

6408603	user1585	grp233	booster	2022-12-05 19:12	2022-12-05 19:37	25m	1	00:14:19	00:00:15	3.88	255.25	1.16	0.00	0.00	0.15	0.00	87.29	35.74	68.96	288.67	59.58	1,349.40	0.04	-		0.97	25		
6408600	user1585	grp233	booster	2022-12-05 18:58	2022-12-05 19:37	39m	1	00:14:19	00:00:15	3.99	25.90	0.83	0.00	0.00	0.15	0.00	91.65	36.26	72.32	280.36	58.51	1,379.23	0.03	-		1.00	39		
6408599	user1585	grp233	booster	2022-12-05 18:58	2022-12-05 19:37	39m	1	00:14:19	00:00:15	3.87	25.95	0.69	0.00	0.00	0.15	0.00	88.08	36.26	69.21	288.50	59.21	1,363.08	0.03	-		0.97	39		
6408598	user1585	grp233	booster	2022-12-05 18:58	2022-12-05 19:37	39m	1	00:14:19	00:00:15	3.89	26.05	0.81	0.00	0.00	0.15	0.00	87.82	36.26	69.49	277.52	58.70	1,363.08	0.03	-		0.97	39		
6408597	user1585	grp233	booster	2022-12-05 18:58	2022-12-05 19:37	39m	1	00:14:19	00:00:15	3.89	26.01	0.83	0.00	0.00	0.15	0.00	93.37	37.20	73.36	290.29	59.70	1,401.71		-		0.97	39		
6408596	user1585	grp233	booster	2022-12-05 18:58	2022-12-05 19:37	39m	1	00:14:19	00:00:15	3.79	26.00	0.69	0.00	0.00	0.15	0.00	93.31	36.26	73.32	287.34	59.88	1,379.23	0.03	-		0.95	39		
6408595	user1585	grp233	booster	2022-12-05 18:58	2022-12-05 19:37	39m	1	00:14:19	00:00:15	3.79	26.06	0.91	0.00	0.00	0.29	0.00	89.95	36.26	70.66	283.61	58.09	1,371.15	0.03	-		0.95	39		
6408594	user1585	grp233	booster	2022-12-05 18:58	2022-12-05 19:37	39m	1	00:14:19	00:00:15	3.77	25.10	0.85	0.00	0.00	0.29	0.00	90.98	36.26	71.37	289.76	59.07	1,371.15	0.03	-		0.94	39		
6408593	user1585	grp233	booster	2022-12-05 18:58	2022-12-05 19:37	39m	1	00:14:19	00:00:15	3.77	25.57	0.54	0.00	0.00	0.15	0.00	90.58	36.26	71.29	279.84	59.92	1,377.21	0.03	-		0.94	39		
6408543	user1594	grp222	booster	2022-12-05 18:21	2022-12-05 19:37	1h15m	1	00:14:19	00:00:15	4.85	135.61	9.93	0.00	0.22	2,672.47	0.01	88.01	21.75	68.00	249.54	56.75	1,306.97	0.08	-		1.00	76		
6408542	user1594	grp222	booster	2022-12-05 18:21	2022-12-05 19:37	1h15m	1	00:14:19	00:00:15	4.60	135.28	11.08	0.00	0.27	2,679.33	0.01	88.83	21.75	68.33	249.86	57.11	1,311.12	0.08	-		1.00	76		
6408541	user1594	grp222	booster	2022-12-05 18:19	2022-12-05 19:37	1h17m	1	00:14:19	00:00:15	4.89	134.76	3.54	0.00	0.32	2,662.06	0.01	90.71	22.09	69.52	270.78	58.91	1,329.04	0.06	-		1.00	78		
6408540	user1594	grp222	booster	2022-12-05 18:19	2022-12-05 19:37	1h17m	1	00:14:19	00:00:15	4.62	134.97	6.55	0.00	0.32	2,682.76	0.01	84.41	21.80	65.07	244.38	58.89	1,303.56	0.08	-		1.00	78		
6408525	user1859	grp379	booster	2022-12-05 18:30	2022-12-05 19:37	1h07m	32	00:14:19	00:00:15	4.01	19.14	6,415.17	2.17	0.00	7.98	0.00	29.19	3.23	5.88	88.19	46.17	1,094.14	0.00	-		0.03	67		
6408440	user2151	grp203	booster	2022-12-05 18:56	2022-12-05 19:23	27m	4	00:14:19	00:00:15	3.88	64.62	6,119.55	1.64	0.00	15.34	0.00	73.47	19.74	60.87	258.13	57.23	1,357.57	0.03	COMPLETED		0.24	27		
6408439	user2151	grp203	booster	2022-12-05 18:56	2022-12-05 19:23	27m	4	00:14:19	00:00:15	3.90	64.60	6,136.10	1.65	0.00	15.38	0.00	75.83	19.92	62.83	262.65	57.01	1,376.25	0.03	COMPLETED		0.24	27		
6408438	user2151	grp203	booster	2022-12-05 18:56	2022-12-05 19:23	27m	4	00:14:19	00:00:15	3.85	64.49	6,133.07	1.65	0.00	15.31	0.00	74.15	19.70	62.30	264.09	56.77	1,364.93	0.03	COMPLETED		0.24	27		
6408434	user1594	grp222	booster	2022-12-05 18:21	2022-12-05 19:37	1h15m	1	00:14:19	00:00:15	4.97	276.89	10.14	0.00	0.27	2,679.01	0.01	89.09	21.75	67.80	254.02	56.97	1,310.08	0.08	-		1.00	76		
6408433	user1069	grp209	booster	2022-12-05 18:21	2022-12-05 19:37	1h15m	1	00:14:19	00:00:15	3.96	18.49	8.34	0.00	39.41	35.76	0.00	38.15	1.39		90.60	46.46	1,366.43	0.01	-		0.99	76		
6408432	user1749	grp261	booster	2022-12-05 18:21	2022-12-05 19:37	1h15m	8	00:14:19	00:00:15	4.44	38.57	229.57	0.06	239.86	24.36	0.06	71.27	5.30	49.69	219.03	55.47	1,368.93	0.03	-		0.14	76		
6408418	user1785	grp217	booster	2022-12-05 18:21	2022-12-05 19:37	1h15m	70	00:14:19	00:00:15	3.49	142.75	3,562.81	1.11	1,719.99	61.79	1.24	48.67	26.99	46.39	186.56	52.56	1,169.81	0.14	-		0.01	76		
6408409	user1002	grp242	booster	2022-12-05 18:21	2022-12-05 19:37	1h15m	100	00:14:19	00:00:15	8.03	94.58	4,049.12	1.48	19.12	4,758.59	0.50	95.07	20.04	59.01	336.93	64.17	1,357.08	3.07	-		0.02	76		
6408400	user1059	grp240	booster	2022-12-05 18:21	2022-12-05 19:37	1h15m	4	00:14:19	00:00:15	3.97	81.35	469.65	0.12	0.04	1.97	0.02	92.78	22.07	17.06	279.04	61.64	1,401.82	0.01	-		0.25	76		
6408395	user1812	grp267	booster	2022-12-05 18:46	2022-12-05 19:37	51m	4	00:14:19	00:00:15	4.37	32.29	429.28	0.13	22.62	247.72	0.02	35.67	7.53	5.42	95.59	46.77	1,317.85	0.02	-		0.27	51		

HPC SYSTEM AND JOB MONITORING WITH LLVIEW

07.12.2022 | VITOR SILVA AND FILIPE GUIMARÃES

INTRODUCTION

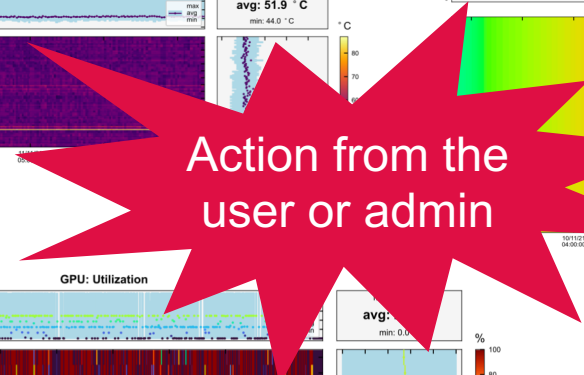
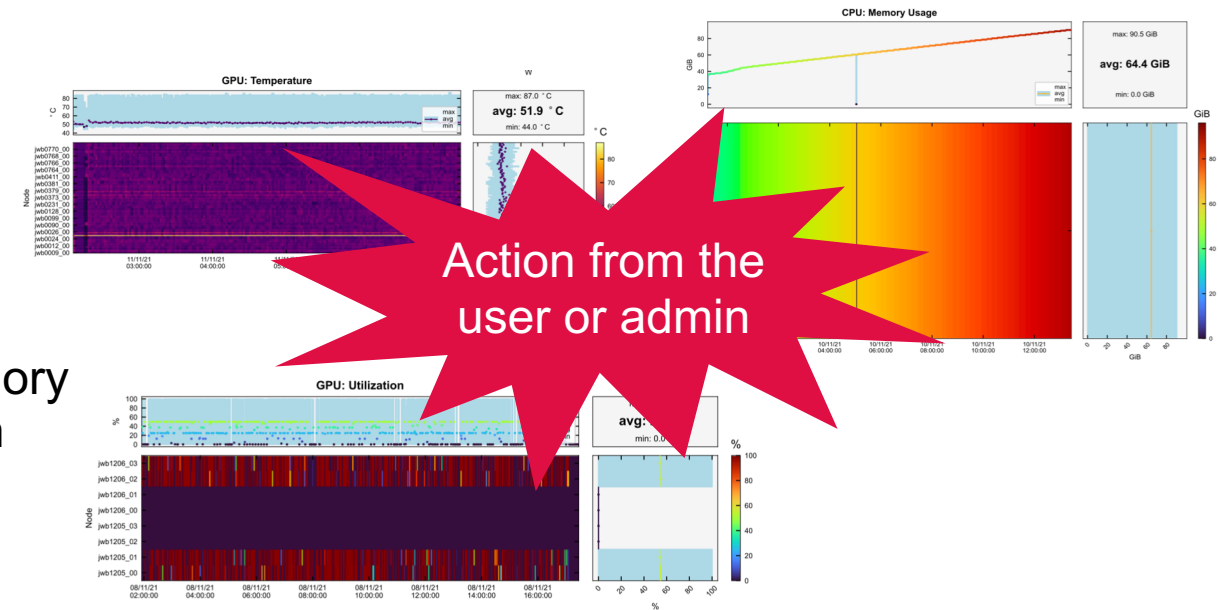
What is monitoring? Why do we need it?



- High temperature
- No fuel
- Battery problems
- Low tire pressure
- Speed
- ...



- High temperature
- No available memory
- Wrong distribution
- Utilization
- ...



INTRODUCTION

What is monitoring? Why do we need it?

System monitoring

Trip monitoring

Performance analysis and tuning



Image by alexandercho on Freepik

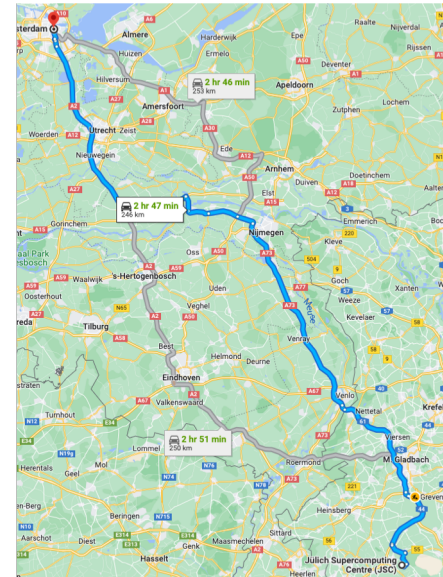
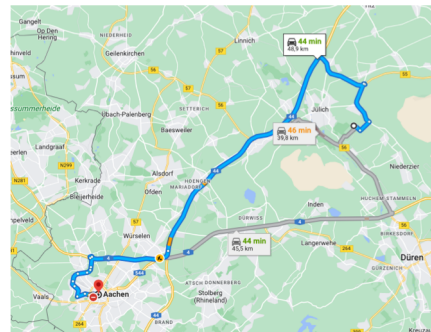
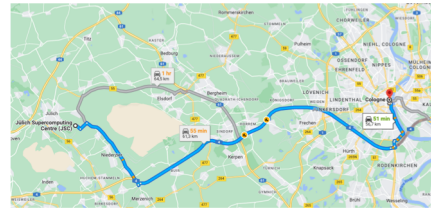


Image by standret on Freepik

INTRODUCTION

What is monitoring? Why do we need it?

System monitoring

Trip monitoring

Performance analysis and tuning



Image by alexandercho on Freepik

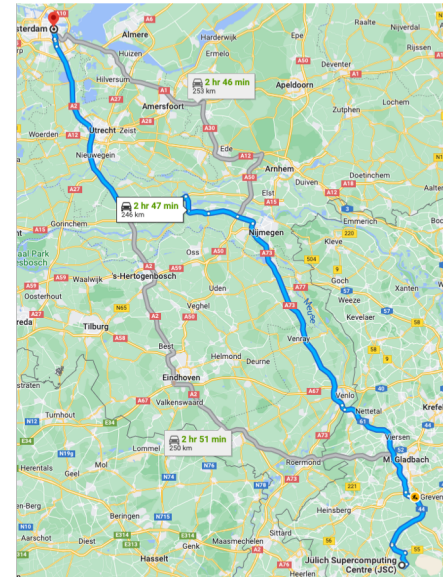
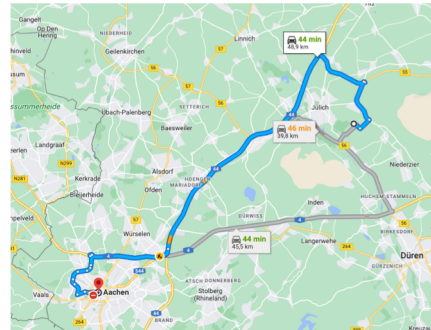
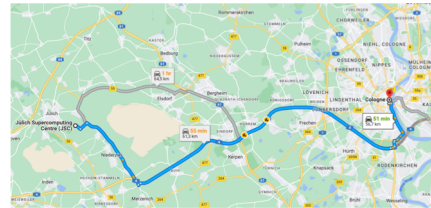


Image by standret on Freepik

INTRODUCTION

What is monitoring? Why do we need it?

