Feast Documentation

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CONTENTS

1 Feature Store **1**

2 Config **11**

3 Data Source **13**
- 3.1 Request Source . . . 14
- 3.2 Push Source . . . 15
- 3.3 BigQuery Source . . . 16
- 3.4 Redshift Source . . . 17
- 3.5 Snowflake Source . . . 18
- 3.6 Spark Source . . . 21
- 3.7 Trino Source . . . 23
- 3.8 PostgreSQL Source . . . 23
- 3.9 File Source . . . 24

4 Entity **27**

5 Feature View **29**
- 5.1 On Demand Feature View . . . 31
- 5.2 Stream Feature View . . . 33

6 Feature **37**

7 Feature Service **39**

8 Registry **41**

9 Registry Store **55**
- 9.1 SQL Registry Store . . . 55
- 9.2 PostgreSQL Registry Store . . . 61

10 Provider **63**
- 10.1 Passthrough Provider . . . 65
- 10.2 Local Provider . . . 67
- 10.3 GCP Provider . . . 67
- 10.4 AWS Provider . . . 67

11 Offline Store **69**
- 11.1 File Offline Store . . . 71
- 11.2 BigQuery Offline Store . . . 73
- 11.3 Redshift Offline Store . . . 77

11.4 Snowflake Offline Store . . . 80
11.5 Spark Offline Store . . . 83
11.6 Trino Offline Store . . . 85
11.7 PostgreSQL Offline Store . . . 85

12 Online Store **89**
12.1 Sqlite Online Store . . . 90
12.2 Datastore Online Store . . . 92
12.3 DynamoDB Online Store . . . 94
12.4 Redis Online Store . . . 96
12.5 PostgreSQL Online Store . . . 98
12.6 HBase Online Store . . . 100

13 Batch Materialization Engine **103**
13.1 Local Engine . . . 104
13.2 (Alpha) Lambda Based Engine . . . 104

Python Module Index **105**

Index **107**

CHAPTER

ONE

FEATURE STORE

class feast.feature_store.**FeatureStore**(*repo_path: Optional[str] = None*, *config: Optional[feast.repo_config.RepoConfig] = None*)

Bases: object

A FeatureStore object is used to define, create, and retrieve features.

Parameters

- **repo_path** (*optional*) – Path to a *feature_store.yaml* used to configure the feature store.
- **config** (*optional*) – Configuration object used to configure the feature store.

apply(*objects: Union[feast.data_source.DataSource, feast.entity.Entity, feast.feature_view.FeatureView, feast.on_demand_feature_view.OnDemandFeatureView, feast.request_feature_view.RequestFeatureView, feast.stream_feature_view.StreamFeatureView, feast.feature_service.FeatureService, feast.saved_dataset.ValidationReference, List[Union[feast.feature_view.FeatureView, feast.on_demand_feature_view.OnDemandFeatureView, feast.request_feature_view.RequestFeatureView, feast.entity.Entity, feast.feature_service.FeatureService, feast.data_source.DataSource, feast.saved_dataset.ValidationReference]]]*, *objects_to_delete: Optional[List[Union[feast.feature_view.FeatureView, feast.on_demand_feature_view.OnDemandFeatureView, feast.request_feature_view.RequestFeatureView, feast.entity.Entity, feast.feature_service.FeatureService, feast.data_source.DataSource, feast.saved_dataset.ValidationReference]]] = None*, *partial: bool = True*)

Register objects to metadata store and update related infrastructure.

The apply method registers one or more definitions (e.g., Entity, FeatureView) and registers or updates these objects in the Feast registry. Once the apply method has updated the infrastructure (e.g., create tables in an online store), it will commit the updated registry. All operations are idempotent, meaning they can safely be rerun.

Parameters

- **objects** – A single object, or a list of objects that should be registered with the Feature Store.
- **objects_to_delete** – A list of objects to be deleted from the registry and removed from the provider's infrastructure. This deletion will only be performed if partial is set to False.
- **partial** – If True, apply will only handle the specified objects; if False, apply will also delete all the objects in objects_to_delete, and tear down any associated cloud resources.

Raises ValueError – The 'objects' parameter could not be parsed properly.

Examples

Register an Entity and a FeatureView.

```
>>> from feast import FeatureStore, Entity, FeatureView, Feature, FileSource,␣
↪RepoConfig
>>> from datetime import timedelta
>>> fs = FeatureStore(repo_path="feature_repo")
>>> driver = Entity(name="driver_id", description="driver id")
>>> driver_hourly_stats = FileSource(
...     path="feature_repo/data/driver_stats.parquet",
...     timestamp_field="event_timestamp",
...     created_timestamp_column="created",
... )
>>> driver_hourly_stats_view = FeatureView(
...     name="driver_hourly_stats",
...     entities=[driver],
...     ttl=timedelta(seconds=86400 * 1),
...     batch_source=driver_hourly_stats,
... )
>>> fs.apply([driver_hourly_stats_view, driver]) # register entity and feature␣
↪view
```

config: *feast.repo_config.RepoConfig*

create_saved_dataset(*from_:* feast.infra.offline_stores.offline_store.RetrievalJob, *name: str*, *storage: feast.saved_dataset.SavedDatasetStorage*, *tags: Optional[Dict[str, str]] = None*, *feature_service: Optional[*feast.feature_service.FeatureService*] = None*) → feast.saved_dataset.SavedDataset

Execute provided retrieval job and persist its outcome in given storage. Storage type (eg, BigQuery or Redshift) must be the same as globally configured offline store. After data successfully persisted saved dataset object with dataset metadata is committed to the registry. Name for the saved dataset should be unique within project, since it's possible to overwrite previously stored dataset with the same name.

Returns SavedDataset object with attached RetrievalJob

Raises **ValueError if given retrieval job doesn't have metadata** –

delete_feature_service(*name: str*)

Deletes a feature service.

Parameters **name** – Name of feature service.

Raises **FeatureServiceNotFoundException** – The feature view could not be found.

delete_feature_view(*name: str*)

Deletes a feature view.

Parameters **name** – Name of feature view.

Raises **FeatureViewNotFoundException** – The feature view could not be found.

static ensure_request_data_values_exist(*needed_request_data: Set[str]*, *needed_request_fv_features: Set[str]*, *request_data_features: Dict[str, List[Any]]*)

get_data_source(*name: str*) → *feast.data_source.DataSource*

Retrieves the list of data sources from the registry.

Parameters **name** – Name of the data source.

Returns The specified data source.

Raises **DataSourceObjectNotFoundException** – The data source could not be found.

get_entity(*name: str*, *allow_registry_cache: bool = False*) → *feast.entity.Entity*
Retrieves an entity.

Parameters

- **name** – Name of entity.
- **allow_registry_cache** – (Optional) Whether to allow returning this entity from a cached registry

Returns The specified entity.

Raises **EntityNotFoundException** – The entity could not be found.

get_feature_server_endpoint() → Optional[str]
Returns endpoint for the feature server, if it exists.

get_feature_service(*name: str*, *allow_cache: bool = False*) → *feast.feature_service.FeatureService*
Retrieves a feature service.

Parameters

- **name** – Name of feature service.
- **allow_cache** – Whether to allow returning feature services from a cached registry.

Returns The specified feature service.

Raises **FeatureServiceNotFoundException** – The feature service could not be found.

get_feature_view(*name: str*, *allow_registry_cache: bool = False*) → *feast.feature_view.FeatureView*
Retrieves a feature view.

Parameters

- **name** – Name of feature view.
- **allow_registry_cache** – (Optional) Whether to allow returning this entity from a cached registry

Returns The specified feature view.

Raises **FeatureViewNotFoundException** – The feature view could not be found.

get_historical_features(*entity_df: Union[pandas.core.frame.DataFrame, str]*, *features: Union[List[str],* feast.feature_service.FeatureService*]*, *full_feature_names: bool = False*) → *feast.infra.offline_stores.offline_store.RetrievalJob*
Enrich an entity dataframe with historical feature values for either training or batch scoring.

This method joins historical feature data from one or more feature views to an entity dataframe by using a time travel join.

Each feature view is joined to the entity dataframe using all entities configured for the respective feature view. All configured entities must be available in the entity dataframe. Therefore, the entity dataframe must contain all entities found in all feature views, but the individual feature views can have different entities.

Time travel is based on the configured TTL for each feature view. A shorter TTL will limit the amount of scanning that will be done in order to find feature data for a specific entity key. Setting a short TTL may result in null values being returned.

Parameters

- **entity_df** (*Union[pd.DataFrame, str]*) – An entity dataframe is a collection of rows containing all entity columns (e.g., customer_id, driver_id) on which features need to be joined, as well as a event_timestamp column used to ensure point-in-time correctness. Either a Pandas DataFrame can be provided or a string SQL query. The query must be of a format supported by the configured offline store (e.g., BigQuery)
- **features** – The list of features that should be retrieved from the offline store. These features can be specified either as a list of string feature references or as a feature service. String feature references must have format "feature_view:feature", e.g. "customer_fv:daily_transactions".
- **full_feature_names** – If True, feature names will be prefixed with the corresponding feature view name, changing them from the format "feature" to "feature_view__feature" (e.g. "daily_transactions" changes to "customer_fv__daily_transactions").

Returns RetrievalJob which can be used to materialize the results.

Raises **ValueError** – Both or neither of features and feature_refs are specified.

Examples

Retrieve historical features from a local offline store.

```
>>> from feast import FeatureStore, RepoConfig
>>> import pandas as pd
>>> fs = FeatureStore(repo_path="feature_repo")
>>> entity_df = pd.DataFrame.from_dict(
...     {
...         "driver_id": [1001, 1002],
...         "event_timestamp": [
...             datetime(2021, 4, 12, 10, 59, 42),
...             datetime(2021, 4, 12, 8, 12, 10),
...         ],
...     }
... )
>>> retrieval_job = fs.get_historical_features(
...     entity_df=entity_df,
...     features=[
...         "driver_hourly_stats:conv_rate",
...         "driver_hourly_stats:acc_rate",
...         "driver_hourly_stats:avg_daily_trips",
...     ],
... )
>>> feature_data = retrieval_job.to_df()
```

static get_needed_request_data(*grouped_odfv_refs: List[Tuple[*feast.on_demand_feature_view.OnDemandFeatureView*, List[str]]], grouped_request_fv_refs: List[Tuple[feast.request_feature_view.RequestFeatureView, List[str]]]*) → Tuple[Set[str], Set[str]]

get_on_demand_feature_view(*name: str*) → *feast.on_demand_feature_view.OnDemandFeatureView*

Retrieves a feature view.

Parameters **name** – Name of feature view.

Returns The specified feature view.

Raises **FeatureViewNotFoundException** – The feature view could not be found.

get_online_features(*features: Union[List[str], feast.feature_service.FeatureService]*, *entity_rows: List[Dict[str, Any]]*, *full_feature_names: bool = False*) → feast.online_response.OnlineResponse

Retrieves the latest online feature data.

Note: This method will download the full feature registry the first time it is run. If you are using a remote registry like GCS or S3 then that may take a few seconds. The registry remains cached up to a TTL duration (which can be set to infinity). If the cached registry is stale (more time than the TTL has passed), then a new registry will be downloaded synchronously by this method. This download may introduce latency to online feature retrieval. In order to avoid synchronous downloads, please call refresh_registry() prior to the TTL being reached. Remember it is possible to set the cache TTL to infinity (cache forever).

Parameters

- **features** – The list of features that should be retrieved from the online store. These features can be specified either as a list of string feature references or as a feature service. String feature references must have format "feature_view:feature", e.g. "customer_fv:daily_transactions".
- **entity_rows** – A list of dictionaries where each key-value is an entity-name, entity-value pair.
- **full_feature_names** – If True, feature names will be prefixed with the corresponding feature view name, changing them from the format "feature" to "feature_view__feature" (e.g. "daily_transactions" changes to "customer_fv__daily_transactions").

Returns OnlineResponse containing the feature data in records.

Raises **Exception** – No entity with the specified name exists.

Examples

Retrieve online features from an online store.

```
>>> from feast import FeatureStore, RepoConfig
>>> fs = FeatureStore(repo_path="feature_repo")
>>> online_response = fs.get_online_features(
...     features=[
...         "driver_hourly_stats:conv_rate",
...         "driver_hourly_stats:acc_rate",
...         "driver_hourly_stats:avg_daily_trips",
...     ],
...     entity_rows=[{"driver_id": 1001}, {"driver_id": 1002}, {"driver_id":␣
↪1003}, {"driver_id": 1004}],
... )
>>> online_response_dict = online_response.to_dict()
```

get_saved_dataset(*name: str*) → feast.saved_dataset.SavedDataset

Find a saved dataset in the registry by provided name and create a retrieval job to pull whole dataset from storage (offline store).

If dataset couldn't be found by provided name SavedDatasetNotFound exception will be raised.

Data will be retrieved from globally configured offline store.

Returns SavedDataset with RetrievalJob attached

Raises `SavedDatasetNotFound` –

`get_stream_feature_view`(*name: str*, *allow_registry_cache: bool = False*) → *feast.stream_feature_view.StreamFeatureView*

Retrieves a stream feature view.

Parameters

- **name** – Name of stream feature view.
- **allow_registry_cache** – (Optional) Whether to allow returning this entity from a cached registry

Returns The specified stream feature view.

Raises `FeatureViewNotFoundException` – The feature view could not be found.

`get_validation_reference`(*name: str*, *allow_cache: bool = False*) → feast.saved_dataset.ValidationReference

Retrieves a validation reference.

Raises `ValidationReferenceNotFoundException` – The validation reference could not be found.

`list_data_sources`(*allow_cache: bool = False*) → List[*feast.data_source.DataSource*]

Retrieves the list of data sources from the registry.

Parameters `allow_cache` – Whether to allow returning data sources from a cached registry.

Returns A list of data sources.

`list_entities`(*allow_cache: bool = False*) → List[*feast.entity.Entity*]

Retrieves the list of entities from the registry.

Parameters `allow_cache` – Whether to allow returning entities from a cached registry.

Returns A list of entities.

`list_feature_services`() → List[*feast.feature_service.FeatureService*]

Retrieves the list of feature services from the registry.

Returns A list of feature services.

`list_feature_views`(*allow_cache: bool = False*) → List[*feast.feature_view.FeatureView*]

Retrieves the list of feature views from the registry.

Parameters `allow_cache` – Whether to allow returning entities from a cached registry.

Returns A list of feature views.

`list_on_demand_feature_views`(*allow_cache: bool = False*) → List[*feast.on_demand_feature_view.OnDemandFeatureView*]

Retrieves the list of on demand feature views from the registry.

Returns A list of on demand feature views.

`list_request_feature_views`(*allow_cache: bool = False*) → List[feast.request_feature_view.RequestFeatureView]

Retrieves the list of feature views from the registry.

Parameters `allow_cache` – Whether to allow returning entities from a cached registry.

Returns A list of feature views.

list_stream_feature_views(*allow_cache: bool = False*) → List[*feast.stream_feature_view.StreamFeatureView*]

Retrieves the list of stream feature views from the registry.

Returns A list of stream feature views.

materialize(*start_date: datetime.datetime*, *end_date: datetime.datetime*, *feature_views: Optional[List[str]] = None*) → None

Materialize data from the offline store into the online store.

This method loads feature data in the specified interval from either the specified feature views, or all feature views if none are specified, into the online store where it is available for online serving.

Parameters

- **start_date** (*datetime*) – Start date for time range of data to materialize into the online store
- **end_date** (*datetime*) – End date for time range of data to materialize into the online store
- **feature_views** (*List[str]*) – Optional list of feature view names. If selected, will only run materialization for the specified feature views.

Examples

Materialize all features into the online store over the interval from 3 hours ago to 10 minutes ago. >>> from feast import FeatureStore, RepoConfig >>> from datetime import datetime, timedelta >>> fs = FeatureStore(repo_path="feature_repo") >>> fs.materialize(... start_date=datetime.utcnow() - timedelta(hours=3), end_date=datetime.utcnow() - timedelta(minutes=10) ...) Materializing... <BLANKLINE> ...

materialize_incremental(*end_date: datetime.datetime*, *feature_views: Optional[List[str]] = None*) → None

Materialize incremental new data from the offline store into the online store.

This method loads incremental new feature data up to the specified end time from either the specified feature views, or all feature views if none are specified, into the online store where it is available for online serving. The start time of the interval materialized is either the most recent end time of a prior materialization or (now - ttl) if no such prior materialization exists.

Parameters

- **end_date** (*datetime*) – End date for time range of data to materialize into the online store
- **feature_views** (*List[str]*) – Optional list of feature view names. If selected, will only run materialization for the specified feature views.

Raises **Exception** – A feature view being materialized does not have a TTL set.

Examples

Materialize all features into the online store up to 5 minutes ago.

```
>>> from feast import FeatureStore, RepoConfig
>>> from datetime import datetime, timedelta
>>> fs = FeatureStore(repo_path="feature_repo")
>>> fs.materialize_incremental(end_date=datetime.utcnow() -␣
↪timedelta(minutes=5))
```

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```
Materializing...

...
```

plan(*desired_repo_contents: feast.repo_contents.RepoContents*) → Tuple[feast.diff.registry_diff.RegistryDiff, feast.diff.infra_diff.InfraDiff, feast.infra.infra_object.Infra]

Dry-run registering objects to metadata store.

The plan method dry-runs registering one or more definitions (e.g., Entity, FeatureView), and produces a list of all the changes the that would be introduced in the feature repo. The changes computed by the plan command are for informational purposes, and are not actually applied to the registry.

Parameters **desired_repo_contents** – The desired repo state.

Raises **ValueError** – The 'objects' parameter could not be parsed properly.

Examples

Generate a plan adding an Entity and a FeatureView.

