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Workshop RENAFAE 2018 RENAFAE 10 ANOS

<https://indico.cern.ch/event/719214/>

HPCs at LHCb



Workshop RENAFAE 2018

HPCs at LHCb

Federico Stagni – 10th LHCb Comp Workshop
(<https://indico.cern.ch/event/561982/> nov/17)



~easy integration when

- WNs have inbound/outbound connectivity
- LHCb CVMFS mounted on the WNs
- SLC6 “compatible”
- At least 2GB/core
- x86

This is the case for OSC and CSCS

When some of the requirements above are not met, we can try to go around them, but this requires dedicated work (and anyway it may not be possible, case by case)

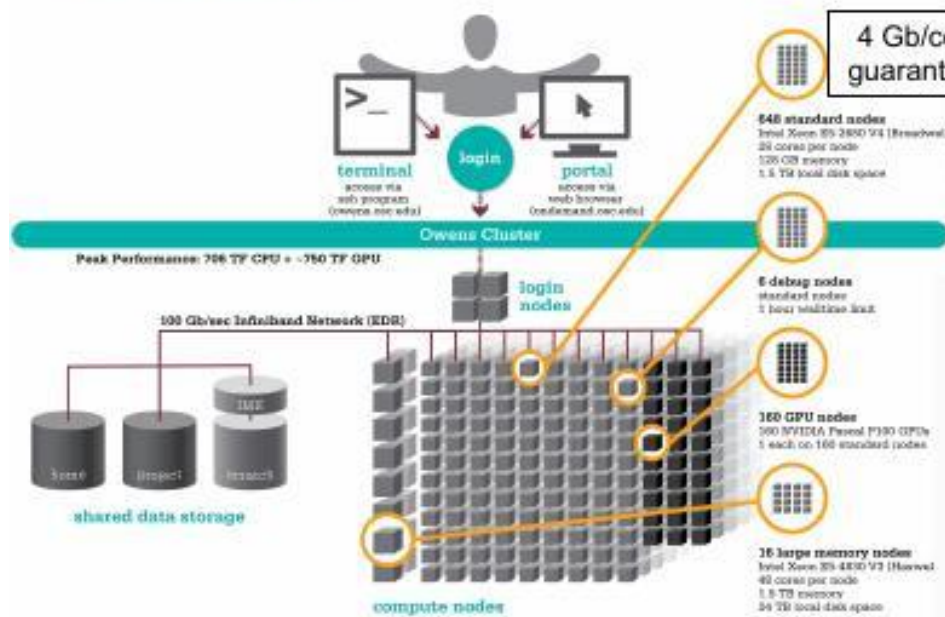


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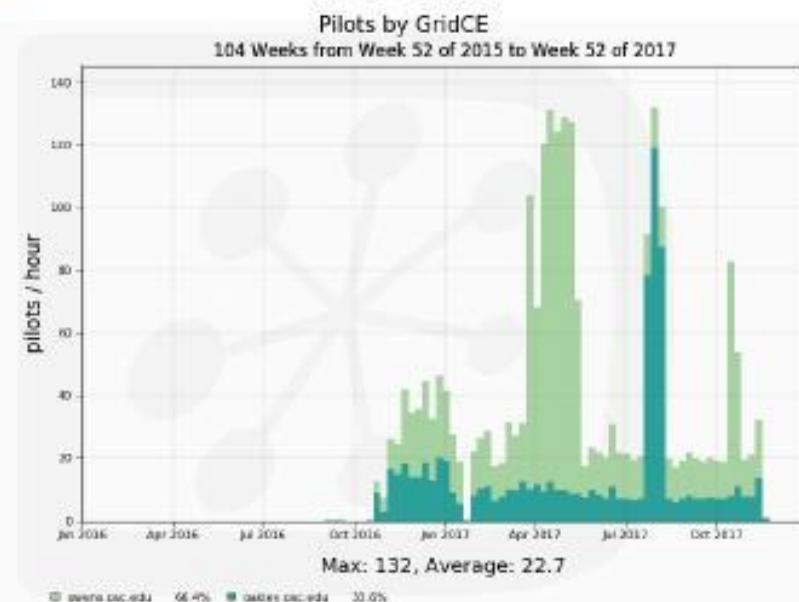
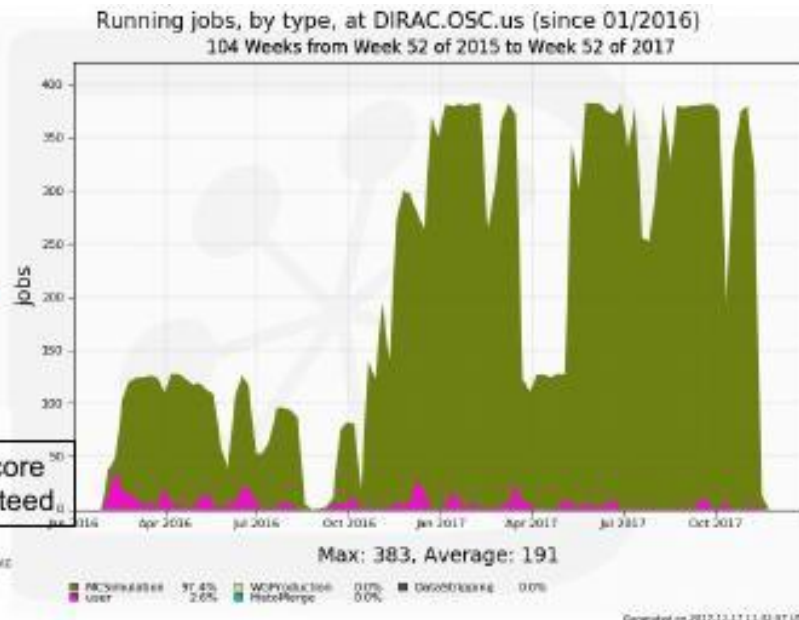
Federico Stagni – 10th LHCb Comp Workshop
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DIRAC.OSC.us

osc.edu



~easy setup!





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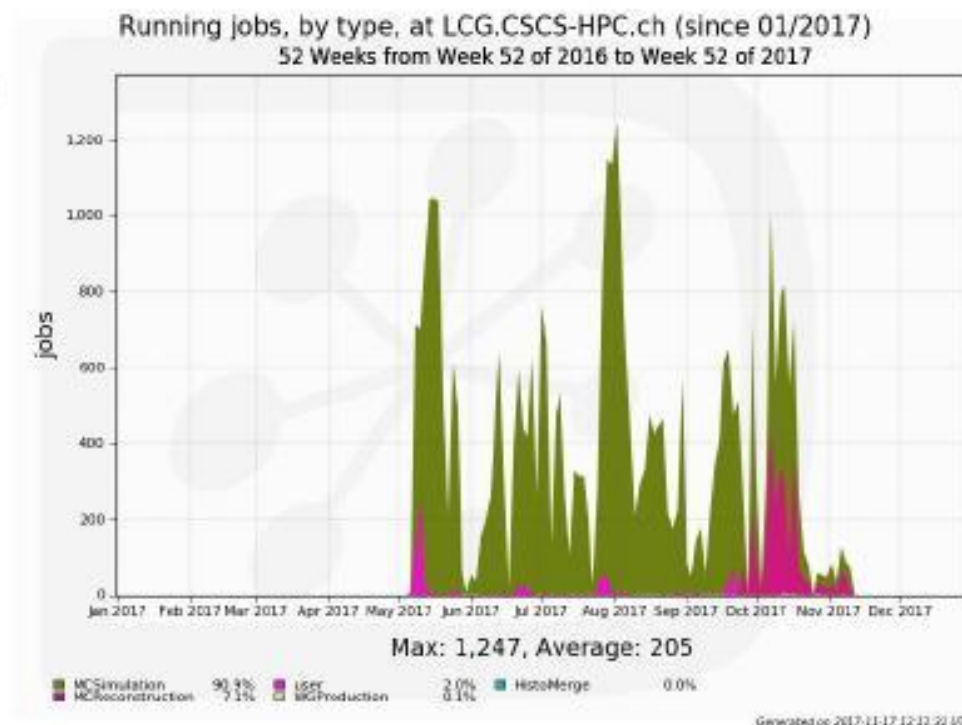


