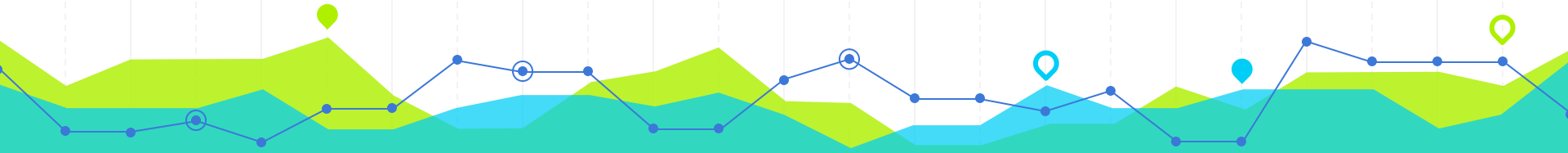
2nd CYGNO Collaboration Meeting 2022



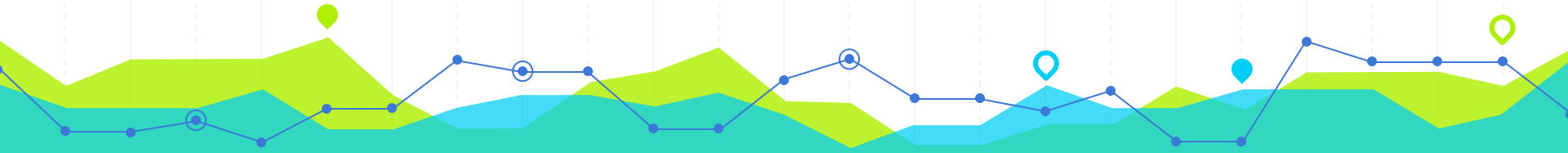
ROMA TRE
UNIVERSITÀ DEGLI STUDI

Status and plans of the middleware

Roma Tre Team and Giovanni

Summary

- Briefly review of what is Middleware
  - From proposal to nowadays
- Problems we are facing
- Very next steps
- Publications

