IDAC PL STATUS

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Light IDAC - Installation Site

- Poznań Supercomputing and Networking Center (PSNC) in Poznań (Poland)
- Light IDAC planned as a part of a larger system KMD3 / PraceLab2 - in total:
  - 25PB storage
  - ~ 6k CPU physical cores system + some GPU
- KMD3 (National Data Repository)/PraceLab2 are run by consortium of Polish supercomputing centres (including NCBJ)

Specification of Light-IDAC (POL-NCB S1)

Specification of light IDAC-PL

- 500 CPU cores
    - 20-30 cores for system/db
    - 470-480 cores for users
- 0.5 TB of storage space for Object Light Catalogue
- 4.5 TB for catalogues
- 2 x 0.25 FTE support stuff
- proposed center could serve 500-1000 users in total and 250 users using center concurrently

As specified in guidelines: https://rtn-003.lsst.io/

Will be ready by the end of 2024

Rack Layout Spreadsheet

	C13	C19	Weight		Rack 1		Power	In-row		C13	C19	Weight		Rack 2		Power		C13	C19	Weight		Rack 3		Power	In-row		C13	C19	Weight		Rack 4		Power		Rack 5		Power	In-row		C13	C19	Weight		Rack 6		Power

Rack 1
	C13	C19	Weight	#	Item	Power
3	2		13.0 kg	47	Leaf backend CE8851	0.97 kW
4	2		13.0 kg	46	Leaf backend CE8851	0.97 kW
5				45		
6				44		
				43–34	Project Data: HDD node Pacific 9550	
17	4		164.0 kg	33		2.5 kW
				32–29	Project Data: HDD node Pacific 9550	
22	4		164.0 kg	28		2.5 kW
				27–23	Project Data: HDD node Pacific 9550	
28	4		164.0 kg	22		2.5 kW
				20–17	Project Data: HDD node Pacific 9550	
33	4		164.0 kg	17		2.5 kW
				16–11	Project Data: HDD node Pacific 9550	
39	4		164.0 kg	11		2.5 kW
				10–6	Project Data: HDD node Pacific 9550	
44	4		164.0 kg	6		2.5 kW
50			100.0 kg			

Rack 2
	C13	C19	Weight	#	Item	Power
3	2		8.0 kg	47	IPMI CE5882	0.13 kW
4	2		8.0 kg	46	SSH CE5882	0.13 kW
5				45		
6	2		67.5 kg	44	iMaster NCE 2288X V5	0.94 kW
8	2		67.5 kg	42	iMaster NCE 2288X V5	0.94 kW
10	2		67.5 kg	40	iMaster NCE 2288X V5	0.94 kW
12				38	Project Data: SSD node Pacific 9550	
16	4		115.0 kg	39		3.5 kW
22	2		40.23 kg	28		
24	2		40.23 kg	26		
26	2		40.23 kg	24		
28	2		40.23 kg	22	NVMe server 2288H V0	0.75 kW
30				20	Ceph server 2288H V0	0.75 kW
31				19		
32				18	Ceph server 2288H V0	0.75 kW
34	2		08.44 kg	16	FAT server 5288 V6	0.94 kW
38	2		08.44 kg	12	FAT server 5288 V6	0.94 kW
42	2		08.44 kg	8	FAT server 5288 V6	0.94 kW
46	2		08.44 kg	4	FAT server 5288 V6	0.94 kW
50			100.0 kg			

