OCI IandT

Data Flow wrt XINA and ocidataview

Data Flow at OCI I&T
from XINA's perspective

OCI

All OCI Packets

HK Packets

Science Packets

GSE Packets

All CCSDS Packets over SpaceWire

ITOS

SWTS

GSE

XINA Marker Packets

GSE CCSDS Packets

FEDS

OCI Science VM #XX

Real Time Data Viewer

OCI Science VM #2
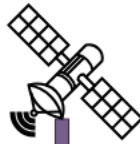
XINA Web Archiver
and Importer
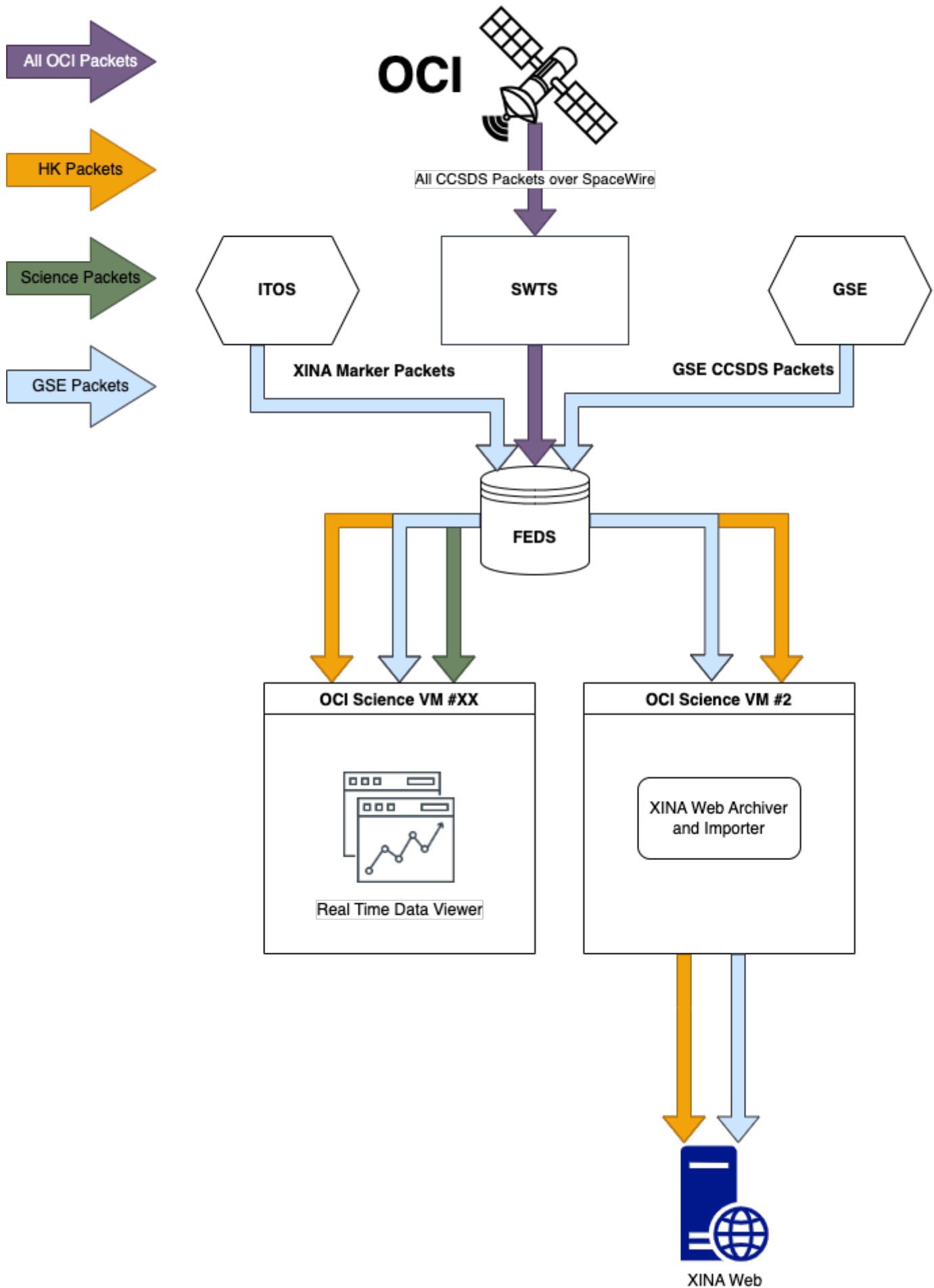
XINA Web

Data Flow In Depth

This diagram shows and describes the lower level details of the XINA data pipeline.
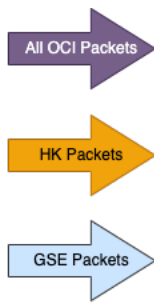
OCI I&T XINA Web Data Pipeline

All OCI Packets
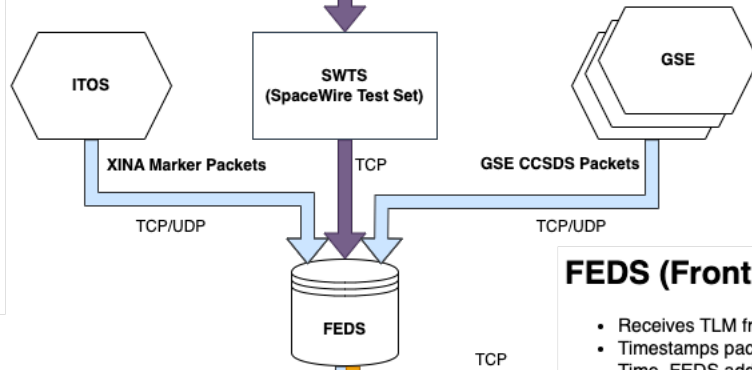
HK Packets

GSE Packets

OCI

All CCSDS Packets over SpaceWire

ITOS (Integrated Test and Operations System)