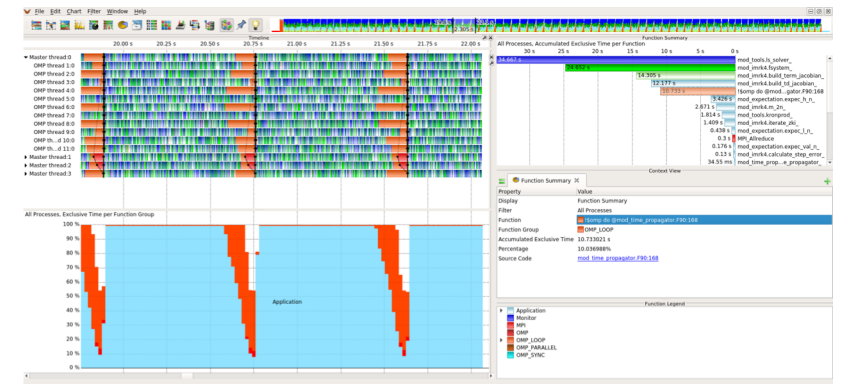
System monitoring

Job monitoring

Performance analysis and tuning

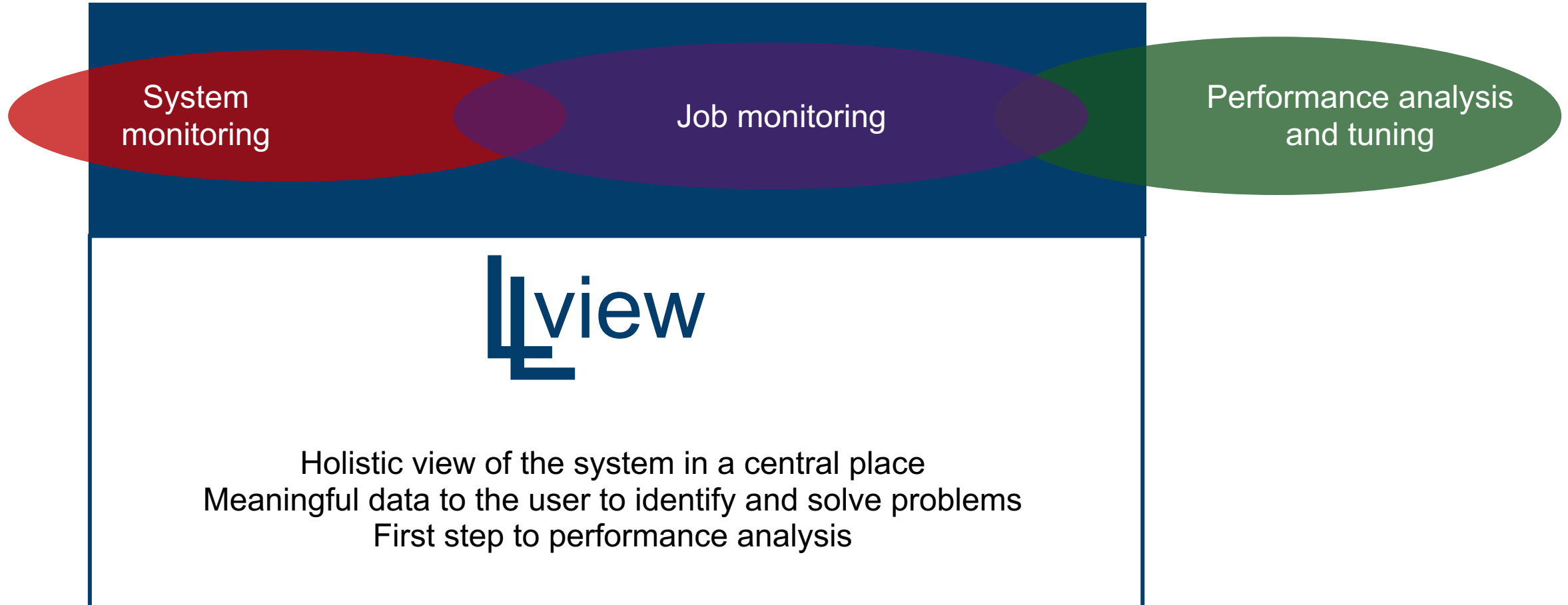


JOBID	PARTITION	NAME
11151737	dc-cpu	AGS-opt
11151736	dc-cpu	AGS-opt
11151735	dc-cpu	AGS-opt
11151734	dc-cpu	AGS-opt
11151733	dc-cpu	AGS-opt
11151732	dc-cpu	AGS-opt
11151731	dc-cpu	AGS-opt
11151730	dc-cpu	AGS-opt
11157475	dc-cpu	st_archi
11157314	dc-cpu	scratch_
11155434	dc-cpu	7zk3m2ca
11155433	dc-cpu	7zk3m2ca
10557341	dc-cpu	np0500_1
10557339	dc-cpu	np0250_1
10557337	dc-cpu	np0200_1
10557331	dc-cpu	np0150_1
10557326	dc-cpu	np0100_1
10557321	dc-cpu	np0050_1
10557315	dc-cpu	np0040_1
10557308	dc-cpu	np0030_1



INTRODUCTION

What is monitoring? Why do we need it?



OUTLINE

- What is LLview?
- How was it developed?
- How does it work?
- What can it do?
- Show me!
- What's next?

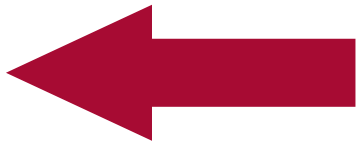
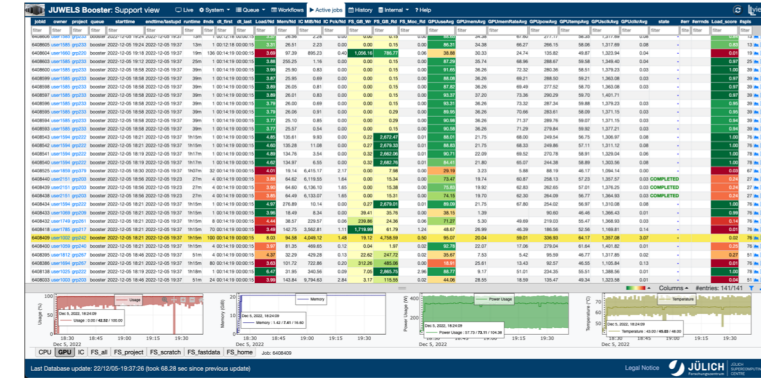
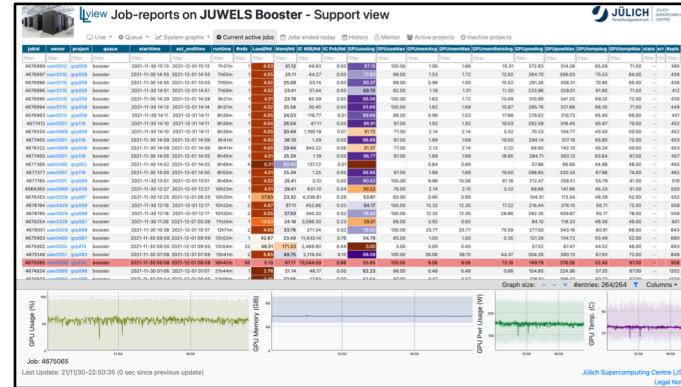
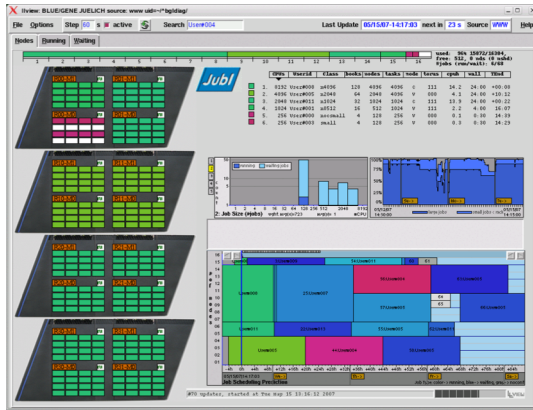
LLVIEW MONITORING TOOL

- Developed in JSC since 2004
- Job report generation for all users available since 2019
- Client-Server architecture
- Perl, Python, Javascript
- Open source* license
- Website: lview.fz-juelich.de
- Contact: lview.jsc@fz-juelich.de

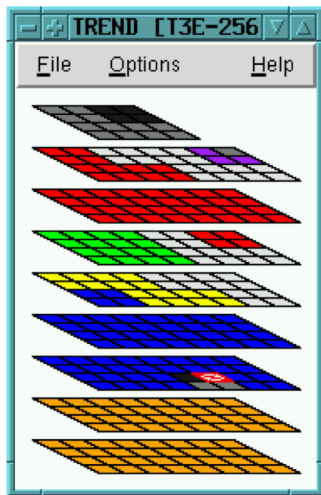


HISTORY

1996-1998
Old times



2004
Initial development



2019
Job reporting
portal

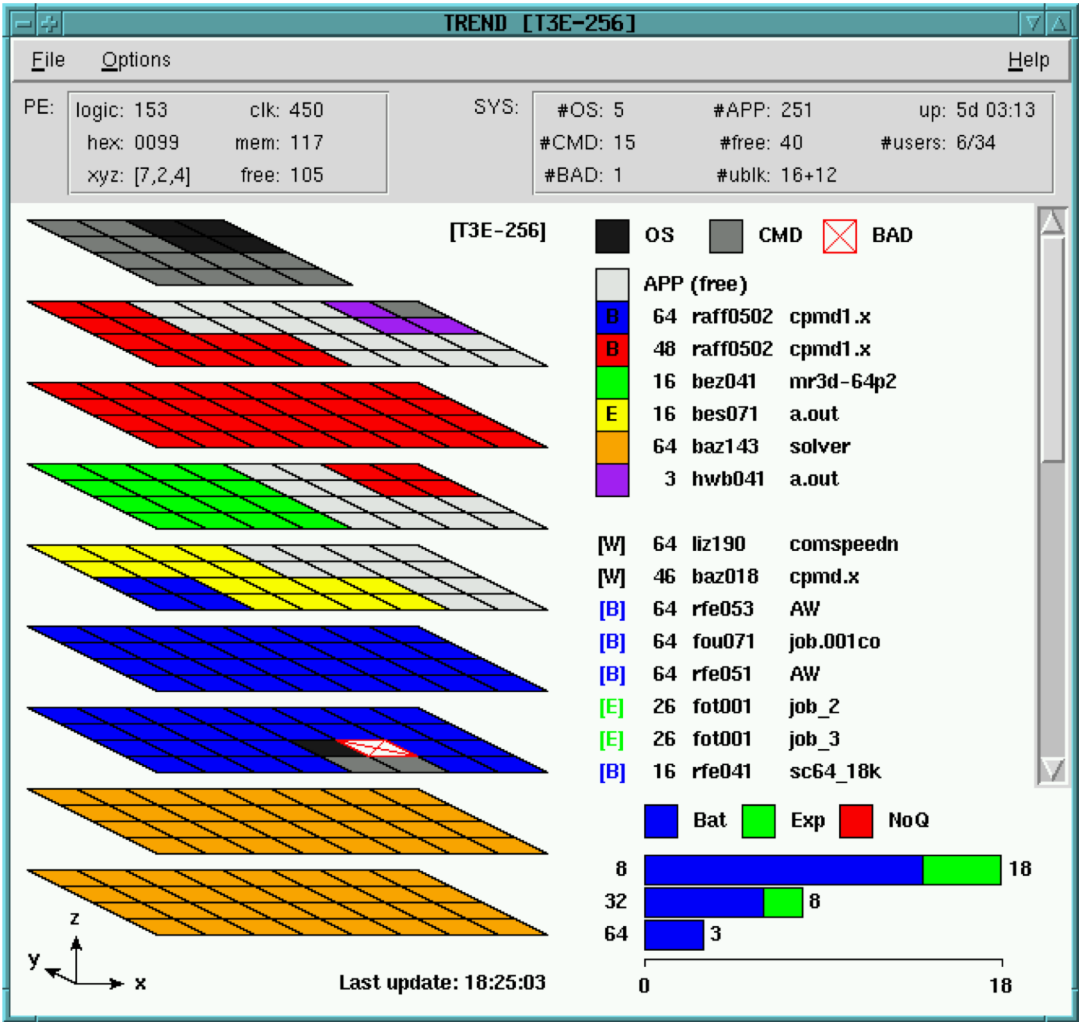


present
redesigned and
restructured version

September 2011 – Integration of LLview with Eclipse PTP **Scalable Control and Monitoring of Supercomputer Applications Using an Integrated Tool Framework**
<https://ieeexplore.ieee.org/document/6047252>

HISTORY

1996-1998: TREND (Torus REsources and Node Display), by Bernd Mohr



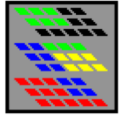
– A first approach on the supervision of batch queues and system utilization

