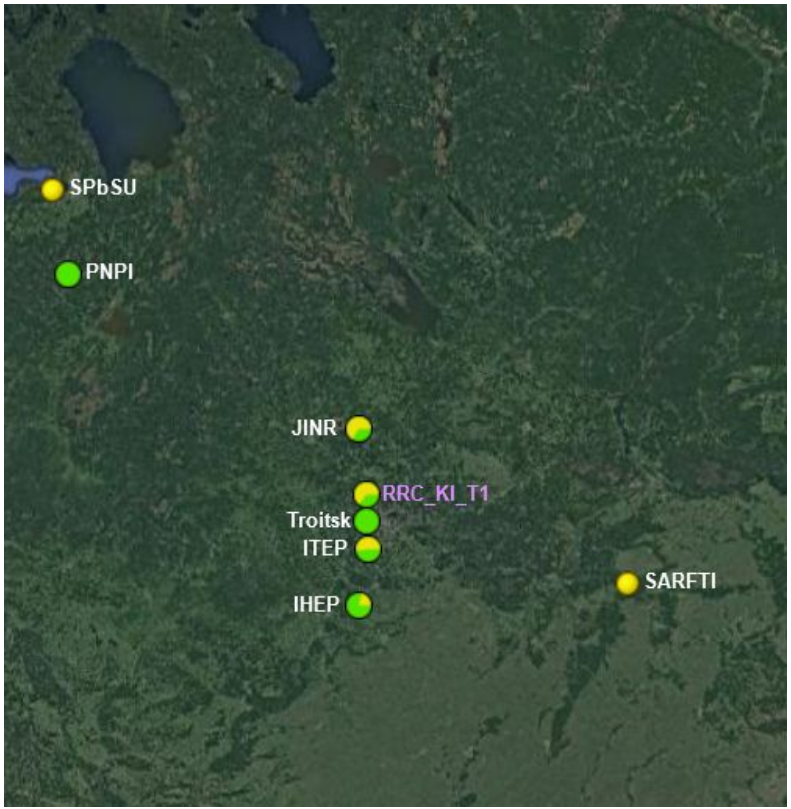
Update of ALICE Russian GRID sites in 2022-2023 for future High Luminosity (HL) LHC mode

Andrey Zarochentsev, SPbSU

Russian sites for Alice data processing



T1:

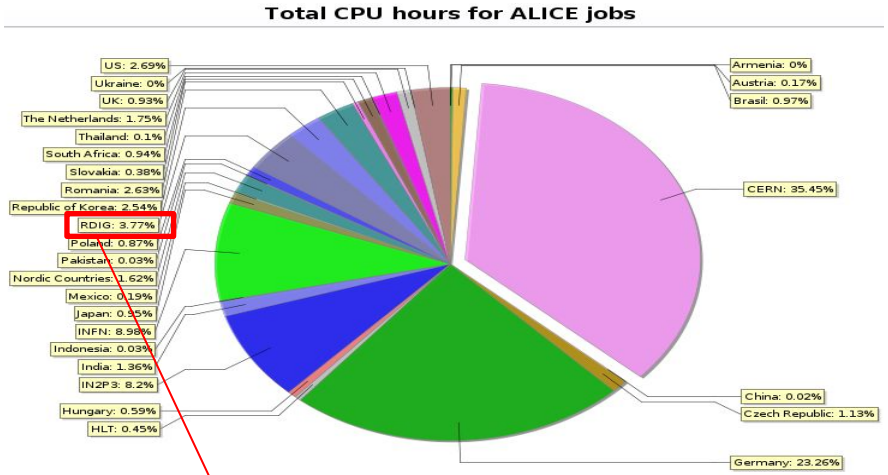
- RRC-KI-T1

T2

- JINR
- IHEP
- ITEP
- PNPI
- SPbSU
- Troitsk
- Sarov

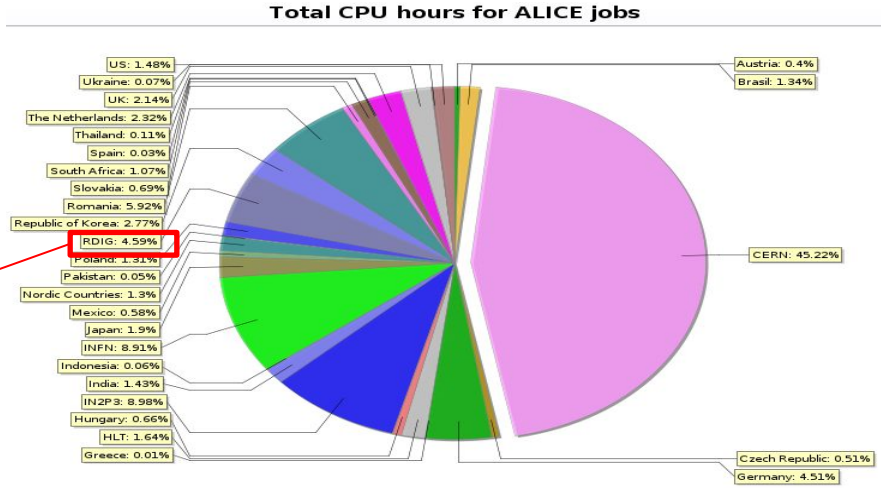
RDIG production in the last 3 years vs 2018