Rack 3
	C13	C19	Weight	#	Item	Power
3	2		13.0 kg	47	Leaf Frontend CE8851	0.97 kW
4	2		13.0 kg	46	Leaf backend CE8851	0.97 kW
6	2		8.0 kg	44	SSH CE5882	0.13 kW
10	2		30.18 kg	28		
12	2		30.18 kg	28	Service server 2288H V0	0.66 kW
14	2		30.18 kg	28	Service server 2288H V0	0.66 kW
16	2		32.55 kg	30	Service server 2288H V0	0.66 kW
18	2		32.55 kg	30	NVMe server 2288H V0	0.75 kW
20	2		32.55 kg	30	NVMe server 2288H V0	0.75 kW
22	2		40.23 kg	28	Ceph server 2288H V0	0.75 kW
24	2		40.23 kg	26	Ceph server 2288H V0	0.75 kW
26	2		40.23 kg	24	Ceph server 2288H V0	0.75 kW
28	2		40.23 kg	22	Ceph server 2288H V0	0.75 kW
30	2		08.44 kg	20	FAT server 5288 V6	0.94 kW
34	2		08.44 kg	16	FAT server 5288 V6	0.94 kW
38	2		08.44 kg	12	FAT server 5288 V6	0.94 kW
42	2		08.44 kg	8	FAT server 5288 V6	0.94 kW
46	2		08.44 kg	4	FAT server 5288 V6	0.94 kW
50			100.0 kg			

Rack 4
	C13	C19	Weight	#	Item	Power
3	2		13.0 kg	47	Leaf Frontend CE8851	0.97 kW
4	2		13.0 kg	46	Leaf backend CE8851	0.97 kW
6	2		8.0 kg	44	SSH CE5882	0.13 kW
12	2		30.18 kg	28	Service server 2288H V0	0.66 kW
14	2		30.18 kg	28	Service server 2288H V0	0.66 kW
16	2		32.55 kg	30	Service server 2288H V0	0.66 kW
18	2		32.55 kg	30	NVMe server 2288H V0	0.75 kW
20	2		32.55 kg	30	NVMe server 2288H V0	0.75 kW
22	2		40.23 kg	28	Ceph server 2288H V0	0.75 kW
24	2		40.23 kg	26	Ceph server 2288H V0	0.75 kW
26	2		40.23 kg	24	Ceph server 2288H V0	0.75 kW
28	2		40.23 kg	22	Ceph server 2288H V0	0.75 kW
30	2		08.44 kg	20	FAT server 5288 V6	0.94 kW
34	2		08.44 kg	16	FAT server 5288 V6	0.94 kW
38	2		08.44 kg	12	FAT server 5288 V6	0.94 kW
42	2		08.44 kg	8	FAT server 5288 V6	0.94 kW
46	2		08.44 kg	4	FAT server 5288 V6	0.94 kW
50			100.0 kg			

Rack 5
	C13	C19	Weight	#	Item	Power
3	2		8.0 kg	47	IPMI CE5882	0.13 kW
4	2		8.0 kg	46	SSH CE5882	0.13 kW
6	2		8.0 kg	44	SSH CE5882	0.13 kW
10	2		30.18 kg	28		
12	2		30.18 kg	28	Service server 2288H V0	0.66 kW
14	2		30.18 kg	28	Service server 2288H V0	0.66 kW
16	2		32.55 kg	30	Service server 2288H V0	0.66 kW
18	2		32.55 kg	30	NVMe server 2288H V0	0.75 kW
20	2		32.55 kg	30	NVMe server 2288H V0	0.75 kW
22	2		40.23 kg	28	Ceph server 2288H V0	0.75 kW
24	2		40.23 kg	26	Ceph server 2288H V0	0.75 kW
26	2		40.23 kg	24	Ceph server 2288H V0	0.75 kW
28	2		40.23 kg	22	Ceph server 2288H V0	0.75 kW
30				20	FAT server 5288 V6	0.94 kW
34				16	FAT server 5288 V6	0.94 kW
38				12	FAT server 5288 V6	0.94 kW
42				8	FAT server 5288 V6	0.94 kW
46				4	FAT server 5288 V6	0.94 kW
50			100.0 kg			