LCG.CSCS-HPC.ch

cscs.ch

swiss national supercomputing centre
(3rd in top500 list)

a LCG site, for us (ARC CE + slurm)
... so this was “transparent” for us





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- Santos Dumont (SDumont)
- Origin: French ATOS/BULL
- Located in Petrópolis/Rio de Janeiro – Brazil
- LHCb project for LHCb use, accepted: 2017





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The machine:

It has 1.1 Petaflops/s installed capacity. The architecture is hybrid.

Today SDumont has 18.144 CPUs on 756 nodes (24 core/node):

- . 504 nodes (thin node) each node with:
- .. 2 X CPU **Intel Xeon** E5-2695v2 Ivy Bridge, 2,4GHZ
- .. 24 core each. Total of 12.096 core.
- .. 64GB DDR3 RAM



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The machine (cont.):

- . 198 nodes (thin nodes) with **GPUs** K40, each one has:
 - .. 2 x CPU Intel Xeon E5-2695v2 Ivy Bridge, 2,4GHZ
 - .. 24 core (12 per CPU), in total 4.752 core
 - .. 64GB DDR3 RAM
 - .. 2 x Nvidia K40 (GPU)

- . 54 nodes (thin node) with **Xeon Phi**, each one has:
 - .. 2 x CPU Intel Xeon E5-2695v2 Ivy Bridge, 2,4GHZ
 - .. 24 core (12 per CPU), total of 1.296 core
 - .. 64GB DDR3 RAM
 - .. 2 x Xeon PHI 7120 (dispositivo MIC)



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The machine (cont):

- . 1 MESCA2 node with shared memory (fat node) with:
 - .. 16 x CPU **Intel Ivy**, 2,4GHZ
 - .. 240 core (15/CPU)
 - .. 6TB RAM
- . All 756 nodes are linked through Infiniband FDR
- . File system LUSTRE with 1.7PB total and a secondary system with 640TB
- . Scheduling System:SLURM