GRID 2021



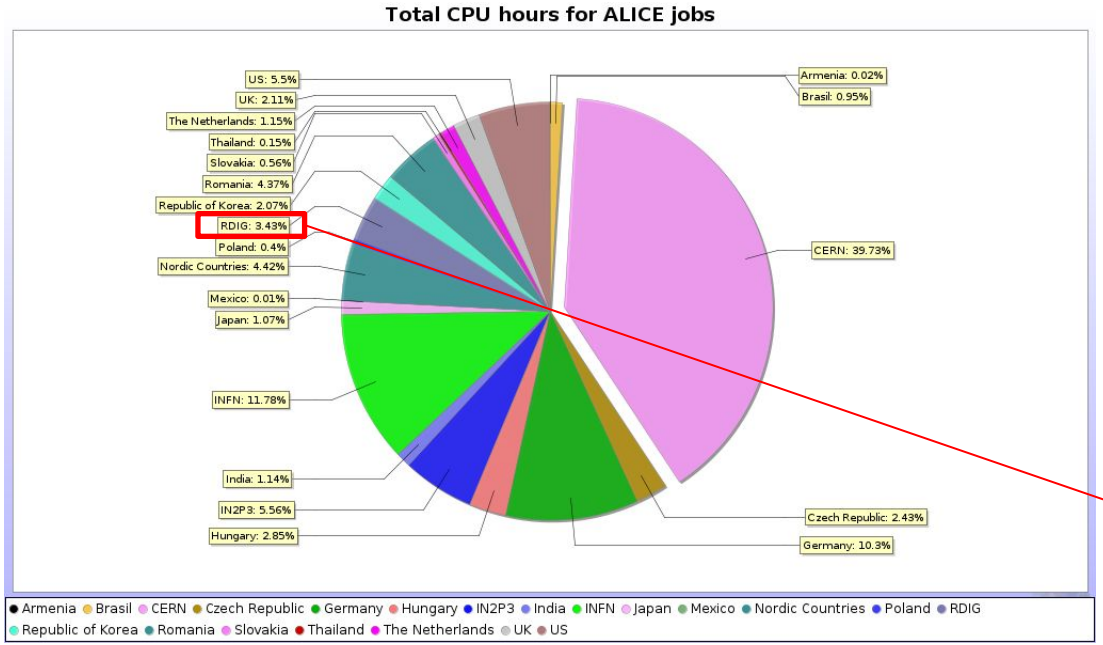
2018-2021

RDIG 3,77 vs 4,59% in 2018



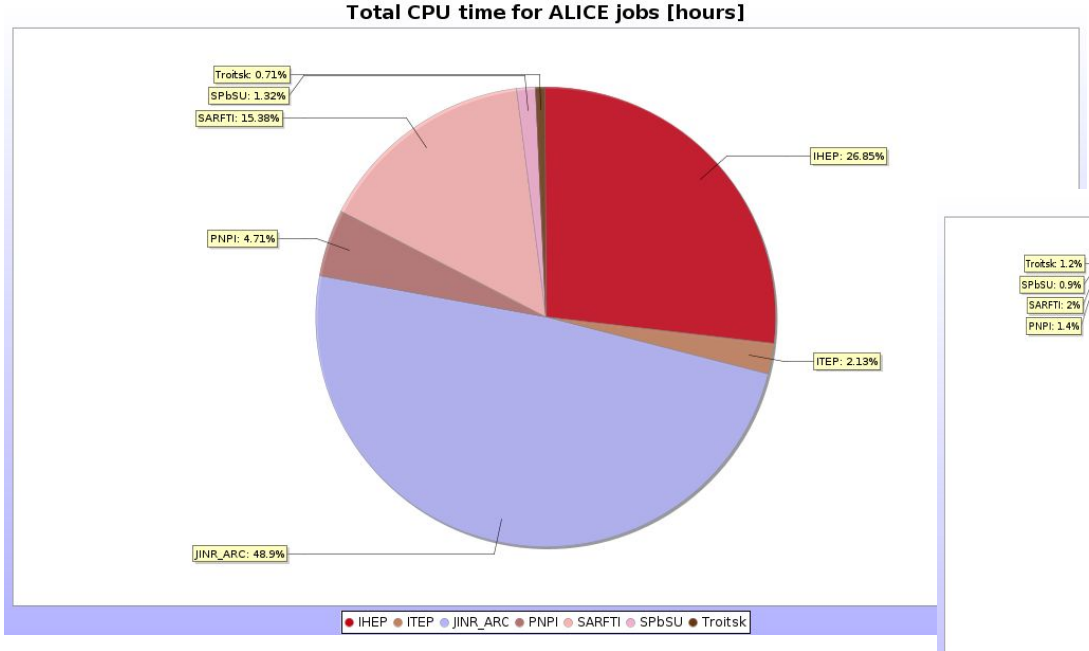
2017-2018

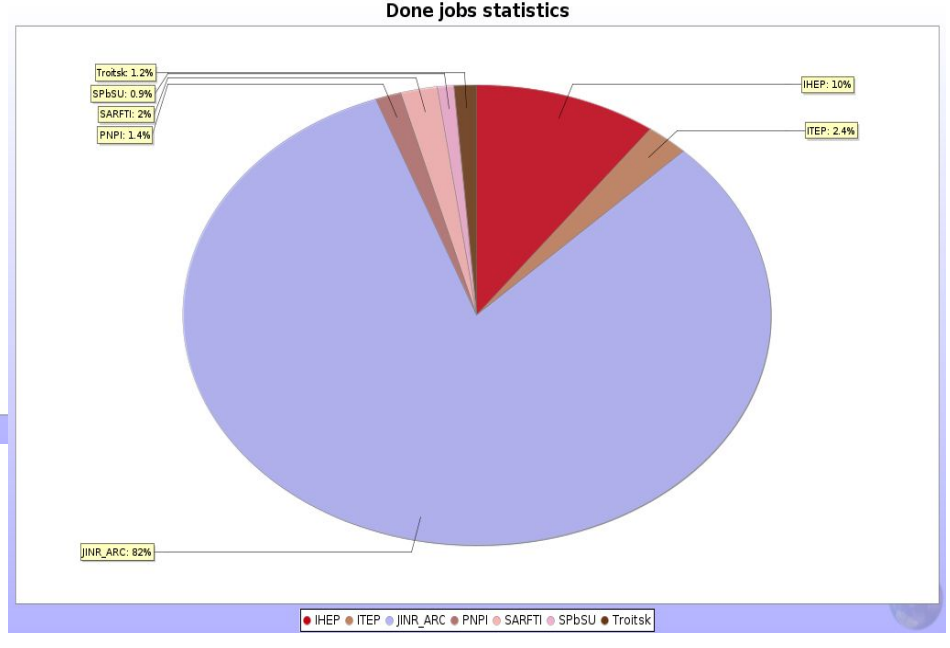
RDIG production in the last 1 year



RDIG 3,43% vs 3,77% in 2021

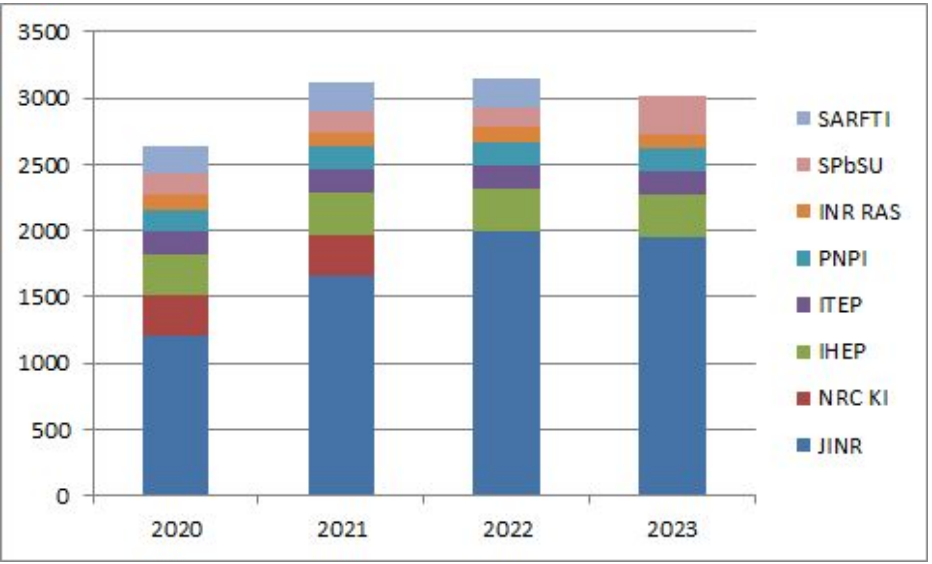
Resource usage by site for the last year