```
>>> from feast import FeatureStore, Entity, FeatureView, Feature, FileSource,␣
↪RepoConfig
>>> from feast.feature_store import RepoContents
>>> from datetime import timedelta
>>> fs = FeatureStore(repo_path="feature_repo")
>>> driver = Entity(name="driver_id", description="driver id")
>>> driver_hourly_stats = FileSource(
...     path="feature_repo/data/driver_stats.parquet",
...     timestamp_field="event_timestamp",
...     created_timestamp_column="created",
... )
>>> driver_hourly_stats_view = FeatureView(
...     name="driver_hourly_stats",
...     entities=[driver],
...     ttl=timedelta(seconds=86400 * 1),
...     batch_source=driver_hourly_stats,
... )
>>> registry_diff, infra_diff, new_infra = fs.plan(RepoContents(
...     data_sources=[driver_hourly_stats],
...     feature_views=[driver_hourly_stats_view],
...     on_demand_feature_views=list(),
...     stream_feature_views=list(),
...     request_feature_views=list(),
...     entities=[driver],
...     feature_services=list())) # register entity and feature view
```

property project: *str*

Gets the project of this feature store.

push(*push_source_name: str*, *df: pandas.core.frame.DataFrame*, *allow_registry_cache: bool = True*, *to: feast.data_source.PushMode = PushMode.ONLINE*)

Push features to a push source. This updates all the feature views that have the push source as stream source.

Parameters

- **push_source_name** – The name of the push source we want to push data to.
- **df** – The data being pushed.
- **allow_registry_cache** – Whether to allow cached versions of the registry.
- **to** – Whether to push to online or offline store. Defaults to online store only.

refresh_registry()
Fetches and caches a copy of the feature registry in memory.

Explicitly calling this method allows for direct control of the state of the registry cache. Every time this method is called the complete registry state will be retrieved from the remote registry store backend (e.g., GCS, S3), and the cache timer will be reset. If refresh_registry() is run before get_online_features() is called, then get_online_features() will use the cached registry instead of retrieving (and caching) the registry itself.

Additionally, the TTL for the registry cache can be set to infinity (by setting it to 0), which means that refresh_registry() will become the only way to update the cached registry. If the TTL is set to a value greater than 0, then once the cache becomes stale (more time than the TTL has passed), a new cache will be downloaded synchronously, which may increase latencies if the triggering method is get_online_features().

property registry: *feast.registry.BaseRegistry*
Gets the registry of this feature store.

repo_path: pathlib.Path

serve(*host: str*, *port: int*, *type_: str*, *no_access_log: bool*, *no_feature_log: bool*) → None
Start the feature consumption server locally on a given port.

serve_transformations(*port: int*) → None
Start the feature transformation server locally on a given port.

serve_ui(*host: str*, *port: int*, *get_registry_dump: Callable*, *registry_ttl_sec: int*) → None
Start the UI server locally

teardown()
Tears down all local and cloud resources for the feature store.

validate_logged_features(*source:* feast.feature_service.FeatureService, *start: datetime.datetime*, *end: datetime.datetime*, *reference: feast.saved_dataset.ValidationReference*, *throw_exception: bool = True*, *cache_profile: bool = True*) → Optional[feast.dqm.errors.ValidationFailed]
Load logged features from an offline store and validate them against provided validation reference.

Parameters

- **source** – Logs source object (currently only feature services are supported)
- **start** – lower bound for loading logged features
- **end** – upper bound for loading logged features
- **reference** – validation reference
- **throw_exception** – throw exception or return it as a result
- **cache_profile** – store cached profile in Feast registry

Returns Throw or return (depends on parameter) ValidationFailed exception if validation was not successful or None if successful.

version() → str
Returns the version of the current Feast SDK/CLI.

write_logged_features(*logs: Union[pyarrow.lib.Table, pathlib.Path]*, *source:* feast.feature_service.FeatureService)

Write logs produced by a source (currently only feature service is supported as a source) to an offline store.

Parameters

- **logs** – Arrow Table or path to parquet dataset directory on disk
- **source** – Object that produces logs

write_to_offline_store(*feature_view_name: str*, *df: pandas.core.frame.DataFrame*, *allow_registry_cache: bool = True*, *reorder_columns: bool = True*)

Persists the dataframe directly into the batch data source for the given feature view.

Fails if the dataframe columns do not match the columns of the batch data source. Optionally reorders the columns of the dataframe to match.

write_to_online_store(*feature_view_name: str*, *df: pandas.core.frame.DataFrame*, *allow_registry_cache: bool = True*)

ingests data directly into the Online store

feast.feature_store.**apply_list_mapping**(*lst: Iterable[Any]*, *mapping_indexes: Iterable[List[int]]*) → Iterable[Any]

CHAPTER

TWO

CONFIG

class feast.repo_config.**FeastConfigBaseModel**
Feast Pydantic Configuration Class

exception feast.repo_config.**FeastConfigError**(*error_message*, *config_path*)

class feast.repo_config.**RegistryConfig**(*, *registry_type: pydantic.types.StrictStr = 'file'*, *registry_store_type: pydantic.types.StrictStr = None*, *path: pydantic.types.StrictStr*, *cache_ttl_seconds: pydantic.types.StrictInt = 600*, ***extra_data: Any*)
Metadata Store Configuration. Configuration that relates to reading from and writing to the Feast registry.

cache_ttl_seconds: pydantic.types.StrictInt
The cache TTL is the amount of time registry state will be cached in memory. If this TTL is exceeded then the registry will be refreshed when any feature store method asks for access to registry state. The TTL can be set to infinity by setting TTL to 0 seconds, which means the cache will only be loaded once and will never expire. Users can manually refresh the cache by calling feature_store.refresh_registry()

Type int

path: pydantic.types.StrictStr
Path to metadata store. Can be a local path, or remote object storage path, e.g. a GCS URI

Type str

registry_store_type: Optional[pydantic.types.StrictStr]
Provider name or a class name that implements RegistryStore.

Type str

registry_type: pydantic.types.StrictStr
Provider name or a class name that implements RegistryStore. If specified, registry_store_type should be redundant.

Type str

class feast.repo_config.**RepoConfig**(*, *registry: Union[pydantic.types.StrictStr, feast.repo_config.RegistryConfig] = 'data/registry.db'*, *project: pydantic.types.StrictStr*, *provider: pydantic.types.StrictStr*, *feature_server: Any = None*, *flags: Any = None*, *repo_path: pathlib.Path = None*, *go_feature_serving: bool = False*, *go_feature_retrieval: bool = False*, *entity_key_serialization_version: pydantic.types.StrictInt = 1*, ***data: Any*)
Repo config. Typically loaded from *feature_store.yaml*

entity_key_serialization_version: pydantic.types.StrictInt
This version is used to control what serialization scheme is used when writing data to the online store. A value <= 1 uses the serialization scheme used by feast up to Feast 0.22. A value of 2 uses a newer

serialization scheme, supported as of Feast 0.23. The main difference between the two scheme is that the serialization scheme v1 stored *long* values as `int`s, which would result in errors trying to serialize a range of values. v2 fixes this error, but v1 is kept around to ensure backwards compatibility - specifically the ability to read feature values for entities that have already been written into the online store.

Type Entity key serialization version

feature_server: Optional[Any]
Feature server configuration (optional depending on provider)

Type FeatureServerConfig

flags: Any
Feature flags for experimental features

Type Flags (deprecated field)

go_feature_retrieval: Optional[bool]
If True, use the embedded Go code to retrieve features instead of the Python SDK.

go_feature_serving: Optional[bool]
If True, use the Go feature server instead of the Python feature server.

project: pydantic.types.StrictStr
Feast project id. This can be any alphanumeric string up to 16 characters. You can have multiple independent feature repositories deployed to the same cloud provider account, as long as they have different project ids.

Type str

provider: pydantic.types.StrictStr
local or gcp or aws

Type str

registry: Union[pydantic.types.StrictStr, *feast.repo_config.RegistryConfig*]
Path to metadata store. Can be a local path, or remote object storage path, e.g. a GCS URI

Type str

CHAPTER

THREE

DATA SOURCE

class feast.data_source.**DataSource**(*, *event_timestamp_column: Optional[str] = None*, *created_timestamp_column: Optional[str] = None*, *field_mapping: Optional[Dict[str, str]] = None*, *date_partition_column: Optional[str] = None*, *description: Optional[str] = ''*, *tags: Optional[Dict[str, str]] = None*, *owner: Optional[str] = ''*, *name: Optional[str] = None*, *timestamp_field: Optional[str] = None*)

DataSource that can be used to source features.

Parameters

- **name** – Name of data source, which should be unique within a project
- **event_timestamp_column** (*optional*) – (Deprecated in favor of timestamp_field) Event timestamp column used for point in time joins of feature values.
- **created_timestamp_column** (*optional*) – Timestamp column indicating when the row was created, used for deduplicating rows.
- **field_mapping** (*optional*) – A dictionary mapping of column names in this data source to feature names in a feature table or view. Only used for feature columns, not entity or timestamp columns.
- **date_partition_column** (*optional*) – Timestamp column used for partitioning.
- **description** (*optional*) –
- **tags** (*optional*) – A dictionary of key-value pairs to store arbitrary metadata.
- **owner** (*optional*) – The owner of the data source, typically the email of the primary maintainer.
- **timestamp_field** (*optional*) – Event timestamp field used for point in time joins of feature values.

abstract static from_proto(*data_source: feast.core.DataSource_pb2.DataSource*) → Any

Converts data source config in protobuf spec to a DataSource class object.

Parameters **data_source** – A protobuf representation of a DataSource.

Returns A DataSource class object.

Raises **ValueError** – The type of DataSource could not be identified.

get_table_column_names_and_types(*config:* feast.repo_config.RepoConfig) → Iterable[Tuple[str, str]]

Returns the list of column names and raw column types.

Parameters **config** – Configuration object used to configure a feature store.

get_table_query_string() → str
Returns a string that can directly be used to reference this table in SQL.

abstract static source_datatype_to_feast_value_type() → Callable[[str], feast.value_type.ValueType]
Returns the callable method that returns Feast type given the raw column type.

abstract to_proto() → feast.core.DataSource_pb2.DataSource
Converts a DataSourceProto object to its protobuf representation.

validate(*config:* feast.repo_config.RepoConfig)
Validates the underlying data source.

Parameters **config** – Configuration object used to configure a feature store.

class feast.data_source.**PushMode**(*value*)
An enumeration.

class feast.data_source.**SourceType**(*value*)
DataSource value type. Used to define source types in DataSource.

3.1 Request Source

class feast.data_source.**RequestSource**(**args*, *name: Optional[str] = None*, *schema: Optional[Union[Dict[str, feast.value_type.ValueType], List[feast.field.Field]]] = None*, *description: Optional[str] = ''*, *tags: Optional[Dict[str, str]] = None*, *owner: Optional[str] = ''*)
RequestSource that can be used to provide input features for on demand transforms

name
Name of the request data source

Type str

schema
Schema mapping from the input feature name to a ValueType

Type List[feast.field.Field]

description
A human-readable description.

Type str

tags
A dictionary of key-value pairs to store arbitrary metadata.

Type Dict[str, str]

owner
The owner of the request data source, typically the email of the primary maintainer.

Type str

static from_proto(*data_source: feast.core.DataSource_pb2.DataSource*)
Converts data source config in protobuf spec to a DataSource class object.

Parameters **data_source** – A protobuf representation of a DataSource.

Returns A DataSource class object.

Raises **ValueError** – The type of DataSource could not be identified.

get_table_column_names_and_types(*config:* feast.repo_config.RepoConfig) → Iterable[Tuple[str, str]]
Returns the list of column names and raw column types.

Parameters **config** – Configuration object used to configure a feature store.

get_table_query_string() → str
Returns a string that can directly be used to reference this table in SQL.

static source_datatype_to_feast_value_type() → Callable[[str], feast.value_type.ValueType]
Returns the callable method that returns Feast type given the raw column type.

to_proto() → feast.core.DataSource_pb2.DataSource
Converts a DataSourceProto object to its protobuf representation.

validate(*config:* feast.repo_config.RepoConfig)
Validates the underlying data source.

Parameters **config** – Configuration object used to configure a feature store.

3.2 Push Source

class feast.data_source.**PushSource**(**args*, *name: Optional[str] = None*, *batch_source: Optional[*feast.data_source.DataSource*] = None*, *description: Optional[str] = ''*, *tags: Optional[Dict[str, str]] = None*, *owner: Optional[str] = ''*)
A source that can be used to ingest features on request

static from_proto(*data_source: feast.core.DataSource_pb2.DataSource*)
Converts data source config in protobuf spec to a DataSource class object.

Parameters **data_source** – A protobuf representation of a DataSource.

Returns A DataSource class object.

Raises **ValueError** – The type of DataSource could not be identified.

get_table_column_names_and_types(*config:* feast.repo_config.RepoConfig) → Iterable[Tuple[str, str]]
Returns the list of column names and raw column types.

Parameters **config** – Configuration object used to configure a feature store.

get_table_query_string() → str
Returns a string that can directly be used to reference this table in SQL.

static source_datatype_to_feast_value_type() → Callable[[str], feast.value_type.ValueType]
Returns the callable method that returns Feast type given the raw column type.

to_proto() → feast.core.DataSource_pb2.DataSource
Converts a DataSourceProto object to its protobuf representation.

validate(*config:* feast.repo_config.RepoConfig)
Validates the underlying data source.

Parameters **config** – Configuration object used to configure a feature store.

3.3 BigQuery Source

class feast.infra.offline_stores.bigquery_source.**BigQueryLoggingDestination**(*, *table_ref*)

to_data_source() → *feast.data_source.DataSource*
Convert this object into a data source to read logs from an offline store.

class feast.infra.offline_stores.bigquery_source.**BigQuerySource**(*, *event_timestamp_column: Optional[str] = ''*, *table: Optional[str] = None*, *created_timestamp_column: Optional[str] = ''*, *field_mapping: Optional[Dict[str, str]] = None*, *date_partition_column: Optional[str] = None*, *query: Optional[str] = None*, *name: Optional[str] = None*, *description: Optional[str] = ''*, *tags: Optional[Dict[str, str]] = None*, *owner: Optional[str] = ''*, *timestamp_field: Optional[str] = None*)

static from_proto(*data_source: feast.core.DataSource_pb2.DataSource*)
Converts data source config in protobuf spec to a DataSource class object.

Parameters **data_source** – A protobuf representation of a DataSource.

Returns A DataSource class object.

Raises **ValueError** – The type of DataSource could not be identified.

get_table_column_names_and_types(*config:* feast.repo_config.RepoConfig) → Iterable[Tuple[str, str]]
Returns the list of column names and raw column types.

Parameters **config** – Configuration object used to configure a feature store.

get_table_query_string() → str
Returns a string that can directly be used to reference this table in SQL

static source_datatype_to_feast_value_type() → Callable[[str], feast.value_type.ValueType]
Returns the callable method that returns Feast type given the raw column type.

to_proto() → feast.core.DataSource_pb2.DataSource
Converts a DataSourceProto object to its protobuf representation.

validate(*config:* feast.repo_config.RepoConfig)
Validates the underlying data source.

Parameters **config** – Configuration object used to configure a feature store.

3.4 Redshift Source

class feast.infra.offline_stores.redshift_source.**RedshiftLoggingDestination**(*, *table_name: str*)

to_data_source() → *feast.data_source.DataSource*
Convert this object into a data source to read logs from an offline store.

class feast.infra.offline_stores.redshift_source.**RedshiftSource**(*, *event_timestamp_column: Optional[str] = ''*, *table: Optional[str] = None*, *schema: Optional[str] = None*, *created_timestamp_column: Optional[str] = ''*, *field_mapping: Optional[Dict[str, str]] = None*, *date_partition_column: Optional[str] = None*, *query: Optional[str] = None*, *name: Optional[str] = None*, *description: Optional[str] = ''*, *tags: Optional[Dict[str, str]] = None*, *owner: Optional[str] = ''*, *database: Optional[str] = ''*, *timestamp_field: Optional[str] = ''*)

property database
Returns the Redshift database of this Redshift source.

static from_proto(*data_source: feast.core.DataSource_pb2.DataSource*)
Creates a RedshiftSource from a protobuf representation of a RedshiftSource.

Parameters **data_source** – A protobuf representation of a RedshiftSource

Returns A RedshiftSource object based on the data_source protobuf.

get_table_column_names_and_types(*config:* feast.repo_config.RepoConfig) → Iterable[Tuple[str, str]]
Returns a mapping of column names to types for this Redshift source.

Parameters **config** – A RepoConfig describing the feature repo

get_table_query_string() → str
Returns a string that can directly be used to reference this table in SQL.

property query
Returns the Redshift query of this Redshift source.

property schema
Returns the schema of this Redshift source.

static source_datatype_to_feast_value_type() → Callable[[str], feast.value_type.ValueType]
Returns the callable method that returns Feast type given the raw column type.

property table
Returns the table of this Redshift source.

to_proto() → feast.core.DataSource_pb2.DataSource
Converts a RedshiftSource object to its protobuf representation.

Returns A DataSourceProto object.

validate(*config:* feast.repo_config.RepoConfig)
Validates the underlying data source.

Parameters **config** – Configuration object used to configure a feature store.

3.5 Snowflake Source

class feast.infra.offline_stores.snowflake_source.**SnowflakeLoggingDestination**(*, *table_name: str*)

to_data_source() → *feast.data_source.DataSource*
Convert this object into a data source to read logs from an offline store.

class feast.infra.offline_stores.snowflake_source.**SnowflakeSource**(*, *database: Optional[str] = None*, *warehouse: Optional[str] = None*, *schema: Optional[str] = None*, *table: Optional[str] = None*, *query: Optional[str] = None*, *event_timestamp_column: Optional[str] = ''*, *date_partition_column: Optional[str] = None*, *created_timestamp_column: Optional[str] = ''*, *field_mapping: Optional[Dict[str, str]] = None*, *name: Optional[str] = None*, *description: Optional[str] = ''*, *tags: Optional[Dict[str, str]] = None*, *owner: Optional[str] = ''*, *timestamp_field: Optional[str] = ''*)

property database
Returns the database of this snowflake source.

static from_proto(*data_source: feast.core.DataSource_pb2.DataSource*)
Creates a SnowflakeSource from a protobuf representation of a SnowflakeSource.

Parameters **data_source** – A protobuf representation of a SnowflakeSource

Returns A SnowflakeSource object based on the data_source protobuf.

get_table_column_names_and_types(*config:* feast.repo_config.RepoConfig) → Iterable[Tuple[str, str]]
Returns a mapping of column names to types for this snowflake source.

Parameters **config** – A RepoConfig describing the feature repo

get_table_query_string() → str
Returns a string that can directly be used to reference this table in SQL.

property query
Returns the snowflake options of this snowflake source.

property schema
Returns the schema of this snowflake source.

static source_datatype_to_feast_value_type() → Callable[[str], feast.value_type.ValueType]
Returns the callable method that returns Feast type given the raw column type.

property table
Returns the table of this snowflake source.

to_proto() → feast.core.DataSource_pb2.DataSource
Converts a SnowflakeSource object to its protobuf representation.

Returns A DataSourceProto object.

validate(*config:* feast.repo_config.RepoConfig)
Validates the underlying data source.

Parameters **config** – Configuration object used to configure a feature store.

property warehouse
Returns the warehouse of this snowflake source.

3.6 Spark Source

class feast.infra.offline_stores.contrib.spark_offline_store.spark_source.**SparkSource**(*, *name: Optional[str] = None*, *table: Optional[str] = None*, *query: Optional[str] = None*, *path: Optional[str] = None*, *file_format: Optional[str] = None*, *event_timestamp_colu Optional[str] = None*, *created_timestamp_colum Optional[str] = None*, *field_mapping: Optional[Dict[str, str]] = None*, *date_partition_column Optional[str] = None*, *description: Optional[str] = ''*, *tags:*

property file_format
Returns the file format of this feature data source.

static from_proto(*data_source: feast.core.DataSource_pb2.DataSource*) → Any
Converts data source config in protobuf spec to a DataSource class object.

Parameters **data_source** – A protobuf representation of a DataSource.

Returns A DataSource class object.

Raises **ValueError** – The type of DataSource could not be identified.

get_table_column_names_and_types(*config:* feast.repo_config.RepoConfig) → Iterable[Tuple[str, str]]
Returns the list of column names and raw column types.

Parameters **config** – Configuration object used to configure a feature store.

get_table_query_string() → str
Returns a string that can directly be used to reference this table in SQL

property path
Returns the path of the spark data source file.

property query
Returns the query of this feature data source

static source_datatype_to_feast_value_type() → Callable[[str], feast.value_type.ValueType]
Returns the callable method that returns Feast type given the raw column type.

property table
Returns the table of this feature data source

to_proto() → feast.core.DataSource_pb2.DataSource
Converts a DataSourceProto object to its protobuf representation.

validate(*config:* feast.repo_config.RepoConfig)
Validates the underlying data source.

Parameters **config** – Configuration object used to configure a feature store.

class feast.infra.offline_stores.contrib.spark_offline_store.spark_source.**SparkSourceFormat**(*value*)
An enumeration.

3.7 Trino Source

3.8 PostgreSQL Source

class feast.infra.offline_stores.contrib.postgres_offline_store.postgres_source.**PostgreSQLSource**(*name: str*, *query: str*, *timestamp_fie Optional[st* = '', *created_tim Optional[st* = '', *field_ma Optional[D str]]* = *None*, *date_pa Optional[st* = '', *description: Optional[st* = '', *tags: Optional[D str]]* = *None*, *owner: Optional[st* = '')

static from_proto(*data_source: feast.core.DataSource_pb2.DataSource*)
Converts data source config in protobuf spec to a DataSource class object.

Parameters **data_source** – A protobuf representation of a DataSource.

Returns A DataSource class object.

Raises **ValueError** – The type of DataSource could not be identified.