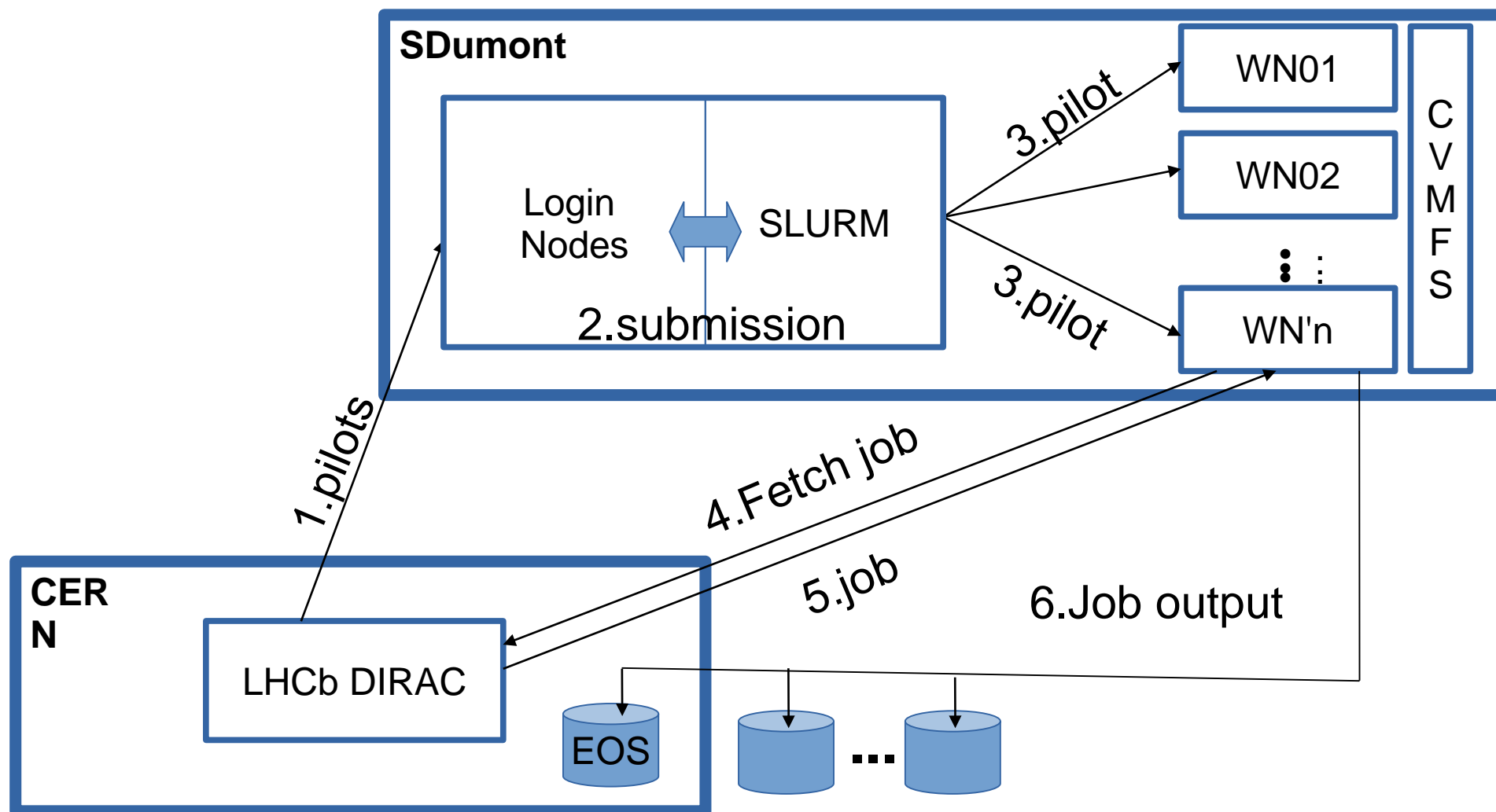
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The LHCb – DIRAC model: Ideal





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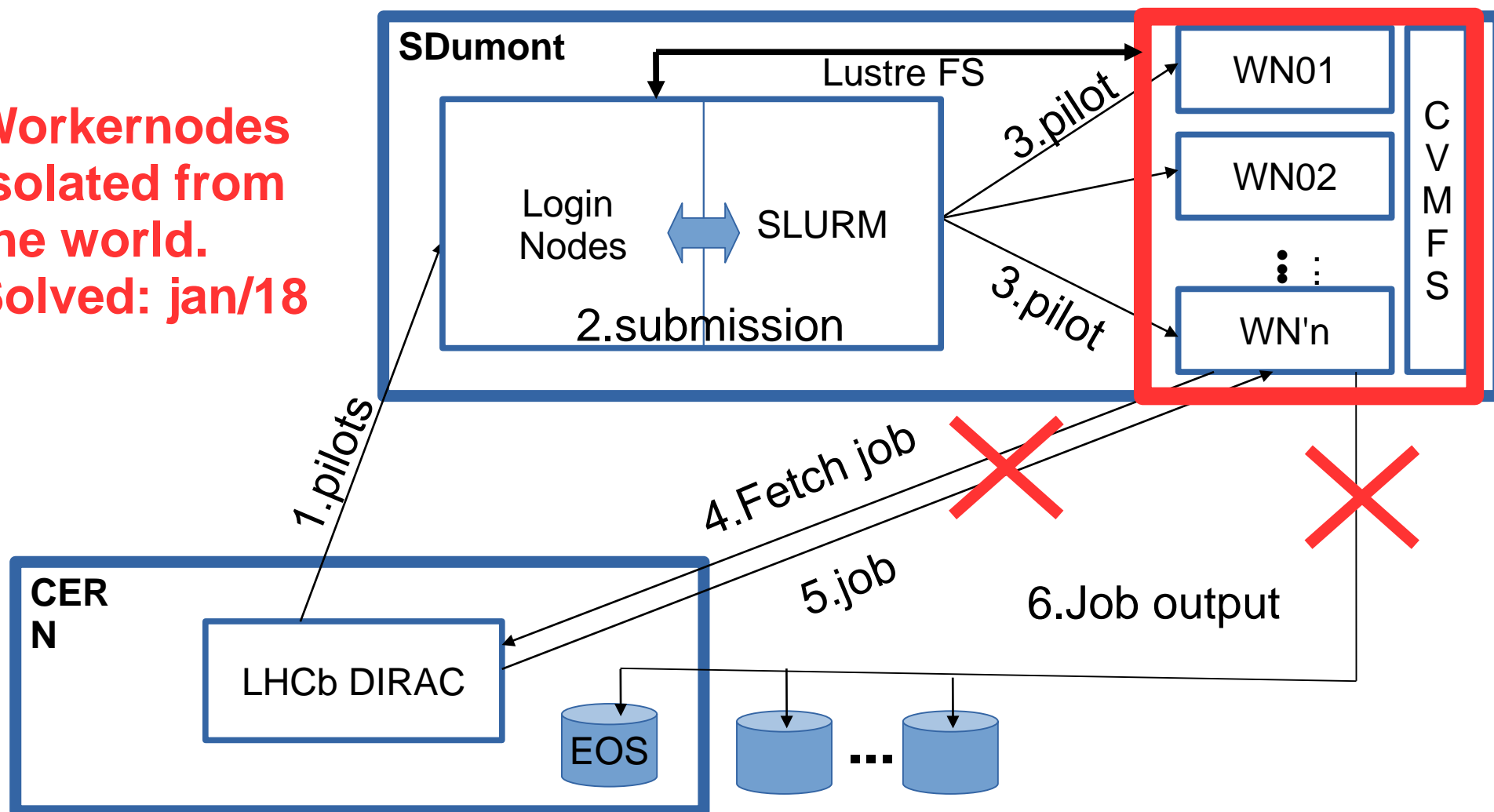