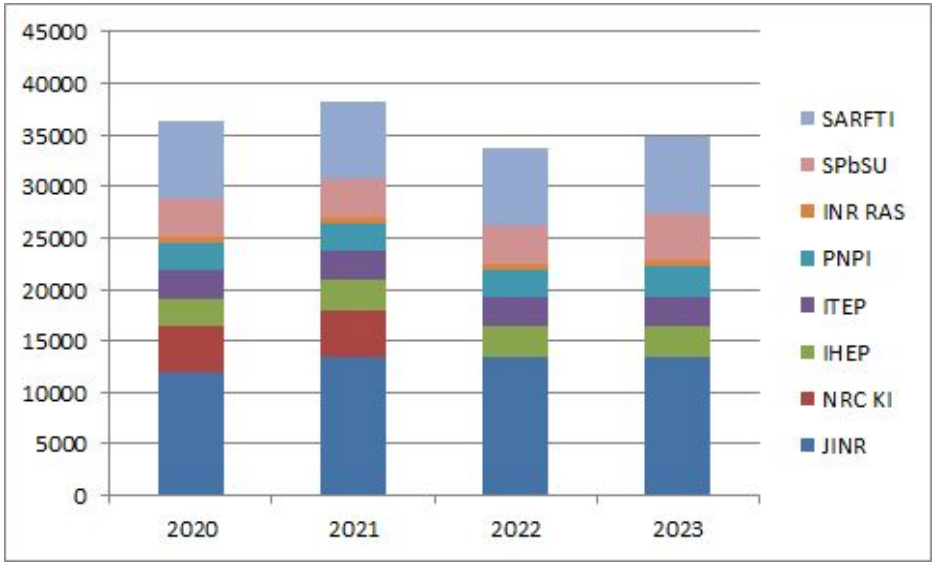


RDIG T2 resources

Disk Russian T2 (TB)



CPU Russian T2 (HEPSPEC06)