– Distributed client/server application

– *trend*, a X11 client implemented in Tcl/Tk

– *jtrend*, a portable Java client

TREND User Guide



Version 2.5d, Oct 1998

Torus REsources and Node Display

Copyright © 1996-1998 Forschungszentrum Jülich, ZAM

Bernd Mohr

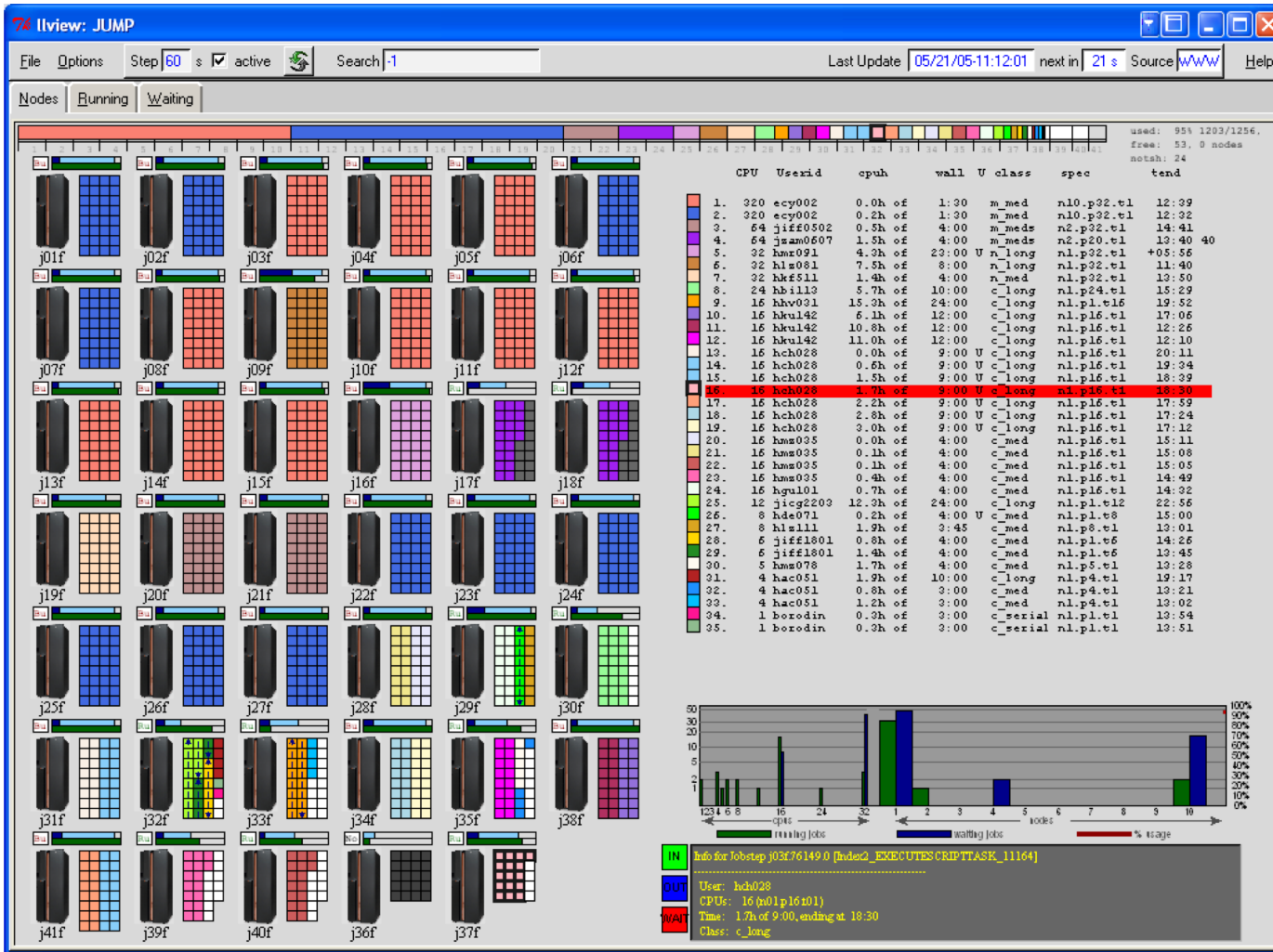
Anke Häming

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TREND User Guide

- [Trend Overview](#)
- [User Client Overview](#)
- [Full Display Mode](#)
- [Mini Display Mode](#)
- [Menu Description and Keyboard Bindings](#)
- [Command Line Switches](#)
- [Preferences](#)

HISTORY



2004: LLview (LoadLeveler® view)

– Version ~1.02

– Client/Server application

– Features:

- mapping Job ↔ Node
- running and waiting jobs view in one window
- statistics/history of cluster usage
- interactive, fast and portable
- client written in Perl/Tk

JUMP machine: 41 p690 nodes (32 PE, 128 GB), 1312 PE, 5.2 TBytes Memory, 50 TBytes (disk), 2.2 PetaBytes (tape). ~ 100 running jobs (on 1-512 PE)

LoadLeveler® is a trademark of the International Business Machines Corporation

HISTORY

2010: LLview

– Version 1.3

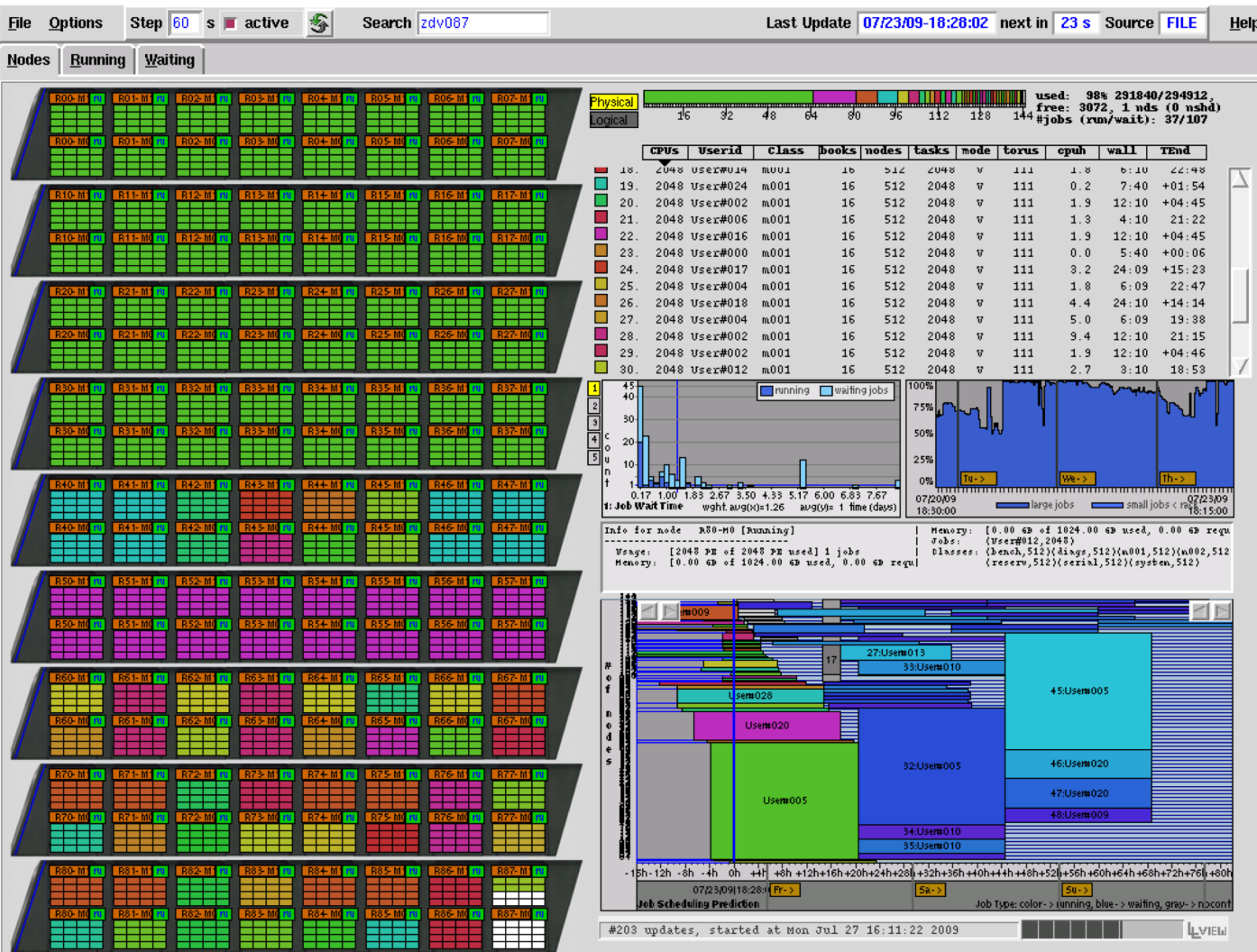
– Architecture changes:

– llview_da: the data adapter makes LLview independent of the system it monitors

– running with LoadLeveler®, BlueGene/P DB2, PBSPro and others...

– LML: hierarchical XML data format

JUGENE (JSC) machine, Blue Gene/P, 72 frames, Power 450 and 294912 cores



LoadLeveler® is a trademark of the International Business Machines Corporation

HISTORY

- 2019: LLview
- Version 1.8
- Main new feature: Job Reporting portal
- Aggregated metrics
- Job error indicators
- Events displayed in a time series set
- Filtering and sorting by metrics
- PDF report

LLview: Job-reports overview on JUWELS (Support View)

Info/Statistics: Time/date of data: 18/11/27-13:18:20
#jobs running: 234
#jobs finished today: 1381
#jobs finished 2weeks: 23645
Page autoreload: PORTAL

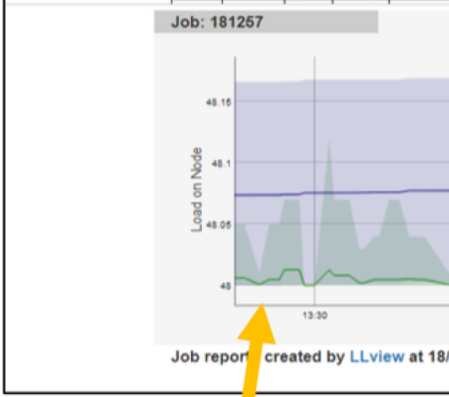
Live(Batch) Live(GPU) Current active jobs

LLview display (SVG) for each partition

Current active jobs

job ended in timeframe: 0.00 to 0.02 hours, 234 jobs total

jobid	owner	group	queue	starttime	endtime	runtime	#nds	Load/Nd	Mem/Nd	IC MIB/Nd	IC pck/Nd	HomeWr	HomeRd	WorkWr	WorkRd	#spis	PDF	
sort	sort	sort	sort	sort	sort	sort	sort	sort	sort	sort	sort	sort	sort	sort	sort	sort	sort	sort
198153	user0323	grp013	batch	2018-11-27 12 15	2018-11-27 14 45	1h01m	17	46.37	40.06 GiB	591.37 MiB/s	2.5113 M/s			25.47 GiB	4088.48 GiB	35	PDF	
196035	user0344	grp050	batch	2018-11-27 00 12	2018-11-28 00 12	13h04m	10	48.05	55.89 GiB	17.88 MiB/s	0.0293 M/s			2309.50 GiB	2273.53 GiB	429	PDF	
198215	user1066	grp068	batch	2018-11-27 13 12	2018-11-27 15 12	3m	128	25.58	75.09 GiB	3212.85 MiB/s	3.4853 M/s			7.42 GiB	349.14 GiB	3	PDF	
191525	user1006	grp155	batch	2018-11-27 12 15	2018-11-27 16 30	1h01m	16	45.71	60.19 GiB	406.87 MiB/s	0.6808 M/s			0.08 GiB	325.03 GiB	35	PDF	
191162	user0233	grp050	batch	2018-11-26 17 00	2018-11-27 16 55	20h15m	16	47.83	84.89 GiB	915.79 MiB/s	0.3184 M/s			364.22 GiB	157.23 GiB	649	PDF	
198246	user0153	grp045	batch	2018-11-27 13 09	2018-11-27 13 49	7m	20	33.37	13.80 GiB	890.39 MiB/s	2.3383 M/s		218.75 GiB	147.58 GiB	81.61 GiB	5	PDF	
191984	user1006	grp155	batch	2018-11-27 10 36	2018-11-27 14 36	2h39m	16	46.89	58.61 GiB	402.08 MiB/s	0.6648 M/s			0.17 GiB	64.36 GiB	89	PDF	
196321	user1017	grp114	mem192	2018-11-27 04 26	2018-11-28 04 26	8h49m	15	39.76	181.93 GiB	1580.64 MiB/s	2.8256 M/s			14.61 GiB	37.18 GiB	310	PDF	
198180	user1017	grp114	mem192	2018-11-27 13 13	2018-11-28 13 13	2m	15	6.75	89.67 GiB	39.88 MiB/s	0.1161 M/s			0.00 GiB	37.			
198042	user0219	grp086	batch	2018-11-27 12 17	2018-11-28 00 17	58m	64	47.85	53.47 GiB	1489.74 MiB/s	1.9873 M/s	0.08 GiB	0.26 GiB	0.00 GiB	31.			
181257	user0313	grp114	batch	2018-11-27 12 17	2018-11-27 12 17	0m	1	0.00	0.00 GiB	0.00 MiB/s	0.00 M/s			0.00 GiB	0.00 GiB	1	PDF	



Load & Memory

Job-Link (JUWELS-Booster)

Jobid: 367709 User: mecke1 Project: synact Date/Time of job data: 21/05/05-14:25:07

Job runtime: 14h26m
-> 60.12% of wall: 1d00h00m

Job start time: 21/05/04-23:59:19
Job last timestamp: 21/05/05-14:25:07 (running)
Job end time (est.): 21/05/05-23:59:33

Queue: booster

Job Size, #nodes: 1 #data points: 866
Job Size, #GPUs: 4 #data points: 733

Job I/O statistics

	Total Data Write	Total Data Read	max. Data rate/Node Write	max. Data rate/Node Read	max. Open-Close Rate/Node
\$HOME:	0.00 MiB	0.00 MiB	0.00MiB/s	0.00MiB/s	0.00 ops/s
\$PROJECT:	0.00 MiB	0.00 MiB	0.00MiB/s	0.00MiB/s	0.00 ops/s
\$SCRATCH:	0.00 MiB	0.00 MiB	0.00MiB/s	0.00MiB/s	0.00 ops/s
\$FASTDATA:	0.00 MiB	0.00 MiB	0.00MiB/s	0.00MiB/s	0.00 ops/s

Job GPU statistics

	avg. GPU usage:	avg. Mem usage rate:	avg. GPU temp.:	avg. GPU power:
	75.72 %	41.94 %	52.77 degC	173.01 W
max. Ck Stream/Mem:	1410/1215 MiB/s	max. Mem usage: 2248.50 MiB	max. GPU temp.: 54.00 degC	max. GPU power: 215.15 W

Job-Usage Overview

GPU Utilization (% of time one or more kernels was executing)

Table of Contents (8 pages)

- Load and Memory 2
- Data Transfer/Node on Inter-communication Fabric 3
- GPU usage (Table) 4
- GPU usage (per GPU) 4
- GPU Usage (Node view) 5
- Node List 7

JUWELS Booster Queue: booster #Nodes: 1 #GPUs: 4
Jobid: 367709 User: mecke1 Project: synact Date/Time of data: 21/05/05-14:25:07