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The LHCb – DIRAC model: 1st issue

**Workernodes
isolated from
the world.
Solved: jan/18**





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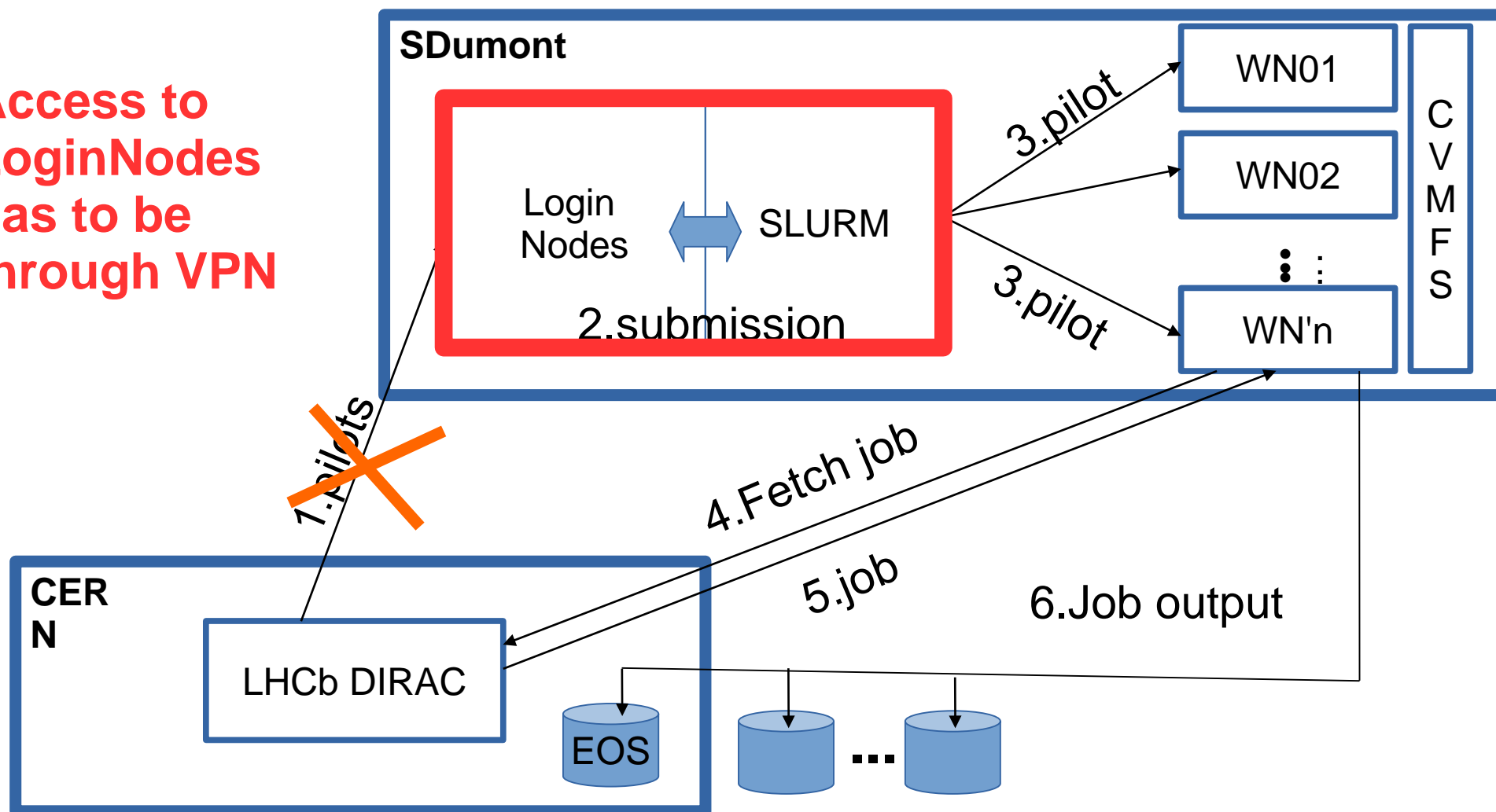


