Technical Evolution.

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A distributed WLCG Tier-2 grouping HEP-labs in the Paris Region

- provide computing resources to HEP and in particular to LHC experiments;
- managed and configured as a single site;
- one site, multiple services (CE’s and SE’s): avoid SPOF, network or scaling issues.
One of the GRIF founding principles is that resources are managed cooperatively

- tech. com. grouping IT eng. from all the labs;
- shared documentation;
- daily “tour de garde”;
- mailing list, weekly visio, monthly meetings.

Sharing know-how and mgmt load leads to a more effective manpower usage. In other words, we get to do much more than we would if we were alone.
GRIF has built its resources on top of a fundamental element: its fast network backbone...

- 10Gb/s network between sites;
- fast connection to CCLyon, GEANT, LHCOpn and LHCOOne;
- such infrastructure made GRIF sites closer to themselves and to the rest of WLCG.
... which took a long work by a lot of people to be realized

- 2006: original proposal by Renater;
- q2/2007: 10Gb/s (shared) LLR-LAL-CC;
- 2007: APC connected at 1Gb/s;
- 2008: 5Gb/s VLAN CC-GRIF;
- 2008: LPNHE and IPNO conn. LHCOpn;
- q1/2010: LLR 10Gb/s via Saphir;
- q2/2010: LPNHE 10Gb/s;
- 2011: 10Gb/s FN NRD-Orsay - CEA;
- 2011-2012: LHCOne.
From SW point of view, GRIF built its unity as a site on the adoption of a common conf. manager

- main actor in the Quattor project;
- configs are homogeneous and centrally manageable. Ease of management.

today less critical: since 2013 exploring different solutions. IRFU now managed by puppet.
Along the years GRIF was kept up-to-date with OS and grid MW versions

- often pioneering the changes with a pilot-site role and providing experience/know-how to the community
  - profiting of close relations with MW developers, WLCG, etc.;
  - supporting all LHC VO’s;

- often implies coordinating requirements of experiments, sw components, other sites....
DPM was chosen as the GRIF storage technology since the very beginning:

- an happy marriage all in all;
- one of the most active sites in the DPM community;
- evolving to a new way of managing and exploiting grid storage (last ~2 years):
  - xrootd federation;
  - http(s) access (and federations);
  - gridftp redirections;
  - …
Farming Evolution.

Torque/Maui was initially chosen as GRIF batch system technology

- despite initial doubts on scaling, it served well for ~10y and up to ~5k slots;
- common choice in EU grid, good support and easy integration with MW products.

Need for multi-core support + Maui no longer maintained + scaling limits: now migrating to HTCondor;
Since 2008 GRIF is running a common Nagios monitoring.

- standard probes + custom plugins + mails for critical alarms;
- important tool for our daily cooperative management of the site;
- exploring new and more complete frameworks (OMD): still with the idea of having a common monitoring aggregator.
Summing Up.

**GRIF has built its success as a Grid site on**

- **a solid infrastructure**
  - performing network backbone;
- **the choice of collaborative admin.**
  - effective way to share manpower and know-how;
- **solid software tools**
  - actively participating to communities/devel.;
- **an active role in the grid community**
  - often pioneering changes and new technologies.