get_table_column_names_and_types(*config:* feast.repo_config.RepoConfig) → Iterable[Tuple[str, str]]
Returns the list of column names and raw column types.

Parameters **config** – Configuration object used to configure a feature store.

get_table_query_string() → str
Returns a string that can directly be used to reference this table in SQL.

static source_datatype_to_feast_value_type() → Callable[[str], feast.value_type.ValueType]
Returns the callable method that returns Feast type given the raw column type.

to_proto() → feast.core.DataSource_pb2.DataSource
Converts a DataSourceProto object to its protobuf representation.

validate(*config:* feast.repo_config.RepoConfig)
Validates the underlying data source.

Parameters **config** – Configuration object used to configure a feature store.

3.9 File Source

class feast.infra.offline_stores.file_source.**FileLoggingDestination**(*, *path: str*, *s3_endpoint_override=''*, *partition_by: Optional[List[str]] = None*)

to_data_source() → *feast.data_source.DataSource*
Convert this object into a data source to read logs from an offline store.

class feast.infra.offline_stores.file_source.**FileSource**(**args*, *path: Optional[str] = None*, *event_timestamp_column: Optional[str] = ''*, *file_format: Optional[feast.data_format.FileFormat] = None*, *created_timestamp_column: Optional[str] = ''*, *field_mapping: Optional[Dict[str, str]] = None*, *date_partition_column: Optional[str] = ''*, *s3_endpoint_override: Optional[str] = None*, *name: Optional[str] = ''*, *description: Optional[str] = ''*, *tags: Optional[Dict[str, str]] = None*, *owner: Optional[str] = ''*, *timestamp_field: Optional[str] = ''*)

static from_proto(*data_source: feast.core.DataSource_pb2.DataSource*)
Converts data source config in protobuf spec to a DataSource class object.

Parameters **data_source** – A protobuf representation of a DataSource.

Returns A DataSource class object.

Raises `ValueError` – The type of DataSource could not be identified.

`get_table_column_names_and_types`(*config:* feast.repo_config.RepoConfig) → Iterable[Tuple[str, str]]
Returns the list of column names and raw column types.

Parameters `config` – Configuration object used to configure a feature store.

`get_table_query_string`() → str
Returns a string that can directly be used to reference this table in SQL.

`property path`
Returns the path of this file data source.

`static source_datatype_to_feast_value_type`() → Callable[[str], feast.value_type.ValueType]
Returns the callable method that returns Feast type given the raw column type.

`to_proto`() → feast.core.DataSource_pb2.DataSource
Converts a DataSourceProto object to its protobuf representation.

`validate`(*config:* feast.repo_config.RepoConfig)
Validates the underlying data source.

Parameters `config` – Configuration object used to configure a feature store.

CHAPTER

FOUR

ENTITY

class feast.entity.**Entity**(**args*, *name: Optional[str] = None*, *value_type: Optional[feast.value_type.ValueType] = None*, *description: str = ''*, *join_key: Optional[str] = None*, *tags: Optional[Dict[str, str]] = None*, *owner: str = ''*, *join_keys: Optional[List[str]] = None*)

An entity defines a collection of entities for which features can be defined. An entity can also contain associated metadata.

name
The unique name of the entity.

Type str

value_type
The type of the entity, such as string or float.

Type deprecated

join_key
A property that uniquely identifies different entities within the collection. The join_key property is typically used for joining entities with their associated features. If not specified, defaults to the name.

Type str

description
A human-readable description.

Type str

tags
A dictionary of key-value pairs to store arbitrary metadata.

Type Dict[str, str]

owner
The owner of the entity, typically the email of the primary maintainer.

Type str

created_timestamp
The time when the entity was created.

Type Optional[datetime.datetime]

last_updated_timestamp
The time when the entity was last updated.

Type Optional[datetime.datetime]

join_keys
A list of properties that uniquely identifies different entities within the collection. This is meant to replace the *join_key* parameter, but currently only supports a list of size one.

Type List[str]

classmethod from_proto(*entity_proto: feast.core.Entity_pb2.Entity*)
Creates an entity from a protobuf representation of an entity.

Parameters **entity_proto** – A protobuf representation of an entity.

Returns An Entity object based on the entity protobuf.

is_valid()
Validates the state of this entity locally.

Raises **ValueError** – The entity does not have a name or does not have a type.

to_proto() → feast.core.Entity_pb2.Entity
Converts an entity object to its protobuf representation.

Returns An EntityProto protobuf.

CHAPTER

FIVE

FEATURE VIEW

class feast.feature_view.**FeatureView**(**args*, *name: Optional[str] = None*, *entities: Optional[Union[List[feast.entity.Entity], List[str]]] = None*, *ttl: Optional[Union[google.protobuf.duration_pb2.Duration, datetime.timedelta]] = None*, *batch_source: Optional[feast.data_source.DataSource] = None*, *stream_source: Optional[feast.data_source.DataSource] = None*, *features: Optional[List[feast.feature.Feature]] = None*, *tags: Optional[Dict[str, str]] = None*, *online: bool = True*, *description: str = ''*, *owner: str = ''*, *schema: Optional[List[feast.field.Field]] = None*, *source: Optional[feast.data_source.DataSource] = None*)

A FeatureView defines a logical group of features.

name
The unique name of the feature view.

Type str

entities
The list of names of entities that this feature view is associated with.

Type List[str]

ttl
The amount of time this group of features lives. A ttl of 0 indicates that this group of features lives forever. Note that large ttl's or a ttl of 0 can result in extremely computationally intensive queries.

Type Optional[datetime.timedelta]

batch_source
The batch source of data where this group of features is stored. This is optional ONLY if a push source is specified as the stream_source, since push sources contain their own batch sources. This is deprecated in favor of *source*.

Type optional

stream_source
The stream source of data where this group of features is stored. This is deprecated in favor of *source*.

Type optional

schema
The schema of the feature view, including feature, timestamp, and entity columns. If not specified, can be inferred from the underlying data source.

Type List[feast.field.Field]

entity_columns
The list of entity columns contained in the schema. If not specified, can be inferred from the underlying data source.

Type List[feast.field.Field]

features
The list of feature columns contained in the schema. If not specified, can be inferred from the underlying data source.

Type List[feast.field.Field]

online
A boolean indicating whether online retrieval is enabled for this feature view.

Type bool

description
A human-readable description.

Type str

tags
A dictionary of key-value pairs to store arbitrary metadata.

Type Dict[str, str]

owner
The owner of the feature view, typically the email of the primary maintainer.

Type str

source
The source of data for this group of features. May be a stream source, or a batch source. If a stream source, the source should contain a batch_source for backfills & batch materialization.

Type optional

ensure_valid()
Validates the state of this feature view locally.

Raises **ValueError** – The feature view does not have a name or does not have entities.

classmethod from_proto(*feature_view_proto: feast.core.FeatureView_pb2.FeatureView*)
Creates a feature view from a protobuf representation of a feature view.

Parameters **feature_view_proto** – A protobuf representation of a feature view.

Returns A FeatureViewProto object based on the feature view protobuf.

property join_keys: List[str]
Returns a list of all the join keys.

property most_recent_end_time: Optional[datetime.datetime]
Retrieves the latest time up to which the feature view has been materialized.

Returns The latest time, or None if the feature view has not been materialized.

to_proto() → feast.core.FeatureView_pb2.FeatureView
Converts a feature view object to its protobuf representation.

Returns A FeatureViewProto protobuf.

with_join_key_map(*join_key_map: Dict[str, str]*)
Returns a copy of this feature view with the join key map set to the given map. This join_key mapping operation is only used as part of query operations and will not modify the underlying FeatureView.

Parameters **join_key_map** – A map of join keys in which the left is the join_key that corresponds with the feature data and the right corresponds with the entity data.

Examples

Join a location feature data table to both the origin column and destination column of the entity data.

temperatures_feature_service = FeatureService(name="temperatures", features=[

location_stats_feature_view .with_name("origin_stats") .with_join_key_map(

{"location_id": "origin_id"}

),

location_stats_feature_view .with_name("destination_stats") .with_join_key_map(

{"location_id": "destination_id"}

),

],

)

5.1 On Demand Feature View

class feast.on_demand_feature_view.**OnDemandFeatureView**(**args*, *name: Optional[str] = None*, *features: Optional[List[*feast.feature.Feature*]] = None*, *sources: Optional[List[Any]] = None*, *udf: Optional[function] = None*, *inputs: Optional[Dict[str, Union[*feast.feature_view.FeatureView*, feast.feature_view_projection.FeatureViewProjection, *feast.data_source.RequestSource*]]] = None*, *schema: Optional[List[feast.field.Field]] = None*, *description: str = ''*, *tags: Optional[Dict[str, str]] = None*, *owner: str = ''*)

[Experimental] An OnDemandFeatureView defines a logical group of features that are generated by applying a transformation on a set of input sources, such as feature views and request data sources.

name
The unique name of the on demand feature view.

Type str

features
The list of features in the output of the on demand feature view.

Type List[feast.field.Field]

source_feature_view_projections
A map from input source names to actual input sources with type FeatureViewProjection.

Type Dict[str, feast.feature_view_projection.FeatureViewProjection]

source_request_sources
A map from input source names to the actual input sources with type RequestSource.

Type Dict[str, *feast.data_source.RequestSource*]

udf
The user defined transformation function, which must take pandas dataframes as inputs.

Type function

description
A human-readable description.

Type str

tags
A dictionary of key-value pairs to store arbitrary metadata.

Type Dict[str, str]

owner
The owner of the on demand feature view, typically the email of the primary maintainer.

Type str

classmethod from_proto(*on_demand_feature_view_proto: feast.core.OnDemandFeatureView_pb2.OnDemandFeatureView*)
Creates an on demand feature view from a protobuf representation.

Parameters **on_demand_feature_view_proto** – A protobuf representation of an on-demand feature view.

Returns A OnDemandFeatureView object based on the on-demand feature view protobuf.

infer_features()
Infers the set of features associated to this feature view from the input source.

Raises **RegistryInferenceFailure** – The set of features could not be inferred.

to_proto() → feast.core.OnDemandFeatureView_pb2.OnDemandFeatureView
Converts an on demand feature view object to its protobuf representation.

Returns A OnDemandFeatureViewProto protobuf.

feast.on_demand_feature_view.**on_demand_feature_view**(**args*, *features: Optional[List[feast.feature.Feature]] = None*, *sources: Optional[List[Union[feast.batch_feature_view.BatchFeatureView, feast.stream_feature_view.StreamFeatureView, feast.data_source.RequestSource, feast.feature_view_projection.FeatureViewProjection]]] = None*, *inputs: Optional[Dict[str, Union[feast.feature_view.FeatureView, feast.data_source.RequestSource]]] = None*, *schema: Optional[List[feast.field.Field]] = None*, *description: str = ''*, *tags: Optional[Dict[str, str]] = None*, *owner: str = ''*)
Creates an OnDemandFeatureView object with the given user function as udf.

Parameters

- **features** (*deprecated*) – The list of features in the output of the on demand feature view, after the transformation has been applied.

- **sources** (*optional*) – A map from input source names to the actual input sources, which may be feature views, or request data sources. These sources serve as inputs to the udf, which will refer to them by name.
- **inputs** (*optional*) – A map from input source names to the actual input sources, which may be feature views, feature view projections, or request data sources. These sources serve as inputs to the udf, which will refer to them by name.
- **schema** (*optional*) – The list of features in the output of the on demand feature view, after the transformation has been applied.
- **description** (*optional*) – A human-readable description.
- **tags** (*optional*) – A dictionary of key-value pairs to store arbitrary metadata.
- **owner** (*optional*) – The owner of the on demand feature view, typically the email of the primary maintainer.

5.2 Stream Feature View

class feast.stream_feature_view.**StreamFeatureView**(*, *name: Optional[str] = None*, *entities: Optional[Union[List[feast.entity.Entity], List[str]]] = None*, *ttl: Optional[datetime.timedelta] = None*, *tags: Optional[Dict[str, str]] = None*, *online: Optional[bool] = True*, *description: Optional[str] = ''*, *owner: Optional[str] = ''*, *schema: Optional[List[feast.field.Field]] = None*, *source: Optional[feast.data_source.DataSource] = None*, *aggregations: Optional[List[feast.aggregation.Aggregation]] = None*, *mode: Optional[str] = 'spark'*, *timestamp_field: Optional[str] = ''*, *udf: Optional[function] = None*)

NOTE: Stream Feature Views are not yet fully implemented and exist to allow users to register their stream sources and schemas with Feast.

name
The unique name of the stream feature view.

Type str

entities
List of entities or entity join keys.

Type List[str]

ttl
The amount of time this group of features lives. A ttl of 0 indicates that this group of features lives forever. Note that large ttl's or a ttl of 0 can result in extremely computationally intensive queries.

Type Optional[datetime.timedelta]

schema
The schema of the feature view, including feature, timestamp, and entity columns. If not specified, can be inferred from the underlying data source.

Type List[feast.field.Field]

source
DataSource. The stream source of data where this group of features is stored.

Type *feast.data_source.DataSource*

aggregations
List of aggregations registered with the stream feature view.

Type List[feast.aggregation.Aggregation]

mode
The mode of execution.

Type str

timestamp_field
Must be specified if aggregations are specified. Defines the timestamp column on which to aggregate windows.

Type str

online
Defines whether this stream feature view is used in online feature retrieval.

Type bool

description
A human-readable description.

Type str

tags
A dictionary of key-value pairs to store arbitrary metadata.

Type Dict[str, str]

owner
The owner of the on demand feature view, typically the email of the primary maintainer.

Type str

udf
The user defined transformation function. This transformation function should have all of the corresponding imports imported within the function.

Type Optional[function]

classmethod from_proto(*sfv_proto*)
Creates a feature view from a protobuf representation of a feature view.

Parameters **feature_view_proto** – A protobuf representation of a feature view.

Returns A FeatureViewProto object based on the feature view protobuf.

to_proto()
Converts a feature view object to its protobuf representation.

Returns A FeatureViewProto protobuf.

feast.stream_feature_view.**stream_feature_view**(*, *entities: Optional[Union[List[feast.entity.Entity], List[str]]] = None*, *ttl: Optional[datetime.timedelta] = None*, *tags: Optional[Dict[str, str]] = None*, *online: Optional[bool] = True*, *description: Optional[str] = ''*, *owner: Optional[str] = ''*, *schema: Optional[List[feast.field.Field]] = None*, *source: Optional[feast.data_source.DataSource] = None*, *aggregations: Optional[List[feast.aggregation.Aggregation]] = None*, *mode: Optional[str] = 'spark'*, *timestamp_field: Optional[str] = ''*)

Creates an StreamFeatureView object with the given user function as udf. Please make sure that the udf contains all non-built in imports within the function to ensure that the execution of a deserialized function does not miss imports.

CHAPTER

SIX

FEATURE

class feast.feature.**Feature**(*name: str*, *dtype: feast.value_type.ValueType*, *labels: Optional[Dict[str, str]] = None*)

A Feature represents a class of serveable feature.

Parameters

- **name** – Name of the feature.
- **dtype** – The type of the feature, such as string or float.
- **labels** (*optional*) – User-defined metadata in dictionary form.

property **dtype**: **feast.value_type.ValueType**

Gets the data type of this feature.

classmethod **from_proto**(*feature_proto: feast.core.Feature_pb2.FeatureSpecV2*)

Parameters **feature_proto** – FeatureSpecV2 protobuf object

Returns Feature object

property **labels**: **Dict[str, str]**

Gets the labels of this feature.

property **name**

Gets the name of this feature.

to_proto() → feast.core.Feature_pb2.FeatureSpecV2

Converts Feature object to its Protocol Buffer representation.

Returns A FeatureSpecProto protobuf.

CHAPTER

SEVEN

FEATURE SERVICE

class feast.feature_service.**FeatureService**(**args*, *name: Optional[str] = None*, *features: Optional[List[Union[feast.feature_view.FeatureView, feast.on_demand_feature_view.OnDemandFeatureView]]] = None*, *tags: Dict[str, str] = None*, *description: str = ''*, *owner: str = ''*, *logging_config: Optional[feast.feature_logging.LoggingConfig] = None*)

A feature service defines a logical group of features from one or more feature views. This group of features can be retrieved together during training or serving.

name
The unique name of the feature service.

Type str

feature_view_projections
A list containing feature views and feature view projections, representing the features in the feature service.

Type List[feast.feature_view_projection.FeatureViewProjection]

description
A human-readable description.

Type str

tags
A dictionary of key-value pairs to store arbitrary metadata.

Type Dict[str, str]

owner
The owner of the feature service, typically the email of the primary maintainer.

Type str

created_timestamp
The time when the feature service was created.

Type Optional[datetime.datetime]

last_updated_timestamp
The time when the feature service was last updated.

Type Optional[datetime.datetime]

classmethod **from_proto**(*feature_service_proto: feast.core.FeatureService_pb2.FeatureService*)
Converts a FeatureServiceProto to a FeatureService object.

Parameters **feature_service_proto** – A protobuf representation of a FeatureService.

`to_proto()` → feast.core.FeatureService_pb2.FeatureService
Converts a feature service to its protobuf representation.

Returns A FeatureServiceProto protobuf.

CHAPTER

EIGHT

REGISTRY

class feast.registry.**BaseRegistry**

abstract apply_data_source(*data_source:* feast.data_source.DataSource, *project: str*, *commit: bool = True*)

Registers a single data source with Feast

Parameters

- **data_source** – A data source that will be registered
- **project** – Feast project that this data source belongs to
- **commit** – Whether to immediately commit to the registry

abstract apply_entity(*entity:* feast.entity.Entity, *project: str*, *commit: bool = True*)

Registers a single entity with Feast

Parameters

- **entity** – Entity that will be registered
- **project** – Feast project that this entity belongs to
- **commit** – Whether the change should be persisted immediately

abstract apply_feature_service(*feature_service:* feast.feature_service.FeatureService, *project: str*, *commit: bool = True*)

Registers a single feature service with Feast

Parameters

- **feature_service** – A feature service that will be registered
- **project** – Feast project that this entity belongs to

abstract apply_feature_view(*feature_view: feast.base_feature_view.BaseFeatureView*, *project: str*, *commit: bool = True*)

Registers a single feature view with Feast

Parameters

- **feature_view** – Feature view that will be registered
- **project** – Feast project that this feature view belongs to
- **commit** – Whether the change should be persisted immediately

abstract apply_materialization(*feature_view: feast.feature_view.FeatureView*, *project: str*, *start_date: datetime.datetime*, *end_date: datetime.datetime*, *commit: bool = True*)

Updates materialization intervals tracked for a single feature view in Feast

Parameters

- **feature_view** – Feature view that will be updated with an additional materialization interval tracked
- **project** – Feast project that this feature view belongs to
- **start_date** (*datetime*) – Start date of the materialization interval to track
- **end_date** (*datetime*) – End date of the materialization interval to track
- **commit** – Whether the change should be persisted immediately

abstract apply_saved_dataset(*saved_dataset: feast.saved_dataset.SavedDataset*, *project: str*, *commit: bool = True*)

Stores a saved dataset metadata with Feast

Parameters

- **saved_dataset** – SavedDataset that will be added / updated to registry
- **project** – Feast project that this dataset belongs to
- **commit** – Whether the change should be persisted immediately

abstract apply_validation_reference(*validation_reference: feast.saved_dataset.ValidationReference*, *project: str*, *commit: bool = True*)

Persist a validation reference

Parameters

- **validation_reference** – ValidationReference that will be added / updated to registry
- **project** – Feast project that this dataset belongs to
- **commit** – Whether the change should be persisted immediately

abstract commit()

Commits the state of the registry cache to the remote registry store.

abstract delete_data_source(*name: str*, *project: str*, *commit: bool = True*)

Deletes a data source or raises an exception if not found.

Parameters

- **name** – Name of data source
- **project** – Feast project that this data source belongs to
- **commit** – Whether the change should be persisted immediately

abstract delete_entity(*name: str*, *project: str*, *commit: bool = True*)

Deletes an entity or raises an exception if not found.

Parameters

- **name** – Name of entity
- **project** – Feast project that this entity belongs to
- **commit** – Whether the change should be persisted immediately

abstract delete_feature_service(*name: str*, *project: str*, *commit: bool = True*)
Deletes a feature service or raises an exception if not found.

Parameters

- **name** – Name of feature service
- **project** – Feast project that this feature service belongs to
- **commit** – Whether the change should be persisted immediately

abstract delete_feature_view(*name: str*, *project: str*, *commit: bool = True*)
Deletes a feature view or raises an exception if not found.

Parameters

- **name** – Name of feature view
- **project** – Feast project that this feature view belongs to
- **commit** – Whether the change should be persisted immediately

delete_saved_dataset(*name: str*, *project: str*, *allow_cache: bool = False*)
Delete a saved dataset.

Parameters

- **name** – Name of dataset
- **project** – Feast project that this dataset belongs to
- **allow_cache** – Whether to allow returning this dataset from a cached registry

Returns Returns either the specified SavedDataset, or raises an exception if none is found

abstract delete_validation_reference(*name: str*, *project: str*, *commit: bool = True*)
Deletes a validation reference or raises an exception if not found.

Parameters

- **name** – Name of validation reference
- **project** – Feast project that this object belongs to
- **commit** – Whether the change should be persisted immediately

