

OPS-SAT Experimenter Framework

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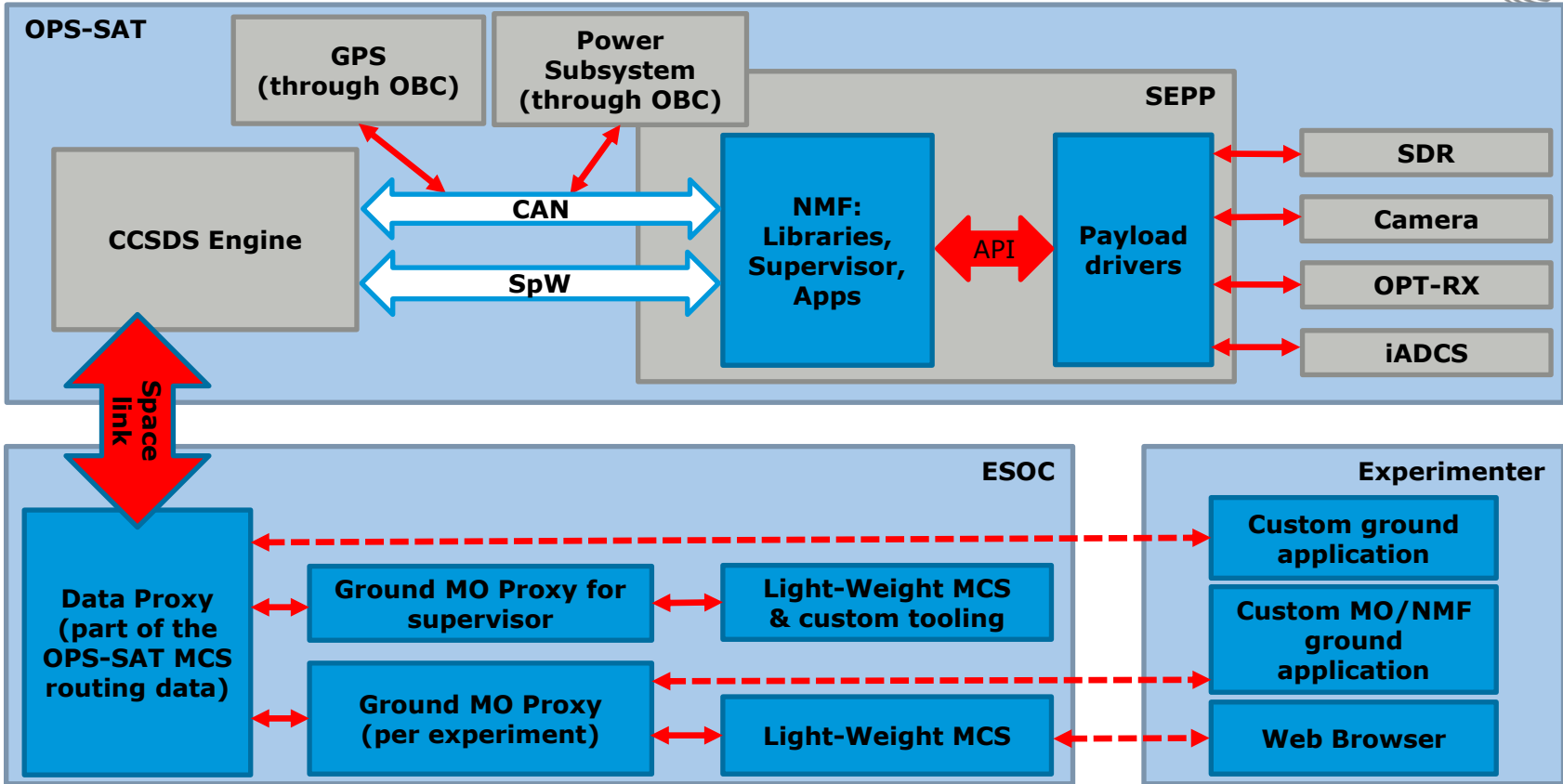
Presentation plan



