PLATO

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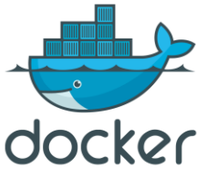
On behalf of the PLATO WP36[1] team

EAS System Design

- Stage 1: **Detection** – signal processing task running on **20x A100 GPU cards**, using bespoke CETRA software by Leigh Smith (Cambridge).
- Stage 2: **Vetting & Modelling** – Several tiers of MCMC modelling of candidate signals, running on **~ 10k CPU cores**.
- The complete pipeline comprises ~60 science codes, running in Docker containers.
- During operations, we reprocess the complete PLATO dataset every 90 days.

Pipeline software stack
All pipeline steps run in isolated containers



- Arbitrary languages can be used for science codes that implement pipeline steps
- Python core pipeline infrastructure
- Docker provides stable and reproducible environments in containers
- Kubernetes (K8s) allows for deployment, scaling and management of containers in a cluster

PDC

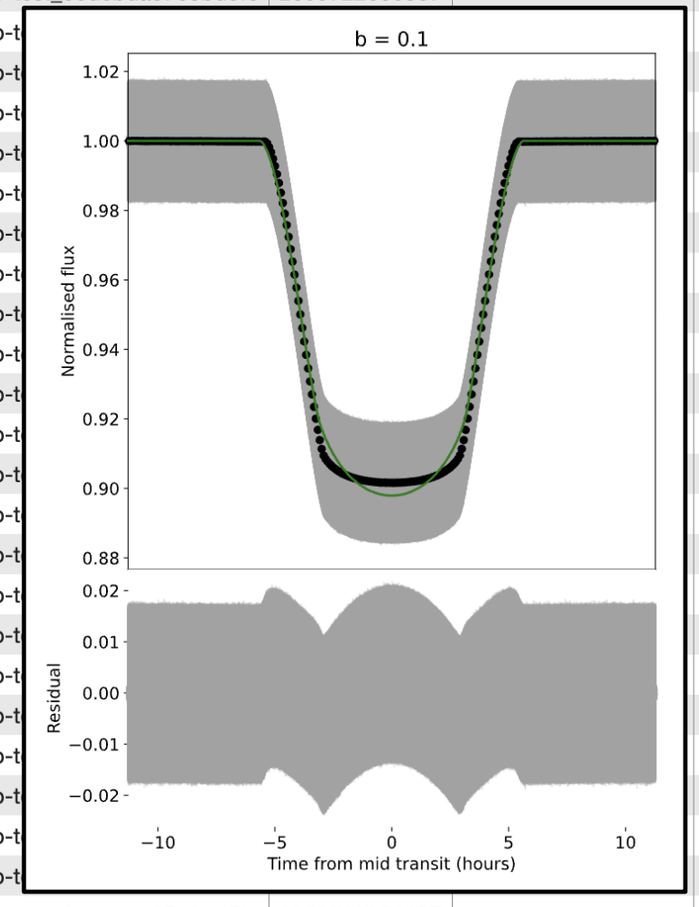
- OpenStack manages large pools of compute resources

IRIS

EAS System Design

EAS Control Panel 4.3.3: icarus.novalocal / plato — Task tree ▾ | TCEs ▾ | File products ▾ | Performance ▾ | Pipeline activity ▾ | Installed modules ▾