abstract get_data_source(*name: str*, *project: str*, *allow_cache: bool = False*) → *feast.data_source.DataSource*
Retrieves a data source.

Parameters

- **name** – Name of data source
- **project** – Feast project that this data source belongs to
- **allow_cache** – Whether to allow returning this data source from a cached registry

Returns Returns either the specified data source, or raises an exception if none is found

abstract get_entity(*name: str*, *project: str*, *allow_cache: bool = False*) → *feast.entity.Entity*
Retrieves an entity.

Parameters

- **name** – Name of entity
- **project** – Feast project that this entity belongs to

- **allow_cache** – Whether to allow returning this entity from a cached registry

Returns Returns either the specified entity, or raises an exception if none is found

abstract get_feature_service(*name: str*, *project: str*, *allow_cache: bool = False*) → *feast.feature_service.FeatureService*

Retrieves a feature service.

Parameters

- **name** – Name of feature service
- **project** – Feast project that this feature service belongs to
- **allow_cache** – Whether to allow returning this feature service from a cached registry

Returns Returns either the specified feature service, or raises an exception if none is found

abstract get_feature_view(*name: str*, *project: str*, *allow_cache: bool = False*) → *feast.feature_view.FeatureView*

Retrieves a feature view.

Parameters

- **name** – Name of feature view
- **project** – Feast project that this feature view belongs to
- **allow_cache** – Allow returning feature view from the cached registry

Returns Returns either the specified feature view, or raises an exception if none is found

abstract get_infra(*project: str*, *allow_cache: bool = False*) → feast.infra.infra_object.Infra

Retrieves the stored Infra object.

Parameters

- **project** – Feast project that the Infra object refers to
- **allow_cache** – Whether to allow returning this entity from a cached registry

Returns The stored Infra object.

abstract get_on_demand_feature_view(*name: str*, *project: str*, *allow_cache: bool = False*) → *feast.on_demand_feature_view.OnDemandFeatureView*

Retrieves an on demand feature view.

Parameters

- **name** – Name of on demand feature view
- **project** – Feast project that this on demand feature view belongs to
- **allow_cache** – Whether to allow returning this on demand feature view from a cached registry

Returns Returns either the specified on demand feature view, or raises an exception if none is found

abstract get_request_feature_view(*name: str*, *project: str*) → feast.request_feature_view.RequestFeatureView

Retrieves a request feature view.

Parameters

- **name** – Name of request feature view
- **project** – Feast project that this feature view belongs to

- **allow_cache** – Allow returning feature view from the cached registry

Returns Returns either the specified feature view, or raises an exception if none is found

abstract get_saved_dataset(*name: str*, *project: str*, *allow_cache: bool = False*) → feast.saved_dataset.SavedDataset

Retrieves a saved dataset.

Parameters

- **name** – Name of dataset
- **project** – Feast project that this dataset belongs to
- **allow_cache** – Whether to allow returning this dataset from a cached registry

Returns Returns either the specified SavedDataset, or raises an exception if none is found

abstract get_stream_feature_view(*name: str*, *project: str*, *allow_cache: bool = False*)

Retrieves a stream feature view.

Parameters

- **name** – Name of stream feature view
- **project** – Feast project that this feature view belongs to
- **allow_cache** – Allow returning feature view from the cached registry

Returns Returns either the specified feature view, or raises an exception if none is found

abstract get_validation_reference(*name: str*, *project: str*, *allow_cache: bool = False*) → feast.saved_dataset.ValidationReference

Retrieves a validation reference.

Parameters

- **name** – Name of dataset
- **project** – Feast project that this dataset belongs to
- **allow_cache** – Whether to allow returning this dataset from a cached registry

Returns Returns either the specified ValidationReference, or raises an exception if none is found

abstract list_data_sources(*project: str*, *allow_cache: bool = False*) → List[*feast.data_source.DataSource*]

Retrieve a list of data sources from the registry

Parameters

- **project** – Filter data source based on project name
- **allow_cache** – Whether to allow returning data sources from a cached registry

Returns List of data sources

abstract list_entities(*project: str*, *allow_cache: bool = False*) → List[*feast.entity.Entity*]

Retrieve a list of entities from the registry

Parameters

- **allow_cache** – Whether to allow returning entities from a cached registry
- **project** – Filter entities based on project name

Returns List of entities

abstract list_feature_services(*project: str*, *allow_cache: bool = False*) → List[*feast.feature_service.FeatureService*]

Retrieve a list of feature services from the registry

Parameters

- **allow_cache** – Whether to allow returning entities from a cached registry
- **project** – Filter entities based on project name

Returns List of feature services

abstract list_feature_views(*project: str*, *allow_cache: bool = False*) → List[*feast.feature_view.FeatureView*]

Retrieve a list of feature views from the registry

Parameters

- **allow_cache** – Allow returning feature views from the cached registry
- **project** – Filter feature views based on project name

Returns List of feature views

abstract list_on_demand_feature_views(*project: str*, *allow_cache: bool = False*) → List[*feast.on_demand_feature_view.OnDemandFeatureView*]

Retrieve a list of on demand feature views from the registry

Parameters

- **project** – Filter on demand feature views based on project name
- **allow_cache** – Whether to allow returning on demand feature views from a cached registry

Returns List of on demand feature views

list_project_metadata(*project: str*, *allow_cache: bool = False*) → List[feast.project_metadata.ProjectMetadata]

Retrieves project metadata

Parameters

- **project** – Filter metadata based on project name
- **allow_cache** – Allow returning feature views from the cached registry

Returns List of project metadata

abstract list_request_feature_views(*project: str*, *allow_cache: bool = False*) → List[feast.request_feature_view.RequestFeatureView]

Retrieve a list of request feature views from the registry

Parameters

- **allow_cache** – Allow returning feature views from the cached registry
- **project** – Filter feature views based on project name

Returns List of request feature views

abstract list_saved_datasets(*project: str*, *allow_cache: bool = False*) → List[feast.saved_dataset.SavedDataset]

Retrieves a list of all saved datasets in specified project

Parameters

- **project** – Feast project
- **allow_cache** – Whether to allow returning this dataset from a cached registry

Returns Returns the list of SavedDatasets

abstract list_stream_feature_views(*project: str*, *allow_cache: bool = False*) → List[*feast.stream_feature_view.StreamFeatureView*]

Retrieve a list of stream feature views from the registry

Parameters

- **project** – Filter stream feature views based on project name
- **allow_cache** – Whether to allow returning stream feature views from a cached registry

Returns List of stream feature views

list_validation_references(*project: str*, *allow_cache: bool = False*) → List[feast.saved_dataset.ValidationReference]

Retrieve a list of validation references from the registry

Parameters

- **allow_cache** – Allow returning feature views from the cached registry
- **project** – Filter feature views based on project name

Returns List of request feature views

abstract proto() → feast.core.Registry_pb2.Registry

Retrieves a proto version of the registry.

Returns The registry proto object.

abstract refresh(*project: Optional[str]*)

Refreshes the state of the registry cache by fetching the registry state from the remote registry store.

to_dict(*project: str*) → Dict[str, List[Any]]

Returns a dictionary representation of the registry contents for the specified project.

For each list in the dictionary, the elements are sorted by name, so this method can be used to compare two registries.

Parameters **project** – Feast project to convert to a dict

abstract update_infra(*infra: feast.infra.infra_object.Infra*, *project: str*, *commit: bool = True*)

Updates the stored Infra object.

Parameters

- **infra** – The new Infra object to be stored.
- **project** – Feast project that the Infra object refers to
- **commit** – Whether the change should be persisted immediately

class feast.registry.**FeastObjectType**(*value*)

An enumeration.

class feast.registry.**Registry**(*registry_config: Optional[feast.repo_config.RegistryConfig]*, *repo_path: Optional[pathlib.Path]*)

Registry: A registry allows for the management and persistence of feature definitions and related metadata.

apply_data_source(*data_source: feast.data_source.DataSource*, *project: str*, *commit: bool = True*)

Registers a single data source with Feast

Parameters

- **data_source** – A data source that will be registered
- **project** – Feast project that this data source belongs to
- **commit** – Whether to immediately commit to the registry

apply_entity(*entity: feast.entity.Entity*, *project: str*, *commit: bool = True*)
Registers a single entity with Feast

Parameters

- **entity** – Entity that will be registered
- **project** – Feast project that this entity belongs to
- **commit** – Whether the change should be persisted immediately

apply_feature_service(*feature_service: feast.feature_service.FeatureService*, *project: str*, *commit: bool = True*)
Registers a single feature service with Feast

Parameters

- **feature_service** – A feature service that will be registered
- **project** – Feast project that this entity belongs to

apply_feature_view(*feature_view: feast.base_feature_view.BaseFeatureView*, *project: str*, *commit: bool = True*)
Registers a single feature view with Feast

Parameters

- **feature_view** – Feature view that will be registered
- **project** – Feast project that this feature view belongs to
- **commit** – Whether the change should be persisted immediately

apply_materialization(*feature_view: feast.feature_view.FeatureView*, *project: str*, *start_date: datetime.datetime*, *end_date: datetime.datetime*, *commit: bool = True*)
Updates materialization intervals tracked for a single feature view in Feast

Parameters

- **feature_view** – Feature view that will be updated with an additional materialization interval tracked
- **project** – Feast project that this feature view belongs to
- **start_date** (*datetime*) – Start date of the materialization interval to track
- **end_date** (*datetime*) – End date of the materialization interval to track
- **commit** – Whether the change should be persisted immediately

apply_saved_dataset(*saved_dataset: feast.saved_dataset.SavedDataset*, *project: str*, *commit: bool = True*)
Stores a saved dataset metadata with Feast

Parameters

- **saved_dataset** – SavedDataset that will be added / updated to registry
- **project** – Feast project that this dataset belongs to
- **commit** – Whether the change should be persisted immediately

apply_validation_reference(*validation_reference: feast.saved_dataset.ValidationReference*, *project: str*, *commit: bool = True*)
Persist a validation reference

Parameters

- **validation_reference** – ValidationReference that will be added / updated to registry
- **project** – Feast project that this dataset belongs to
- **commit** – Whether the change should be persisted immediately

commit()
Commits the state of the registry cache to the remote registry store.

delete_data_source(*name: str*, *project: str*, *commit: bool = True*)
Deletes a data source or raises an exception if not found.

Parameters

- **name** – Name of data source
- **project** – Feast project that this data source belongs to
- **commit** – Whether the change should be persisted immediately

delete_entity(*name: str*, *project: str*, *commit: bool = True*)
Deletes an entity or raises an exception if not found.

Parameters

- **name** – Name of entity
- **project** – Feast project that this entity belongs to
- **commit** – Whether the change should be persisted immediately

delete_feature_service(*name: str*, *project: str*, *commit: bool = True*)
Deletes a feature service or raises an exception if not found.

Parameters

- **name** – Name of feature service
- **project** – Feast project that this feature service belongs to
- **commit** – Whether the change should be persisted immediately

delete_feature_view(*name: str*, *project: str*, *commit: bool = True*)
Deletes a feature view or raises an exception if not found.

Parameters

- **name** – Name of feature view
- **project** – Feast project that this feature view belongs to
- **commit** – Whether the change should be persisted immediately

delete_saved_dataset(*name: str*, *project: str*, *allow_cache: bool = False*)
Delete a saved dataset.

Parameters

- **name** – Name of dataset
- **project** – Feast project that this dataset belongs to
- **allow_cache** – Whether to allow returning this dataset from a cached registry

Returns Returns either the specified SavedDataset, or raises an exception if none is found

delete_validation_reference(*name: str*, *project: str*, *commit: bool = True*)
Deletes a validation reference or raises an exception if not found.

Parameters

- **name** – Name of validation reference
- **project** – Feast project that this object belongs to
- **commit** – Whether the change should be persisted immediately

get_data_source(*name: str*, *project: str*, *allow_cache: bool = False*) → *feast.data_source.DataSource*
Retrieves a data source.

Parameters

- **name** – Name of data source
- **project** – Feast project that this data source belongs to
- **allow_cache** – Whether to allow returning this data source from a cached registry

Returns Returns either the specified data source, or raises an exception if none is found

get_entity(*name: str*, *project: str*, *allow_cache: bool = False*) → *feast.entity.Entity*
Retrieves an entity.

Parameters

- **name** – Name of entity
- **project** – Feast project that this entity belongs to
- **allow_cache** – Whether to allow returning this entity from a cached registry

Returns Returns either the specified entity, or raises an exception if none is found

get_feature_service(*name: str*, *project: str*, *allow_cache: bool = False*) → *feast.feature_service.FeatureService*
Retrieves a feature service.

Parameters

- **name** – Name of feature service
- **project** – Feast project that this feature service belongs to
- **allow_cache** – Whether to allow returning this feature service from a cached registry

Returns Returns either the specified feature service, or raises an exception if none is found

get_feature_view(*name: str*, *project: str*, *allow_cache: bool = False*) → *feast.feature_view.FeatureView*
Retrieves a feature view.

Parameters

- **name** – Name of feature view
- **project** – Feast project that this feature view belongs to
- **allow_cache** – Allow returning feature view from the cached registry

Returns Returns either the specified feature view, or raises an exception if none is found

get_infra(*project: str*, *allow_cache: bool = False*) → feast.infra.infra_object.Infra
Retrieves the stored Infra object.

Parameters

- **project** – Feast project that the Infra object refers to
- **allow_cache** – Whether to allow returning this entity from a cached registry

Returns The stored Infra object.

get_on_demand_feature_view(*name: str*, *project: str*, *allow_cache: bool = False*) → *feast.on_demand_feature_view.OnDemandFeatureView*

Retrieves an on demand feature view.

Parameters

- **name** – Name of on demand feature view
- **project** – Feast project that this on demand feature view belongs to
- **allow_cache** – Whether to allow returning this on demand feature view from a cached registry

Returns Returns either the specified on demand feature view, or raises an exception if none is found

get_request_feature_view(*name: str*, *project: str*)

Retrieves a feature view.

Parameters

- **name** – Name of feature view
- **project** – Feast project that this feature view belongs to

Returns Returns either the specified feature view, or raises an exception if none is found

get_saved_dataset(*name: str*, *project: str*, *allow_cache: bool = False*) → feast.saved_dataset.SavedDataset

Retrieves a saved dataset.

Parameters

- **name** – Name of dataset
- **project** – Feast project that this dataset belongs to
- **allow_cache** – Whether to allow returning this dataset from a cached registry

Returns Returns either the specified SavedDataset, or raises an exception if none is found

get_stream_feature_view(*name: str*, *project: str*, *allow_cache: bool = False*) → *feast.stream_feature_view.StreamFeatureView*

Retrieves a stream feature view.

Parameters

- **name** – Name of stream feature view
- **project** – Feast project that this stream feature view belongs to
- **allow_cache** – Allow returning feature view from the cached registry

Returns Returns either the specified feature view, or raises an exception if none is found

get_validation_reference(*name: str*, *project: str*, *allow_cache: bool = False*) → feast.saved_dataset.ValidationReference

Retrieves a validation reference.

Parameters

- **name** – Name of dataset
- **project** – Feast project that this dataset belongs to
- **allow_cache** – Whether to allow returning this dataset from a cached registry

Returns Returns either the specified ValidationReference, or raises an exception if none is found

list_data_sources(*project: str*, *allow_cache: bool = False*) → List[*feast.data_source.DataSource*]
Retrieve a list of data sources from the registry

Parameters

- **project** – Filter data source based on project name
- **allow_cache** – Whether to allow returning data sources from a cached registry

Returns List of data sources

list_entities(*project: str*, *allow_cache: bool = False*) → List[*feast.entity.Entity*]
Retrieve a list of entities from the registry

Parameters

- **allow_cache** – Whether to allow returning entities from a cached registry
- **project** – Filter entities based on project name

Returns List of entities

list_feature_services(*project: str*, *allow_cache: bool = False*) → List[*feast.feature_service.FeatureService*]
Retrieve a list of feature services from the registry

Parameters

- **allow_cache** – Whether to allow returning entities from a cached registry
- **project** – Filter entities based on project name

Returns List of feature services

list_feature_views(*project: str*, *allow_cache: bool = False*) → List[*feast.feature_view.FeatureView*]
Retrieve a list of feature views from the registry

Parameters

- **allow_cache** – Allow returning feature views from the cached registry
- **project** – Filter feature views based on project name

Returns List of feature views

list_on_demand_feature_views(*project: str*, *allow_cache: bool = False*) → List[*feast.on_demand_feature_view.OnDemandFeatureView*]
Retrieve a list of on demand feature views from the registry

Parameters

- **project** – Filter on demand feature views based on project name
- **allow_cache** – Whether to allow returning on demand feature views from a cached registry

Returns List of on demand feature views

list_project_metadata(*project: str*, *allow_cache: bool = False*) → List[feast.project_metadata.ProjectMetadata]
Retrieves project metadata

Parameters

- **project** – Filter metadata based on project name
- **allow_cache** – Allow returning feature views from the cached registry

Returns List of project metadata

list_request_feature_views(*project: str*, *allow_cache: bool = False*) → List[feast.request_feature_view.RequestFeatureView]
Retrieve a list of request feature views from the registry

Parameters

- **allow_cache** – Allow returning feature views from the cached registry
- **project** – Filter feature views based on project name

Returns List of feature views

list_saved_datasets(*project: str*, *allow_cache: bool = False*) → List[feast.saved_dataset.SavedDataset]
Retrieves a list of all saved datasets in specified project

Parameters

- **project** – Feast project
- **allow_cache** – Whether to allow returning this dataset from a cached registry

Returns Returns the list of SavedDatasets

list_stream_feature_views(*project: str*, *allow_cache: bool = False*) → List[*feast.stream_feature_view.StreamFeatureView*]
Retrieve a list of stream feature views from the registry

Parameters

- **project** – Filter stream feature views based on project name
- **allow_cache** – Whether to allow returning stream feature views from a cached registry

Returns List of stream feature views

list_validation_references(*project: str*, *allow_cache: bool = False*) → List[feast.saved_dataset.ValidationReference]
Retrieve a list of validation references from the registry

Parameters

- **allow_cache** – Allow returning feature views from the cached registry
- **project** – Filter feature views based on project name

Returns List of request feature views

proto() → feast.core.Registry_pb2.Registry
Retrieves a proto version of the registry.

Returns The registry proto object.

refresh(*project: Optional[str]*)
Refreshes the state of the registry cache by fetching the registry state from the remote registry store.

teardown()
Tears down (removes) the registry.

to_dict(*project: str*) → Dict[str, List[Any]]
Returns a dictionary representation of the registry contents for the specified project.

For each list in the dictionary, the elements are sorted by name, so this method can be used to compare two registries.

Parameters **project** – Feast project to convert to a dict

update_infra(*infra: feast.infra.infra_object.Infra*, *project: str*, *commit: bool = True*)
Updates the stored Infra object.

Parameters

- **infra** – The new Infra object to be stored.
- **project** – Feast project that the Infra object refers to
- **commit** – Whether the change should be persisted immediately

CHAPTER

NINE

REGISTRY STORE

class feast.registry_store.**RegistryStore**
A registry store is a storage backend for the Feast registry.

abstract get_registry_proto() → feast.core.Registry_pb2.Registry
Retrieves the registry proto from the registry path. If there is no file at that path, raises a FileNotFoundError.

Returns Returns either the registry proto stored at the registry path, or an empty registry proto.

abstract teardown()
Tear down the registry.

abstract update_registry_proto(*registry_proto: feast.core.Registry_pb2.Registry*)
Overwrites the current registry proto with the proto passed in. This method writes to the registry path.

Parameters **registry_proto** – the new RegistryProto

9.1 SQL Registry Store

class feast.infra.registry_stores.sql.**FeastMetadataKeys**(*value*)
An enumeration.

class feast.infra.registry_stores.sql.**SqlRegistry**(*registry_config: Optional[feast.repo_config.RegistryConfig]*, *repo_path: Optional[pathlib.Path]*)

apply_data_source(*data_source:* feast.data_source.DataSource, *project: str*, *commit: bool = True*)
Registers a single data source with Feast

Parameters

- **data_source** – A data source that will be registered
- **project** – Feast project that this data source belongs to
- **commit** – Whether to immediately commit to the registry

apply_entity(*entity:* feast.entity.Entity, *project: str*, *commit: bool = True*)
Registers a single entity with Feast

Parameters

- **entity** – Entity that will be registered
- **project** – Feast project that this entity belongs to
- **commit** – Whether the change should be persisted immediately

apply_feature_service(*feature_service: feast.feature_service.FeatureService*, *project: str*, *commit: bool = True*)
Registers a single feature service with Feast

Parameters

- **feature_service** – A feature service that will be registered