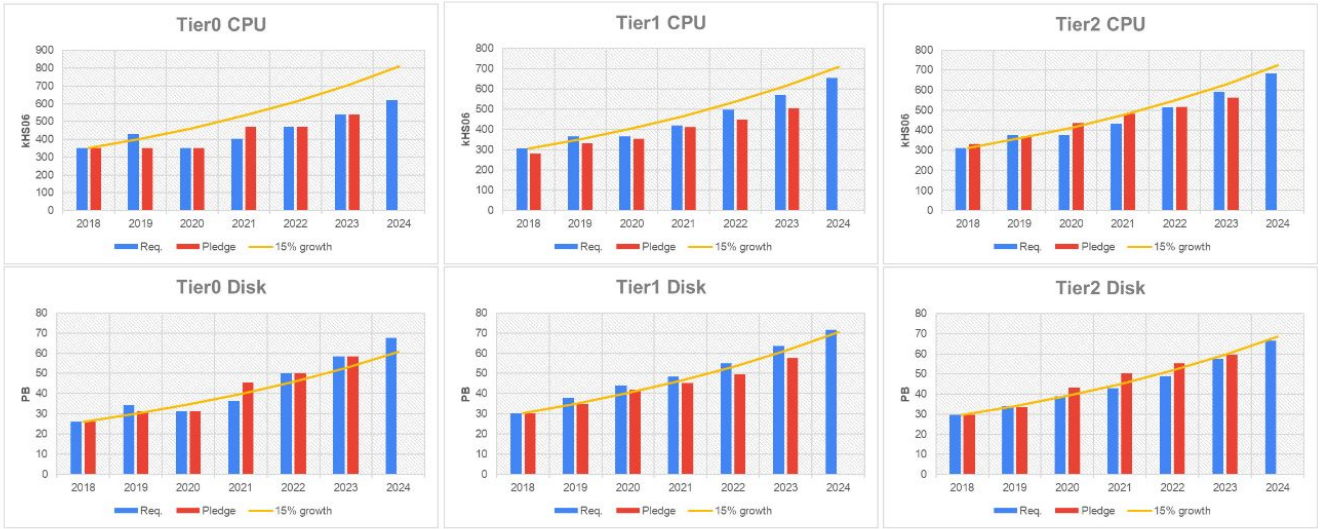


ALICE T1/T2 Workshop - Stefano Piano - ALICE computing resources

A Large Ion Collider Experiment

ALICE

Expected growth of CPU and disk space in 2022-2024

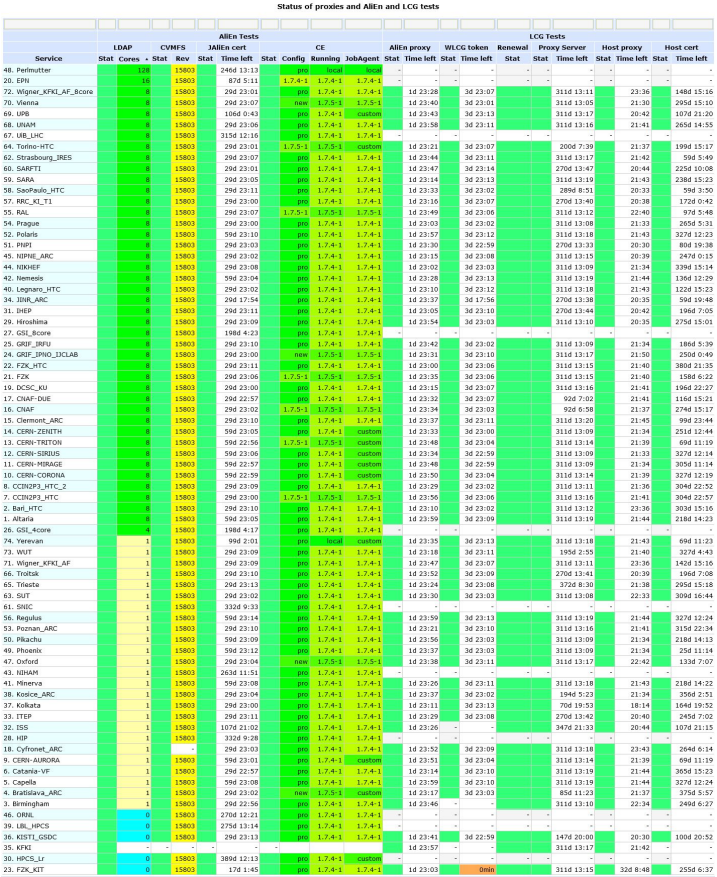


------- 15% growth: annually compounded rate from 2018 along LS2

Technical upgrade goals for ALICE sites:

- Sites need to support 8-core job slots
  - Configuration depends on the setup of the site
    - ARC CE and HTCondor CE forward requests to their batch system
    - Batch systems may need 8-core queues and/or fragmentation tuning
- Transition from X509 + VOMS to WLCG tokens during Run 3
  - Works for HTCondor CE
  - Doesn`t work for ARC6 (jobs submitted by REST interface work only with token+x509 proxy)