Rack 6
	C13	C19	Weight	#	Item	Power
3	2		8.0 kg	47	SSH CE5882	0.13 kW
4				46		
6				20		
12	2			38	Service server 2288H V0	0.66 kW
14				36	Service server 2288H V0	0.66 kW
16				34	Service server 2288H V0	0.66 kW
18	2		30.18 kg	32	NVMe server 2288H V0	0.75 kW
20	2		30.18 kg	30	NVMe server 2288H V0	0.75 kW
22	2		30.18 kg	28	Ceph server 2288H V0	0.75 kW
24	2		32.55 kg	30	Ceph server 2288H V0	0.75 kW
26	2		32.55 kg	23	Ceph server 2288H V0	0.75 kW
28	2		32.55 kg	22	Ceph server 2288H V0	0.75 kW
30	2		40.23 kg	20	FAT server 5288 V6	0.94 kW
32	2		40.23 kg	18		
34	2		08.44 kg	16	FAT server 5288 V6	0.94 kW
38	2		08.44 kg	12	FAT server 5288 V6	0.94 kW
42	2		08.44 kg	8	FAT server 5288 V6	0.94 kW
46	2		08.44 kg	4	FAT server 5288 V6	0.94 kW
50			100.0 kg			

Summary

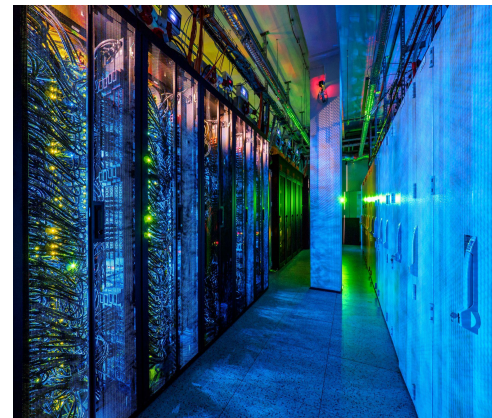|	Rack 1	Rack 2	Rack 3	Rack 4	Rack 5	Rack 6
Power	16.95 kW	12.6 kW	13.26 kW	13.26 kW	11.45 kW	11.32 kW
Weight	1170.0 kg	990.62 kg	883.3 kg	883.3 kg	807.3 kg	710.41 kg
C13	28	32	34	34	32	32
C19	0	0	0	0	0	0

In-row Cooling (between racks)

Specification of Light-IDAC (POL-NCB S1) +
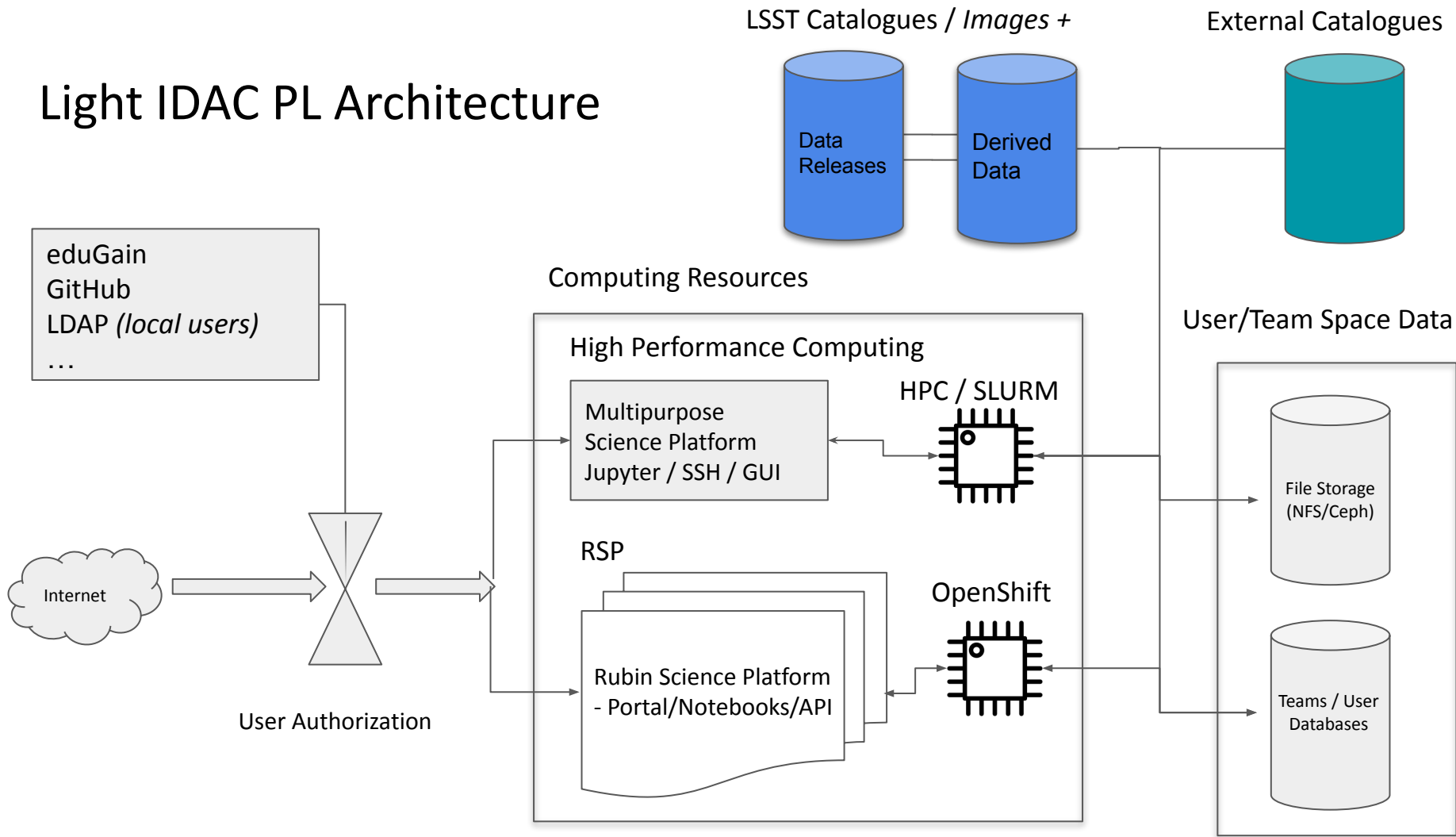
Specification of Light IDAC-PL +