GPU Utilization [GPUs 0 - 4] Average/Node: 75.72 % (% of time one or more kernels was executing)

GPU Mem Usage [GPUs 0 - 4] max. Memory/Node: 2248.50 MiB

GPU Power [GPUs 0 - 4] Average Power/Node: 173.01 W, max. Power/Node: 215.15 W

GPU StreamMP Ck. [GPUs 0 - 4] avg. Ck/Node: 1408.36 MiB, min. Ck/Node: 210.00 MiB, max. Ck/Node: 1410.00 MiB

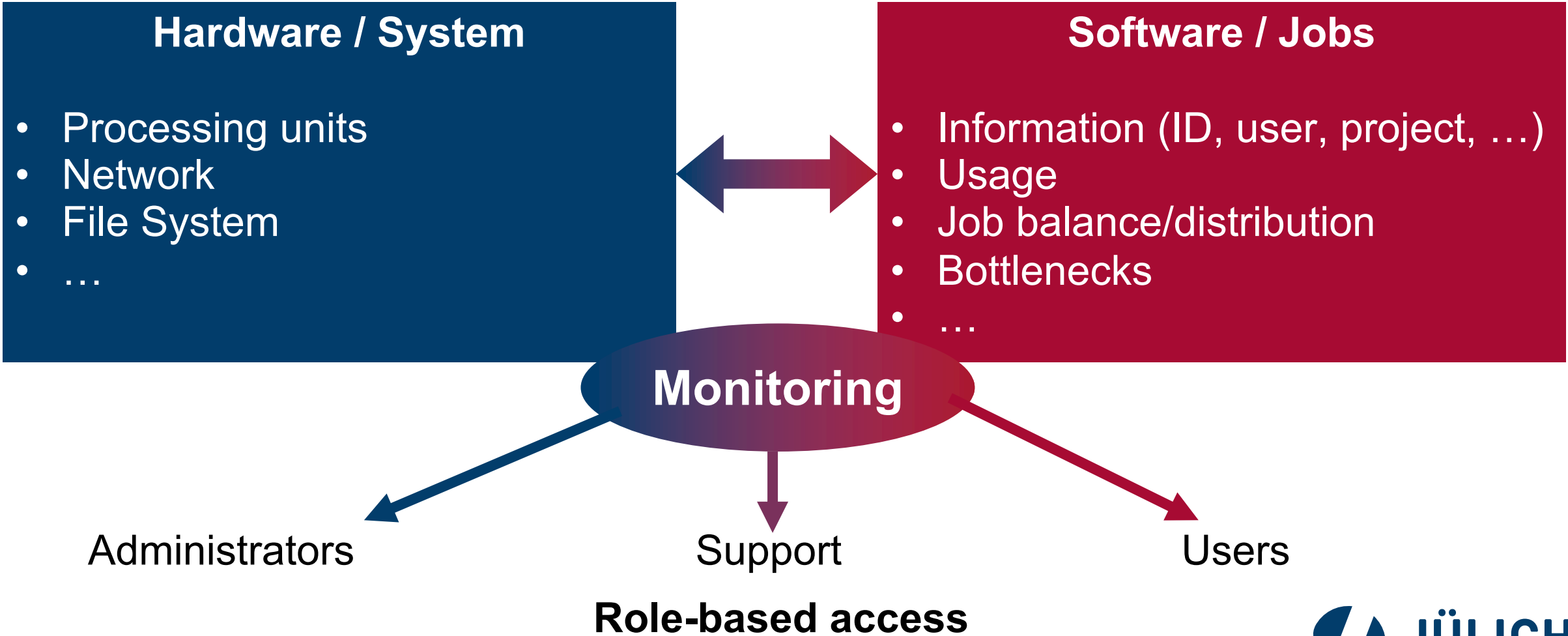
GPU Ck. throttle reas. [GPUs 0 - 4] avg. reason #: 0.00, min. reason #: 0, max. reason #: 1

GPU PCIe TX [GPUs 0 - 4] avg. PCIe TX/Node: 5435.88 kbps, max. PCIe TX/Node: 18000.00 kbps

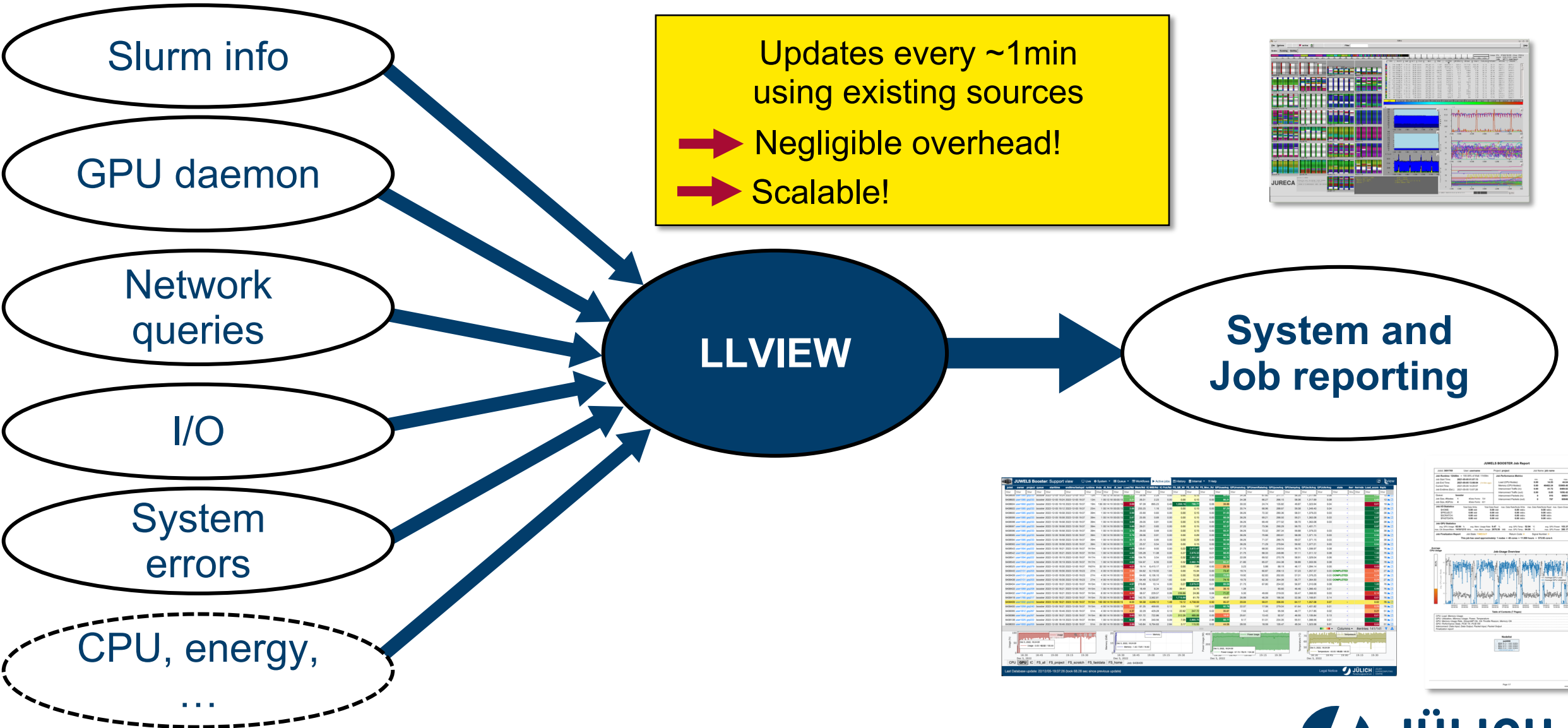
GPU PCIe RX [GPUs 0 - 4] avg. PCIe RX/Node: 19298.77 kbps, max. PCIe RX/Node: 22000.00 kbps

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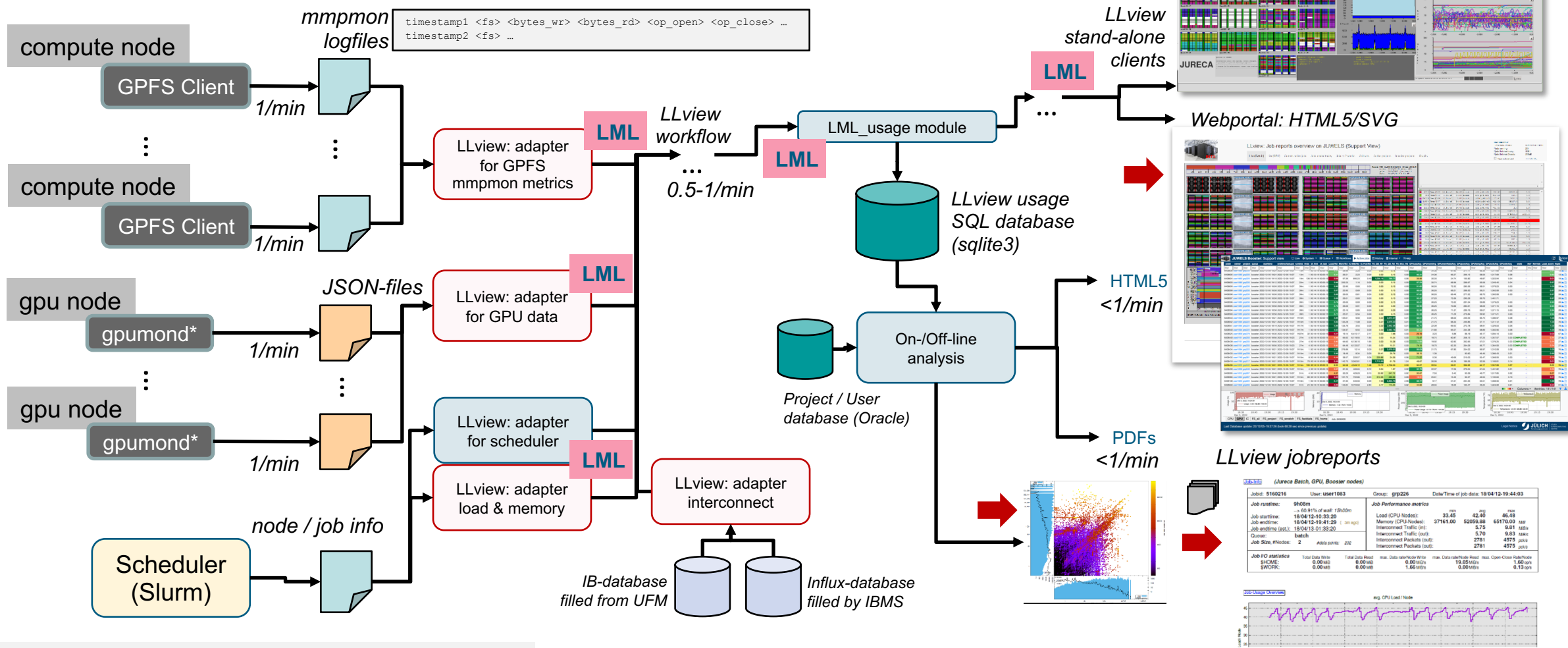
HOLISTIC VIEW OF THE SYSTEM



LLVIEW COLLECTS INFORMATION FROM DIFFERENT SOURCES

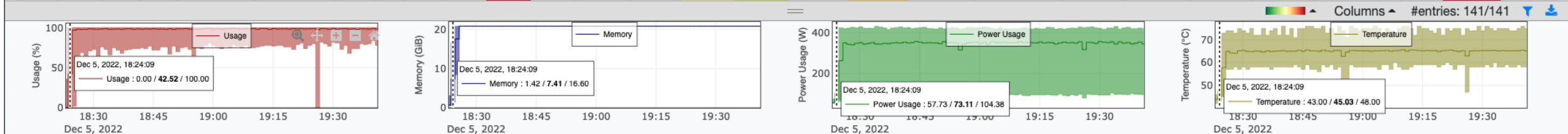


LLVIEW: DATA SOURCES AND DATA FLOW

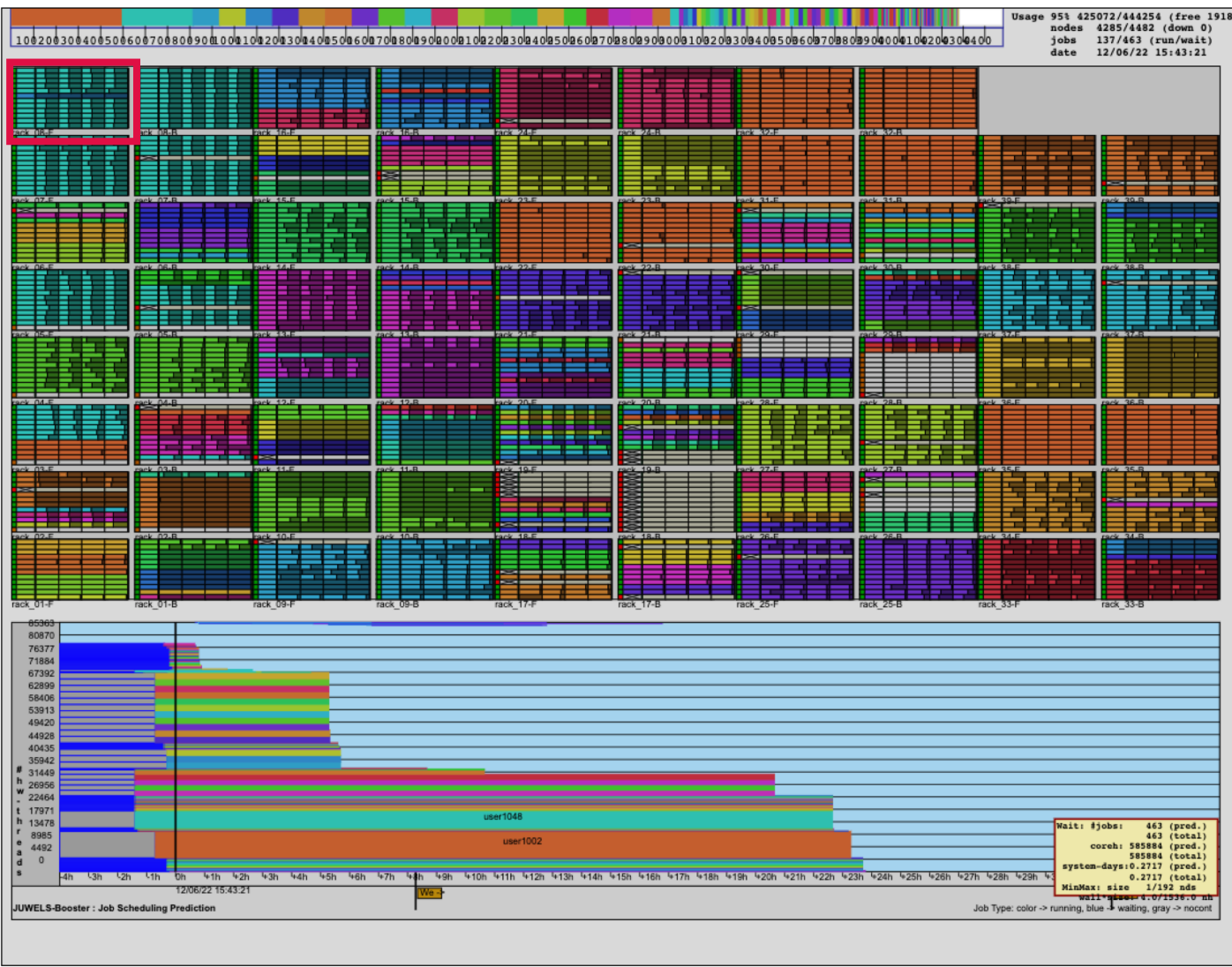


* gpumond&watchman (D.Krause, JSC)
<https://github.com/kraused/gpu-tools/tree/master/nvidia/gpumond>