- System overview
- Nanosat MO Framework (NMF) – capabilities and architecture
- NMF Simulator
- NMF Consumer Test Tool
- Light-Weight Mission Control System (LWMCS – EUD4MO)
- Demo



System overview



Nanosat MO Framework – Capabilities



- Monitoring & Control
- Payloads Abstraction Layer
- Supervises applications through a management component (NMF Supervisor)
- Implements handling of basic signals required by the OPS-SAT system
- Space to ground replication (Ground MO Proxy)
- Offline mirroring of the M&C data on the ground



Your code

Application

NMF Core

NMF Generic Composites

Platform
Adapters
(Sim or OPS-SAT)

Payloads Abstraction Layer (Platform Services)

M&C Services Implementation

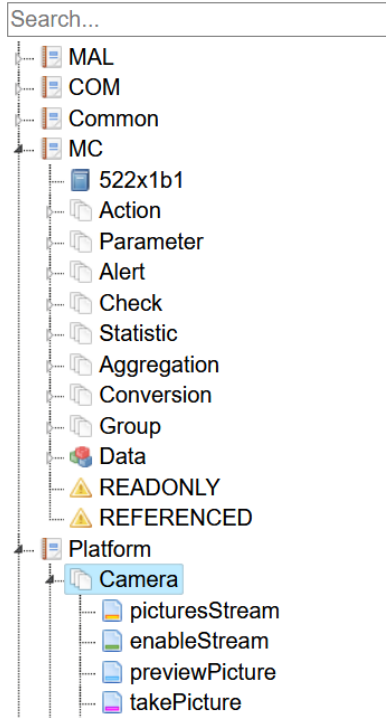
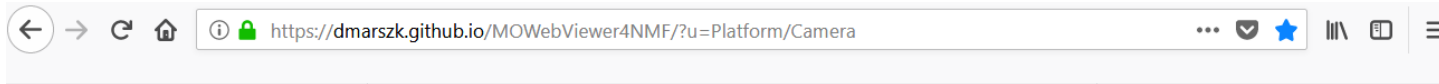
NMF Core

iADCS, Camera,
OPT-RX, SDR, Power,
GNSS

Satellite Platform

Satellite Bus

CAN, SpW,
TCP/IP



Area Identifier	Service Identifier	Area Number	Service Number	Area Version
Platform	Camera	105	1	2
Interaction Pattern	Operation Identifier	Operation Number	Support in Replay	Capability Set
Pub-Sub	picturesStream	1	false	1
Submit	enableStream	2	false	
Request	previewPicture	4	false	2
Invoke	takePicture	5	false	3
Request	getProperties	6	true	4

High Level Requirements

The Camera service shall provide:

1. the capability for streaming pictures;
2. the capability for previewing pictures;
3. the capability for taking pictures;
4. the capability for requesting the service and camera properties.

Functional Requirements

Comment

The Camera service allows a consumer to acquire pictures and control a camera in the spacecraft platform. The service can perform format conversions in case the consumer selects a specific format other than raw. The service can also stream pictures periodically.

- Simulates core OPS-SAT payloads - GPS, iADCS, Camera
- Allows executing simulation scenarios
- Time control
- Visualisation interface (Celestia)
- Portable implementation
- Hybrid mode

CTT: Consumer Test Tool@OSMitySOM

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Communication Settings (Directory)
nanosat-mo-supervisor x
App: payloads-test x

Communication Settings

Directory Service URI:

Fetch Information
Connect to Selected Provider

Providers List:

	Service name	Supported Capabilities	Service Properties	URI address	Broker URI Address
13. nanosat-mo-supervisor	Aggregation	All Supported	{}	maltcp://172.17.0.1:10...	maltcp://172.17.0.1:10...
14. App: payloads-test	Action	All Supported	{}	maltcp://172.17.0.1:10...	null
	Archive	All Supported	{}	maltcp://172.17.0.1:10...	null
	Heartbeat	All Supported	{}	maltcp://172.17.0.1:10...	maltcp://172.17.0.1:10...
	Parameter	All Supported	{}	maltcp://172.17.0.1:10...	maltcp://172.17.0.1:10...
	Event	All Supported	{}	maltcp://172.17.0.1:10...	maltcp://172.17.0.1:10...
	Alert	All Supported	{}	maltcp://172.17.0.1:10...	null
	ArchiveSync	All Supported	{}	maltcp://172.17.0.1:10...	null
	Directory	All Supported	{}	maltcp://172.17.0.1:10...	null