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The LHCb – DIRAC model: 2nd issue

**Access to
LoginNodes
has to be
through VPN**





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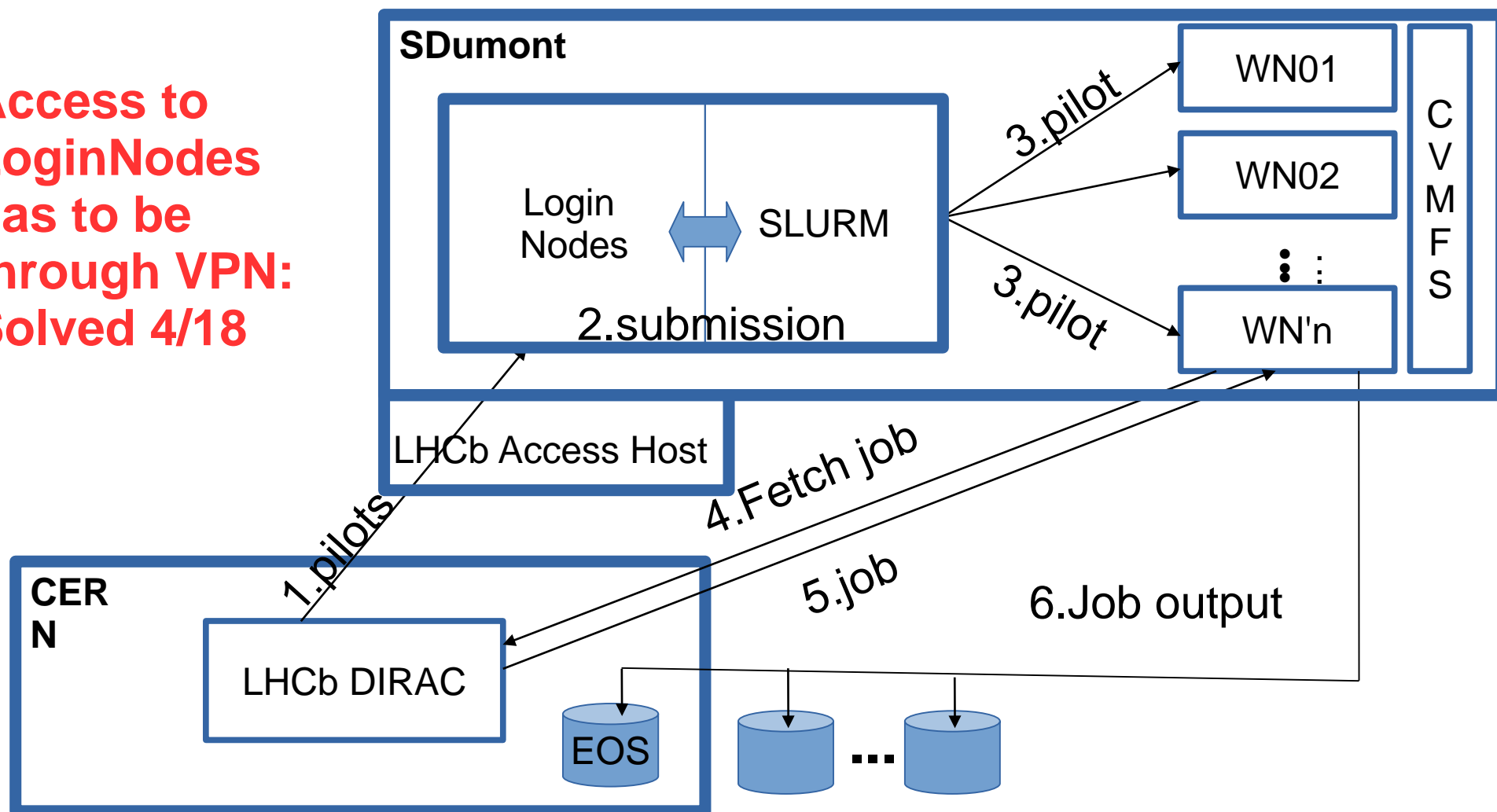


