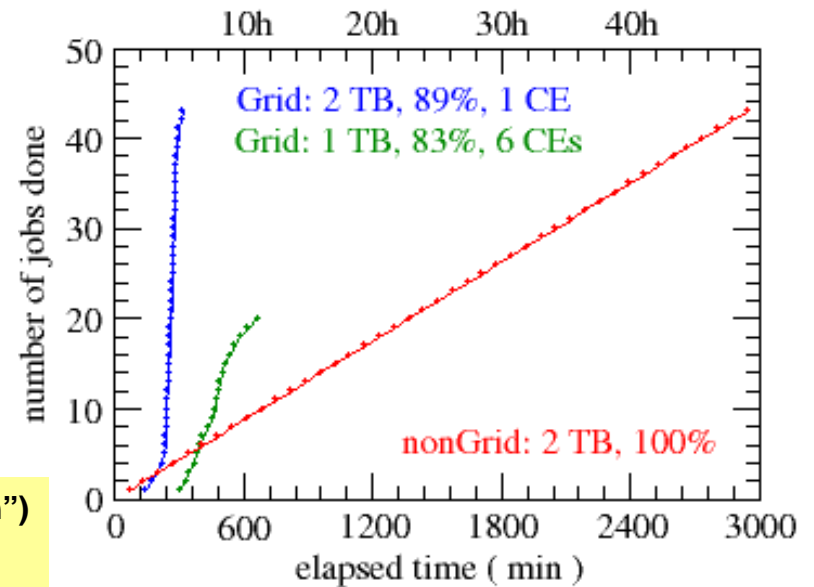
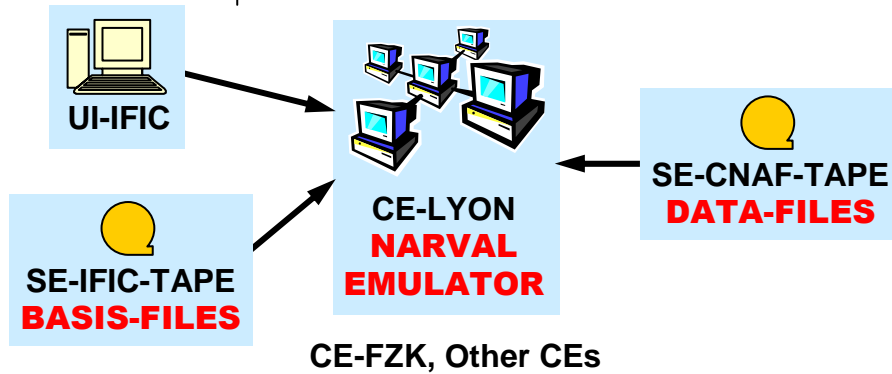
COMPUTING SITES :

CNAF, LNL, IFIC, FZK, LYON, LIP, MANCHESTER

FEW DATA TRANSFER RATES FROM STORAGE TO NODES : →

| SE | CE | MB/s |
|------|--------|------|
| CNAF | IFIC | 12 |
| CNAF | CNAF | 33 |
| CNAF | LNL | 39 |
| CNAF | FZK | 30 |
| CNAF | LYON | 13 |
| IFIC | IFIC | 44 |
| IFIC | MANCH. | 10 |
| IFIC | LIP | 5 |

FIRST TESTS OF PSA ON THE GRID



Results :