ALICE Sites with 8-core job slots



Status of proxies and AliEn and LCG tests

	AliEn Tests										LCG Tests									
	LDAP		CVMFS		JAliEn cert		CE				AliEn proxy		WLCG token		Renewal		Proxy Server		Host proxy		Host cert	
Service	Stat	Cores +	Stat	Rev	Stat	Time left	Stat	Config	Running	JobAgent	Stat	Time left	Stat	Time left	Stat	Stat	Time left	Stat	Time left	Stat	Time left	
48. Perlmutter		128		15803		246d 13:13		prod	local	local	-	-	-	-	-	-	-	-	-	-	-	-
20. EPN		16		15803		87d 5:11		1.7.4-1	1.7.4-1	1.7.4-1	-	-	-	-	-	-	-	-	-	-	-	-
72. Wigner_KFKI_AF_8core		8		15803		29d 23:01		pro	1.7.4-1	1.7.4-1		1d 23:28		3d 23:07			311d 13:11		23:36		148d 15:16	
70. Vienna		8		15803		29d 23:07		new	1.7.5-1	1.7.5-1		1d 23:40		3d 23:01			311d 13:05		21:30		295d 15:10	
69. UPB		8		15803		106d 0:43		pro	1.7.4-1	custom		1d 23:43		3d 23:13			311d 13:17		20:42		107d 21:20	
68. UNAM		8		15803		29d 23:06		pro	1.7.4-1	1.7.4-1		1d 23:58		3d 23:11			311d 13:16		21:41		265d 14:55	
67. UB_LHC		8		15803		315d 12:16		pro	1.7.4-1	1.7.4-1	-	-	-	-	-	-	-	-	-	-	-	-
64. Torino-HTC		8		15803		29d 23:01		1.7.5-1	1.7.5-1	custom		1d 23:21		3d 23:07			200d 7:39		21:37		199d 15:17	
62. Strasbourg_IRES		8		15803		29d 23:07		pro	1.7.4-1	1.7.4-1		1d 23:44		3d 23:11			311d 13:17		21:42		59d 5:49	
60. SARFTI		8		15803		29d 23:01		pro	1.7.4-1	1.7.4-1		1d 23:47		3d 23:14			270d 13:47		20:44		225d 10:08	
59. SARA		8		15803		29d 23:05		pro	1.7.4-1	1.7.4-1		1d 23:14		3d 23:13			311d 13:19		21:43		238d 15:23	
58. SaoPaulo_HTC		8		15803		29d 23:11		pro	1.7.4-1	1.7.4-1		1d 23:33		3d 23:02			289d 8:51		20:33		59d 3:50	
57. RRC_KI_T1		8		15803		29d 23:00		pro	1.7.4-1	1.7.4-1		1d 23:16		3d 23:07			270d 13:40		20:38		172d 0:42	
55. RAL		8		15803		29d 23:07		1.7.5-1	1.7.5-1	1.7.5-1		1d 23:49		3d 23:06			311d 13:12		22:40		97d 5:48	
54. Prague		8		15803		29d 23:00		pro	1.7.4-1	1.7.4-1		1d 23:03		3d 23:02			311d 13:08		21:33		265d 5:31	
52. Polaris		8		15803		59d 23:10		pro	1.7.4-1	1.7.4-1		1d 23:57		3d 23:12			311d 13:18		21:43		327d 12:23	
51. PNPI		8		15803		29d 23:03		pro	1.7.4-1	1.7.4-1		1d 23:30		3d 22:59			270d 13:33		20:30		80d 19:38	
45. NIPNE_ARC		8		15803		29d 23:02		pro	1.7.4-1	1.7.4-1		1d 23:15		3d 23:08			311d 13:15		20:39		247d 0:15	
44. NIKHEF		8		15803		29d 23:08		pro	1.7.4-1	1.7.4-1		1d 23:02		3d 23:03			311d 13:09		21:34		339d 15:14	
42. Nemesis		8		15803		59d 23:04		pro	1.7.4-1	1.7.4-1		1d 23:28		3d 23:13			311d 13:19		21:44		136d 12:29	
40. Legnaro_HTC		8		15803		29d 23:02		pro	1.7.4-1	1.7.4-1		1d 23:10		3d 23:12			311d 13:18		21:43		122d 15:23	
34. JINR_ARC		8		15803		29d 17:54		pro	1.7.4-1	1.7.4-1		1d 23:37		3d 17:56			270d 13:38		20:35		59d 19:48	