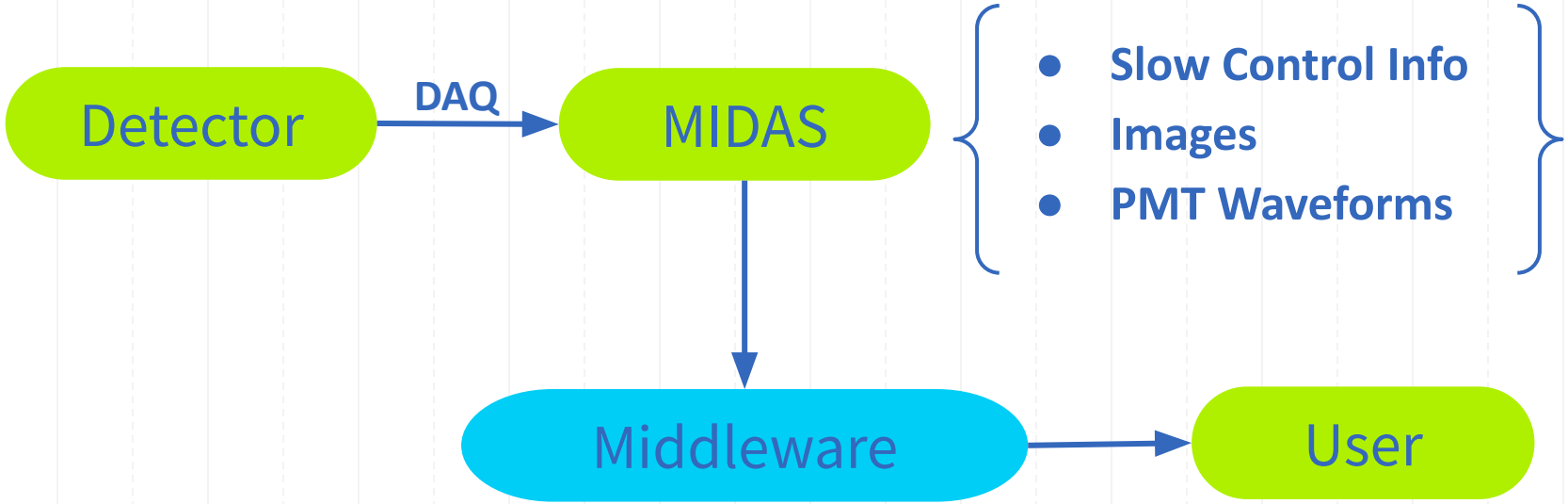


Briefly review of what is Middleware

Briefly review of what is Middleware

Middleware is a framework capable of **processing the data** acquired by the detector and its sensors, **delivery quality information** about the runs **online** and **send** all the information to a **central Database**.

From proposal to nowadays



From proposal to nowadays

Middleware

- Retrieve the information
- Quasi-online analysis
- Visualization
- Monitoring

- SQL Databases
  - Run Table
  - Slow Control
  - Reco Table
  - Macro Table

From proposal to nowadays

Middleware

- Retrieve the information
- Quasi-online analysis
- Visualization
- Monitoring

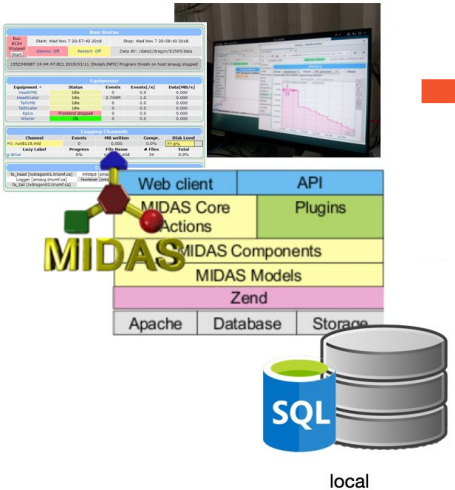
- SQL Databases
  - Run Table
  - Slow Control
  - Reco Table
  - Macro Table

Done

In development

data flow - schematic view

from detector to cloud (today's status)