jobid	owner	project	queue	starttime	endtime/lastupd	runtime	#nds	dt_first	dt_last	Load/Nd	Mem/Nd	IC MIB/Nd	IC Pck/Nd	FS_GB_Wr	FS_GB_Rd	FS_Moc_Rd	GPUUseAvg	GPUmemAvg	GPUmemRateAvg	GPUpowAvg	GPUtempAvg	GPUusclkgAvg	GPUclkrAvg	state	#err	#errnds	Load_score	#spls
6408006	user1080	grp233	booster	2022-12-05 19:24	2022-12-05 19:37	13m	1	00:12:18	00:00:15	3.37	26.56	2.23	0.00	0.00	0.15	0.00	86.00	34.38	67.00	277.17	56.55	1,317.69	0.08	-	-	0.84	13	
6408605	user1585	grp233	booster	2022-12-05 19:24	2022-12-05 19:37	13m	1	00:12:18	00:00:15	3.31	26.51	2.23	0.00	0.00	0.15	0.00	86.31	34.38	66.27	266.15	58.06	1,317.69	0.08	-	-	0.83	13	
6408604	user1660	grp220	booster	2022-12-05 19:18	2022-12-05 19:37	19m	136	00:14:19	00:00:15	3.69	97.39	895.23	0.40	1,056.16	786.77	0.06	38.88	30.33	24.74	135.82	49.87	1,323.94	0.04	-	-	0.01	19	
6408603	user1585	grp233	booster	2022-12-05 19:12	2022-12-05 19:37	25m	1	00:14:19	00:00:15	3.88	255.25	1.16	0.00	0.00	0.15	0.00	87.29	35.74	68.96	288.67	59.58	1,349.40	0.04	-	-	0.97	25	
6408600	user1585	grp233	booster	2022-12-05 18:58	2022-12-05 19:37	39m	1	00:14:19	00:00:15	3.99	25.90	0.83	0.00	0.00	0.15	0.00	91.65	36.26	72.32	280.36	58.51	1,379.23	0.03	-	-	1.00	39	
6408599	user1585	grp233	booster	2022-12-05 18:58	2022-12-05 19:37	39m	1	00:14:19	00:00:15	3.87	25.95	0.69	0.00	0.00	0.15	0.00	88.08	36.26	69.21	288.50	59.21	1,363.08	0.03	-	-	0.97	39	
6408598	user1585	grp233	booster	2022-12-05 18:58	2022-12-05 19:37	39m	1	00:14:19	00:00:15	3.89	26.05	0.81	0.00	0.00	0.15	0.00	87.82	36.26	69.49	277.52	58.70	1,363.08	0.03	-	-	0.97	39	
6408597	user1585	grp233	booster	2022-12-05 18:58	2022-12-05 19:37	39m	1	00:14:19	00:00:15	3.89	26.01	0.83	0.00	0.00	0.15	0.00	93.37	37.20	73.36	290.29	59.70	1,401.71	0.03	-	-	0.97	39	
6408596	user1585	grp233	booster	2022-12-05 18:58	2022-12-05 19:37	39m	1	00:14:19	00:00:15	3.79	26.00	0.69	0.00	0.00	0.15	0.00	93.31	36.26	73.32	287.34	59.88	1,379.23	0.03	-	-	0.95	39	
6408595	user1585	grp233	booster	2022-12-05 18:58	2022-12-05 19:37	39m	1	00:14:19	00:00:15	3.79	26.06	0.91	0.00	0.00	0.29	0.00	89.95	36.26	70.66	283.61	58.09	1,371.15	0.03	-	-	0.95	39	
6408594	user1585	grp233	booster	2022-12-05 18:58	2022-12-05 19:37	39m	1	00:14:19	00:00:15	3.77	25.10	0.85	0.00	0.00	0.29	0.00	90.98	36.26	71.37	289.76	59.07	1,371.15	0.03	-	-	0.94	39	
6408593	user1585	grp233	booster	2022-12-05 18:58	2022-12-05 19:37	39m	1	00:14:19	00:00:15	3.77	25.57	0.54	0.00	0.00	0.15	0.00	90.58	36.26	71.29	279.84	59.92	1,377.21	0.03	-	-	0.94	39	
6408543	user1594	grp222	booster	2022-12-05 18:21	2022-12-05 19:37	1h15m	1	00:14:19	00:00:15	4.85	135.61	9.93	0.00	0.22	2,672.47	0.01	88.01	21.75	68.00	249.54	56.75	1,306.97	0.08	-	-	1.00	76	
6408542	user1594	grp222	booster	2022-12-05 18:21	2022-12-05 19:37	1h15m	1	00:14:19	00:00:15	4.60	135.28	11.08	0.00	0.27	2,679.33	0.01	88.83	21.75	68.33	249.86	57.11	1,311.12	0.08	-	-	1.00	76	
6408541	user1594	grp222	booster	2022-12-05 18:19	2022-12-05 19:37	1h17m	1	00:14:19	00:00:15	4.89	134.76	3.54	0.00	0.32	2,662.06	0.01	90.71	22.09	69.52	270.78	58.91	1,329.04	0.06	-	-	1.00	78	
6408540	user1594	grp222	booster	2022-12-05 18:19	2022-12-05 19:37	1h17m	1	00:14:19	00:00:15	4.62	134.97	6.55	0.00	0.32	2,682.76	0.01	84.41	21.80	65.07	244.38	58.89	1,303.56	0.08	-	-	1.00	78	
6408525	user1859	grp379	booster	2022-12-05 18:30	2022-12-05 19:37	1h07m	32	00:14:19	00:00:15	4.01	19.14	6,415.17	2.17	0.00	7.98	0.00	29.19	3.23	5.88	88.19	46.17	1,094.14	0.00	-	-	0.03	67	
6408440	user2151	grp203	booster	2022-12-05 18:56	2022-12-05 19:23	27m	4	00:14:19	00:00:15	3.88	64.62	6,119.55	1.64	0.00	15.34	0.00	73.47	19.74	60.87	258.13	57.23	1,357.57	0.03	COMPLETED	-	0.24	27	
6408439	user2151	grp203	booster	2022-12-05 18:56	2022-12-05 19:23	27m	4	00:14:19	00:00:15	3.90	64.60	6,136.10	1.65	0.00	15.38	0.00	75.83	19.92	62.83	262.65	57.01	1,376.25	0.03	COMPLETED	-	0.24	27	
6408438	user2151	grp203	booster	2022-12-05 18:56	2022-12-05 19:23	27m	4	00:14:19	00:00:15	3.85	64.49	6,133.07	1.65	0.00	15.31	0.00	74.15	19.70	62.30	264.09	56.77	1,364.93	0.03	COMPLETED	-	0.24	27	
6408434	user1594	grp222	booster	2022-12-05 18:21	2022-12-05 19:37	1h15m	1	00:14:19	00:00:15	4.97	276.89	10.14	0.00	0.27	2,679.01	0.01	89.09	21.75	67.80	254.02	56.97	1,310.08	0.08	-	-	1.00	76	
6408433	user1069	grp209	booster	2022-12-05 18:21	2022-12-05 19:37	1h15m	1	00:14:19	00:00:15	3.96	18.49	8.34	0.00	39.41	35.76	0.00	38.15	1.39		90.60	46.46	1,366.43	0.01	-	-	0.99	76	
6408432	user1749	grp261	booster	2022-12-05 18:21	2022-12-05 19:37	1h15m	8	00:14:19	00:00:15	4.44	38.57	229.57	0.06	239.86	24.36	0.06	71.27	5.30	49.69	219.03	55.47	1,368.93	0.03	-	-	0.14	76	
6408418	user1785	grp217	booster	2022-12-05 18:21	2022-12-05 19:37	1h15m	70	00:14:19	00:00:15	3.49	142.75	3,562.81	1.11	1,719.99	61.79	1.24	48.67	26.99	46.39	186.56	52.56	1,169.81	0.14	-	-	0.01	76	
6408409	user1002	grp242	booster	2022-12-05 18:21	2022-12-05 19:37	1h15m	100	00:14:19	00:00:15	8.03	94.58	4,049.12	1.48	19.12	4,758.59	0.50	95.07	20.04	59.01	336.93	64.17	1,357.08	3.07	-	-	0.02	76	
6408400	user1059	grp240	booster	2022-12-05 18:21	2022-12-05 19:37	1h15m	4	00:14:19	00:00:15	3.97	81.35	469.65	0.12	0.04	1.97	0.02	92.78	22.07	17.06	279.04	61.64	1,401.82	0.01	-	-	0.25	76	
6408395	user1812	grp267	booster	2022-12-05 18:46	2022-12-05 19:37	51m	4	00:14:19	00:00:15	4.37	32.29	429.28	0.13	22.62	247.72	0.02	35.67	7.53	5.42	95.59	46.77	1,317.85	0.02	-	-	0.27	51	
6408386	user1694	grp267	booster	2022-12-05 18:21	2022-12-05 19:37	1h15m	80	00:14:19	00:00:15	3.63	101.72	722.86	0.20	312.26	485.06	0.00	18.91	25.61	13.43	92.57	46.55	1,105.84	0.13	-	-	0.01	76	
6408138	user1025	grp222	booster	2022-12-05 18:19	2022-12-05 19:37	1h18m	1	00:14:19	00:00:15	6.47	31.95	340.56	0.09	7.05	2,865.75	2.96	88.77	9.17	51.01	234.35	55.51	1,388.56	0.01	-	-	1.00	78	
6408033	user1003	grp203	booster	2022-12-05 18:46	2022-12-05 19:37	51m	24	00:14:19	00:00:15	3.99	143.84	9,794.63	2.84	3.17	115.55	0.02	44.06	28.55	18.59	135.47	49.34	1,323.58	0.01	-	-	0.04	51	



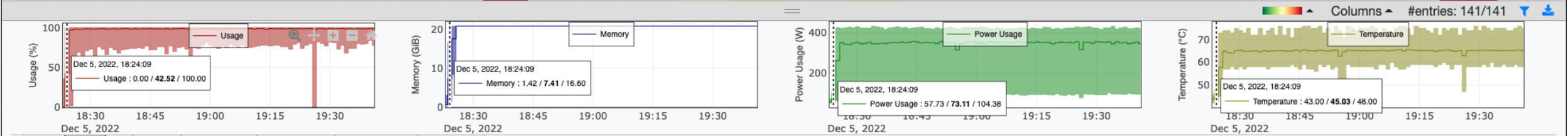
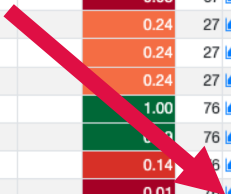
CPU GPU IC FS_all FS_project FS_scratch FS_fastdata FS_home Job: 6408409