- Provides commanding and telemetry viewing to systems: GSE, instrument, spacecraft, board, etc
- Provides some archiving features
- Command and Telemetry packets are described using the Record Language
- STOL Scripting Language

ITOS

SWTS (SpaceWire Test Set)

GSE

XINA Marker Packets

TCP

GSE CCSDS Packets

TCP/UDP

TCP/UDP

FEDS

TCP

FEDS (Front End Data System)

- Receives TLM from all data sources
- Timestamps packets with the Ground Receipt Time. FEDS adds its own headers around the original packet.
- Archives packets with configurable file size or duration (TBC)
- Supports archiving data into different files based on assigned virtual channel
- Allows clients to connect to receive packets in real-time. Each client has a configurable filter file to control data streams the client receives.
- Provides interface to perform playbacks of packets for a given time range
- Supports pass through of CMDs to archive all CMDs

ocigse

- Connects to FEDS to receives packets over TCP
- Performs any needed processing
- Breaks up packet stream into 10-minute (configurable) files
- Calls **xina_oci_gse** and **xina_import** to import the 10-minute files into XINA

xina_oci_gse

- Creates JSON files to import 10-minute file into XINA and create xina-run task
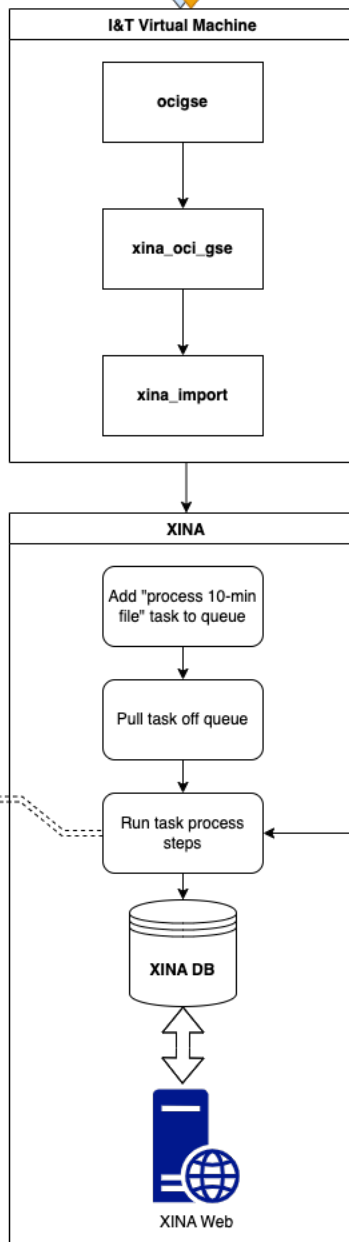- JSON format adheres to XINA's API

xina_import

- Reads JSON files and performs described actions. For example, import 10-minute file and create xina-run task.
- Needs xina_tunnel running to access XINA

I&T Virtual Machine

ocigse

xina_oci_gse

xina_import

XINA

Add "process 10-min file" task to queue

Pull task off queue

Run task process steps

XINA DB

XINA Web

Process Steps

1. Extract markers from 10-minute file
2. **Extract TLM data from 10-minute file (raw packets), calculate binned data. Mnemonic extraction info comes from converted ITOS DB.**
3. Perform any other required processing
4. Delete existing data from XINA DB
5. Import data into XINA DB

ITOS DB Conversion Process

ITOS DB

Convert to SQLite format

Move to server to process

Convert DB to internal mnemonic db format

Generate code for pseudo mnemonics and expression conversions

Release new version for XINA Processing to extract mnemonic data
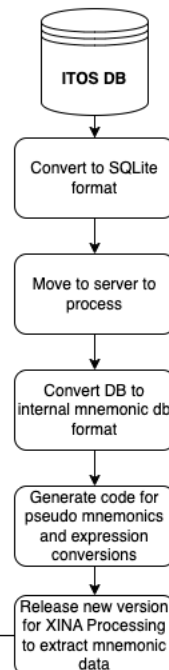
Raw Capture Process

DDC Raw Captures

CCSDS Packets (i.e. L0 data)

↓

Processed by Data Viewer

↓

Displayed by Data Viewer (DDC Raw Viewer)

This path was generally used during the more extensive testing, for example, FPA tuning. David's tools perform more analysis and generate more plots than the Data Viewer. These plots were used by Ulrik to make tuning decisions.

Export to CSV
- Raw samples
- HK data

↓

Generate plots using David Morgan Python Tools

↓

Provide to people

Generate Images/Screenshots from Data Viewer plots

↓

Provide to people

This path was generally used for the Raw Captures that were part of every DDC functional or basic checkouts of the instrument since the plots were "good enough"

Scope Capture Process

DDC Scope
Captures

CCSDS Packets (i.e.
L0 data)

↓

Processed by Data
Viewer

↓

Displayed by Data
Viewer (DDC Scope
Mode Viewer)

Export to CSV
- Raw samples
- HK data

↓

Provide data to Kim
Jepsen. Kim
performed the re-
timing himself.

↓

Kim performs in depth
analysis and presents
results

Generate
Images/Screenshots
from Data Viewer
plots

↓

Provide to people

This path was used when Kim was
required to do in-depth analysis

This path was generally used for an
initial look at the scope captures. The
Data Viewer only displays the samples
of the scope capture vs. "time"