- present plan: storage of (lite) catalog data
- new present-day needs: images
  (at least co-adds)

Under consideration @'23 => Must have @'24+

- additional storage
- access to GPUs for ML
- access to more CPUs
- → funding project for extra storage and
  GPU submitted (for now out of scope of
  the Light IDAC - an addition)

Light IDAC PL Architecture

LSST Catalogues / *Images +*

Data Releases

Derived Data

External Catalogues

eduGain
GitHub
LDAP *(local users)*
…

Computing Resources

User/Team Space Data

High Performance Computing

Multipurpose Science Platform Jupyter / SSH / GUI

HPC / SLURM

File Storage (NFS/Ceph)

RSP

Rubin Science Platform - Portal/Notebooks/API

OpenShift

Internet

User Authorization

Teams / User Databases

Current status

- all Light IDAC PL hardware installed @PSNC
  - ~1/3 of the storage up and running (NFS appliance with fast SSD cache)
  - the rest is to be set up and configured (as CephFS instance) - ongoing - *not a priority*
- configuration of optical fiber connecting storage (KMD) to computing CPU/GPU resources (PraceLab2) ongoing
- our **RSP** instance migrated from the demonstrator site at CIS/NCBJ (@Świerk) to the new OKD site setup on new hardware (@PSNC)
- we use this migration to check our automated procedures for setting up our RSP instance
- **next steps - uploading some substantial part of DR data for functional and scalability tests based on generic tutorials and more realistic scientific use cases**
- a fully operational Light IDAC-PL RSP based expected 2024Q4/2025Q1
- new proposals to double+ storage resources to allow for image analyses using GPUs - submitted
- multi-purpose science platform installation/configuration ongoing - *not a priority*

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Rubin Science Platform

Portal

Discover data in the browser

Learn more about the portal.

Notebooks

Process and analyze LSST data with Jupyter notebooks in the cloud

Learn more about notebooks.

APIs

Learn how to programatically access data with Virtual Observatory interfaces

In-kind software effort and the main science cases

- Science Pipeline Development in the LSST
    - Galaxies Science Collaboration
    - Dark Energy Science Collaboration
    - AGN Collaboration
- Ongoing, but signed MoA needed to successfully apply for budget for more FTEs to complete (in progress).