CPUS	USER	Ugum	wait	Class	qname	start	r/V(NB)	on(NB/S)	rs(NB/S)	l(NB/S)	l(NB/S)	l(NB/S)	l(NB/S)
1984	user2151	0.3h of 1:00	1:00	booster	n04.p24.t00	16:24	0.0	0.0	0	0.00	3.69	4.14	
1984	user2151	0.2h of 1:00	1:00	booster	n04.p24.t00	16:30	0.0	0.0	0	0.00	3.86	4.15	
1984	user1046	1.4h of 24:00	24:00	booster	n04.p96.t00+14:22	+14:22	0.0	0.0	0	0.00	4.77	5.56	
1984	user1046	1.4h of 24:00	24:00	booster	n04.p96.t00+14:22	+14:22	0.0	0.0	0	0.00	4.61	5.37	
1984	user2151	0.4h of 1:00	1:00	booster	n04.p24.t00	16:22	0.0	0.0	0	0.00	3.97	4.19	
1984	user1585	0.3h of 24:00	24:00	booster	n04.p96.t00+15:24	+15:24	0.0	0.0	0	0.00	3.00	3.41	
1984	user1585	0.3h of 24:00	24:00	booster	n04.p96.t00+15:24	+15:24	0.0	0.0	0	0.00	2.96	3.24	
1984	user1046	1.4h of 24:00	24:00	booster	n04.p96.t00+14:22	+14:22	0.0	0.0	0	0.00	4.73	5.54	
1984	user2151	0.2h of 1:00	1:00	booster	n04.p24.t00	16:30	0.0	0.0	0	0.00	3.79	4.14	
1984	user1046	1.4h of 24:00	24:00	booster	n04.p96.t00+14:22	+14:22	0.0	0.0	0	0.00	4.51	5.26	
1984	user1585	0.3h of 24:00	24:00	booster	n04.p96.t00+15:24	+15:24	0.0	0.0	0	0.00	2.94	3.24	
1984	user2151	0.2h of 1:00	1:00	booster	n04.p24.t00	16:30	0.0	0.0	0	0.00	3.79	4.24	
1984	user2151	0.2h of 1:00	1:00	booster	n04.p24.t00	16:32	0.0	0.0	0	0.00	3.20	4.12	
1984	user2151	0.1h of 1:00	1:00	booster	n04.p24.t00	16:36	0.0	0.0	0	0.00	3.31	4.07	
1984	user2151	0.2h of 1:00	1:00	booster	n04.p24.t00	16:30	0.0	0.0	0	0.00	3.81	4.17	
1984	user2151	0.2h of 1:00	1:00	booster	n04.p24.t00	16:32	0.0	0.0	0	0.00	4.89	7.39	
1984	user1585	0.2h of 24:00	24:00	booster	n04.p96.t00+15:30	+15:30	0.0	0.0	0	0.00	3.05	3.73	
1984	user2151	0.2h of 1:00	1:00	booster	n04.p24.t00	16:30	0.0	0.0	0	0.00	3.80	4.19	
1984	user1585	0.3h of 24:00	24:00	booster	n04.p96.t00+15:24	+15:24	0.0	0.0	0	0.00	3.01	3.17	
1984	user1585	0.3h of 24:00	24:00	booster	n04.p96.t00+15:24	+15:24	0.0	0.0	0	0.00	2.87	3.19	
1984	user1585	0.3h of 24:00	24:00	booster	n04.p96.t00+15:24	+15:24	0.0	0.0	0	0.00	2.95	3.38	
1984	user2151	0.2h of 1:00	1:00	booster	n04.p24.t00	16:32	0.0	0.0	0	0.00	4.83	7.43	
1984	user1046	1.4h of 24:00	24:00	booster	n04.p96.t00+14:22	+14:22	0.0	0.0	0	0.00	4.54	5.34	
1984	user2151	0.4h of 1:00	1:00	booster	n04.p24.t00	16:22	0.0	0.0	0	0.00	3.82	4.08	
1984	user2151	0.2h of 1:00	1:00	booster	n04.p24.t00	16:30	0.0	0.0	0	0.00	3.79	4.07	
1984	user2151	0.2h of 1:00	1:00	booster	n04.p24.t00	16:30	0.0	0.0	0	0.00	3.81	4.17	
1984	user1046	1.4h of 24:00	24:00	booster	n04.p96.t00+14:22	+14:22	0.0	0.0	0	0.00	4.50	5.21	
1984	user1585	0.3h of 24:00	24:00	booster	n04.p96.t00+15:24	+15:24	0.0	0.0	0	0.00	2.92	3.30	
1984	user2151	0.2h of 1:00	1:00	booster	n04.p24.t00	16:32	0.0	0.0	0	0.00	3.23	4.11	
1984	user2151	0.2h of 1:00	1:00	booster	n04.p24.t00	16:30	0.0	0.0	0	0.00	3.79	4.11	
1488	user1040	1.4h of 12:00	12:00	booster	n03.p04.t00+02:22	+02:22	0.0	0.0	0	0.00	52.17	75.83	
11904	user1003	0.3h of 6:00	6:00	booster	n24.p96.t00	21:24	0.0	0.0	0	0.00	3.82	4.83	
11904	user1003	0.7h of 6:00	6:00	booster	n24.p96.t00	21:00	0.0	0.0	0	0.00	3.86	4.81	
11904	user1003	0.7h of 6:00	6:00	booster	n24.p96.t00	21:00	0.0	0.0	0	0.00	3.86	4.54	
11904	user1003	0.3h of 6:00	6:00	booster	n24.p96.t00	21:24	0.0	0.0	0	0.00	3.66	4.37	
11904	user1003	0.7h of 6:00	6:00	booster	n24.p96.t00	21:02	0.0	0.0	0	0.00	3.86	4.37	

Last Database update: 22/12/06-15:42:29 (took 56.34 sec since previous update)

jobid	owner	project	queue	starttime	endtime/lastupd	runtime	#nds	dt_first	dt_last	Load/Nd	Mem/Nd	IC MIB/Nd	IC Pck/Nd	FS_GB_Wr	FS_GB_Rd	FS_Moc_Rd	GPUUseAvg	GPUmemAvg	GPUmemRateAvg	GPUpowAvg	GPUtempAvg	GPUscikAvg	GPUclkrAvg	state	#err	#errnds	Load_score	#spl
6408006	user1080	grp233	booster	2022-12-05 19:24	2022-12-05 19:37	13m	1	00:12:18	00:00:15	3.37	26.56	2.23	0.00	0.00	0.15	0.00	86.00	34.38	67.00	277.17	56.55	1,317.09	0.08	-	-	0.84	13	
6408605	user1585	grp233	booster	2022-12-05 19:24	2022-12-05 19:37	13m	1	00:12:18	00:00:15	3.31	26.51	2.23	0.00	0.00	0.15	0.00	86.31	34.38	66.27	266.15	58.06	1,317.69	0.08	-	-	0.83	13	
6408604	user1660	grp220	booster	2022-12-05 19:18	2022-12-05 19:37	19m	136	00:14:19	00:00:15	3.69	97.39	895.23	0.40	1,056.16	786.77	0.06	38.88	30.33	24.74	135.82	49.87	1,323.94	0.04	-	-	0.01	19	
6408603	user1585	grp233	booster	2022-12-05 19:12	2022-12-05 19:37	25m	1	00:14:19	00:00:15	3.88	255.25	1.16	0.00	0.00	0.15	0.00	87.29	35.74	68.96	288.67	59.58	1,349.40	0.04	-	-	0.97	25	
6408600	user1585	grp233	booster	2022-12-05 18:58	2022-12-05 19:37	39m	1	00:14:19	00:00:15	3.99	25.90	0.83	0.00	0.00	0.15	0.00	91.65	36.26	72.32	280.36	58.51	1,379.23	0.03	-	-	1.00	39	
6408599	user1585	grp233	booster	2022-12-05 18:58	2022-12-05 19:37	39m	1	00:14:19	00:00:15	3.87	25.95	0.69	0.00	0.00	0.15	0.00	88.08	36.26	69.21	288.50	59.21	1,363.08	0.03	-	-	0.97	39	
6408598	user1585	grp233	booster	2022-12-05 18:58	2022-12-05 19:37	39m	1	00:14:19	00:00:15	3.89	26.05	0.81	0.00	0.00	0.15	0.00	87.82	36.26	69.49	277.52	58.70	1,363.08	0.03	-	-	0.97	39	
6408597	user1585	grp233	booster	2022-12-05 18:58	2022-12-05 19:37	39m	1	00:14:19	00:00:15	3.89	26.01	0.83	0.00	0.00	0.15	0.00	93.37	37.20	73.36	290.29	59.70	1,401.71	0.03	-	-	0.97	39	
6408596	user1585	grp233	booster	2022-12-05 18:58	2022-12-05 19:37	39m	1	00:14:19	00:00:15	3.79	26.00	0.69	0.00	0.00	0.15	0.00	93.31	36.26	73.32	287.34	59.88	1,379.23	0.03	-	-	0.95	39	
6408595	user1585	grp233	booster	2022-12-05 18:58	2022-12-05 19:37	39m	1	00:14:19	00:00:15	3.79	26.06	0.91	0.00	0.00	0.29	0.00	89.95	36.26	70.66	283.61	58.09	1,371.15	0.03	-	-	0.95	39	
6408594	user1585	grp233	booster	2022-12-05 18:58	2022-12-05 19:37	39m	1	00:14:19	00:00:15	3.77	25.10	0.85	0.00	0.00	0.29	0.00	90.98	36.26	71.37	289.76	59.07	1,371.15	0.03	-	-	0.94	39	
6408593	user1585	grp233	booster	2022-12-05 18:58	2022-12-05 19:37	39m	1	00:14:19	00:00:15	3.77	25.57	0.54	0.00	0.00	0.15	0.00	90.58	36.26	71.29	279.84	59.92	1,377.21	0.03	-	-	0.94	39	
6408543	user1594	grp222	booster	2022-12-05 18:21	2022-12-05 19:37	1h15m	1	00:14:19	00:00:15	4.85	135.61	9.93	0.00	0.22	2,672.47	0.01	88.01	21.75	68.00	249.54	56.75	1,306.97	0.08	-	-	1.00	76	
6408542	user1594	grp222	booster	2022-12-05 18:21	2022-12-05 19:37	1h15m	1	00:14:19	00:00:15	4.60	135.28	11.08	0.00	0.27	2,679.33	0.01	88.83	21.75	68.33	249.86	57.11	1,311.12	0.08	-	-	1.00	76	
6408541	user1594	grp222	booster	2022-12-05 18:19	2022-12-05 19:37	1h17m	1	00:14:19	00:00:15	4.89	134.76	3.54	0.00	0.32	2,662.06	0.01	90.71	22.09	69.52	270.78	58.91	1,329.04	0.06	-	-	1.00	78	
6408540	user1594	grp222	booster	2022-12-05 18:19	2022-12-05 19:37	1h17m	1	00:14:19	00:00:15	4.62	134.97	6.55	0.00	0.32	2,682.76	0.01	84.41	21.80	65.07	244.38	58.89	1,303.56	0.08	-	-	1.00	78	
6408525	user1859	grp379	booster	2022-12-05 18:30	2022-12-05 19:37	1h07m	32	00:14:19	00:00:15	4.01	19.14	6,415.17	2.17	0.00	7.98	0.00	29.19	3.23	5.88	88.19	46.17	1,094.14	0.00	-	-	0.03	67	
6408440	user2151	grp203	booster	2022-12-05 18:56	2022-12-05 19:23	27m	4	00:14:19	00:00:15	3.88	64.62	6,119.55	1.64	0.00	15.34	0.00	73.47	19.74	60.87	258.13	57.23	1,357.57	0.03	COMPLETED	-	0.24	27	
6408439	user2151	grp203	booster	2022-12-05 18:56	2022-12-05 19:23	27m	4	00:14:19	00:00:15	3.90	64.60	6,136.10	1.65	0.00	15.38	0.00	75.83	19.92	62.83	262.65	57.01	1,376.25	0.03	COMPLETED	-	0.24	27	
6408438	user2151	grp203	booster	2022-12-05 18:56	2022-12-05 19:23	27m	4	00:14:19	00:00:15	3.85	64.49	6,133.07	1.65	0.00	15.31	0.00	74.15	19.70	62.30	264.09	56.77	1,364.93	0.03	COMPLETED	-	0.24	27	
6408434	user1594	grp222	booster	2022-12-05 18:21	2022-12-05 19:37	1h15m	1	00:14:19	00:00:15	4.97	276.89	10.14	0.00	0.27	2,679.01	0.01	89.09	21.75	67.80	254.02	56.97	1,310.08	0.08	-	-	1.00	76	
6408433	user1069	grp209	booster	2022-12-05 18:21	2022-12-05 19:37	1h15m	1	00:14:19	00:00:15	3.96	18.49	8.34	0.00	39.41	35.76	0.00	38.15	1.39		90.60	46.46	1,366.43	0.01	-	-	0.24	76	
6408432	user1749	grp261	booster	2022-12-05 18:21	2022-12-05 19:37	1h15m	8	00:14:19	00:00:15	4.44	38.57	229.57	0.06	239.86	24.36	0.06	71.27	5.30	49.69	219.03	55.47	1,368.93	0.03	-	-	0.14	76	
6408418	user1785	grp217	booster	2022-12-05 18:21	2022-12-05 19:37	1h15m	70	00:14:19	00:00:15	3.49	142.75	3,562.81	1.11	1,719.99	61.79	1.24	48.67	26.99	46.39	186.56	52.56	1,169.81	0.14	-	-	0.01	76	
6408409	user1002	grp242	booster	2022-12-05 18:21	2022-12-05 19:37	1h15m	100	00:14:19	00:00:15	8.03	94.58	4,049.12	1.48	19.12	4,758.59	0.50	95.07	20.04	59.01	336.93	64.17	1,357.08	3.07	-	-	0.02	76	
6408400	user1059	grp240	booster	2022-12-05 18:21	2022-12-05 19:37	1h15m	4	00:14:19	00:00:15	3.97	81.35	469.65	0.12	0.04	1.97	0.02	92.78	22.07	17.06	279.04	61.64	1,401.82	0.01	-	-	0.25	76	
6408395	user1812	grp267	booster	2022-12-05 18:46	2022-12-05 19:37	51m	4	00:14:19	00:00:15	4.37	32.29	429.28	0.13	22.62	247.72	0.02	35.67	7.53	5.42	95.59	46.77	1,317.85	0.02	-	-	0.27	51	
6408386	user1694	grp267	booster	2022-12-05 18:21	2022-12-05 19:37	1h15m	80	00:14:19	00:00:15	3.63	101.72	722.86	0.20	312.26	485.06	0.00	18.91	25.61	13.43	92.57	46.55	1,105.84	0.13	-	-	0.01	76	
6408138	user1025	grp222	booster	2022-12-05 18:19	2022-12-05 19:37	1h18m	1	00:14:19	00:00:15	6.47	31.95	340.56	0.09	7.05	2,865.75	2.96	88.77	9.17	51.01	234.35	55.51	1,388.56	0.01	-	-	1.00	78	
6408033	user1003	grp203	booster	2022-12-05 18:46	2022-12-05 19:37	51m	24	00:14:19	00:00:15	3.99	143.84	9,794.63	2.84	3.17	115.55	0.02	44.06	28.55	18.59	135.47	49.34	1,323.58	0.01	-	-	0.04	51	