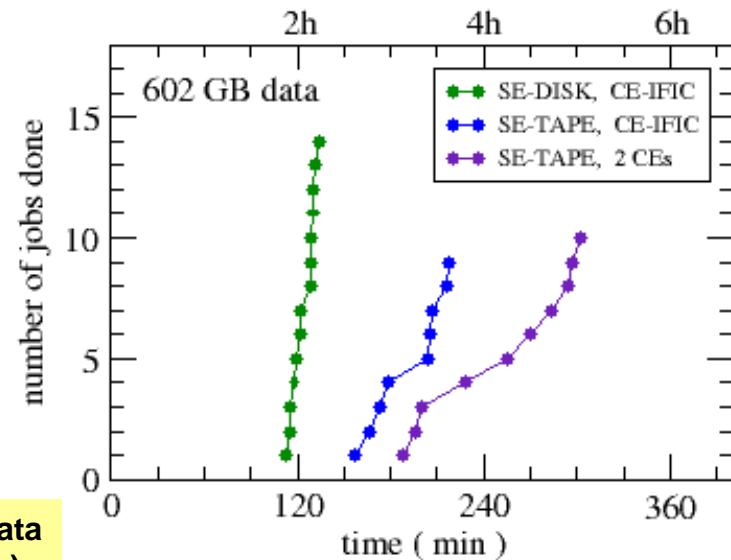
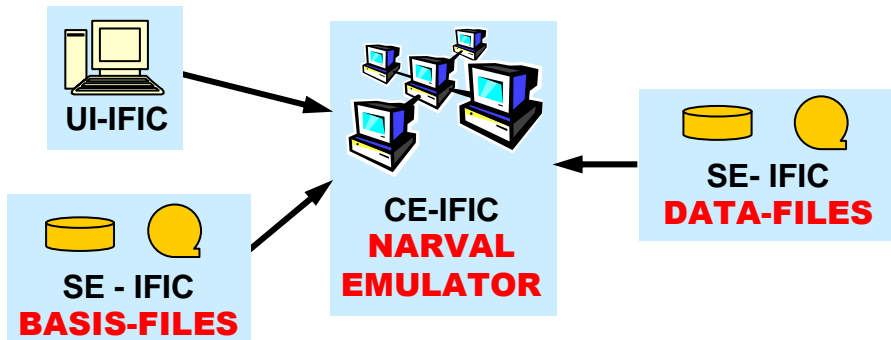
- Jobs fail because of connection error (“timeout connection”)
- Relatively small data transfer rates for some sites
- But, Grid still better than nonGrid processing in this case

| # jobs | Data | CE | Effic. | t_task | t_cp | t_ex | t_jb | t_13TB | tr_rate |
|--------|---------|--------------------------|--------|--------|--------|--------|--------|--------|----------|
| 30* | 129 GB | LYON | 100 % | 55 min | 27 min | 18 min | 45 min | 3.8 d | 2.8 MB/s |
| 46 | 1978 GB | FZK | 89 % | 5.5 h | 2.8 h | 1.5 h | 4.3 h | 40.6 h | 4.3 MB/s |
| 24 | 1032 GB | LIP-UK FZK (3) LNL | 83 % | 11 h | 4.7 h | 1.2 h | 5.9 h | 7 d | ---- |

more tests...

TESTS OF PSA USING THE GRID-IFIC RESOURCES

A sample of 602 GB Data-Files is copied to IFIC, into TAPE and DISK



Results :

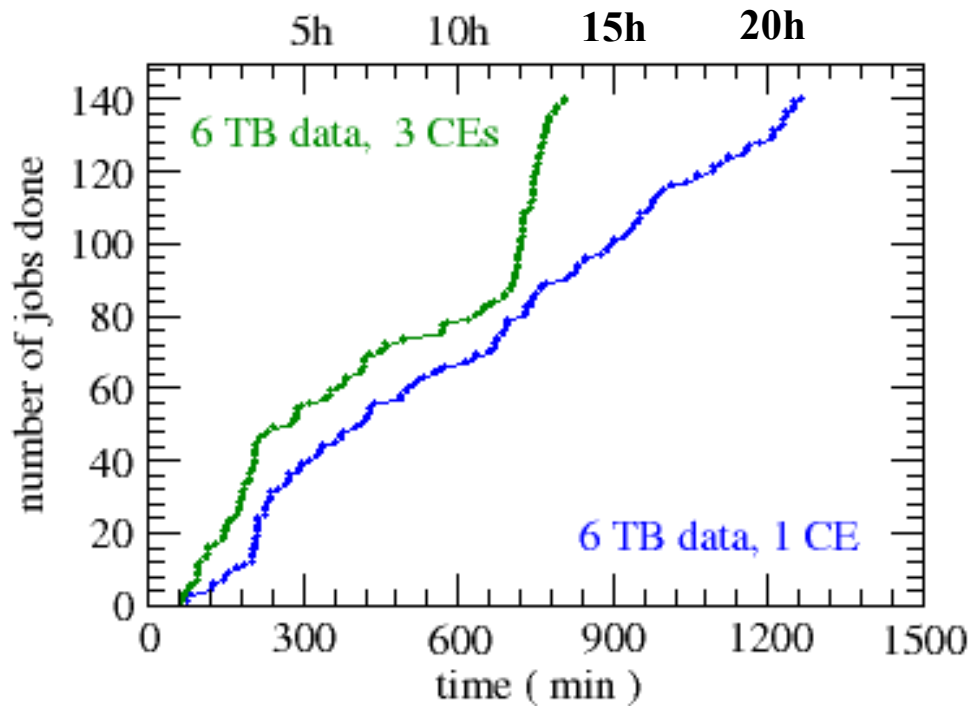
- Performance is clearly improved with the direct access to data (allowed by LUSTRE distributed file system adopted at IFIC)
- 100 % efficiency reached (error connections avoided)