Module	Job name	Priority	Execution ID	Target ID	DP2 ID	Status	Timestamp	Run time (Wall clock)
✔ execution_chain	triggered_chain	0.0	pdcdb-test_0cdcbda37e8bd5fe	2859722000387	–		Completed 2025-11-14 14:12:59	00s
→ ✔ software_versions_record	transit_pipe_01	0.0	pdcdb-t				Completed 2025-11-14 14:13:07	00s
→ ✔ ingest_merged_lc	transit_pipe_01	0.0	pdcdb-t				Completed 2025-11-14 14:14:00	34s
✔ execution_chain	triggered_chain	0.0	pdcdb-t				Completed 2025-11-14 14:13:01	00s
→ ✔ software_versions_record	transit_pipe_02	0.0	pdcdb-t				Completed 2025-11-14 14:13:10	01s
→ ✔ ingest_dp5	transit_pipe_02	0.0	pdcdb-t				Completed 2025-11-14 14:13:46	02s
✔ execution_chain	triggered_chain	0.0	pdcdb-t				Completed 2025-11-14 14:13:03	01s
→ ✔ software_versions_record	transit_pipe_04	0.0	pdcdb-t				Completed 2025-11-14 14:13:11	00s
→ ✔ file_copy	transit_pipe_04	0.0	pdcdb-t				Completed 2025-11-14 14:14:05	00s
→ ✔ execution_do_while_iteration	transit_pipe_04	0.0	pdcdb-t				Completed 2025-11-14 14:13:14	00s
→ → ✔ execution_chain	transit_pipe_04	0.0	pdcdb-t				Completed 2025-11-14 14:13:18	00s
→ → → ✔ choose_detectors	transit_pipe_04	0.0	pdcdb-t				Completed 2025-11-14 14:13:59	00s
→ → → ✔ execution_do_while_iteration	transit_pipe_04	0.0	pdcdb-t				Completed 2025-11-14 14:14:07	00s
→ → → → ✔ execution_chain	transit_pipe_04	0.0	pdcdb-t				Completed 2025-11-14 14:14:11	00s
→ → → → → ✔ lc_filter_null	transit_pipe_04	0.0	pdcdb-t				Completed 2025-11-14 14:15:36	01s
→ → → → → ✔ cetra_search	transit_pipe_04	0.0	pdcdb-t				Completed 2025-11-14 14:19:11	01m55s
→ → → → → ✔ execution_do_while_iteration	transit_pipe_04	0.0	pdcdb-t				Completed 2025-11-14 14:20:19	00s
→ → → → → → ✔ execution_chain	transit_pipe_04	0.0	pdcdb-t				Completed 2025-11-14 14:20:27	00s
→ → → → → → → ✔ lc_filter_null	transit_pipe_04	0.0	pdcdb-t				Completed 2025-11-14 14:20:36	01s
→ → → → → → → ✔ transit_search_tls	transit_pipe_04	0.0	pdcdb-t				Completed 2025-11-14 14:21:57	55s
→ → → → → → → ✔ execution_do_while_iteration	transit_pipe_04	0.0	pdcdb-t				Completed 2025-11-14 14:22:09	00s
→ → → → → → → → ✔ execution_chain	transit_pipe_04	0.0	pdcdb-t				Completed 2025-11-14 14:22:16	00s
→ → → → → → → → → ✔ canonicalise_tces	transit_pipe_04	0.0	pdcdb-t				Completed 2025-11-14 14:24:12	01m30s
→ → → → → → → → → ✔ tce_modelling_1	transit_pipe_04	0.0	pdcdb-test_0cdcbda37e8bd5fe	2859722000387	–		Completed 2025-11-14 14:30:19	05m55s



Timeline

- March 2025 – End-to-end test 2a.
- May 2025 – End-to-end tests 2b and 3a.
- July 2025 – End-to-end tests 2c and 3b.
- September 2025 – End-to-end tests 2d and 3c.
- November 2025 – End-to-end tests 2e and 3d.
- December 2025 – 15% scale load test.
- December 2025 – Start of science performance testing.
- **January 2026** – End-to-end tests 2f and 3e.
- March 2026 – End-to-end tests 2g and 3f.
- March 2026 – Performance testing on archival data (e.g. TESS).
- Summer 2026 – Integration tests with ESA Science Operations Centre.
- Summer 2026 – Injection experiment to measure false positive/negative rates.
- August 2026 –100% scale load test.
- **Dec 2026 – PLATO launch!!**