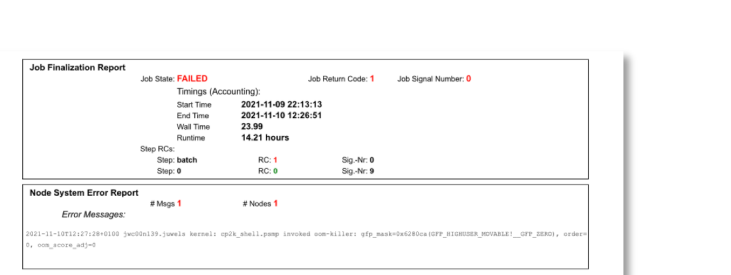
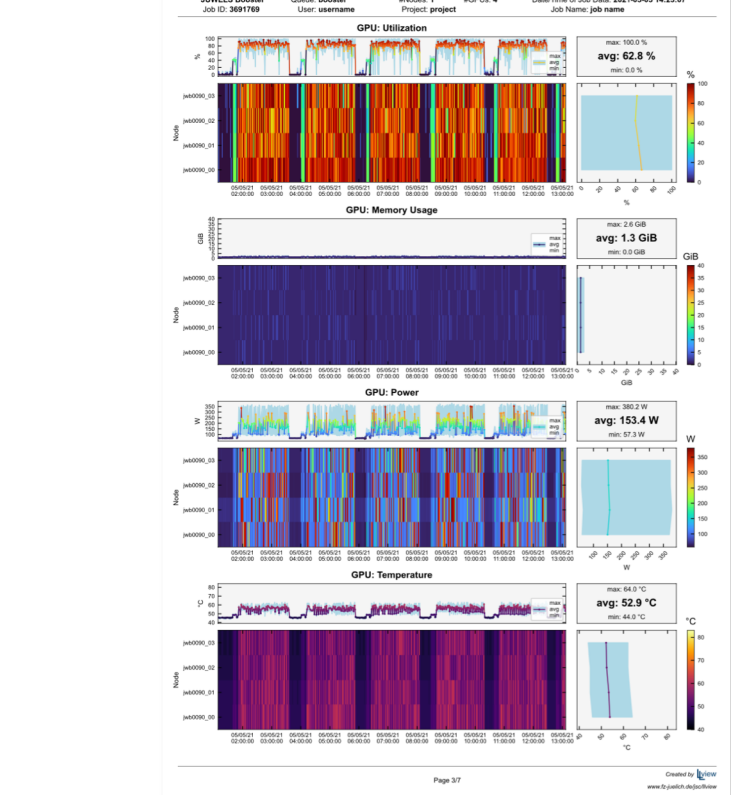
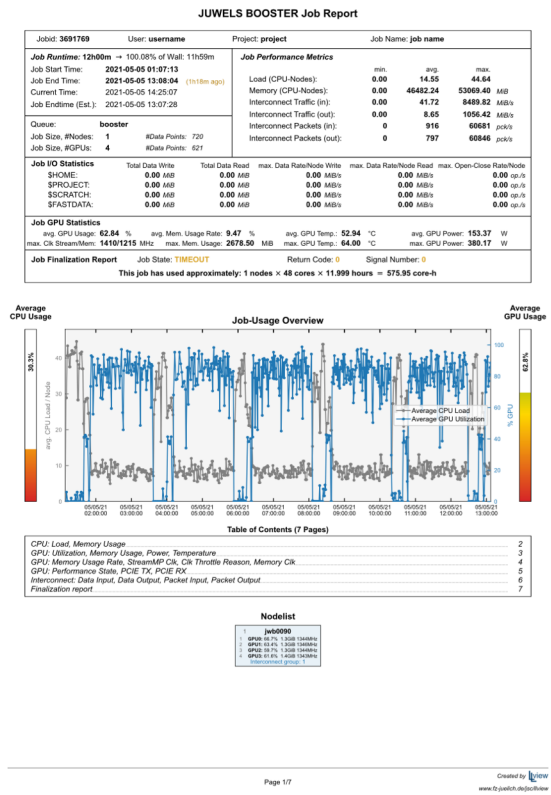


CPU GPU IC FS_all FS_project FS_scratch FS_fastdata FS_home Job: 6408409

DETAILED REPORTS

HTML and PDF

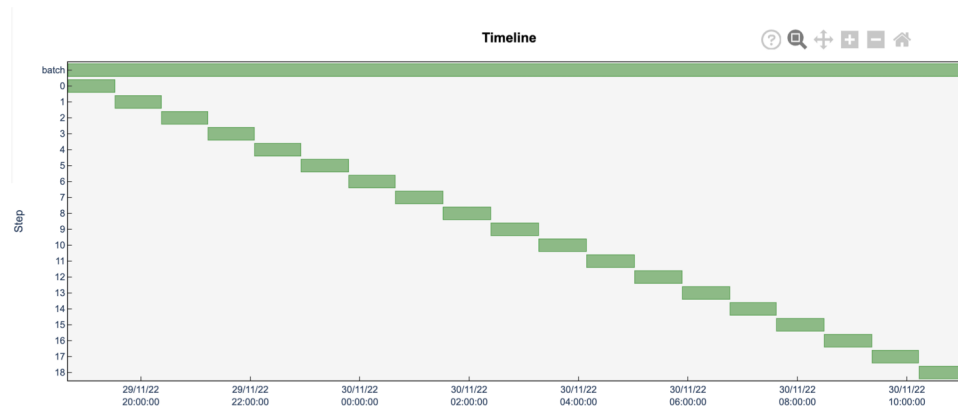
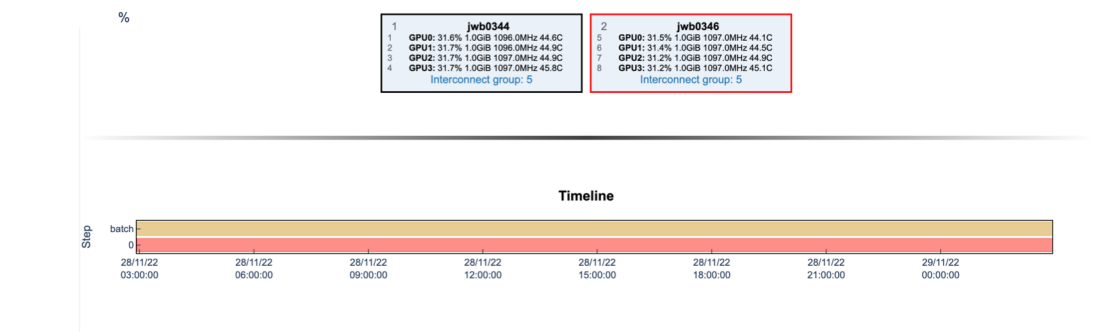
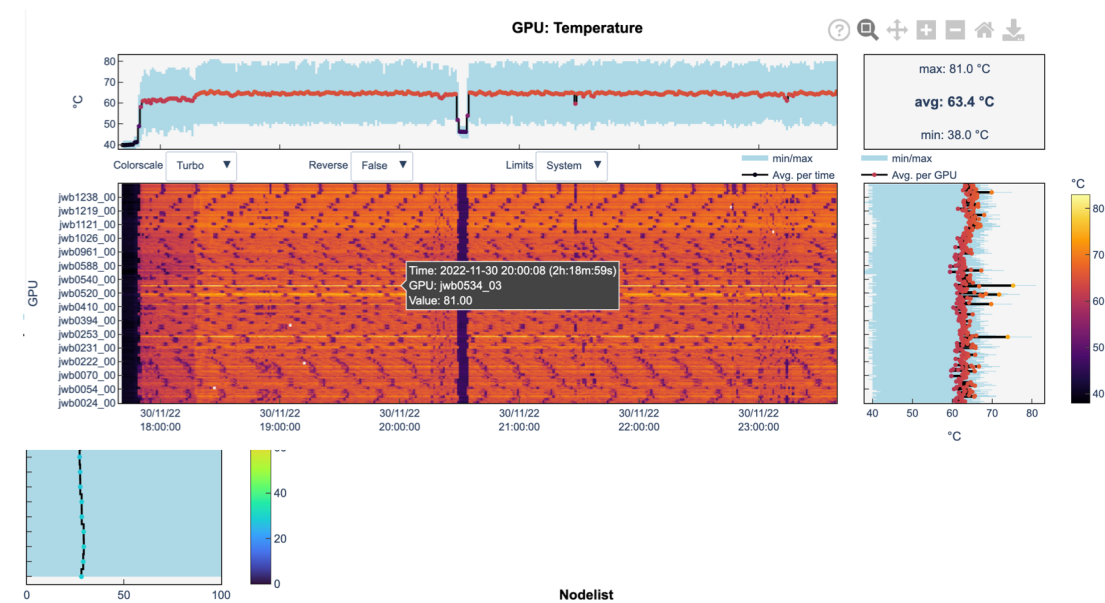
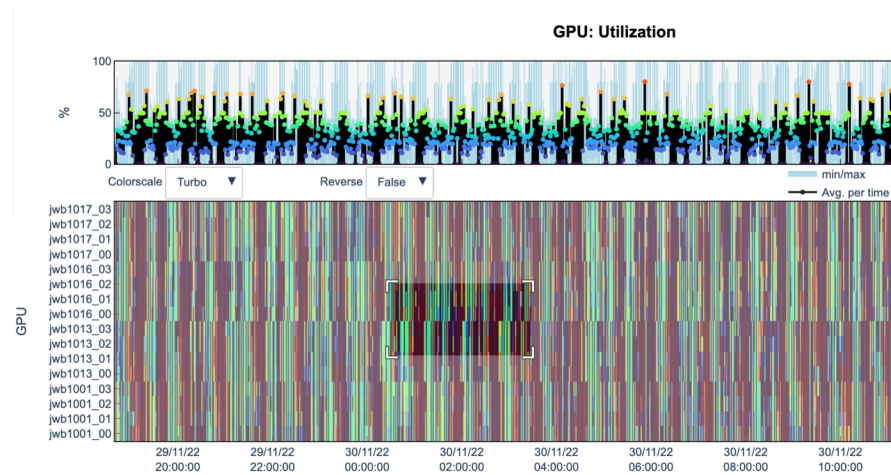
- Basic job information
- General average usage
- Computing time spent/estimation
- Status
- CPU
 - Load, Memory usage
- GPU
 - Usage, Power, Temperature, ...
- I/O
- Network traffic
- Nodelist (with interconnected cells)
- Error messages
- Timeline



DETAILED REPORTS

HTML and PDF

- Dynamic:
- Hover
- Zoom
- Pan
- Synchronize
- Errors



System Error Report

Msgs: 1 # Nodes: 1

Error Messages:

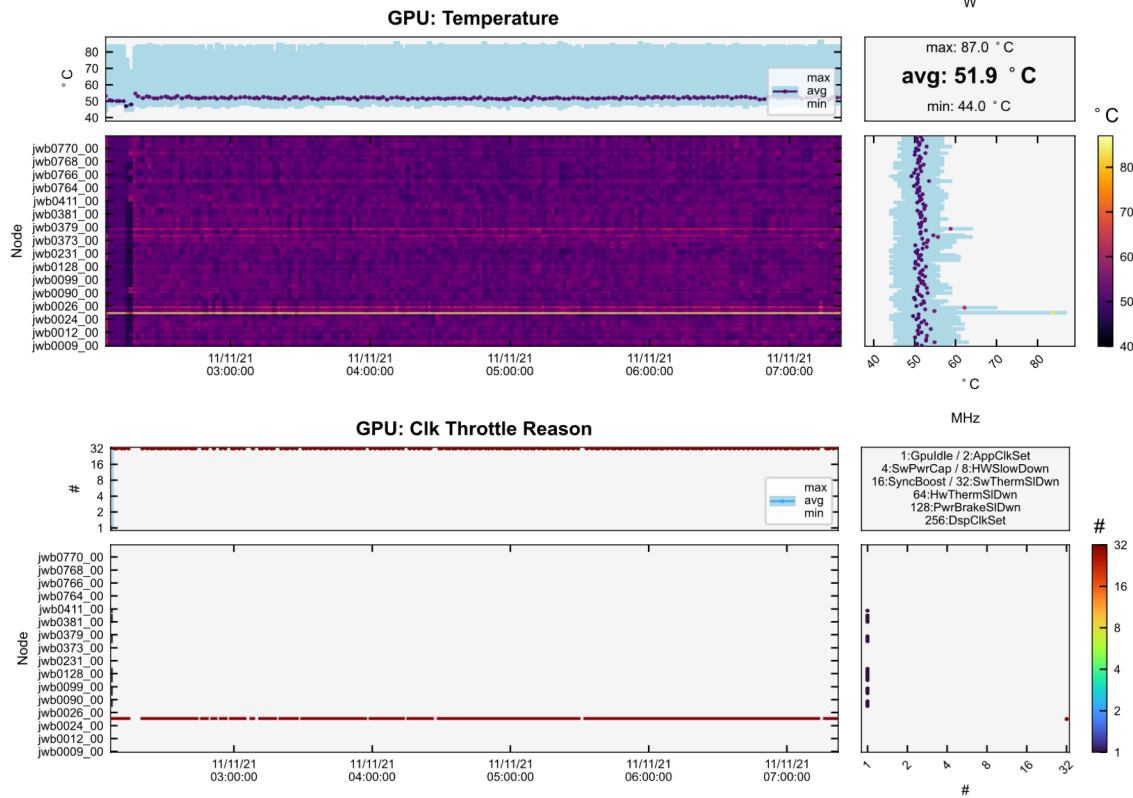
```
2022-11-28T11:31:43+0100 jwb0346.juwels kernel: rpc_conn_mgr[4700]: segfault at 8 ip 00007f57e38a76fa sp 00007f57cb7f9cf0 error 4 in libim_common.so.0.0.0[7f57e382f000+17f000]
```