- **project** – Feast project that this entity belongs to

apply_feature_view(*feature_view: feast.base_feature_view.BaseFeatureView*, *project: str*, *commit: bool = True*)
Registers a single feature view with Feast

Parameters

- **feature_view** – Feature view that will be registered
- **project** – Feast project that this feature view belongs to
- **commit** – Whether the change should be persisted immediately

apply_materialization(*feature_view: feast.feature_view.FeatureView*, *project: str*, *start_date: datetime.datetime*, *end_date: datetime.datetime*, *commit: bool = True*)
Updates materialization intervals tracked for a single feature view in Feast

Parameters

- **feature_view** – Feature view that will be updated with an additional materialization interval tracked
- **project** – Feast project that this feature view belongs to
- **start_date** (*datetime*) – Start date of the materialization interval to track
- **end_date** (*datetime*) – End date of the materialization interval to track
- **commit** – Whether the change should be persisted immediately

apply_saved_dataset(*saved_dataset: feast.saved_dataset.SavedDataset*, *project: str*, *commit: bool = True*)
Stores a saved dataset metadata with Feast

Parameters

- **saved_dataset** – SavedDataset that will be added / updated to registry
- **project** – Feast project that this dataset belongs to
- **commit** – Whether the change should be persisted immediately

apply_validation_reference(*validation_reference: feast.saved_dataset.ValidationReference*, *project: str*, *commit: bool = True*)
Persist a validation reference

Parameters

- **validation_reference** – ValidationReference that will be added / updated to registry
- **project** – Feast project that this dataset belongs to
- **commit** – Whether the change should be persisted immediately

commit()
Commits the state of the registry cache to the remote registry store.

delete_data_source(*name: str*, *project: str*, *commit: bool = True*)
Deletes a data source or raises an exception if not found.

Parameters

- **name** – Name of data source
- **project** – Feast project that this data source belongs to
- **commit** – Whether the change should be persisted immediately

delete_entity(*name: str*, *project: str*, *commit: bool = True*)
Deletes an entity or raises an exception if not found.

Parameters

- **name** – Name of entity
- **project** – Feast project that this entity belongs to
- **commit** – Whether the change should be persisted immediately

delete_feature_service(*name: str*, *project: str*, *commit: bool = True*)
Deletes a feature service or raises an exception if not found.

Parameters

- **name** – Name of feature service
- **project** – Feast project that this feature service belongs to
- **commit** – Whether the change should be persisted immediately

delete_feature_view(*name: str*, *project: str*, *commit: bool = True*)
Deletes a feature view or raises an exception if not found.

Parameters

- **name** – Name of feature view
- **project** – Feast project that this feature view belongs to
- **commit** – Whether the change should be persisted immediately

delete_validation_reference(*name: str*, *project: str*, *commit: bool = True*)
Deletes a validation reference or raises an exception if not found.

Parameters

- **name** – Name of validation reference
- **project** – Feast project that this object belongs to
- **commit** – Whether the change should be persisted immediately

get_data_source(*name: str*, *project: str*, *allow_cache: bool = False*) → *feast.data_source.DataSource*
Retrieves a data source.

Parameters

- **name** – Name of data source
- **project** – Feast project that this data source belongs to
- **allow_cache** – Whether to allow returning this data source from a cached registry

Returns Returns either the specified data source, or raises an exception if none is found

get_entity(*name: str*, *project: str*, *allow_cache: bool = False*) → *feast.entity.Entity*
Retrieves an entity.

Parameters

- **name** – Name of entity
- **project** – Feast project that this entity belongs to
- **allow_cache** – Whether to allow returning this entity from a cached registry

Returns Returns either the specified entity, or raises an exception if none is found

get_feature_service(*name: str*, *project: str*, *allow_cache: bool = False*) → *feast.feature_service.FeatureService*

Retrieves a feature service.

Parameters

- **name** – Name of feature service
- **project** – Feast project that this feature service belongs to
- **allow_cache** – Whether to allow returning this feature service from a cached registry

Returns Returns either the specified feature service, or raises an exception if none is found

get_feature_view(*name: str*, *project: str*, *allow_cache: bool = False*) → *feast.feature_view.FeatureView*

Retrieves a feature view.

Parameters

- **name** – Name of feature view
- **project** – Feast project that this feature view belongs to
- **allow_cache** – Allow returning feature view from the cached registry

Returns Returns either the specified feature view, or raises an exception if none is found

get_infra(*project: str*, *allow_cache: bool = False*) → feast.infra.infra_object.Infra

Retrieves the stored Infra object.

Parameters

- **project** – Feast project that the Infra object refers to
- **allow_cache** – Whether to allow returning this entity from a cached registry

Returns The stored Infra object.

get_on_demand_feature_view(*name: str*, *project: str*, *allow_cache: bool = False*) → *feast.on_demand_feature_view.OnDemandFeatureView*

Retrieves an on demand feature view.

Parameters

- **name** – Name of on demand feature view
- **project** – Feast project that this on demand feature view belongs to
- **allow_cache** – Whether to allow returning this on demand feature view from a cached registry

Returns Returns either the specified on demand feature view, or raises an exception if none is found

get_request_feature_view(*name: str*, *project: str*)

Retrieves a request feature view.

Parameters

- **name** – Name of request feature view

- **project** – Feast project that this feature view belongs to
- **allow_cache** – Allow returning feature view from the cached registry

Returns Returns either the specified feature view, or raises an exception if none is found

get_saved_dataset(*name: str*, *project: str*, *allow_cache: bool = False*) → feast.saved_dataset.SavedDataset

Retrieves a saved dataset.

Parameters

- **name** – Name of dataset
- **project** – Feast project that this dataset belongs to
- **allow_cache** – Whether to allow returning this dataset from a cached registry

Returns Returns either the specified SavedDataset, or raises an exception if none is found

get_stream_feature_view(*name: str*, *project: str*, *allow_cache: bool = False*)

Retrieves a stream feature view.

Parameters

- **name** – Name of stream feature view
- **project** – Feast project that this feature view belongs to
- **allow_cache** – Allow returning feature view from the cached registry

Returns Returns either the specified feature view, or raises an exception if none is found

get_validation_reference(*name: str*, *project: str*, *allow_cache: bool = False*) → feast.saved_dataset.ValidationReference

Retrieves a validation reference.

Parameters

- **name** – Name of dataset
- **project** – Feast project that this dataset belongs to
- **allow_cache** – Whether to allow returning this dataset from a cached registry

Returns Returns either the specified ValidationReference, or raises an exception if none is found

list_data_sources(*project: str*, *allow_cache: bool = False*) → List[*feast.data_source.DataSource*]

Retrieve a list of data sources from the registry

Parameters

- **project** – Filter data source based on project name
- **allow_cache** – Whether to allow returning data sources from a cached registry

Returns List of data sources

list_entities(*project: str*, *allow_cache: bool = False*) → List[*feast.entity.Entity*]

Retrieve a list of entities from the registry

Parameters

- **allow_cache** – Whether to allow returning entities from a cached registry
- **project** – Filter entities based on project name

Returns List of entities

list_feature_services(*project: str*, *allow_cache: bool = False*) → List[*feast.feature_service.FeatureService*]
Retrieve a list of feature services from the registry

Parameters

- **allow_cache** – Whether to allow returning entities from a cached registry
- **project** – Filter entities based on project name

Returns List of feature services

list_feature_views(*project: str*, *allow_cache: bool = False*) → List[*feast.feature_view.FeatureView*]
Retrieve a list of feature views from the registry

Parameters

- **allow_cache** – Allow returning feature views from the cached registry
- **project** – Filter feature views based on project name

Returns List of feature views

list_on_demand_feature_views(*project: str*, *allow_cache: bool = False*) → List[*feast.on_demand_feature_view.OnDemandFeatureView*]
Retrieve a list of on demand feature views from the registry

Parameters

- **project** – Filter on demand feature views based on project name
- **allow_cache** – Whether to allow returning on demand feature views from a cached registry

Returns List of on demand feature views

list_project_metadata(*project: str*, *allow_cache: bool = False*) → List[feast.project_metadata.ProjectMetadata]
Retrieves project metadata

Parameters

- **project** – Filter metadata based on project name
- **allow_cache** – Allow returning feature views from the cached registry

Returns List of project metadata

list_request_feature_views(*project: str*, *allow_cache: bool = False*) → List[feast.request_feature_view.RequestFeatureView]
Retrieve a list of request feature views from the registry

Parameters

- **allow_cache** – Allow returning feature views from the cached registry
- **project** – Filter feature views based on project name

Returns List of request feature views

list_saved_datasets(*project: str*, *allow_cache: bool = False*) → List[feast.saved_dataset.SavedDataset]
Retrieves a list of all saved datasets in specified project

Parameters

- **project** – Feast project
- **allow_cache** – Whether to allow returning this dataset from a cached registry

Returns Returns the list of SavedDatasets

list_stream_feature_views(*project: str*, *allow_cache: bool = False*) → List[*feast.stream_feature_view.StreamFeatureView*]
Retrieve a list of stream feature views from the registry

Parameters

- **project** – Filter stream feature views based on project name
- **allow_cache** – Whether to allow returning stream feature views from a cached registry

Returns List of stream feature views

proto() → feast.core.Registry_pb2.Registry
Retrieves a proto version of the registry.

Returns The registry proto object.

refresh(*project: Optional[str]*)
Refreshes the state of the registry cache by fetching the registry state from the remote registry store.

update_infra(*infra: feast.infra.infra_object.Infra*, *project: str*, *commit: bool = True*)
Updates the stored Infra object.

Parameters

- **infra** – The new Infra object to be stored.
- **project** – Feast project that the Infra object refers to
- **commit** – Whether the change should be persisted immediately

9.2 PostgreSQL Registry Store

class feast.infra.registry_stores.contrib.postgres.registry_store.**PostgreSQLRegistryStore**(*config: feast.infra.registr*
reg-
istry_path:
str)

get_registry_proto() → feast.core.Registry_pb2.Registry
Retrieves the registry proto from the registry path. If there is no file at that path, raises a FileNotFoundError.

Returns Returns either the registry proto stored at the registry path, or an empty registry proto.

teardown()
Tear down the registry.

update_registry_proto(*registry_proto: feast.core.Registry_pb2.Registry*)
Overwrites the current registry proto with the proto passed in. This method writes to the registry path.

Parameters **registry_proto** – the new RegistryProto

class feast.infra.registry_stores.contrib.postgres.registry_store.**PostgresRegistryConfig**(*, *registry_type: pydantic.types.StrictStr = 'file'*, *registry_store_type: pydantic.types.StrictStr = None*, *path: pydantic.types.StrictStr*, *cache_ttl_seconds: pydantic.types.StrictInt = 600*, *host: str*, *port: int*, *database: str*, *db_schema: str*, *user: str*, *password: str*, *sslmode: str = None*, *sslkey_path: str = None*, *sslcert_path: str = None*, *sslrootcert_path: str = None*, ***extra_data: Any*)

CHAPTER

TEN

PROVIDER

class feast.infra.provider.**Provider**(*config:* feast.repo_config.RepoConfig)

get_feature_server_endpoint() → Optional[str]
Returns endpoint for the feature server, if it exists.

ingest_df(*feature_view:* feast.feature_view.FeatureView, *entities: List[*feast.entity.Entity*]*, *df: pandas.core.frame.DataFrame*)
Ingests a DataFrame directly into the online store

ingest_df_to_offline_store(*feature_view:* feast.feature_view.FeatureView, *df: pyarrow.lib.Table*)
Ingests a DataFrame directly into the offline store

abstract online_read(*config:* feast.repo_config.RepoConfig, *table:* feast.feature_view.FeatureView, *entity_keys: List[feast.types.EntityKey_pb2.EntityKey]*, *requested_features: Optional[List[str]] = None*) → List[Tuple[Optional[datetime.datetime], Optional[Dict[str, feast.types.Value_pb2.Value]]]]
Read feature values given an Entity Key. This is a low level interface, not expected to be used by the users directly.

Returns Data is returned as a list, one item per entity key. Each item in the list is a tuple of event_ts for the row, and the feature data as a dict from feature names to values. Values are returned as Value proto message.

abstract online_write_batch(*config:* feast.repo_config.RepoConfig, *table:* feast.feature_view.FeatureView, *data: List[Tuple[feast.types.EntityKey_pb2.EntityKey, Dict[str, feast.types.Value_pb2.Value], datetime.datetime, Optional[datetime.datetime]]]*, *progress: Optional[Callable[[int], Any]]*) → None
Write a batch of feature rows to the online store. This is a low level interface, not expected to be used by the users directly.

If a tz-naive timestamp is passed to this method, it is assumed to be UTC.

Parameters

- **config** – The RepoConfig for the current FeatureStore.
- **table** – Feast FeatureView
- **data** – a list of quadruplets containing Feature data. Each quadruplet contains an Entity Key, a dict containing feature values, an event timestamp for the row, and the created timestamp for the row if it exists.
- **progress** – Optional function to be called once every mini-batch of rows is written to the online store. Can be used to display progress.

plan_infra(*config:* feast.repo_config.RepoConfig, *desired_registry_proto:* *feast.core.Registry_pb2.Registry*) → feast.infra.infra_object.Infra

Returns the Infra required to support the desired registry.

Parameters

- **config** – The RepoConfig for the current FeatureStore.
- **desired_registry_proto** – The desired registry, in proto form.

abstract retrieve_feature_service_logs(*feature_service:* feast.feature_service.FeatureService, *start_date:* *datetime.datetime*, *end_date:* *datetime.datetime*, *config:* feast.repo_config.RepoConfig, *registry:* feast.registry.BaseRegistry) → *feast.infra.offline_stores.offline_store.RetrievalJob*

Read logged features from an offline store for a given time window [from, to). Target table is determined based on logging configuration from the feature service.

Returns RetrievalJob object, which wraps the query to the offline store.

abstract retrieve_saved_dataset(*config:* feast.repo_config.RepoConfig, *dataset:* *feast.saved_dataset.SavedDataset*) → *feast.infra.offline_stores.offline_store.RetrievalJob*

Read saved dataset from offline store. All parameters for retrieval (like path, datetime boundaries, column names for both keys and features, etc) are determined from SavedDataset object.

Returns RetrievalJob object, which is lazy wrapper for actual query performed under the hood.

abstract teardown_infra(*project: str*, *tables: Sequence[*feast.feature_view.FeatureView*]*, *entities:* *Sequence[*feast.entity.Entity*]*)

Tear down all cloud resources for a repo.

Parameters

- **project** – Feast project to which tables belong
- **tables** – Tables that are declared in the feature repo.
- **entities** – Entities that are declared in the feature repo.

abstract update_infra(*project: str*, *tables_to_delete: Sequence[*feast.feature_view.FeatureView*]*, *tables_to_keep: Sequence[*feast.feature_view.FeatureView*]*, *entities_to_delete:* *Sequence[*feast.entity.Entity*]*, *entities_to_keep: Sequence[*feast.entity.Entity*]*, *partial: bool*)

Reconcile cloud resources with the objects declared in the feature repo.

Parameters

- **project** – Project to which tables belong
- **tables_to_delete** – Tables that were deleted from the feature repo, so provider needs to clean up the corresponding cloud resources.
- **tables_to_keep** – Tables that are still in the feature repo. Depending on implementation, provider may or may not need to update the corresponding resources.
- **entities_to_delete** – Entities that were deleted from the feature repo, so provider needs to clean up the corresponding cloud resources.
- **entities_to_keep** – Entities that are still in the feature repo. Depending on implementation, provider may or may not need to update the corresponding resources.
- **partial** – if true, then tables_to_delete and tables_to_keep are *not* exhaustive lists. There may be other tables that are not touched by this update.

abstract write_feature_service_logs(*feature_service: feast.feature_service.FeatureService*, *logs: Union[pyarrow.lib.Table, pathlib.Path]*, *config: feast.repo_config.RepoConfig*, *registry: feast.registry.BaseRegistry*)

Write features and entities logged by a feature server to an offline store.

Schema of logs table is being inferred from the provided feature service. Only feature services with configured logging are accepted.

Logs dataset can be passed as Arrow Table or path to parquet directory.

10.1 Passthrough Provider

class feast.infra.passthrough_provider.**PassthroughProvider**(*config: feast.repo_config.RepoConfig*)

The Passthrough provider delegates all operations to the underlying online and offline stores.

ingest_df(*feature_view: feast.feature_view.FeatureView*, *entities: List[feast.entity.Entity]*, *df: pandas.core.frame.DataFrame*)

Ingests a DataFrame directly into the online store

ingest_df_to_offline_store(*feature_view: feast.feature_view.FeatureView*, *table: pyarrow.lib.Table*)

Ingests a DataFrame directly into the offline store

online_read(*config: feast.repo_config.RepoConfig*, *table: feast.feature_view.FeatureView*, *entity_keys: List[feast.types.EntityKey_pb2.EntityKey]*, *requested_features: List[str] = None*) → List

Read feature values given an Entity Key. This is a low level interface, not expected to be used by the users directly.

Returns Data is returned as a list, one item per entity key. Each item in the list is a tuple of event_ts for the row, and the feature data as a dict from feature names to values. Values are returned as Value proto message.

online_write_batch(*config: feast.repo_config.RepoConfig*, *table: feast.feature_view.FeatureView*, *data: List[Tuple[feast.types.EntityKey_pb2.EntityKey, Dict[str, feast.types.Value_pb2.Value], datetime.datetime, Optional[datetime.datetime]]]*, *progress: Optional[Callable[[int], Any]]*) → None

Write a batch of feature rows to the online store. This is a low level interface, not expected to be used by the users directly.

If a tz-naive timestamp is passed to this method, it is assumed to be UTC.

Parameters

- **config** – The RepoConfig for the current FeatureStore.
- **table** – Feast FeatureView
- **data** – a list of quadruplets containing Feature data. Each quadruplet contains an Entity Key, a dict containing feature values, an event timestamp for the row, and the created timestamp for the row if it exists.
- **progress** – Optional function to be called once every mini-batch of rows is written to the online store. Can be used to display progress.

retrieve_feature_service_logs(*feature_service: feast.feature_service.FeatureService*, *start_date: datetime.datetime*, *end_date: datetime.datetime*, *config: feast.repo_config.RepoConfig*, *registry: feast.registry.BaseRegistry*) → *feast.infra.offline_stores.offline_store.RetrievalJob*

Read logged features from an offline store for a given time window [from, to). Target table is determined

based on logging configuration from the feature service.

Returns RetrievalJob object, which wraps the query to the offline store.

retrieve_saved_dataset(*config:* feast.repo_config.RepoConfig, *dataset:* *feast.saved_dataset.SavedDataset*) → *feast.infra.offline_stores.offline_store.RetrievalJob*

Read saved dataset from offline store. All parameters for retrieval (like path, datetime boundaries, column names for both keys and features, etc) are determined from SavedDataset object.

Returns RetrievalJob object, which is lazy wrapper for actual query performed under the hood.

teardown_infra(*project: str*, *tables: Sequence[*feast.feature_view.FeatureView*]*, *entities: Sequence[*feast.entity.Entity*]*) → None

Tear down all cloud resources for a repo.

Parameters

- **project** – Feast project to which tables belong
- **tables** – Tables that are declared in the feature repo.
- **entities** – Entities that are declared in the feature repo.

update_infra(*project: str*, *tables_to_delete: Sequence[*feast.feature_view.FeatureView*]*, *tables_to_keep: Sequence[*feast.feature_view.FeatureView*]*, *entities_to_delete: Sequence[*feast.entity.Entity*]*, *entities_to_keep: Sequence[*feast.entity.Entity*]*, *partial: bool*)

Reconcile cloud resources with the objects declared in the feature repo.

Parameters

- **project** – Project to which tables belong
- **tables_to_delete** – Tables that were deleted from the feature repo, so provider needs to clean up the corresponding cloud resources.
- **tables_to_keep** – Tables that are still in the feature repo. Depending on implementation, provider may or may not need to update the corresponding resources.
- **entities_to_delete** – Entities that were deleted from the feature repo, so provider needs to clean up the corresponding cloud resources.
- **entities_to_keep** – Entities that are still in the feature repo. Depending on implementation, provider may or may not need to update the corresponding resources.
- **partial** – if true, then tables_to_delete and tables_to_keep are *not* exhaustive lists. There may be other tables that are not touched by this update.

write_feature_service_logs(*feature_service:* feast.feature_service.FeatureService, *logs:* *Union[pyarrow.lib.Table, str]*, *config:* feast.repo_config.RepoConfig, *registry:* feast.registry.BaseRegistry)

Write features and entities logged by a feature server to an offline store.

Schema of logs table is being inferred from the provided feature service. Only feature services with configured logging are accepted.

Logs dataset can be passed as Arrow Table or path to parquet directory.

10.2 Local Provider

class feast.infra.local.**LocalProvider**(*config:* feast.repo_config.RepoConfig)
This class only exists for backwards compatibility.

plan_infra(*config:* feast.repo_config.RepoConfig, *desired_registry_proto:* *feast.core.Registry_pb2.Registry*) → feast.infra.infra_object.Infra
Returns the Infra required to support the desired registry.

Parameters

- **config** – The RepoConfig for the current FeatureStore.
- **desired_registry_proto** – The desired registry, in proto form.

10.3 GCP Provider

class feast.infra.gcp.**GcpProvider**(*config:* feast.repo_config.RepoConfig)
This class only exists for backwards compatibility.

10.4 AWS Provider

class feast.infra.aws.**AwsProvider**(*config:* feast.repo_config.RepoConfig)

get_feature_server_endpoint() → Optional[str]
Returns endpoint for the feature server, if it exists.