31. IHEP		8		15803		29d 23:11		pro	1.7.4-1	1.7.4-1		1d 23:05		3d 23:10			270d 13:44		20:42		196d 7:05	
29. Hiroshima		8		15803		29d 23:09		pro	1.7.4-1	1.7.4-1		1d 23:54		3d 23:03			311d 13:10		20:35		275d 15:01	
27. GSI_8core		8		15803		198d 4:23		pro	1.7.4-1	1.7.4-1	-	-	-	-	-	-	-	-	-	-	-	-
25. GRIF_IRFU		8		15803		29d 23:10		pro	1.7.4-1	1.7.4-1		1d 23:42		3d 23:02			311d 13:09		21:34		186d 5:39	
24. GRIF_IPNO_IJCLAB		8		15803		29d 23:00		new	1.7.5-1	1.7.5-1		1d 23:31		3d 23:10			311d 13:17		21:50		250d 0:49	
22. FZK_HTC		8		15803		29d 23:11		pro	1.7.4-1	1.7.4-1		1d 23:00		3d 23:06			311d 13:15		21:40		380d 21:35	
21. FZK		8		15803		29d 23:06		1.7.5-1	1.7.5-1	1.7.5-1		1d 23:35		3d 23:06			311d 13:15		21:40		158d 6:22	
19. DCSC_KU		8		15803		29d 23:00		pro	1.7.4-1	1.7.4-1		1d 23:15		3d 23:07			311d 13:16		21:41		196d 22:27	
17. CNAF-DUE		8		15803		29d 22:57		pro	1.7.4-1	1.7.4-1		1d 23:32		3d 23:07			92d 7:02		21:41		116d 15:21	
16. CNAF		8		15803		29d 23:02		1.7.5-1	1.7.5-1	1.7.5-1		1d 23:34		3d 23:03			92d 6:58		21:37		274d 15:17	
15. Clermont_ARC		8		15803		29d 23:10		pro	1.7.4-1	1.7.4-1		1d 23:37		3d 23:11			311d 13:20		21:45		99d 23:44	
14. CERN-ZENITH		8		15803		29d 23:05		pro	1.7.4-1	custom		1d 23:33		3d 23:00			311d 13:09		21:34		251d 12:44	
13. CERN-TRITON		8		15803		59d 22:56		1.7.5-1	1.7.5-1	custom		1d 23:48		3d 23:04			311d 13:14		21:39		69d 11:19	
12. CERN-SIRIUS		8		15803		59d 23:06		pro	1.7.4-1	custom		1d 23:34		3d 22:59			311d 13:09		21:33		327d 12:14	
11. CERN-MIRAGE		8		15803		59d 22:57		pro	1.7.4-1	custom		1d 23:48		3d 22:59			311d 13:09		21:34		305d 11:14	
10. CERN-CORONA		8		15803		59d 22:59		pro	1.7.4-1	custom		1d 23:50		3d 23:04			311d 13:14		21:39		327d 12:19	
8. CCIN2P3_HTC_2		8		15803		29d 23:09		pro	1.7.4-1	1.7.4-1		1d 23:29		3d 23:02			311d 13:11		21:36		304d 22:52	
7. CCIN2P3_HTC		8		15803		29d 23:00		1.7.5-1	1.7.5-1	1.7.5-1		1d 23:56		3d 23:06			311d 13:16		21:41		304d 22:57	
2. Bari_HTC		8		15803		29d 23:10		pro	1.7.4-1	1.7.4-1		1d 23:10		3d 23:02			311d 13:12		23:36		303d 15:16	
1. Altaria		8		15803		59d 23:05		pro	1.7.4-1	1.7.4-1		1d 23:59		3d 23:09			311d 13:19		21:44		218d 14:23	
26. GSI_4core		4		15803		198d 4:17		pro	1.7.4-1	1.7.4-1	-	-	-	-	-	-	-	-	-	-	-	-
74. Yerevan		1		15803		99d 2:01		pro	local	custom		1d 23:35		3d 23:13			311d 13:18		21:43		69d 11:23	
73. WUT		1		15803		29d 23:09		pro	1.7.4-1	1.7.4-1		1d 23:18		3d 23:11			195d 2:55		21:40		327d 4:43	
71. Wigner_KFKI_AF		1		15803		29d 23:09		pro	1.7.4-1	1.7.4-1		1d 23:47		3d 23:07			311d 13:11		23:36		142d 15:16	
66. Troitsk		1		15803		29d 23:10		pro	1.7.4-1	1.7.4-1		1d 23:52		3d 23:09			270d 13:41		20:39		196d 7:08	