DEMO

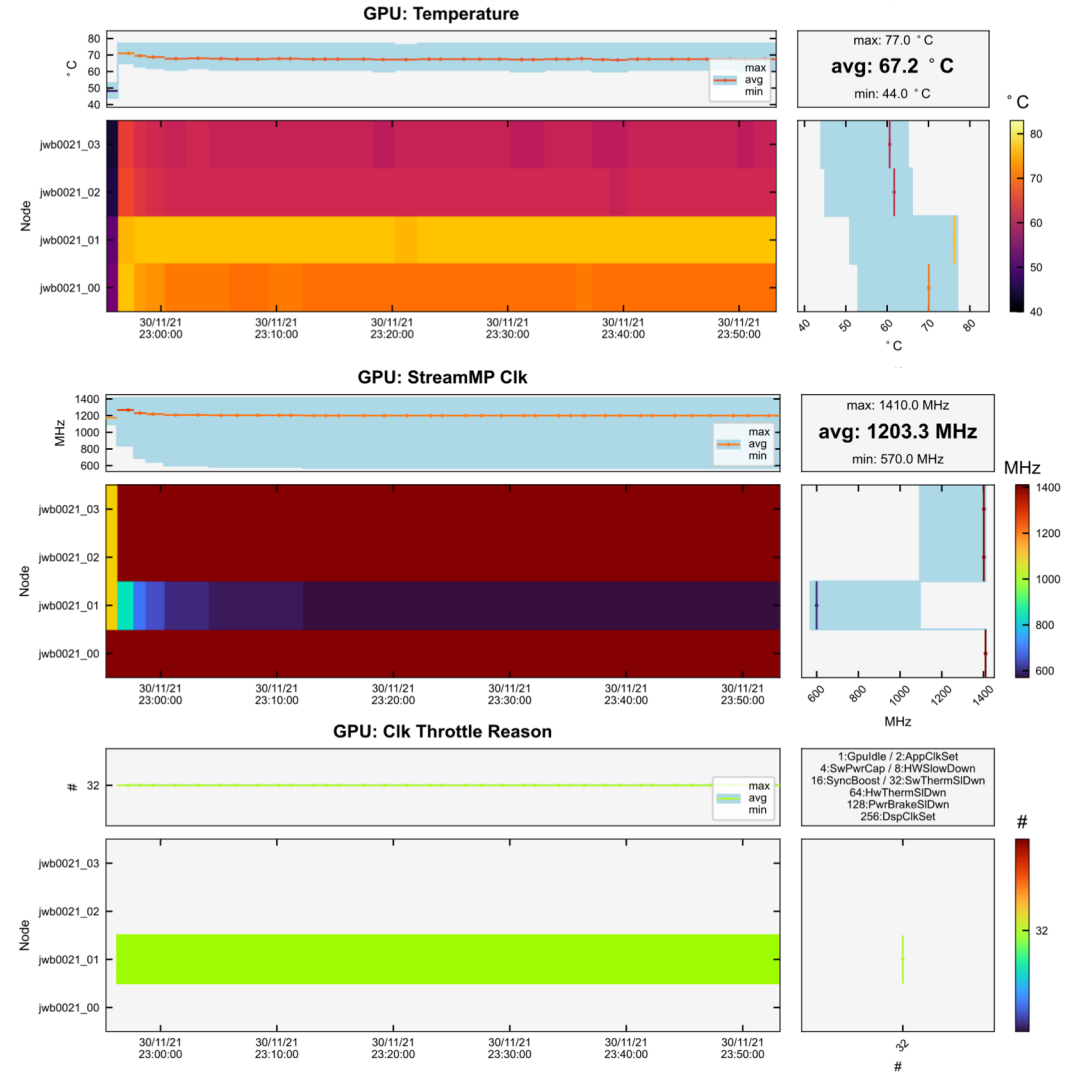
EXAMPLES

GPU Throttling

128 GPUs:



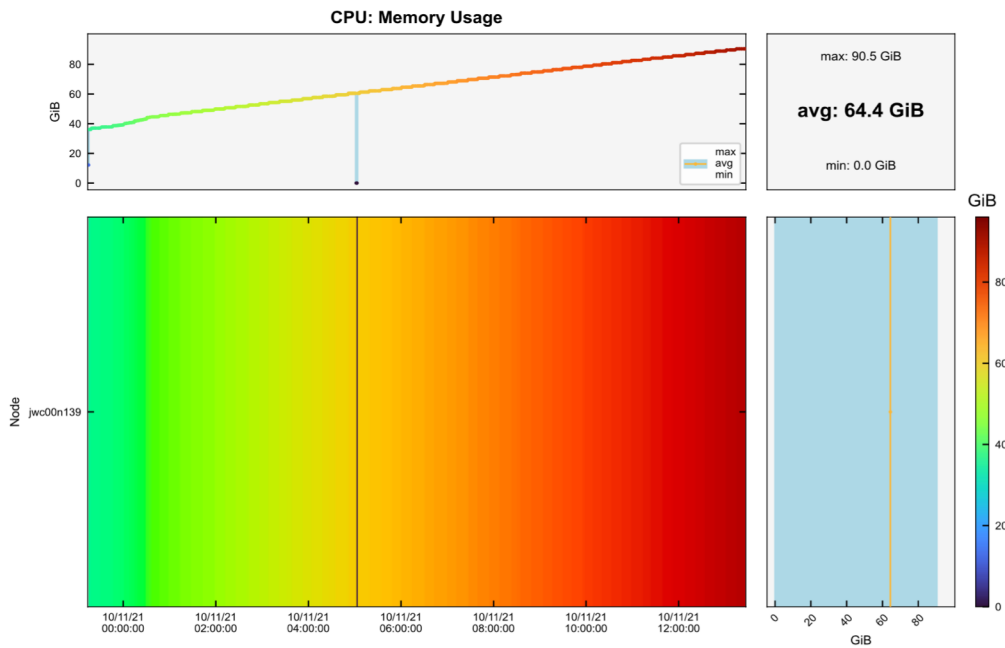
4 GPUs:



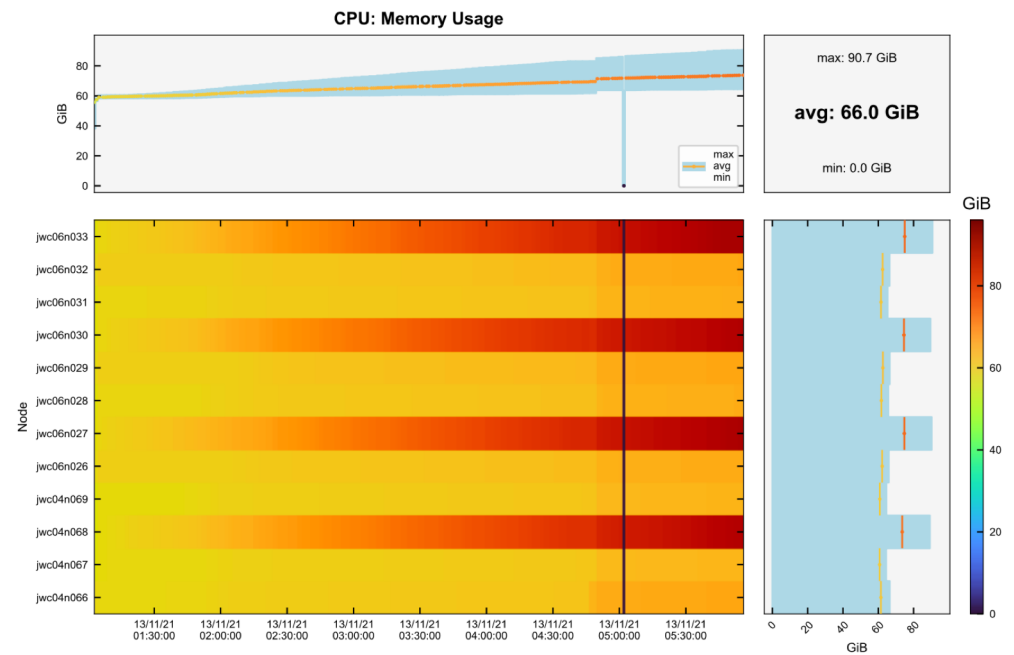
EXAMPLES

Out-of-memory (memory leak?)

Job crashed after 14h:



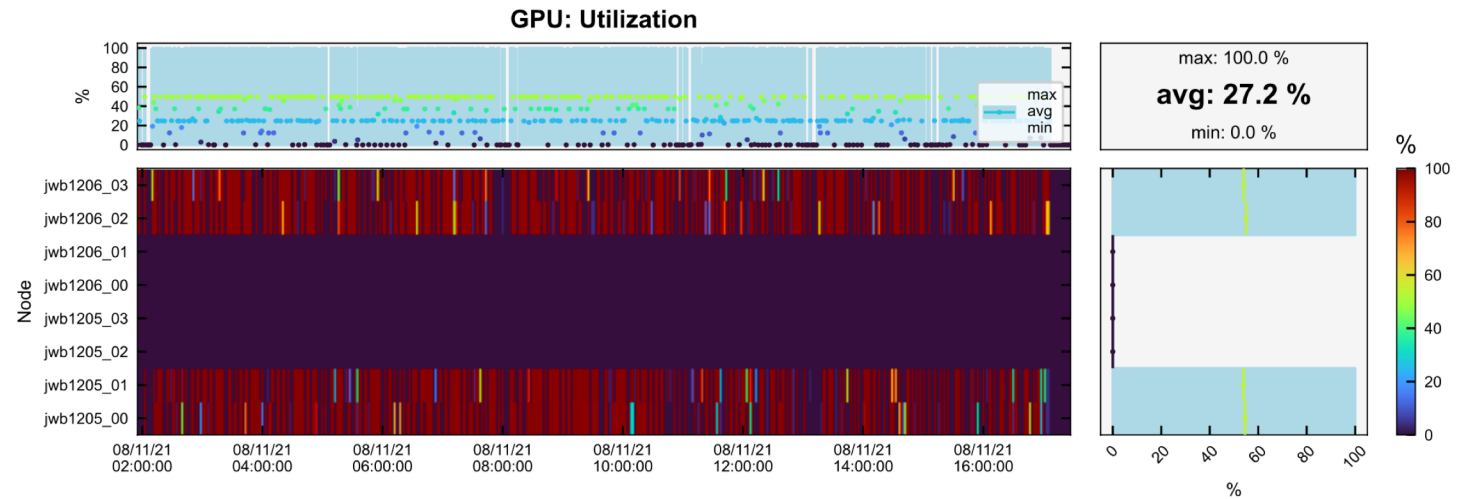
Multi-node:



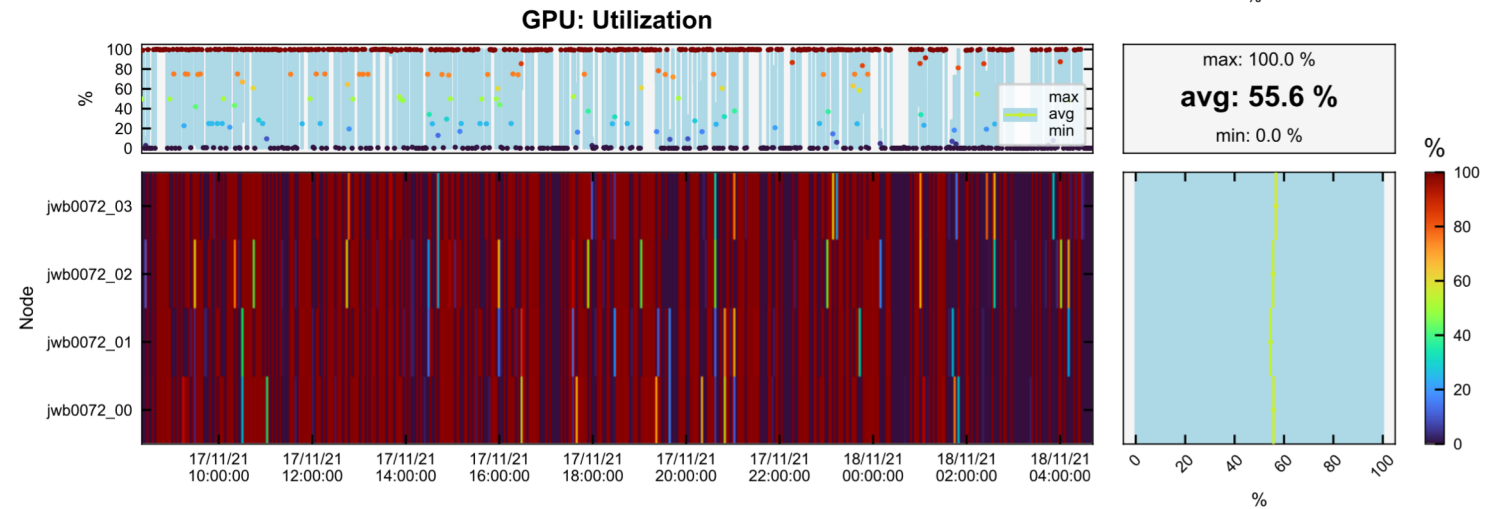
EXAMPLES

Unused GPUs

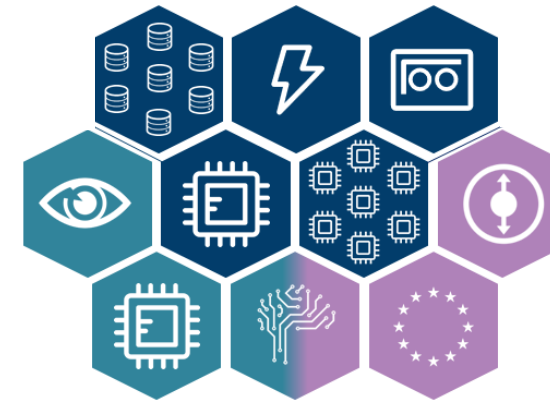
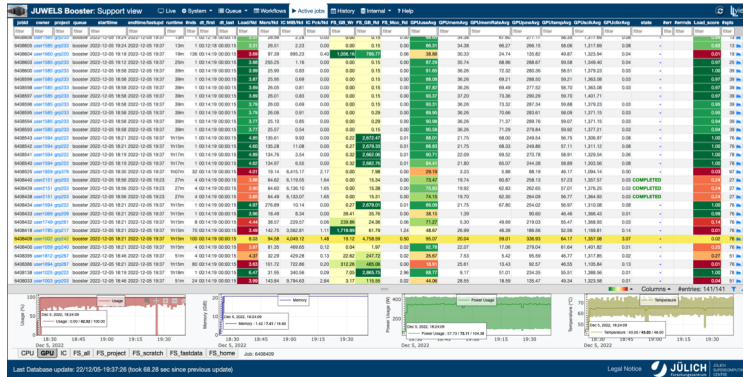
2 nodes (8 GPUs) using only 2 GPUs each



1 nodes using all 4 GPUs



FUTURE PLANS



present
redesigned and
restructured version

- New metrics and data sources
- Faster updates (preparation for JUPITER)
- Workflow and project reports
- Overall usage of shared resources
- ...

OUTLOOK AND COLLABORATION OPPORTUNITIES

- EU-Projects:

- New inputs/metrics
- Modular approach
- Extensions when other metrics are available (e.g., user-initialized profiles)



- Open to suggestions and requests (sources, metrics and presentation)
- Exchange experience:
 - analysing and presenting report data
 - how to use monitoring in daily HPC support activities

- Website: [llview.fz-juelich.de](http://view.fz-juelich.de)

Contact: llview.jsc@fz-juelich.de

Thank you!