teardown_infra(*project: str*, *tables: Sequence[*feast.feature_view.FeatureView*]*, *entities:* *Sequence[*feast.entity.Entity*]*) → None
Tear down all cloud resources for a repo.

Parameters

- **project** – Feast project to which tables belong
- **tables** – Tables that are declared in the feature repo.
- **entities** – Entities that are declared in the feature repo.

update_infra(*project: str*, *tables_to_delete: Sequence[*feast.feature_view.FeatureView*]*, *tables_to_keep:* *Sequence[*feast.feature_view.FeatureView*]*, *entities_to_delete: Sequence[*feast.entity.Entity*]*, *entities_to_keep: Sequence[*feast.entity.Entity*]*, *partial: bool*)
Reconcile cloud resources with the objects declared in the feature repo.

Parameters

- **project** – Project to which tables belong
- **tables_to_delete** – Tables that were deleted from the feature repo, so provider needs to clean up the corresponding cloud resources.
- **tables_to_keep** – Tables that are still in the feature repo. Depending on implementation, provider may or may not need to update the corresponding resources.
- **entities_to_delete** – Entities that were deleted from the feature repo, so provider needs to clean up the corresponding cloud resources.

- **entities_to_keep** – Entities that are still in the feature repo. Depending on implementation, provider may or may not need to update the corresponding resources.
- **partial** – if true, then tables_to_delete and tables_to_keep are *not* exhaustive lists. There may be other tables that are not touched by this update.

CHAPTER

ELEVEN

OFFLINE STORE

class feast.infra.offline_stores.offline_store.**OfflineStore**

OfflineStore is an object used for all interaction between Feast and the service used for offline storage of features.

static offline_write_batch(*config:* feast.repo_config.RepoConfig, *feature_view:* feast.feature_view.FeatureView, *table: pyarrow.lib.Table*, *progress: Optional[Callable[[int], Any]]*)

Write features to a specified destination in the offline store. Data can be appended to an existing table (destination) or a new one will be created automatically

(if it doesn't exist).

Hence, this function can be called repeatedly with the same destination config to write features.

Parameters

- **config** – Repo configuration object
- **feature_view** – FeatureView to write the data to.
- **table** – pyarrow table containing feature data and timestamp column for historical feature retrieval
- **progress** – Optional function to be called once every mini-batch of rows is written to
- **progress.** (*the online store. Can be used to display*) –

abstract static pull_all_from_table_or_query(*config:* feast.repo_config.RepoConfig, *data_source:* feast.data_source.DataSource, *join_key_columns: List[str]*, *feature_name_columns: List[str]*, *timestamp_field: str*, *start_date: datetime.datetime*, *end_date: datetime.datetime*) → *feast.infra.offline_stores.offline_store.RetrievalJob*

Returns a Retrieval Job for all join key columns, feature name columns, and the event timestamp columns that occur between the start_date and end_date.

Note that join_key_columns, feature_name_columns, timestamp_field, and created_timestamp_column have all already been mapped to column names of the source table and those column names are the values passed into this function.

Parameters

- **config** – Repo configuration object
- **data_source** – Data source to pull all of the columns from
- **join_key_columns** – Columns of the join keys
- **feature_name_columns** – Columns of the feature names needed

- **timestamp_field** – Timestamp column
- **start_date** – Starting date of query
- **end_date** – Ending date of query

abstract static pull_latest_from_table_or_query(*config: feast.repo_config.RepoConfig*, *data_source: feast.data_source.DataSource*, *join_key_columns: List[str]*, *feature_name_columns: List[str]*, *timestamp_field: str*, *created_timestamp_column: Optional[str]*, *start_date: datetime.datetime*, *end_date: datetime.datetime*) → *feast.infra.offline_stores.offline_store.RetrievalJob*

This method pulls data from the offline store, and the FeatureStore class is used to write this data into the online store. This method is invoked when running materialization (using the *feast materialize* or *feast materialize-incremental* commands, or the corresponding FeatureStore.materialize() method. This method pulls data from the offline store, and the FeatureStore class is used to write this data into the online store.

Note that join_key_columns, feature_name_columns, timestamp_field, and created_timestamp_column have all already been mapped to column names of the source table and those column names are the values passed into this function.

Parameters

- **config** – Repo configuration object
- **data_source** – Data source to pull all of the columns from
- **join_key_columns** – Columns of the join keys
- **feature_name_columns** – Columns of the feature names needed
- **timestamp_field** – Timestamp column
- **start_date** – Starting date of query
- **end_date** – Ending date of query

static write_logged_features(*config: feast.repo_config.RepoConfig*, *data: Union[pyarrow.lib.Table, pathlib.Path]*, *source: feast.feature_logging.LoggingSource*, *logging_config: feast.feature_logging.LoggingConfig*, *registry: feast.registry.BaseRegistry*)

Write logged features to a specified destination (taken from logging_config) in the offline store. Data can be appended to an existing table (destination) or a new one will be created automatically

(if it doesn't exist).

Hence, this function can be called repeatedly with the same destination to flush logs in chunks.

Parameters

- **config** – Repo configuration object
- **data** – Arrow table or path to parquet directory that contains logs dataset.
- **source** – Logging source that provides schema and some additional metadata.
- **logging_config** – used to determine destination
- **registry** – Feast registry

This is an optional method that could be supported only be some stores.

class feast.infra.offline_stores.offline_store.**RetrievalJob**

RetrievalJob is used to manage the execution of a historical feature retrieval

abstract property metadata: Optional[feast.infra.offline_stores.offline_store.RetrievalMetadata]

Return metadata information about retrieval. Should be available even before materializing the dataset itself.

abstract persist(*storage: feast.saved_dataset.SavedDatasetStorage*)

Run the retrieval and persist the results in the same offline store used for read.

supports_remote_storage_export() → bool

This method should return True if the RetrievalJob supports *to_remote_storage()*.

to_arrow(*validation_reference: Optional[ValidationReference] = None*) → pyarrow.lib.Table

Return dataset as pyarrow Table synchronously :param validation_reference: If provided resulting dataset will be validated against this reference profile.

to_df(*validation_reference: Optional[ValidationReference] = None*) → pandas.core.frame.DataFrame

Return dataset as Pandas DataFrame synchronously including on demand transforms :param validation_reference: If provided resulting dataset will be validated against this reference profile.

to_remote_storage() → List[str]

This method should export the result of this RetrievalJob to remote storage (such as S3, GCS, HDFS, etc). Implementations of this method should export the results as multiple parquet files, each file sized appropriately depending on how much data is being returned by the retrieval job.

Returns A list of parquet file paths in remote storage.

11.1 File Offline Store

class feast.infra.offline_stores.file.**FileOfflineStore**

static offline_write_batch(*config: feast.repo_config.RepoConfig*, *feature_view: feast.feature_view.FeatureView*, *table: pyarrow.lib.Table*, *progress: Optional[Callable[[int], Any]]*)

Write features to a specified destination in the offline store. Data can be appended to an existing table (destination) or a new one will be created automatically

(if it doesn't exist).

Hence, this function can be called repeatedly with the same destination config to write features.

Parameters

- **config** – Repo configuration object
- **feature_view** – FeatureView to write the data to.
- **table** – pyarrow table containing feature data and timestamp column for historical feature retrieval
- **progress** – Optional function to be called once every mini-batch of rows is written to
- **progress.** (*the online store. Can be used to display*) –

static pull_all_from_table_or_query(*config: feast.repo_config.RepoConfig*, *data_source: feast.data_source.DataSource*, *join_key_columns: List[str]*, *feature_name_columns: List[str]*, *timestamp_field: str*, *start_date: datetime.datetime*, *end_date: datetime.datetime*) → *feast.infra.offline_stores.offline_store.RetrievalJob*

Returns a Retrieval Job for all join key columns, feature name columns, and the event timestamp columns that occur between the start_date and end_date.

Note that join_key_columns, feature_name_columns, timestamp_field, and created_timestamp_column have all already been mapped to column names of the source table and those column names are the values passed into this function.

Parameters

- **config** – Repo configuration object
- **data_source** – Data source to pull all of the columns from
- **join_key_columns** – Columns of the join keys
- **feature_name_columns** – Columns of the feature names needed
- **timestamp_field** – Timestamp column
- **start_date** – Starting date of query
- **end_date** – Ending date of query

static pull_latest_from_table_or_query(*config: feast.repo_config.RepoConfig*, *data_source: feast.data_source.DataSource*, *join_key_columns: List[str]*, *feature_name_columns: List[str]*, *timestamp_field: str*, *created_timestamp_column: Optional[str]*, *start_date: datetime.datetime*, *end_date: datetime.datetime*) → *feast.infra.offline_stores.offline_store.RetrievalJob*

This method pulls data from the offline store, and the FeatureStore class is used to write this data into the online store. This method is invoked when running materialization (using the *feast materialize* or *feast materialize-incremental* commands, or the corresponding FeatureStore.materialize() method. This method pulls data from the offline store, and the FeatureStore class is used to write this data into the online store.

Note that join_key_columns, feature_name_columns, timestamp_field, and created_timestamp_column have all already been mapped to column names of the source table and those column names are the values passed into this function.

Parameters

- **config** – Repo configuration object
- **data_source** – Data source to pull all of the columns from
- **join_key_columns** – Columns of the join keys
- **feature_name_columns** – Columns of the feature names needed
- **timestamp_field** – Timestamp column
- **start_date** – Starting date of query
- **end_date** – Ending date of query

static write_logged_features(*config: feast.repo_config.RepoConfig*, *data: Union[pyarrow.lib.Table, pathlib.Path]*, *source: feast.feature_logging.LoggingSource*, *logging_config: feast.feature_logging.LoggingConfig*, *registry: feast.registry.BaseRegistry*)

Write logged features to a specified destination (taken from logging_config) in the offline store. Data can

be appended to an existing table (destination) or a new one will be created automatically

(if it doesn't exist).

Hence, this function can be called repeatedly with the same destination to flush logs in chunks.

Parameters

- **config** – Repo configuration object
- **data** – Arrow table or path to parquet directory that contains logs dataset.
- **source** – Logging source that provides schema and some additional metadata.
- **logging_config** – used to determine destination
- **registry** – Feast registry

This is an optional method that could be supported only be some stores.

class feast.infra.offline_stores.file.**FileOfflineStoreConfig**(*, *type: Literal['file'] = 'file'*)

Offline store config for local (file-based) store

type: Literal['file']

Offline store type selector

class feast.infra.offline_stores.file.**FileRetrievalJob**(*evaluation_function: Callable*, *full_feature_names: bool*, *on_demand_feature_views: Optional[List[*feast.on_demand_feature_view.OnDemandFeatureV *= None*, *metadata: Optional[feast.infra.offline_stores.offline_store.RetrievalMetadata = None*)

property metadata: Optional[feast.infra.offline_stores.offline_store.RetrievalMetadata]

Return metadata information about retrieval. Should be available even before materializing the dataset itself.

persist(*storage: feast.saved_dataset.SavedDatasetStorage*)

Run the retrieval and persist the results in the same offline store used for read.

supports_remote_storage_export() → bool

This method should return True if the RetrievalJob supports *to_remote_storage()*.

11.2 BigQuery Offline Store

class feast.infra.offline_stores.bigquery.**BigQueryOfflineStore**

static offline_write_batch(*config:* feast.repo_config.RepoConfig, *feature_view:* feast.feature_view.FeatureView, *table: pyarrow.lib.Table*, *progress: Optional[Callable[[int], Any]]*)

Write features to a specified destination in the offline store. Data can be appended to an existing table (destination) or a new one will be created automatically

(if it doesn't exist).

Hence, this function can be called repeatedly with the same destination config to write features.

Parameters

- **config** – Repo configuration object
- **feature_view** – FeatureView to write the data to.
- **table** – pyarrow table containing feature data and timestamp column for historical feature retrieval
- **progress** – Optional function to be called once every mini-batch of rows is written to
- **progress.** (*the online store. Can be used to display*) –

static pull_all_from_table_or_query(*config: feast.repo_config.RepoConfig*, *data_source: feast.data_source.DataSource*, *join_key_columns: List[str]*, *feature_name_columns: List[str]*, *timestamp_field: str*, *start_date: datetime.datetime*, *end_date: datetime.datetime*) → *feast.infra.offline_stores.offline_store.RetrievalJob*

Returns a Retrieval Job for all join key columns, feature name columns, and the event timestamp columns that occur between the start_date and end_date.

Note that join_key_columns, feature_name_columns, timestamp_field, and created_timestamp_column have all already been mapped to column names of the source table and those column names are the values passed into this function.

Parameters

- **config** – Repo configuration object
- **data_source** – Data source to pull all of the columns from
- **join_key_columns** – Columns of the join keys
- **feature_name_columns** – Columns of the feature names needed
- **timestamp_field** – Timestamp column
- **start_date** – Starting date of query
- **end_date** – Ending date of query

static pull_latest_from_table_or_query(*config: feast.repo_config.RepoConfig*, *data_source: feast.data_source.DataSource*, *join_key_columns: List[str]*, *feature_name_columns: List[str]*, *timestamp_field: str*, *created_timestamp_column: Optional[str]*, *start_date: datetime.datetime*, *end_date: datetime.datetime*) → *feast.infra.offline_stores.offline_store.RetrievalJob*

This method pulls data from the offline store, and the FeatureStore class is used to write this data into the online store. This method is invoked when running materialization (using the *feast materialize* or *feast materialize-incremental* commands, or the corresponding FeatureStore.materialize() method. This method pulls data from the offline store, and the FeatureStore class is used to write this data into the online store.

Note that join_key_columns, feature_name_columns, timestamp_field, and created_timestamp_column have all already been mapped to column names of the source table and those column names are the values passed into this function.

Parameters

- **config** – Repo configuration object
- **data_source** – Data source to pull all of the columns from
- **join_key_columns** – Columns of the join keys
- **feature_name_columns** – Columns of the feature names needed
- **timestamp_field** – Timestamp column

- **start_date** – Starting date of query
- **end_date** – Ending date of query

static write_logged_features(*config: feast.repo_config.RepoConfig*, *data: Union[pyarrow.lib.Table, pathlib.Path]*, *source: feast.feature_logging.LoggingSource*, *logging_config: feast.feature_logging.LoggingConfig*, *registry: feast.registry.BaseRegistry*)

Write logged features to a specified destination (taken from logging_config) in the offline store. Data can be appended to an existing table (destination) or a new one will be created automatically

(if it doesn't exist).

Hence, this function can be called repeatedly with the same destination to flush logs in chunks.

Parameters

- **config** – Repo configuration object
- **data** – Arrow table or path to parquet directory that contains logs dataset.
- **source** – Logging source that provides schema and some additional metadata.
- **logging_config** – used to determine destination
- **registry** – Feast registry

This is an optional method that could be supported only be some stores.

class feast.infra.offline_stores.bigquery.**BigQueryOfflineStoreConfig**(*, *type: Literal['bigquery'] = 'bigquery'*, *dataset: pydantic.types.StrictStr = 'feast'*, *project_id: pydantic.types.StrictStr = None*, *location: pydantic.types.StrictStr = None*, *gcs_staging_location: str = None*)

Offline store config for GCP BigQuery

dataset: pydantic.types.StrictStr
(optional) BigQuery Dataset name for temporary tables

gcs_staging_location: Optional[str]
(optional) GCS location used for offloading BigQuery results as parquet files.

location: Optional[pydantic.types.StrictStr]
(optional) GCP location name used for the BigQuery offline store. Examples of location names include `US`, `EU`, `us-central1`, `us-west4`. If a location is not specified, the location defaults to the `US` multi-regional location. For more information on BigQuery data locations see: https://cloud.google.com/bigquery/docs/locations

project_id: Optional[pydantic.types.StrictStr]
(optional) GCP project name used for the BigQuery offline store

type: Literal['bigquery']
Offline store type selector

class feast.infra.offline_stores.bigquery.**BigQueryRetrievalJob**(*query: Union[str, Callable[[], AbstractContextManager[str]]]*, *client: google.cloud.bigquery.client.Client*, *config: feast.repo_config.RepoConfig*, *full_feature_names: bool*, *on_demand_feature_views: Optional[List[feast.on_demand_feature_view.OnDeman = None*, *metadata: Optional[feast.infra.offline_stores.offline_store.Retrieva = None*)

property metadata: Optional[feast.infra.offline_stores.offline_store.RetrievalMetadata]

Return metadata information about retrieval. Should be available even before materializing the dataset itself.

persist(*storage: feast.saved_dataset.SavedDatasetStorage*)

Run the retrieval and persist the results in the same offline store used for read.

supports_remote_storage_export() → bool

This method should return True if the RetrievalJob supports *to_remote_storage()*.

to_bigquery(*job_config: Optional[google.cloud.bigquery.job.query.QueryJobConfig] = None*, *timeout: int = 1800*, *retry_cadence: int = 10*) → str

Triggers the execution of a historical feature retrieval query and exports the results to a BigQuery table. Runs for a maximum amount of time specified by the timeout parameter (defaulting to 30 minutes).

Parameters

- **job_config** – An optional bigquery.QueryJobConfig to specify options like destination table, dry run, etc.
- **timeout** – An optional number of seconds for setting the time limit of the QueryJob.
- **retry_cadence** – An optional number of seconds for setting how long the job should checked for completion.

Returns Returns the destination table name or returns None if job_config.dry_run is True.

to_remote_storage() → List[str]

This method should export the result of this RetrievalJob to remote storage (such as S3, GCS, HDFS, etc). Implementations of this method should export the results as multiple parquet files, each file sized appropriately depending on how much data is being returned by the retrieval job.

Returns A list of parquet file paths in remote storage.

to_sql() → str

Returns the SQL query that will be executed in BigQuery to build the historical feature table.

feast.infra.offline_stores.bigquery.**block_until_done**(*client: google.cloud.bigquery.client.Client*, *bq_job: Union[google.cloud.bigquery.job.query.QueryJob, google.cloud.bigquery.job.load.LoadJob]*, *timeout: int = 1800*, *retry_cadence: float = 1*)

Waits for bq_job to finish running, up to a maximum amount of time specified by the timeout parameter (defaulting to 30 minutes).

Parameters

- **client** – A bigquery.client.Client to monitor the bq_job.
- **bq_job** – The bigquery.job.QueryJob that blocks until done runnning.
- **timeout** – An optional number of seconds for setting the time limit of the job.
- **retry_cadence** – An optional number of seconds for setting how long the job should checked for completion.

Raises

- **BigQueryJobStillRunning exception if the function has blocked longer than 30 minutes.** –
- **BigQueryJobCancelled exception to signify when that the job has been cancelled (i.e. from timeout or KeyboardInterrupt)** –

11.3 Redshift Offline Store

class feast.infra.offline_stores.redshift.**RedshiftOfflineStore**

static offline_write_batch(*config: feast.repo_config.RepoConfig*, *feature_view: feast.feature_view.FeatureView*, *table: pyarrow.lib.Table*, *progress: Optional[Callable[[int], Any]]*)

Write features to a specified destination in the offline store. Data can be appended to an existing table (destination) or a new one will be created automatically

(if it doesn't exist).

Hence, this function can be called repeatedly with the same destination config to write features.

Parameters

- **config** – Repo configuration object
- **feature_view** – FeatureView to write the data to.
- **table** – pyarrow table containing feature data and timestamp column for historical feature retrieval
- **progress** – Optional function to be called once every mini-batch of rows is written to
- **progress.** (*the online store. Can be used to display*) –

static pull_all_from_table_or_query(*config: feast.repo_config.RepoConfig*, *data_source: feast.data_source.DataSource*, *join_key_columns: List[str]*, *feature_name_columns: List[str]*, *timestamp_field: str*, *start_date: datetime.datetime*, *end_date: datetime.datetime*) → *feast.infra.offline_stores.offline_store.RetrievalJob*

Returns a Retrieval Job for all join key columns, feature name columns, and the event timestamp columns that occur between the start_date and end_date.

Note that join_key_columns, feature_name_columns, timestamp_field, and created_timestamp_column have all already been mapped to column names of the source table and those column names are the values passed into this function.

Parameters

- **config** – Repo configuration object
- **data_source** – Data source to pull all of the columns from

- **join_key_columns** – Columns of the join keys
- **feature_name_columns** – Columns of the feature names needed
- **timestamp_field** – Timestamp column
- **start_date** – Starting date of query
- **end_date** – Ending date of query

static pull_latest_from_table_or_query(*config: feast.repo_config.RepoConfig*, *data_source: feast.data_source.DataSource*, *join_key_columns: List[str]*, *feature_name_columns: List[str]*, *timestamp_field: str*, *created_timestamp_column: Optional[str]*, *start_date: datetime.datetime*, *end_date: datetime.datetime*) → *feast.infra.offline_stores.offline_store.RetrievalJob*

This method pulls data from the offline store, and the FeatureStore class is used to write this data into the online store. This method is invoked when running materialization (using the *feast materialize* or *feast materialize-incremental* commands, or the corresponding FeatureStore.materialize() method. This method pulls data from the offline store, and the FeatureStore class is used to write this data into the online store.