| # jobs | Data | SE | CE | Effic. | t_task | t_cp | t_ex | t_jb | t_13TB | tr_rate |
|--------|--------|------|---------------|--------|--------|----------------|----------------|----------------|--------|----------------------|
| 14 | 602 GB | TAPE | LIP MANCH. | 71 % | 5.0 h | 2.3 h 1.3 h | 2.3 h 2.0 h | 4.6 h 3.3 h | 6.2 d | 5.2 MB/s 9.2 MB/s |
| 14 | 602 GB | TAPE | IFIC | 64 % | 3.6 h | 1.5 h | 1.7 h | 3.2 h | 5.1 d | 8.0 MB/s |
| 14 | 602 GB | DISK | IFIC | 100 % | 2.2 h | 0.0 | 2.0 h | 2.0 h | 48 h | ---- |

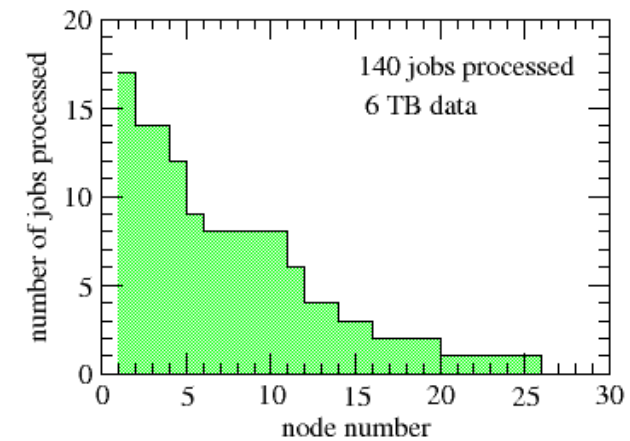
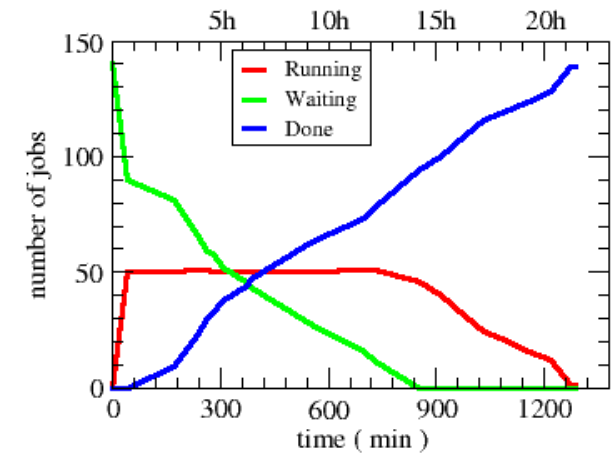
MORE TESTS OF PSA USING THE GRID-IFIC RESOURCES

Processing 6 TB Data in one task :

- Data-Files and Basis-Files stored on DISK.
- Submit to Grid 140 jobs. Each job processes 10 times the 43 GB Data corresponding to the 3 B-G-R Data-Files.
- Mean time execution of Narval Emulator : 6.2 h
- For the “right processing” (no concurrent access to data files) better performance could be expected...



140 jobs, 6 TB Data, 1 CE



GENERAL CONCLUSIONS

THANK YOU !