

# Operational Architecture

Managed documentation for Operational Architecture.

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# Operational Data Flows

# Operational Data Flows

| Field              | Value                                                                         |
|--------------------|-------------------------------------------------------------------------------|
| Distribution       | WCT English — OpenC5ISR                                                       |
| Product            | OpenC5ISR                                                                     |
| Release            | 0.15.1                                                                        |
| Deployment         | <code>openc5isr-en.wallacecorptech.com</code>                                 |
| Source             | <code>/srv/wct/releases/OpenC5ISR-v0.15.0</code>                              |
| Evidence           | Reference architecture                                                        |
| Source fingerprint | <code>63d2b1097707e25d666401cdc6362e395968600a40a08690210cd8c0b75fbf50</code> |
| Status             | Generated baseline — human review required                                    |

“ **Verification boundary:** This page combines platform design guidance with static evidence from the release. It does not prove that every detected interface is enabled, reachable, secure, or operational in the deployed environment.

## Reference flow

| Producer          | Information product                                 | Primary consumer/store                          |
|-------------------|-----------------------------------------------------|-------------------------------------------------|
| Sensor/device     | Raw signal, frame, telemetry or observation         | Edge adapter / domain module                    |
| Domain module     | Typed observation, track, product or alert          | OpenBus / OpenData / OpenFiles                  |
| OpenKnowledge     | Type, relationship and policy context               | Analytics, automation and operator applications |
| Operator/analytic | Decision, annotation, correlation or recommendation | OpenTask / OpenCOP / OpenIIA                    |

| Producer   | Information product                                  | Primary consumer/store                   |
|------------|------------------------------------------------------|------------------------------------------|
| OpenTask   | Assigned action and state transition                 | Human, robot, service or external system |
| All stages | Provenance, timestamps, audit and retained artifacts | OpenFiles / OpenData / OpenAAR-MR        |

# Control points

- Validate schema and semantic type at ingestion.
  - Preserve source time separately from processing and receipt time.
  - Carry handling and release policy with the object, not only in the user interface.
  - Reference large imagery/video/files rather than embedding them in high-rate event messages.
  - Make task and effect transitions explicit, acknowledged and auditable.
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# Maintainer Notes

Add human-reviewed deployment notes, corrections, decisions, screenshots, and links here.  
Content outside the generated block is preserved on future runs.

# Timing, Positioning and OpenPNT

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| Distribution       | WCT English — OpenC5ISR                                          |
| Product            | OpenC5ISR                                                        |
| Release            | 0.15.1                                                           |
| Deployment         | openc5isr-en.wallacecorptech.com                                 |
| Source             | /srv/wct/releases/OpenC5ISR-v0.15.0                              |
| Evidence           | Reference architecture and timing term scan                      |
| Source fingerprint | 63d2b1097707e25d666401cdc6362e395968600a40a08690210cd8c0b75fbf50 |
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## Timing and positioning role

OpenPNT should register and monitor the clocks, coordinate frames and position sources used by sensors, radios, tracks, simulations and analytic products. Accurate correlation requires knowing not only a timestamp and coordinate, but also their source, reference frame, uncertainty and quality.

# Required metadata

| Area            | Minimum context                                                                                          |
|-----------------|----------------------------------------------------------------------------------------------------------|
| Time            | UTC timestamp, clock source, synchronization method, offset/error estimate and leap/time-scale handling. |
| Position        | Coordinate reference system, datum, origin, axes, units, uncertainty and update time.                    |
| Sensor geometry | Platform pose, antenna/camera offsets, orientation and calibration profile.                              |
| Simulation      | Scenario clock, time acceleration, federation epoch and mapping to wall-clock time.                      |

# Observed timing indicators

| Indicator    | Count/evidence |
|--------------|----------------|
| PTP/PPS      | 1064           |
| camera/video | 362            |
| UHD/USRP     | 324            |
| AIS          | 154            |
| FlightGear   | 121            |
| DIS          | 85             |
| PlutoSDR     | 56             |
| HackRF       | 55             |
| SoapySDR     | 54             |
| ADS-B        | 46             |

# Verification tests

- Confirm NTP/PTP/White Rabbit service state and measured offset on every participating host.
- Verify sensor products carry source timestamp and clock-quality metadata end to end.
- Validate coordinate transforms against known control points and record calibration versions.

- Alert when time or position quality falls below mission thresholds instead of silently accepting degraded data.
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