Note that join_key_columns, feature_name_columns, timestamp_field, and created_timestamp_column have all already been mapped to column names of the source table and those column names are the values passed into this function.

Parameters

- **config** – Repo configuration object
- **data_source** – Data source to pull all of the columns from
- **join_key_columns** – Columns of the join keys
- **feature_name_columns** – Columns of the feature names needed
- **timestamp_field** – Timestamp column
- **start_date** – Starting date of query
- **end_date** – Ending date of query

static write_logged_features(*config: feast.repo_config.RepoConfig*, *data: Union[pyarrow.lib.Table, pathlib.Path]*, *source: feast.feature_logging.LoggingSource*, *logging_config: feast.feature_logging.LoggingConfig*, *registry: feast.registry.BaseRegistry*)

Write logged features to a specified destination (taken from logging_config) in the offline store. Data can be appended to an existing table (destination) or a new one will be created automatically

(if it doesn't exist).

Hence, this function can be called repeatedly with the same destination to flush logs in chunks.

Parameters

- **config** – Repo configuration object
- **data** – Arrow table or path to parquet directory that contains logs dataset.
- **source** – Logging source that provides schema and some additional metadata.
- **logging_config** – used to determine destination
- **registry** – Feast registry

This is an optional method that could be supported only be some stores.

class feast.infra.offline_stores.redshift.**RedshiftOfflineStoreConfig**(*, *type: Literal['redshift'] = 'redshift'*, *cluster_id: pydantic.types.StrictStr*, *region: pydantic.types.StrictStr*, *user: pydantic.types.StrictStr*, *database: pydantic.types.StrictStr*, *s3_staging_location: pydantic.types.StrictStr*, *iam_role: pydantic.types.StrictStr*)

Offline store config for AWS Redshift

cluster_id: pydantic.types.StrictStr
Redshift cluster identifier

database: pydantic.types.StrictStr
Redshift database name

iam_role: pydantic.types.StrictStr
IAM Role for Redshift, granting it access to S3

region: pydantic.types.StrictStr
Redshift cluster's AWS region

s3_staging_location: pydantic.types.StrictStr
S3 path for importing & exporting data to Redshift

type: Literal['redshift']
Offline store type selector

user: pydantic.types.StrictStr
Redshift user name

class feast.infra.offline_stores.redshift.**RedshiftRetrievalJob**(*query: Union[str, Callable[[], AbstractContextManager[str]]]*, *redshift_client*, *s3_resource*, *config: feast.repo_config.RepoConfig*, *full_feature_names: bool*, *on_demand_feature_views: Optional[List[feast.on_demand_feature_view.OnDeman = None*, *metadata: Optional[feast.infra.offline_stores.offline_store.Retrieva = None*)

property metadata: Optional[feast.infra.offline_stores.offline_store.RetrievalMetadata]
Return metadata information about retrieval. Should be available even before materializing the dataset itself.

persist(*storage: feast.saved_dataset.SavedDatasetStorage*)
Run the retrieval and persist the results in the same offline store used for read.

supports_remote_storage_export() → bool
This method should return True if the RetrievalJob supports *to_remote_storage()*.

to_redshift(*table_name: str*) → None
Save dataset as a new Redshift table

to_remote_storage() → List[str]
This method should export the result of this RetrievalJob to remote storage (such as S3, GCS, HDFS, etc). Implementations of this method should export the results as multiple parquet files, each file sized appropriately depending on how much data is being returned by the retrieval job.

Returns A list of parquet file paths in remote storage.

to_s3() → str
Export dataset to S3 in Parquet format and return path

11.4 Snowflake Offline Store

class feast.infra.offline_stores.snowflake.**SnowflakeOfflineStore**

static offline_write_batch(*config: feast.repo_config.RepoConfig*, *feature_view: feast.feature_view.FeatureView*, *table: pyarrow.lib.Table*, *progress: Optional[Callable[[int], Any]]*)
Write features to a specified destination in the offline store. Data can be appended to an existing table (destination) or a new one will be created automatically

(if it doesn't exist).

Hence, this function can be called repeatedly with the same destination config to write features.

Parameters

- **config** – Repo configuration object
- **feature_view** – FeatureView to write the data to.
- **table** – pyarrow table containing feature data and timestamp column for historical feature retrieval
- **progress** – Optional function to be called once every mini-batch of rows is written to
- **progress.** (*the online store. Can be used to display*) –

static pull_all_from_table_or_query(*config: feast.repo_config.RepoConfig*, *data_source: feast.data_source.DataSource*, *join_key_columns: List[str]*, *feature_name_columns: List[str]*, *timestamp_field: str*, *start_date: datetime.datetime*, *end_date: datetime.datetime*) → *feast.infra.offline_stores.offline_store.RetrievalJob*
Returns a Retrieval Job for all join key columns, feature name columns, and the event timestamp columns that occur between the start_date and end_date.

Note that join_key_columns, feature_name_columns, timestamp_field, and created_timestamp_column have all already been mapped to column names of the source table and those column names are the values passed into this function.

Parameters

- **config** – Repo configuration object
- **data_source** – Data source to pull all of the columns from
- **join_key_columns** – Columns of the join keys
- **feature_name_columns** – Columns of the feature names needed

- **timestamp_field** – Timestamp column
- **start_date** – Starting date of query
- **end_date** – Ending date of query

static pull_latest_from_table_or_query(*config: feast.repo_config.RepoConfig*, *data_source: feast.data_source.DataSource*, *join_key_columns: List[str]*, *feature_name_columns: List[str]*, *timestamp_field: str*, *created_timestamp_column: Optional[str]*, *start_date: datetime.datetime*, *end_date: datetime.datetime*) → *feast.infra.offline_stores.offline_store.RetrievalJob*

This method pulls data from the offline store, and the FeatureStore class is used to write this data into the online store. This method is invoked when running materialization (using the *feast materialize* or *feast materialize-incremental* commands, or the corresponding FeatureStore.materialize() method. This method pulls data from the offline store, and the FeatureStore class is used to write this data into the online store.

Note that join_key_columns, feature_name_columns, timestamp_field, and created_timestamp_column have all already been mapped to column names of the source table and those column names are the values passed into this function.

Parameters

- **config** – Repo configuration object
- **data_source** – Data source to pull all of the columns from
- **join_key_columns** – Columns of the join keys
- **feature_name_columns** – Columns of the feature names needed
- **timestamp_field** – Timestamp column
- **start_date** – Starting date of query
- **end_date** – Ending date of query

static write_logged_features(*config: feast.repo_config.RepoConfig*, *data: Union[pyarrow.lib.Table, pathlib.Path]*, *source: feast.feature_logging.LoggingSource*, *logging_config: feast.feature_logging.LoggingConfig*, *registry: feast.registry.BaseRegistry*)

Write logged features to a specified destination (taken from logging_config) in the offline store. Data can be appended to an existing table (destination) or a new one will be created automatically

(if it doesn't exist).

Hence, this function can be called repeatedly with the same destination to flush logs in chunks.

Parameters

- **config** – Repo configuration object
- **data** – Arrow table or path to parquet directory that contains logs dataset.
- **source** – Logging source that provides schema and some additional metadata.
- **logging_config** – used to determine destination
- **registry** – Feast registry

This is an optional method that could be supported only be some stores.

class feast.infra.offline_stores.snowflake.**SnowflakeOfflineStoreConfig**(*, *type: Literal['snowflake.offline'] = 'snowflake.offline'*, *config_path: str = '/home/docs/.snowsql/config'*, *account: str = None*, *user: str = None*, *password: str = None*, *role: str = None*, *warehouse: str = None*, *database: str = None*, *schema: str = None*, *storage_integration_name: str = None*, *blob_export_location: str = None*)

Offline store config for Snowflake

account: Optional[str]
Snowflake deployment identifier – drop .snowflakecomputing.com

blob_export_location: Optional[str]
Location (in S3, Google storage or Azure storage) where data is offloaded

config_path: Optional[str]
Snowflake config path – absolute path required (Cant use ~)

database: Optional[str]
Snowflake database name

password: Optional[str]
Snowflake password

role: Optional[str]
Snowflake role name

schema_: Optional[str]
Snowflake schema name

storage_integration_name: Optional[str]
Storage integration name in snowflake

type: Literal['snowflake.offline']
Offline store type selector

user: Optional[str]
Snowflake user name

warehouse: Optional[str]
Snowflake warehouse name

class feast.infra.offline_stores.snowflake.**SnowflakeRetrievalJob**(*query: Union[str, Callable[[], AbstractContextManager[str]]]*, *snowflake_conn: snowflake.connector.connection.SnowflakeConnec*
config: feast.repo_config.RepoConfig, *full_feature_names: bool*, *on_demand_feature_views: Optional[List[*feast.on_demand_feature_view.OnDem
= None, *metadata: Optional[feast.infra.offline_stores.offline_store.Retrie*
= None)

property metadata:
Optional[feast.infra.offline_stores.offline_store.RetrievalMetadata]
Return metadata information about retrieval. Should be available even before materializing the dataset itself.

persist(*storage: feast.saved_dataset.SavedDatasetStorage*)
Run the retrieval and persist the results in the same offline store used for read.

supports_remote_storage_export() → bool
This method should return True if the RetrievalJob supports *to_remote_storage()*.

to_remote_storage() → List[str]
This method should export the result of this RetrievalJob to remote storage (such as S3, GCS, HDFS, etc). Implementations of this method should export the results as multiple parquet files, each file sized appropriately depending on how much data is being returned by the retrieval job.

Returns A list of parquet file paths in remote storage.

to_snowflake(*table_name: str*, *temporary=False*) → None
Save dataset as a new Snowflake table

to_sql() → str
Returns the SQL query that will be executed in Snowflake to build the historical feature table.

11.5 Spark Offline Store

class feast.infra.offline_stores.contrib.spark_offline_store.spark.**SparkOfflineStore**

static pull_all_from_table_or_query(*config:* feast.repo_config.RepoConfig, *data_source:* feast.data_source.DataSource, *join_key_columns: List[str]*, *feature_name_columns: List[str]*, *timestamp_field: str*, *start_date: datetime.datetime*, *end_date: datetime.datetime*) → *feast.infra.offline_stores.offline_store.RetrievalJob*
Note that join_key_columns, feature_name_columns, timestamp_field, and created_timestamp_column have all already been mapped to column names of the source table and those column names are the values passed into this function.

static pull_latest_from_table_or_query(*config: feast.repo_config.RepoConfig*, *data_source: feast.data_source.DataSource*, *join_key_columns: List[str]*, *feature_name_columns: List[str]*, *timestamp_field: str*, *created_timestamp_column: Optional[str]*, *start_date: datetime.datetime*, *end_date: datetime.datetime*) → *feast.infra.offline_stores.offline_store.RetrievalJob*

This method pulls data from the offline store, and the FeatureStore class is used to write this data into the online store. This method is invoked when running materialization (using the *feast materialize* or *feast materialize-incremental* commands, or the corresponding FeatureStore.materialize() method. This method pulls data from the offline store, and the FeatureStore class is used to write this data into the online store.

Note that join_key_columns, feature_name_columns, timestamp_field, and created_timestamp_column have all already been mapped to column names of the source table and those column names are the values passed into this function.

Parameters

- **config** – Repo configuration object
- **data_source** – Data source to pull all of the columns from
- **join_key_columns** – Columns of the join keys
- **feature_name_columns** – Columns of the feature names needed
- **timestamp_field** – Timestamp column
- **start_date** – Starting date of query
- **end_date** – Ending date of query

class feast.infra.offline_stores.contrib.spark_offline_store.spark.**SparkOfflineStoreConfig**(*, *type: pydantic.types.StrictStr = 'spark'*, *spark_conf: Dict[str, str] = None*)

spark_conf: Optional[Dict[str, str]]
Configuration overlay for the spark session

type: pydantic.types.StrictStr
Offline store type selector

class feast.infra.offline_stores.contrib.spark_offline_store.spark.**SparkRetrievalJob**(*spark_session: pyspark.sql.session.SparkS query: str, full_feature_names: bool, on_demand_feature_vie Optional[List[feast.on_den = None, metadata: Optional[feast.infra.offline_ = None*)

property metadata:
Optional[feast.infra.offline_stores.offline_store.RetrievalMetadata]
Return metadata information about retrieval. Should be available even before materializing the dataset itself.

persist(*storage: feast.saved_dataset.SavedDatasetStorage*)
Run the retrieval and persist the results in the same offline store used for read. Please note the persisting is done only within the scope of the spark session.

11.6 Trino Offline Store

11.7 PostgreSQL Offline Store

class
feast.infra.offline_stores.contrib.postgres_offline_store.postgres.**PostgreSQLOfflineStore**

static pull_all_from_table_or_query(*config:* feast.repo_config.RepoConfig, *data_source:* feast.data_source.DataSource, *join_key_columns: List[str], feature_name_columns: List[str], timestamp_field: str, start_date: datetime.datetime, end_date: datetime.datetime*) → *feast.infra.offline_stores.offline_store.RetrievalJob*
Returns a Retrieval Job for all join key columns, feature name columns, and the event timestamp columns that occur between the start_date and end_date.

Note that join_key_columns, feature_name_columns, timestamp_field, and created_timestamp_column have all already been mapped to column names of the source table and those column names are the values passed into this function.

Parameters

- **config** – Repo configuration object
- **data_source** – Data source to pull all of the columns from
- **join_key_columns** – Columns of the join keys

- **feature_name_columns** – Columns of the feature names needed
- **timestamp_field** – Timestamp column
- **start_date** – Starting date of query
- **end_date** – Ending date of query

static pull_latest_from_table_or_query(*config: feast.repo_config.RepoConfig*, *data_source: feast.data_source.DataSource*, *join_key_columns: List[str]*, *feature_name_columns: List[str]*, *timestamp_field: str*, *created_timestamp_column: Optional[str]*, *start_date: datetime.datetime*, *end_date: datetime.datetime*) → *feast.infra.offline_stores.offline_store.RetrievalJob*

This method pulls data from the offline store, and the FeatureStore class is used to write this data into the online store. This method is invoked when running materialization (using the *feast materialize* or *feast materialize-incremental* commands, or the corresponding FeatureStore.materialize() method. This method pulls data from the offline store, and the FeatureStore class is used to write this data into the online store.

Note that join_key_columns, feature_name_columns, timestamp_field, and created_timestamp_column have all already been mapped to column names of the source table and those column names are the values passed into this function.

Parameters

- **config** – Repo configuration object
- **data_source** – Data source to pull all of the columns from
- **join_key_columns** – Columns of the join keys
- **feature_name_columns** – Columns of the feature names needed
- **timestamp_field** – Timestamp column
- **start_date** – Starting date of query
- **end_date** – Ending date of query

class feast.infra.offline_stores.contrib.postgres_offline_store.postgres.**PostgreSQLOfflineStoreConfig**(*,

class feast.infra.offline_stores.contrib.postgres_offline_store.postgres.**PostgreSQLRetrievalJob**(*query: Union[str, Callable[[], AbstractContextManager[str]]], config: feast.repo_config.RepoConfig, full_feature_names: bool, on_demand_feature_views: Optional[List[feast.on_demand_feature_view.OnDemandFeatureView]], metadata: Optional[feast.infra.offline_stores.offline_store.RetrievalMetadata] = None*)

property metadata:
Optional[feast.infra.offline_stores.offline_store.RetrievalMetadata]

Return metadata information about retrieval. Should be available even before materializing the dataset itself.

persist(*storage: feast.saved_dataset.SavedDatasetStorage*)

Run the retrieval and persist the results in the same offline store used for read.

feast.infra.offline_stores.contrib.postgres_offline_store.postgres.**build_point_in_time_query**(*feature_view_query: List[dict], left_table_query_string: str, entity_df_event_timestamp_col: str, entity_df_columns: KeysView[str], query_template: str, full_feature_names: bool = False*) → str

Build point-in-time query between each feature view table and the entity dataframe for PostgreSQL

CHAPTER

TWELVE

ONLINE STORE

class feast.infra.online_stores.online_store.**OnlineStore**

OnlineStore is an object used for all interaction between Feast and the service used for online storage of features.

abstract online_read(*config:* feast.repo_config.RepoConfig, *table:* feast.feature_view.FeatureView, *entity_keys: List[feast.types.EntityKey_pb2.EntityKey]*, *requested_features: Optional[List[str]] = None*) → List[Tuple[Optional[datetime.datetime], Optional[Dict[str, feast.types.Value_pb2.Value]]]]

Read feature values given an Entity Key. This is a low level interface, not expected to be used by the users directly.

Parameters

- **config** – The RepoConfig for the current FeatureStore.
- **table** – Feast FeatureView
- **entity_keys** – a list of entity keys that should be read from the FeatureStore.
- **requested_features** – (Optional) A subset of the features that should be read from the FeatureStore.

Returns Data is returned as a list, one item per entity key in the original order as the entity_keys argument. Each item in the list is a tuple of event_ts for the row, and the feature data as a dict from feature names to values. Values are returned as Value proto message.

abstract online_write_batch(*config:* feast.repo_config.RepoConfig, *table:* feast.feature_view.FeatureView, *data: List[Tuple[feast.types.EntityKey_pb2.EntityKey, Dict[str, feast.types.Value_pb2.Value], datetime.datetime, Optional[datetime.datetime]]]*, *progress: Optional[Callable[[int], Any]]*) → None

Write a batch of feature rows to the online store. This is a low level interface, not expected to be used by the users directly.

If a tz-naive timestamp is passed to this method, it should be assumed to be UTC by implementors.

Parameters

- **config** – The RepoConfig for the current FeatureStore.
- **table** – Feast FeatureView
- **data** – a list of quadruplets containing Feature data. Each quadruplet contains an Entity Key,
- **values** (*a dict containing feature*) –

- **row** (*an event timestamp for the*) –
- **and** –
- **exists.** (*the created timestamp for the row if it*) –
- **progress** – Optional function to be called once every mini-batch of rows is written to
- **progress.** (*the online store. Can be used to display*) –

plan(*config:* feast.repo_config.RepoConfig, *desired_registry_proto: feast.core.Registry_pb2.Registry*) → List[feast.infra.infra_object.InfraObject]

Returns the set of InfraObjects required to support the desired registry.

Parameters

- **config** – The RepoConfig for the current FeatureStore.
- **desired_registry_proto** – The desired registry, in proto form.

12.1 Sqlite Online Store

class feast.infra.online_stores.sqlite.**SqliteOnlineStore**

OnlineStore is an object used for all interaction between Feast and the service used for offline storage of features.

_conn

SQLite connection.

Type Optional[sqlite3.Connection]

online_read(*config:* feast.repo_config.RepoConfig, *table:* feast.feature_view.FeatureView, *entity_keys: List[feast.types.EntityKey_pb2.EntityKey]*, *requested_features: Optional[List[str]] = None*) → List[Tuple[Optional[datetime.datetime], Optional[Dict[str, feast.types.Value_pb2.Value]]]]

Read feature values given an Entity Key. This is a low level interface, not expected to be used by the users directly.

Parameters

- **config** – The RepoConfig for the current FeatureStore.
- **table** – Feast FeatureView
- **entity_keys** – a list of entity keys that should be read from the FeatureStore.
- **requested_features** – (Optional) A subset of the features that should be read from the FeatureStore.

Returns Data is returned as a list, one item per entity key in the original order as the entity_keys argument. Each item in the list is a tuple of event_ts for the row, and the feature data as a dict from feature names to values. Values are returned as Value proto message.

online_write_batch(*config:* feast.repo_config.RepoConfig, *table:* feast.feature_view.FeatureView, *data: List[Tuple[feast.types.EntityKey_pb2.EntityKey, Dict[str, feast.types.Value_pb2.Value], datetime.datetime, Optional[datetime.datetime]]]*, *progress: Optional[Callable[[int], Any]]*) → None

Write a batch of feature rows to the online store. This is a low level interface, not expected to be used by the users directly.

If a tz-naive timestamp is passed to this method, it should be assumed to be UTC by implementors.

Parameters

- **config** – The RepoConfig for the current FeatureStore.

- **table** – Feast FeatureView
- **data** – a list of quadruplets containing Feature data. Each quadruplet contains an Entity Key,
- **values** (*a dict containing feature*) –
- **row** (*an event timestamp for the*) –
- **and** –
- **exists.** (*the created timestamp for the row if it*) –
- **progress** – Optional function to be called once every mini-batch of rows is written to
- **progress.** (*the online store. Can be used to display*) –

plan(*config:* feast.repo_config.RepoConfig, *desired_registry_proto: feast.core.Registry_pb2.Registry*) → List[feast.infra.infra_object.InfraObject]

Returns the set of InfraObjects required to support the desired registry.

Parameters

- **config** – The RepoConfig for the current FeatureStore.
- **desired_registry_proto** – The desired registry, in proto form.

class feast.infra.online_stores.sqlite.**SqliteOnlineStoreConfig**(*, *type: Literal['sqlite', 'feast.infra.online_stores.sqlite.SqliteOnlineStore'] = 'sqlite'*, *path: pydantic.types.StrictStr = 'data/online.db'*)

Online store config for local (SQLite-based) store

path: pydantic.types.StrictStr

(optional) Path to sqlite db

type: Literal['sqlite', 'feast.infra.online_stores.sqlite.SqliteOnlineStore']

Online store type selector

class feast.infra.online_stores.sqlite.**SqliteTable**(*path: str*, *name: str*)

A Sqlite table managed by Feast.

path

The absolute path of the Sqlite file.

Type str

name

The name of the table.

conn

SQLite connection.

Type sqlite3.Connection

static from_infra_object_proto(*infra_object_proto: feast.core.InfraObject_pb2.InfraObject*) → Any

Returns an InfraObject created from a protobuf representation.

Parameters **infra_object_proto** – A protobuf representation of an InfraObject.

Raises **FeastInvalidInfraObjectType** – The type of InfraObject could not be identified.

