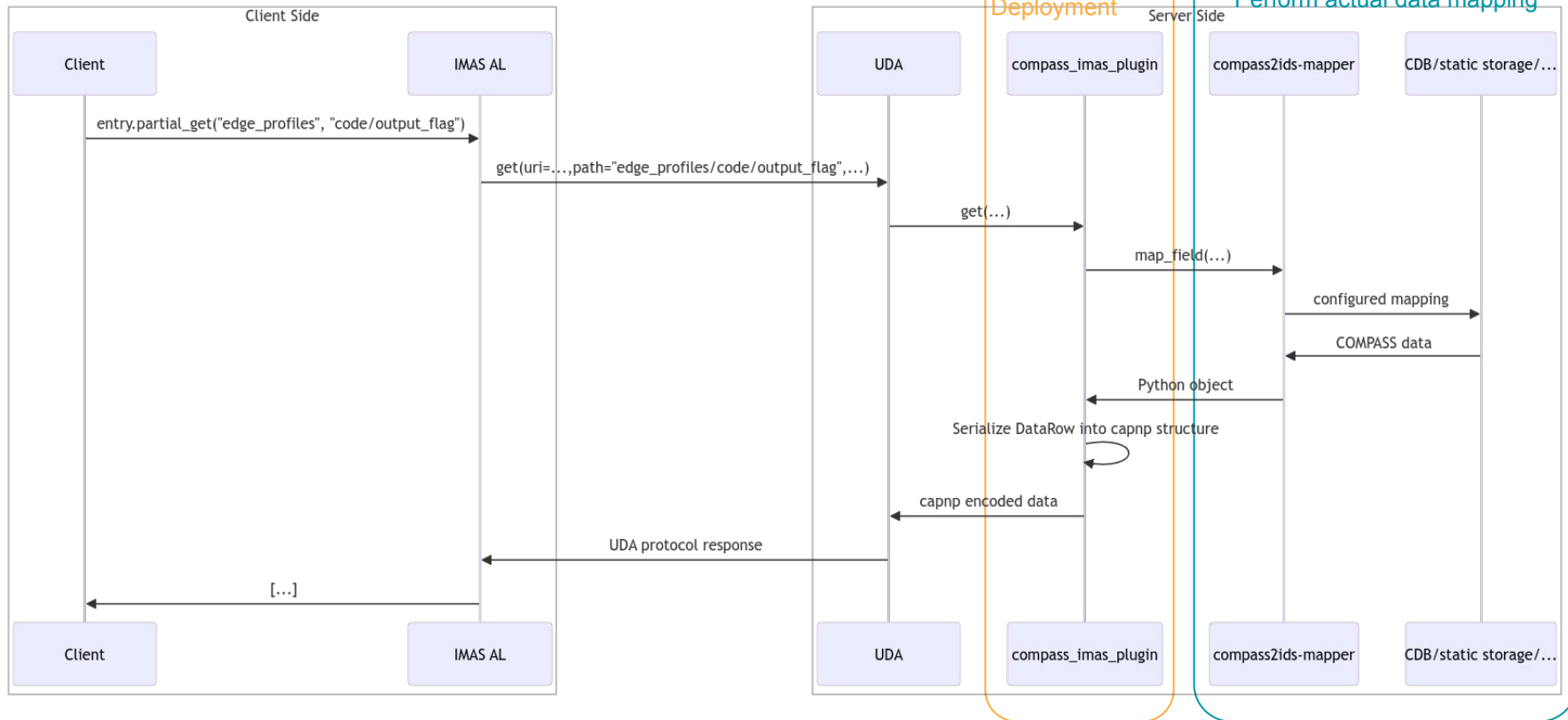


# COMPASS data to IMAS IDS mapping

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**Disclaimer:** The proposed architecture is in its early stages and may be subject to change.

## COMPASS IDS plugin

- Developed with best practices:
  - continuous testing
  - continuous deployment as:
    - docker image or deb package
- Deployment version:
  - Depends only on open-source packages (e.g. [UDA](#) server)
- Testing version:
  - Utilizes Python IMAS AL for end-to-end testing
- Python to C++ serialization
  - Python facilitates easier development of future mappings
- Mapping process
  - Actual mapping performed by the COMPASS to IDS mapper library.
- First deployment of testing COMPASS UDA server:
  - Limited to selected IP addresses
  - Scheduled for the end of September 2024
- Next steps:
  - complete COMPASS mapping schema
  - Secure UDA server:
    - Consider using only SSL and/or OAuth2 for authentication.
  - Deploy a second instance with COMPASS-U synthetic data, followed by experimental data when they become available.

## COMPASS to IDS mapper

- Standalone Python Library
  - Relies solely on open-source dependencies (e.g., [OMAS](#))
  - Optionally supports closed-source backend libraries (e.g., IMAS)
- [Uses](#) json/yaml configuration files for mapping specification
- Mapping Capabilities:
  - Supports mapping to various data sources:
    - COMPASS database (CDB) [1]
    - Static files (e.g., HDF5, netCDF, CSV)
  - Future enhancement: machine description will be sourced from the machine description server
  - Aggregations:
    - For example, summary IDS fields require resampling of the time axis to unify data from various sources
- Direct mapping of both: single IDS field and whole IDS entry
- Core Abstract mapper provide with functions: `map_ids`, `map_leaf` for flexible mapping
- **Q: `pf_active.coil::element::geometry.rectangle.r`**

[1] J. Urban, et al.: *Integrated data acquisition, storage, retrieval and processing using the COMPASS DataBase (CDB)*, Fus. Eng. and Design, **89** (5), 2014

```
{
  "entry": "summary",
  "time axis": "time",
  "time factor": "1e-3",
  "resampling method": "interp1d",
  "resampling args": {
    "freq": 1e4
  },
  "fields_or_datasets": [
    {
      "dataset": "EFIT",
      "fields": [
        {
          "source": "li",
          "target": "global_quantities.li" ,
        },...
      ],...
    },
    {
      "dataset": "MAGNETICS_RAW",
      "fields": [
        {
          "source": "diamagnetic loop 1 1 RAW",
          "target": "global_quantities.v_loop" ,
        },...
      ],...
    }
  ]
}
```