65. Trieste		1		15803		29d 23:13		pro	1.7.4-1	1.7.4-1		1d 23:24		3d 23:08			372d 8:30		21:38		295d 15:18	
63. SUT		1		15803		29d 23:02		pro	1.7.4-1	1.7.4-1		1d 23:30		3d 23:03			311d 13:08		22:33		309d 16:44	
61. SNIC		1		15803		332d 9:33		pro	1.7.4-1	1.7.4-1	-	-	-	-	-	-	-	-	-	-	-	-
56. Regulus		1		15803		59d 23:14		pro	1.7.4-1	1.7.4-1		1d 23:59		3d 23:13			311d 13:19		21:44		327d 12:24	
53. Poznan_ARC		1		15803		29d 23:10		pro	1.7.4-1	1.7.4-1		1d 23:21		3d 23:10			311d 13:16		21:41		315d 22:34	
50. Pikachu		1		15803		59d 23:09		pro	1.7.4-1	1.7.4-1		1d 23:56		3d 23:03			311d 13:09		21:34		218d 14:13	
49. Phoenix		1		15803		59d 23:12		pro	1.7.4-1	1.7.4-1		1d 23:37		3d 23:03			311d 13:09		21:34		25d 11:14	
47. Oxford		1		15803		29d 23:04		new	1.7.5-1	1.7.5-1		1d 23:38		3d 23:11			311d 13:17		22:42		133d 7:07	
43. NDHAM		1		15803		263d 11:51		pro	1.7.4-1	1.7.4-1	-	-	-	-	-	-	-	-	-	-	-	-
41. Minerva		1		15803		59d 23:08		pro	1.7.4-1	1.7.4-1		1d 23:26		3d 23:11			311d 13:18		21:43		218d 14:22	
38. Kosice_ARC		1		15803		29d 23:04		pro	1.7.4-1	1.7.4-1		1d 23:37		3d 23:02			194d 5:23		21:34		356d 2:51	
37. Kolkata		1		15803		29d 23:00		pro	1.7.4-1	1.7.4-1		1d 23:11		3d 23:13			70d 19:53		18:14		164d 19:52	
33. ITEP		1		15803		29d 23:11		pro	1.7.4-1	1.7.4-1		1d 23:29		3d 23:08			270d 13:42		20:40		245d 7:02	
32. ISS		1		15803		107d 21:02		pro	1.7.4-1	1.7.4-1		1d 23:26		-			347d 21:33		20:44		107d 21:15	
28. HIP		1		15803		332d 9:28		pro	1.7.4-1	1.7.4-1	-	-	-	-	-	-	-	-	-	-	-	-
18. Cyfronet_ARC		1		-		29d 23:03		pro	1.7.4-1	1.7.4-1		1d 23:52		3d 23:09			311d 13:18		23:43		264d 6:14	
9. CERN-AURORA		1		15803		59d 23:01		pro	1.7.4-1	custom		1d 23:51		3d 23:04			311d 13:14		21:39		69d 11:19	
6. Catania-VF		1		15803		29d 22:57		pro	1.7.4-1	1.7.4-1		1d 23:14		3d 23:10			311d 13:19		21:44		365d 15:23	
5. Cagliari		1		15803		29d 23:08		pro	1.7.4-1	1.7.4-1		1d 23:59		3d 23:10			311d 13:19		21:44		327d 12:24	
4. Bratislava_ARC		1		15803		29d 23:02		new	1.7.5-1	custom		1d 23:17		3d 23:03			85d 11:23		21:37		375d 5:57	
3. Birmingham		1		15803		29d 22:56		pro	1.7.4-1	1.7.4-1		1d 23:46	-	-			311d 13:10		22:34		249d 6:27	
46. ORNL		0		15803		270d 12:21		pro	1.7.4-1	1.7.4-1	-	-	-	-	-	-	-	-	-	-	-	-
39. LBL_HPCS		0		15803		275d 13:14		pro	1.7.4-1	1.7.4-1	-	-	-	-	-	-	-	-	-	-	-	-
36. KISTI_GSDC		0		15803		29d 23:13		pro	1.7.4-1	1.7.4-1		1d 23:41		3d 22:59			147d 20:00		20:30		100d 20:52	
35. KFKI	-	-	-	-	-	-	-	-	-	-		1d 23:57	-	-			311d 13:17		21:42	-	-	
30. HPCS_Lr		0		15803		389d 12:13		pro	1.7.4-1	custom	-	-	-	-	-	-	-	-	-	-	-	-
23. FZK_KIT		0		15803		17d 1:45		pro	1.7.4-1	1.7.4-1		1d 23:03		0min			311d 13:15		32d 8:48		255d 6:37	