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The LHCb – DIRAC model

**Access to
LoginNodes
has to be
through VPN:
Solved 4/18**





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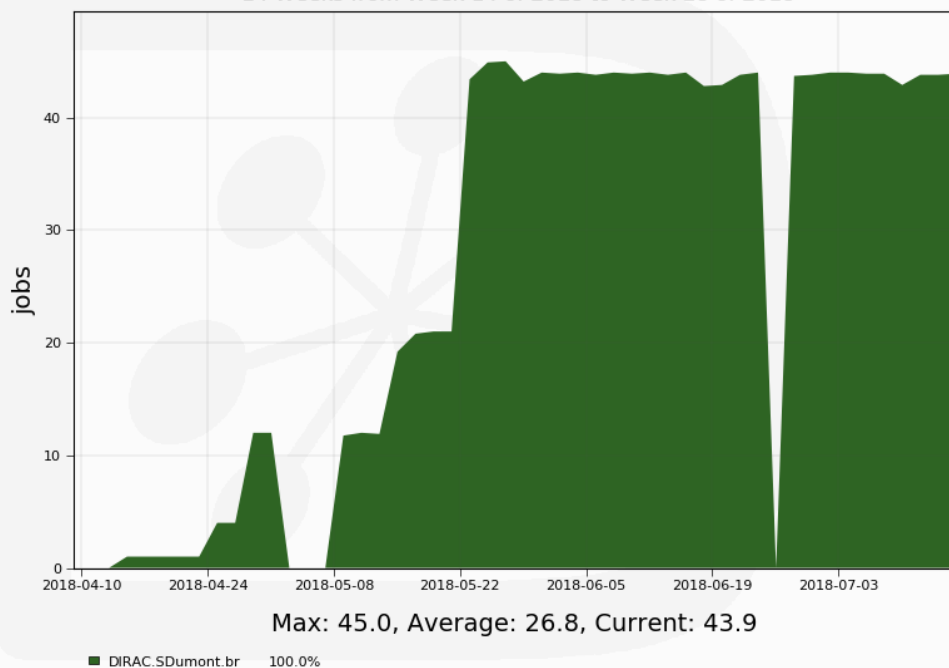