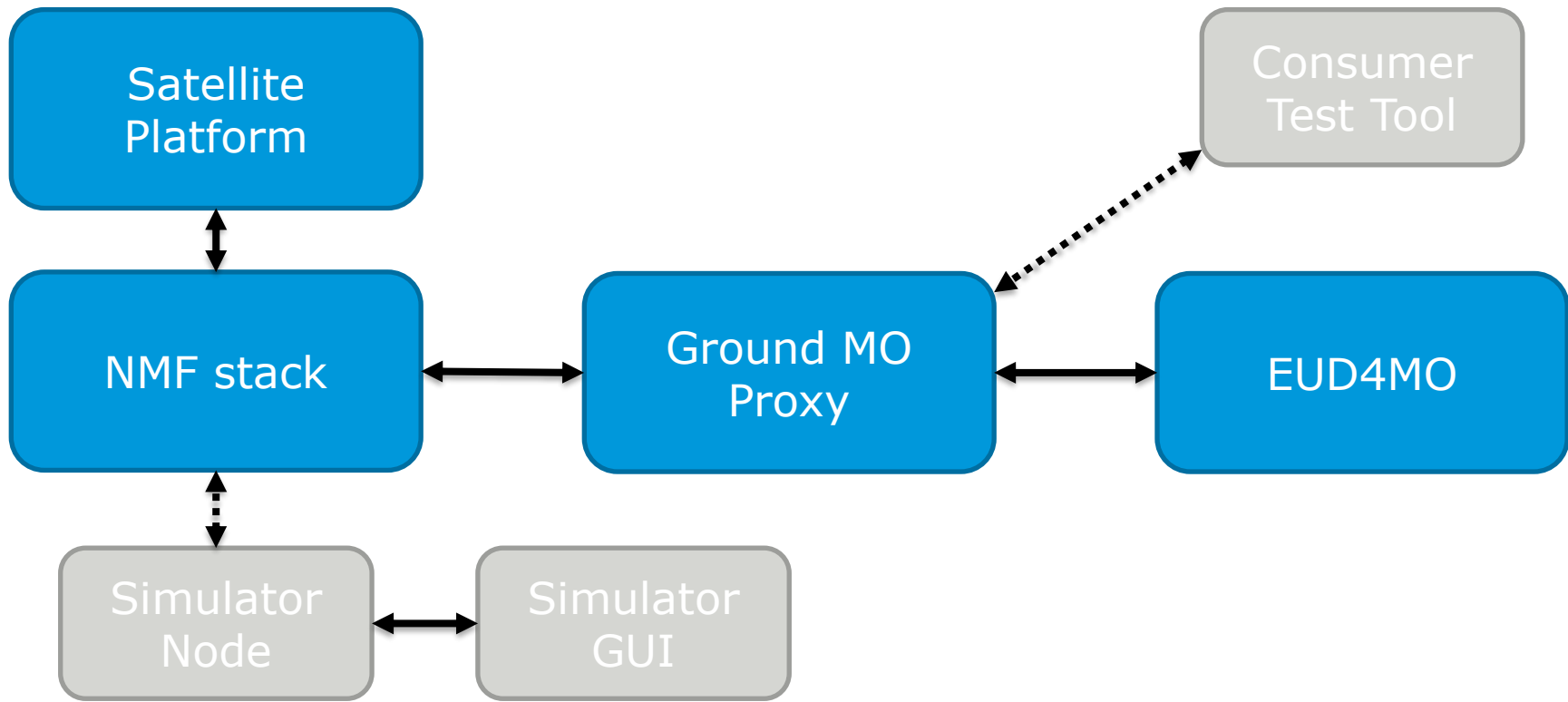
Light-Weight Mission Control System



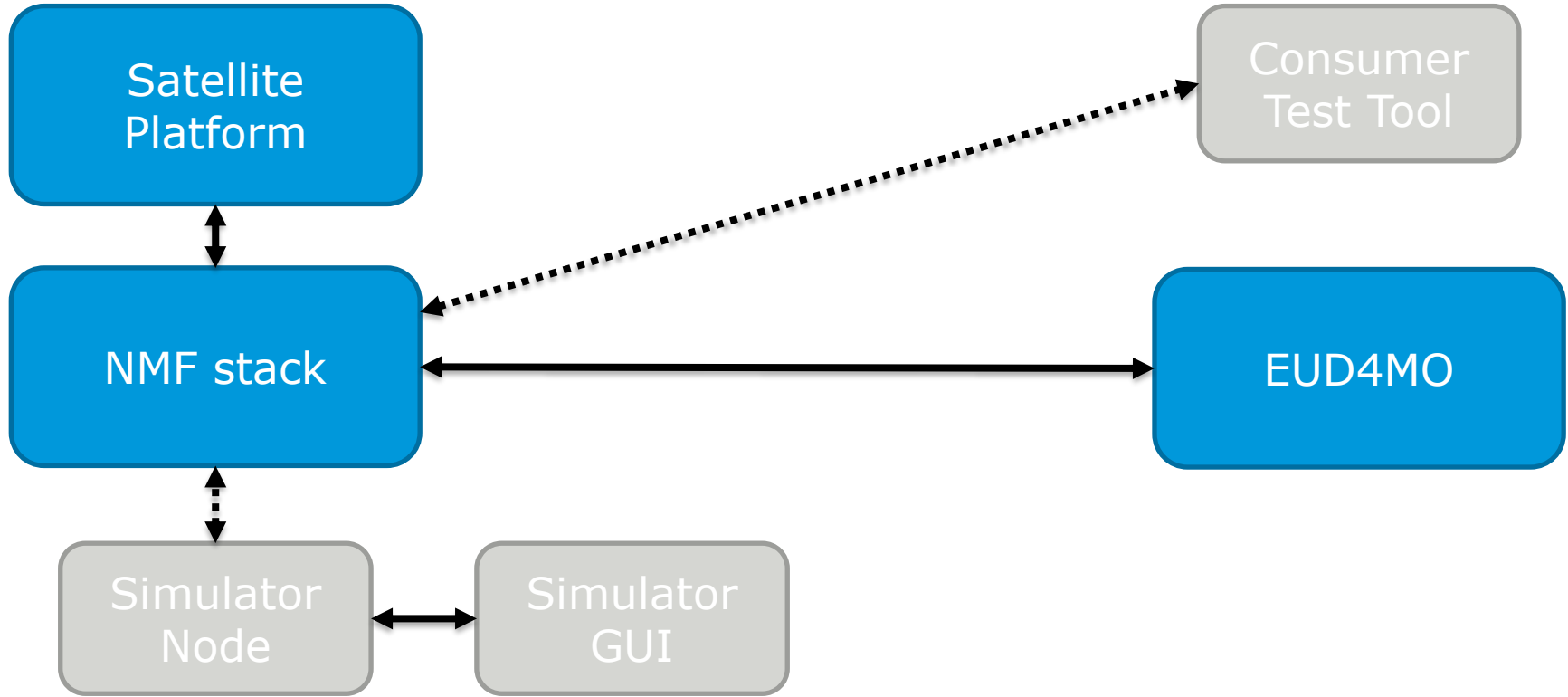
- Web interface hosted on ESOC premises
- High level consumer of M&C services
- Visualising the telemetry (Parameters and Alerts)
- Browsing history of the telemetry
- Telecommanding in an organised manner (Actions)
- Browsing history of the telecommands



Production-like Connectivity



SDK Connectivity – Ground



Demos



- Code + CTT + LWMCS
- Camera Acquisitor System (Lorenzo)



System overview