https://alimonitor.cern.ch/stats?page=proxies

T1:

- RRC-KI-T1 (SLURM)

T2

- JINR (SLURM)
- IHEP (Torque)
- ITEP
- PNPI (Torque-> SLURM)
- SPbSU
- Troitsk
- Sarov (Torque -> SLURM)

Transition from X509 + VOMS to WLCG tokens

Now works with HTCondor only

All Russian sites work with ARC (for ALICE)

ARC7 promises full token support

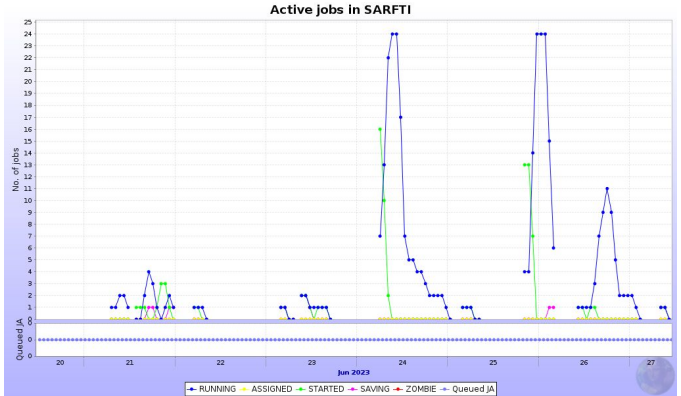
https://www.nordugrid.org/arc/arc7/overview/arc-ce-components.html

Resume: we can test ARC7 for ALICE jobs.

Steps of ARC7 tests

- March - tests on virtual testbed. End of March - job submission tests with tokens only.
- April - installation on real site SARFTI. OPS errors and ALICE errors
  - https://ggus.eu/index.php?mode=ticket_info&ticket_id=161830
  - https://bugzilla.nordugrid.org/show_bug.cgi?id=4118
- May - submit errors resolved, jAliEn updated for ARC7
- June - start alice jobs with tokens on SARFTI

Resume: Sites on ARC7 can work for ALICE, but ARC7 is not ready for production.
Main problem - transition from glue1 to glue2.



Resume

Performance of the Russian sites does not increase, but stable.

Most russian sites support multi-core jobs

Russian sites can hope to continue use ARC in the future.

Thanks for attention.

"This work is supported by the SPbSU grant ID: 94031112"