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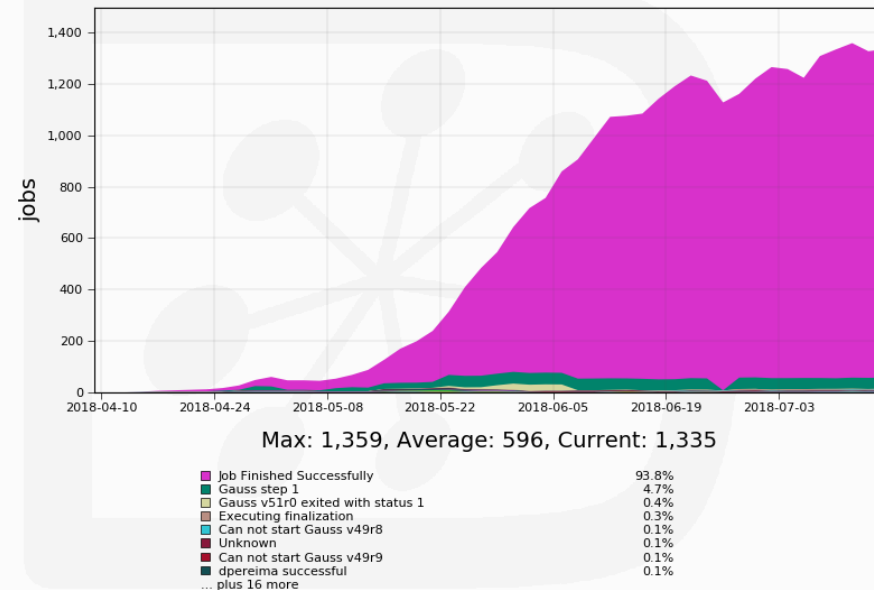
SDumont Production

Running Jobs by Site - SDumont
14 Weeks from Week 14 of 2018 to Week 28 of 2018



Generated on 2018-07-17 10:35:13 UTC

Jobs by Site - SDumont - ApplicationStatus
14 Weeks from Week 14 of 2018 to Week 28 of 2018



Generated on 2018-07-17 10:40:19 UTC



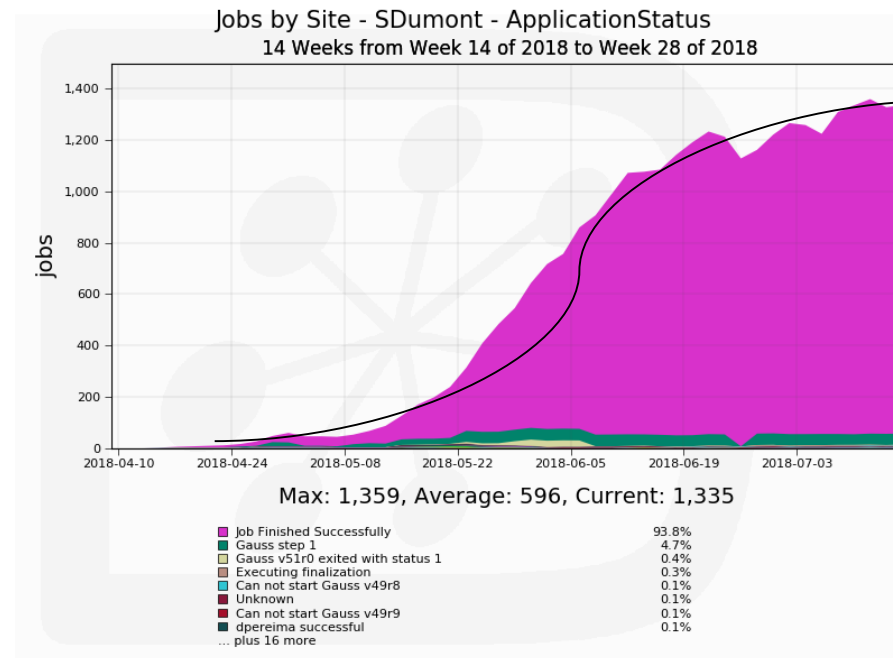
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What's next?





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THANK YOU!



Questions?
Suggestions?
Experiences?

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