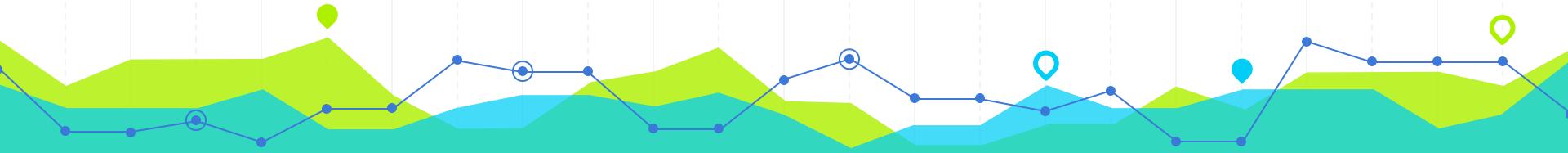
local storage

DAQ running locally

Reconstruction running locally

timestamp	Run	Event	Nclu	Size	nhits	Integral	xmean	ymean	xmax	xmin	ymax	ymin
1653989775	846	479	1	112	16	181.76470588235293	30.28095238095238	880.2346560846561	39	20	891	872
1653989775	846	479	2	128	20	265.5294117647058	30.775254441795523	209.04920523609164	51	28	215	204
1653989775	846	479	3	160	18	133.64705882352948	84.52822291317867	771.867017459938	95	76	779	764
1653989775	846	479	4	192	20	134.5294117647059	2248.870026292726	1335.6790534618758	2259	2236	1343	1328
1653989776	846	480	1	96	14	300.52941176470586	9.835922090729781	1813.0751972386588	15	8	1823	1804
1653989776	846	480	2	64	16	285.64705882352945	28.386762238828727	1729.1178892786334	31	24	1735	1724
1653989776	846	480	3	128	16	156.64705882352595	32.63340049760727	1007.1864406779661	43	24	1015	1000
1653989776	846	480	4	144	18	346.70588235294093	35.553263972009944	749.2419566697358	47	24	755	744
1653989776	846	480	5	144	21	230.4705882352942	42.592031182330004	592.2504330879169	51	36	607	584
1653989776	846	480	6	96	15	297.3529411764704	45.43109540636042	1853.155477031802	51	40	1859	1844
1653989776	846	480	7	176	23	329.41176470588215	46.96754199967738	2049.1464687652915	55	36	2059	2044
1653989776	846	480	8	144	18	189.82352941176467	52.8510526315789	820.8087368421054	59	44	827	812
1653989776	846	480	9	192	22	393.7647058823529	56.19953188999414	783.9046957284962	63	48	795	772
1653989776	846	480	10	160	23	159.23529411764707	99.18919814446654	1092.1045946542965	111	88	1099	1088
1653989776	846	480	11	176	31	235.88235294117644	1125.363636363695	999.3466249319544	1135	1116	1007	992
1653989776	846	480	12	128	17	259.94117647058823	2191.3359281437124	1287.9009580838324	2199	2184	1299	1280
1653989776	846	480	13	352	52	480.41176470588255	2206.910145761411	1204.6896816263902	2227	2188	1227	1184
1653989776	846	480	14	160	21	324.2941176470589	2204.8646630576814	222.23595295874554	2211	2196	231	212
1653989777	846	481	1	128	14	258.70588235294093	13.376329649901892	2038.2439326654967	19	8	2047	2028
1653989777	846	481	2	320	45	800.3529411764705	28.612665219964496	2180.7683961333596	43	12	2199	2164
1653989777	846	481	3	144	20	417.41176470588825	31.037538410431033	846.1266506104145	47	20	851	840

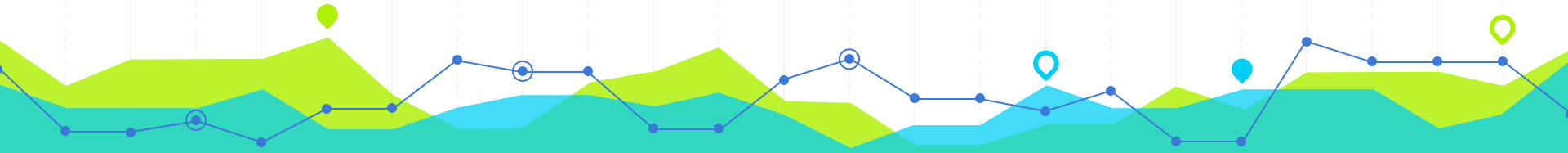
Database on Cloud



Problems we are facing

Problems we are/were facing

- Desynchronized the acquisition system and the Middleware ⟶ Solved thanks to Stefano
- Middleware is too slow (taking over 10 seconds to analyse one image).



Very next steps

Very next steps

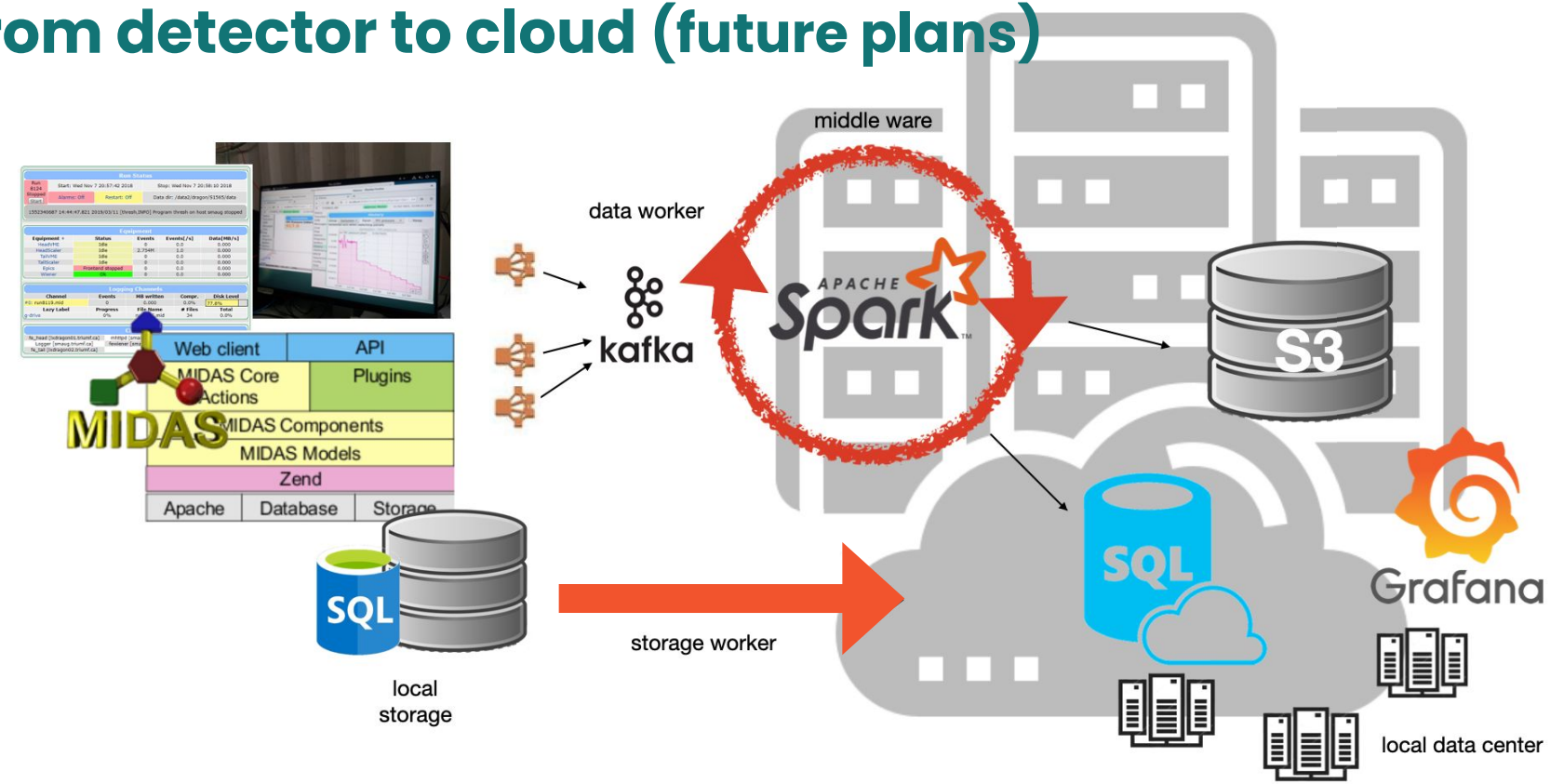
- Bring Middleware completely to the cloud:
  - Set a worker that will **just and only** take the information from MIDAS and **send to the cloud** (without any analysis);
  - Receive this information on the cloud and then **run the quasi-online analysis** with the possibility to **parallelize** the work as needed.

Very next steps

- Finalize the Grafana configuration to authentication using IAM:
  - This will allow all cygners access to the monitoring plots.
- Develop a function at CYGNO_LIB able to retrieve the SQL Reco/Macro/SlowControl information easily.

data flow – schematic view

from detector to cloud (future plans)



Publications related to this work

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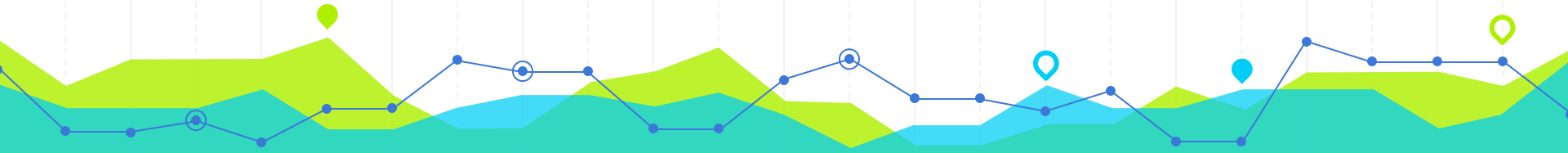
- Talk + Proceedings at ISGC 2022
- Talk + Conference Record at IEEE 2022
- Abstract accepted as ‘Poster’ to the CHEP 2023

Should we try to write a full paper?



THANK YOU!