static from_proto(*sqlite_table_proto: feast.core.SqliteTable_pb2.SqliteTable*) → Any

Converts a protobuf representation of a subclass to an object of that subclass.

Parameters **infra_object_proto** – A protobuf representation of an InfraObject.

Raises **FeastInvalidInfraObjectType** – The type of InfraObject could not be identified.

teardown()
Tears down the infrastructure object.

to_infra_object_proto() → feast.core.InfraObject_pb2.InfraObject
Converts an InfraObject to its protobuf representation, wrapped in an InfraObjectProto.

to_proto() → Any
Converts an InfraObject to its protobuf representation.

update()
Deploys or updates the infrastructure object.

12.2 Datastore Online Store

class feast.infra.online_stores.datastore.**DatastoreOnlineStore**
OnlineStore is an object used for all interaction between Feast and the service used for offline storage of features.

online_read(*config:* feast.repo_config.RepoConfig, *table:* feast.feature_view.FeatureView, *entity_keys:* *List[feast.types.EntityKey_pb2.EntityKey]*, *requested_features: Optional[List[str]] = None*) → List[Tuple[Optional[datetime.datetime], Optional[Dict[str, feast.types.Value_pb2.Value]]]]
Read feature values given an Entity Key. This is a low level interface, not expected to be used by the users directly.

Parameters

- **config** – The RepoConfig for the current FeatureStore.
- **table** – Feast FeatureView
- **entity_keys** – a list of entity keys that should be read from the FeatureStore.
- **requested_features** – (Optional) A subset of the features that should be read from the FeatureStore.

Returns Data is returned as a list, one item per entity key in the original order as the entity_keys argument. Each item in the list is a tuple of event_ts for the row, and the feature data as a dict from feature names to values. Values are returned as Value proto message.

online_write_batch(*config:* feast.repo_config.RepoConfig, *table:* feast.feature_view.FeatureView, *data:* *List[Tuple[feast.types.EntityKey_pb2.EntityKey, Dict[str, feast.types.Value_pb2.Value], datetime.datetime, Optional[datetime.datetime]]]*, *progress: Optional[Callable[[int], Any]]*) → None
Write a batch of feature rows to the online store. This is a low level interface, not expected to be used by the users directly.

If a tz-naive timestamp is passed to this method, it should be assumed to be UTC by implementors.

Parameters

- **config** – The RepoConfig for the current FeatureStore.
- **table** – Feast FeatureView
- **data** – a list of quadruplets containing Feature data. Each quadruplet contains an Entity Key,
- **values** (*a dict containing feature*) –

- **row** (*an event timestamp for the*) –
- **and** –
- **exists.** (*the created timestamp for the row if it*) –
- **progress** – Optional function to be called once every mini-batch of rows is written to
- **progress.** (*the online store. Can be used to display*) –

class feast.infra.online_stores.datastore.**DatastoreOnlineStoreConfig**(*, *type: Literal['datastore'] = 'datastore'*, *project_id: pydantic.types.StrictStr = None*, *namespace: pydantic.types.StrictStr = None*, *write_concurrency: pydantic.types.PositiveInt = 40*, *write_batch_size: pydantic.types.PositiveInt = 50*)

Online store config for GCP Datastore

namespace: Optional[pydantic.types.StrictStr]
(optional) Datastore namespace

project_id: Optional[pydantic.types.StrictStr]
(optional) GCP Project Id

type: Literal['datastore']
Online store type selector

write_batch_size: Optional[pydantic.types.PositiveInt]
(optional) Amount of feature rows per batch being written into Datastore

write_concurrency: Optional[pydantic.types.PositiveInt]
(optional) Amount of threads to use when writing batches of feature rows into Datastore

class feast.infra.online_stores.datastore.**DatastoreTable**(*project: str*, *name: str*, *project_id: Optional[str] = None*, *namespace: Optional[str] = None*)

A Datastore table managed by Feast.

project
The Feast project of the table.

Type str

name
The name of the table.

project_id
The GCP project id.

Type optional

namespace
Datastore namespace.

Type optional

static from_infra_object_proto(*infra_object_proto: feast.core.InfraObject_pb2.InfraObject*) → Any
Returns an InfraObject created from a protobuf representation.

Parameters **infra_object_proto** – A protobuf representation of an InfraObject.

Raises **FeastInvalidInfraObjectType** – The type of InfraObject could not be identified.

static from_proto(*datastore_table_proto: feast.core.DatastoreTable_pb2.DatastoreTable*) → Any
Converts a protobuf representation of a subclass to an object of that subclass.

Parameters **infra_object_proto** – A protobuf representation of an InfraObject.

Raises **FeastInvalidInfraObjectType** – The type of InfraObject could not be identified.

teardown()
Tears down the infrastructure object.

to_infra_object_proto() → feast.core.InfraObject_pb2.InfraObject
Converts an InfraObject to its protobuf representation, wrapped in an InfraObjectProto.

to_proto() → Any
Converts an InfraObject to its protobuf representation.

update()
Deploys or updates the infrastructure object.

12.3 DynamoDB Online Store

class feast.infra.online_stores.dynamodb.**DynamoDBOnlineStore**
Online feature store for AWS DynamoDB.

_dynamodb_client
Boto3 DynamoDB client.

_dynamodb_resource
Boto3 DynamoDB resource.

online_read(*config:* feast.repo_config.RepoConfig, *table:* feast.feature_view.FeatureView, *entity_keys: List[feast.types.EntityKey_pb2.EntityKey]*, *requested_features: Optional[List[str]] = None*) → List[Tuple[Optional[datetime.datetime], Optional[Dict[str, feast.types.Value_pb2.Value]]]]
Retrieve feature values from the online DynamoDB store.

Parameters

- **config** – The RepoConfig for the current FeatureStore.
- **table** – Feast FeatureView.
- **entity_keys** – a list of entity keys that should be read from the FeatureStore.

online_write_batch(*config:* feast.repo_config.RepoConfig, *table:* feast.feature_view.FeatureView, *data: List[Tuple[feast.types.EntityKey_pb2.EntityKey, Dict[str, feast.types.Value_pb2.Value], datetime.datetime, Optional[datetime.datetime]]]*, *progress: Optional[Callable[[int], Any]]*) → None
Write a batch of feature rows to online DynamoDB store.

Note: This method applies a `batch_writer` to automatically handle any unprocessed items and resend them as needed, this is useful if you're loading a lot of data at a time.

Parameters

- **config** – The RepoConfig for the current FeatureStore.
- **table** – Feast FeatureView.

- **data** – a list of quadruplets containing Feature data. Each quadruplet contains an Entity Key,
- **values** (*a dict containing feature*) –
- **row** (*an event timestamp for the*) –
- **and** –
- **exists.** (*the created timestamp for the row if it*) –
- **progress** – Optional function to be called once every mini-batch of rows is written to
- **progress.** (*the online store. Can be used to display*) –

teardown(*config:* feast.repo_config.RepoConfig, *tables: Sequence[*feast.feature_view.FeatureView*]*, *entities: Sequence[*feast.entity.Entity*]*)

Delete tables from the DynamoDB Online Store.

Parameters

- **config** – The RepoConfig for the current FeatureStore.
- **tables** – Tables to delete from the feature repo.

update(*config:* feast.repo_config.RepoConfig, *tables_to_delete: Sequence[*feast.feature_view.FeatureView*]*, *tables_to_keep: Sequence[*feast.feature_view.FeatureView*]*, *entities_to_delete: Sequence[*feast.entity.Entity*]*, *entities_to_keep: Sequence[*feast.entity.Entity*]*, *partial: bool*)

Update tables from the DynamoDB Online Store.

Parameters

- **config** – The RepoConfig for the current FeatureStore.
- **tables_to_delete** – Tables to delete from the DynamoDB Online Store.
- **tables_to_keep** – Tables to keep in the DynamoDB Online Store.

class feast.infra.online_stores.dynamodb.**DynamoDBOnlineStoreConfig**(*, *type: Literal['dynamodb']* = *'dynamodb'*, *batch_size: int* = *40*, *endpoint_url: str* = *None*, *region: pydantic.types.StrictStr*, *table_name_template: pydantic.types.StrictStr* = *'{project}.{table_name}'*)

Online store config for DynamoDB store

batch_size: int

Number of items to retrieve in a DynamoDB BatchGetItem call.

endpoint_url: Optional[str]

8000

Type DynamoDB local development endpoint Url, i.e. http

Type //localhost

region: pydantic.types.StrictStr

AWS Region Name

table_name_template: pydantic.types.StrictStr

DynamoDB table name template

type: Literal['dynamodb']
Online store type selector

class feast.infra.online_stores.dynamodb.**DynamoDBTable**(*name: str*, *region: str*, *endpoint_url: Optional[str] = None*)

A DynamoDB table managed by Feast.

name
The name of the table.

region
The region of the table.

Type str

endpoint_url
Local DynamoDB Endpoint Url.

_dynamodb_client
Boto3 DynamoDB client.

_dynamodb_resource
Boto3 DynamoDB resource.

static from_infra_object_proto(*infra_object_proto: feast.core.InfraObject_pb2.InfraObject*) → Any
Returns an InfraObject created from a protobuf representation.

Parameters **infra_object_proto** – A protobuf representation of an InfraObject.

Raises **FeastInvalidInfraObjectType** – The type of InfraObject could not be identified.

static from_proto(*dynamodb_table_proto: feast.core.DynamoDBTable_pb2.DynamoDBTable*) → Any
Converts a protobuf representation of a subclass to an object of that subclass.

Parameters **infra_object_proto** – A protobuf representation of an InfraObject.

Raises **FeastInvalidInfraObjectType** – The type of InfraObject could not be identified.

teardown()
Tears down the infrastructure object.

to_infra_object_proto() → feast.core.InfraObject_pb2.InfraObject
Converts an InfraObject to its protobuf representation, wrapped in an InfraObjectProto.

to_proto() → Any
Converts an InfraObject to its protobuf representation.

update()
Deploys or updates the infrastructure object.

12.4 Redis Online Store

class feast.infra.online_stores.redis.**RedisOnlineStore**

online_read(*config: feast.repo_config.RepoConfig*, *table: feast.feature_view.FeatureView*, *entity_keys: List[feast.types.EntityKey_pb2.EntityKey]*, *requested_features: Optional[List[str]] = None*) → List[Tuple[Optional[datetime.datetime], Optional[Dict[str, feast.types.Value_pb2.Value]]]]
Read feature values given an Entity Key. This is a low level interface, not expected to be used by the users directly.

Parameters

- **config** – The RepoConfig for the current FeatureStore.
- **table** – Feast FeatureView
- **entity_keys** – a list of entity keys that should be read from the FeatureStore.
- **requested_features** – (Optional) A subset of the features that should be read from the FeatureStore.

Returns Data is returned as a list, one item per entity key in the original order as the entity_keys argument. Each item in the list is a tuple of event_ts for the row, and the feature data as a dict from feature names to values. Values are returned as Value proto message.

online_write_batch(*config: feast.repo_config.RepoConfig*, *table: feast.feature_view.FeatureView*, *data: List[Tuple[feast.types.EntityKey_pb2.EntityKey, Dict[str, feast.types.Value_pb2.Value], datetime.datetime, Optional[datetime.datetime]]]*, *progress: Optional[Callable[[int], Any]]*) → None

Write a batch of feature rows to the online store. This is a low level interface, not expected to be used by the users directly.

If a tz-naive timestamp is passed to this method, it should be assumed to be UTC by implementors.

Parameters

- **config** – The RepoConfig for the current FeatureStore.
- **table** – Feast FeatureView
- **data** – a list of quadruplets containing Feature data. Each quadruplet contains an Entity Key,
- **values** (*a dict containing feature*) –
- **row** (*an event timestamp for the*) –
- **and** –
- **exists.** (*the created timestamp for the row if it*) –
- **progress** – Optional function to be called once every mini-batch of rows is written to
- **progress.** (*the online store. Can be used to display*) –

teardown(*config: feast.repo_config.RepoConfig*, *tables: Sequence[feast.feature_view.FeatureView]*, *entities: Sequence[feast.entity.Entity]*)

We delete the keys in redis for tables/views being removed.

update(*config: feast.repo_config.RepoConfig*, *tables_to_delete: Sequence[feast.feature_view.FeatureView]*, *tables_to_keep: Sequence[feast.feature_view.FeatureView]*, *entities_to_delete: Sequence[feast.entity.Entity]*, *entities_to_keep: Sequence[feast.entity.Entity]*, *partial: bool*)

Look for join_keys (list of entities) that are not in use anymore (usually this happens when the last feature view that was using specific compound key is deleted) and remove all features attached to this "join_keys".

class feast.infra.online_stores.redis.**RedisOnlineStoreConfig**(**, type: Literal['redis'] = 'redis', redis_type: feast.infra.online_stores.redis.RedisType = RedisType.redis, connection_string: pydantic.types.StrictStr = 'localhost:6379', key_ttl_seconds: int = None*)

Online store config for Redis store

connection_string: pydantic.types.StrictStr
Connection string containing the host, port, and configuration parameters for Redis format: host:port,parameter1,parameter2 eg. redis:6379,db=0

key_ttl_seconds: Optional[int]
(Optional) redis key bin ttl (in seconds) for expiring entities

redis_type: feast.infra.online_stores.redis.RedisType
redis or redis_cluster

Type Redis type

type: Literal['redis']
Online store type selector

class feast.infra.online_stores.redis.**RedisType**(*value*)
An enumeration.

12.5 PostgreSQL Online Store

class feast.infra.online_stores.contrib.postgres.**PostgreSQLOnlineStore**

online_read(*config:* feast.repo_config.RepoConfig, *table:* feast.feature_view.FeatureView, *entity_keys:* *List[feast.types.EntityKey_pb2.EntityKey]*, *requested_features: Optional[List[str]] = None*) → List[Tuple[Optional[datetime.datetime], Optional[Dict[str, feast.types.Value_pb2.Value]]]]
Read feature values given an Entity Key. This is a low level interface, not expected to be used by the users directly.

Parameters

- **config** – The RepoConfig for the current FeatureStore.
- **table** – Feast FeatureView
- **entity_keys** – a list of entity keys that should be read from the FeatureStore.
- **requested_features** – (Optional) A subset of the features that should be read from the FeatureStore.

Returns Data is returned as a list, one item per entity key in the original order as the entity_keys argument. Each item in the list is a tuple of event_ts for the row, and the feature data as a dict from feature names to values. Values are returned as Value proto message.

online_write_batch(*config:* feast.repo_config.RepoConfig, *table:* feast.feature_view.FeatureView, *data:* *List[Tuple[feast.types.EntityKey_pb2.EntityKey, Dict[str, feast.types.Value_pb2.Value], datetime.datetime, Optional[datetime.datetime]]]*, *progress: Optional[Callable[[int], Any]]*) → None
Write a batch of feature rows to the online store. This is a low level interface, not expected to be used by the users directly.

If a tz-naive timestamp is passed to this method, it should be assumed to be UTC by implementors.

Parameters

- **config** – The RepoConfig for the current FeatureStore.
- **table** – Feast FeatureView
- **data** – a list of quadruplets containing Feature data. Each quadruplet contains an Entity Key,

- **values** (*a dict containing feature*) –
- **row** (*an event timestamp for the*) –
- **and** –
- **exists.** (*the created timestamp for the row if it*) –
- **progress** – Optional function to be called once every mini-batch of rows is written to
- **progress.** (*the online store. Can be used to display*) –

class feast.infra.online_stores.contrib.postgres.**PostgreSQLOnlineStoreConfig**(*, *host: pydantic.types.StrictStr*, *port: int = 5432*, *database: pydantic.types.StrictStr*, *db_schema: pydantic.types.StrictStr = 'public'*, *user: pydantic.types.StrictStr*, *password: pydantic.types.StrictStr*, *sslmode: pydantic.types.StrictStr = None*, *sslkey_path: pydantic.types.StrictStr = None*, *sslcert_path: pydantic.types.StrictStr = None*, *sslrootcert_path: pydantic.types.StrictStr = None*, *type: Literal['postgres'] = 'postgres'*)

12.6 HBase Online Store

class feast.infra.online_stores.contrib.hbase_online_store.hbase.**HbaseConnection**(*store_config: feast.infra.online_stores.cont*

Hbase connecttion to connect to hbase.

store_config
Online store config for Hbase store.

close() → None
Close the happybase connection.

property real_conn: happybase.connection.Connection
Stores the real happybase Connection to connect to hbase.

class feast.infra.online_stores.contrib.hbase_online_store.hbase.**HbaseOnlineStore**
Online feature store for Hbase.

_conn
Happybase Connection to connect to hbase thrift server.

Type happybase.connection.Connection

online_read(*config:* feast.repo_config.RepoConfig, *table:* feast.feature_view.FeatureView, *entity_keys: List[feast.types.EntityKey_pb2.EntityKey], requested_features: Optional[List[str]] = None*) → List[Tuple[Optional[datetime.datetime], Optional[Dict[str, feast.types.Value_pb2.Value]]]]
Retrieve feature values from the Hbase online store.

Parameters

- **config** – The RepoConfig for the current FeatureStore.
- **table** – Feast FeatureView.
- **entity_keys** – a list of entity keys that should be read from the FeatureStore.
- **requested_features** – a list of requested feature names.

online_write_batch(*config:* feast.repo_config.RepoConfig, *table:* feast.feature_view.FeatureView, *data: List[Tuple[feast.types.EntityKey_pb2.EntityKey, Dict[str, feast.types.Value_pb2.Value], datetime.datetime, Optional[datetime.datetime]]], progress: Optional[Callable[[int], Any]]*) → None
Write a batch of feature rows to Hbase online store.

Parameters

- **config** – The RepoConfig for the current FeatureStore.
- **table** – Feast FeatureView.
- **data** – a list of quadruplets containing Feature data. Each quadruplet contains an Entity Key,
- **values** (*a dict containing feature*) –
- **row** (*an event timestamp for the*) –
- **and** –
- **exists.** (*the created timestamp for the row if it*) –
- **progress** – Optional function to be called once every mini-batch of rows is written to
- **progress.** (*the online store. Can be used to display*) –

teardown(*config:* feast.repo_config.RepoConfig, *tables: Sequence[*feast.feature_view.FeatureView*]*, *entities: Sequence[*feast.entity.Entity*]*)
Delete tables from the Hbase Online Store.

Parameters

- **config** – The RepoConfig for the current FeatureStore.
- **tables** – Tables to delete from the feature repo.

update(*config:* feast.repo_config.RepoConfig, *tables_to_delete: Sequence[*feast.feature_view.FeatureView*]*, *tables_to_keep: Sequence[*feast.feature_view.FeatureView*]*, *entities_to_delete: Sequence[*feast.entity.Entity*]*, *entities_to_keep: Sequence[*feast.entity.Entity*]*, *partial: bool*)
Update tables from the Hbase Online Store.

Parameters

- **config** – The RepoConfig for the current FeatureStore.
- **tables_to_delete** – Tables to delete from the Hbase Online Store.
- **tables_to_keep** – Tables to keep in the Hbase Online Store.

class feast.infra.online_stores.contrib.hbase_online_store.hbase.**HbaseOnlineStoreConfig**(*, *type: Literal['hbase'] = 'hbase'*, *host: str*, *port: str*)

Online store config for Hbase store

host: str
Hostname of Hbase Thrift server

port: str
Port in which Hbase Thrift server is running

type: Literal['hbase']
Online store type selector

CHAPTER

THIRTEEN

BATCH MATERIALIZATION ENGINE

class feast.infra.materialization.**BatchMaterializationEngine**(*, *repo_config:* feast.repo_config.RepoConfig, *offline_store:* feast.infra.offline_stores.offline_store.OfflineStore, *online_store:* feast.infra.online_stores.online_store.OnlineStore, ***kwargs*)

abstract materialize(*registry:* feast.registry.BaseRegistry, *tasks:* *List[feast.infra.materialization.batch_materialization_engine.MaterializationTask]*) → List[feast.infra.materialization.batch_materialization_engine.MaterializationJob]

Materialize data from the offline store to the online store for this feature repo. :param registry: The feast registry containing the applied feature views. :param tasks: A list of individual materialization tasks.

Returns A list of materialization jobs representing each task.

abstract teardown_infra(*project: str*, *fvs: Sequence[Union[feast.batch_feature_view.BatchFeatureView,* feast.stream_feature_view.StreamFeatureView, feast.feature_view.FeatureView*]]*, *entities: Sequence[*feast.entity.Entity*]*)

This method ensures that any infrastructure or resources set up by ``update()``are torn down.

abstract update(*project: str*, *views_to_delete:* *Sequence[Union[feast.batch_feature_view.BatchFeatureView,* feast.stream_feature_view.StreamFeatureView, feast.feature_view.FeatureView*]]*, *views_to_keep: Sequence[Union[feast.batch_feature_view.BatchFeatureView,* feast.stream_feature_view.StreamFeatureView, feast.feature_view.FeatureView*]]*, *entities_to_delete: Sequence[*feast.entity.Entity*]*, *entities_to_keep:* *Sequence[*feast.entity.Entity*]*)

This method ensures that any necessary infrastructure or resources needed by the engine are set up ahead of materialization.

class feast.infra.materialization.**MaterializationJob**

MaterializationJob represents an ongoing or executed process that materializes data as per the definition of a materialization task.

class feast.infra.materialization.**MaterializationTask**(*project: str*, *feature_view: Union[feast.batch_feature_view.BatchFeatureView, feast.stream_feature_view.StreamFeatureView, feast.feature_view.FeatureView]*, *start_time: datetime.datetime*, *end_time: datetime.datetime*, *tqdm_builder: Callable[[int], tqdm.std.tqdm]*)

A MaterializationTask represents a unit of data that needs to be materialized from an offline store to an online store.

13.1 Local Engine

class feast.infra.materialization.**LocalMaterializationEngine**(*, *repo_config: feast.repo_config.RepoConfig*, *offline_store: feast.infra.offline_stores.offline_store.OfflineStore*, *online_store: feast.infra.online_stores.online_store.OnlineStore*, ***kwargs*)

materialize(*registry*, *tasks: List[feast.infra.materialization.batch_materialization_engine.MaterializationTask]*) → List[feast.infra.materialization.batch_materialization_engine.MaterializationJob]

Materialize data from the offline store to the online store for this feature repo. :param registry: The feast registry containing the applied feature views. :param tasks: A list of individual materialization tasks.

Returns A list of materialization jobs representing each task.

teardown_infra(*project: str*, *fvs: Sequence[Union[feast.batch_feature_view.BatchFeatureView, feast.stream_feature_view.StreamFeatureView, feast.feature_view.FeatureView]]*, *entities: Sequence[feast.entity.Entity]*)

This method ensures that any infrastructure or resources set up by ``update()``are torn down.

update(*project: str*, *views_to_delete: Sequence[Union[feast.batch_feature_view.BatchFeatureView, feast.stream_feature_view.StreamFeatureView, feast.feature_view.FeatureView]]*, *views_to_keep: Sequence[Union[feast.batch_feature_view.BatchFeatureView, feast.stream_feature_view.StreamFeatureView, feast.feature_view.FeatureView]]*, *entities_to_delete: Sequence[feast.entity.Entity]*, *entities_to_keep: Sequence[feast.entity.Entity]*)

This method ensures that any necessary infrastructure or resources needed by the engine are set up ahead of materialization.

13.2 (Alpha) Lambda Based Engine

feast.infra.materialization.lambda.**lambda_engine**

alias of <module 'feast.infra.materialization.lambda.lambda_engine' from '/home/docs/checkouts/readthedocs.org/user_builds/feast/checkouts/v0.23.1/sdk/python/feast/infra/materialization/lambda/lambda

PYTHON MODULE INDEX

f

feast.data_source, 15
feast.entity, 27
feast.feature, 37
feast.feature_service, 39
feast.feature_store, 1
feast.feature_view, 29
feast.infra.aws, 67
feast.infra.gcp, 67
feast.infra.local, 67
feast.infra.materialization, 103
feast.infra.offline_stores.bigquery, 73
feast.infra.offline_stores.bigquery_source, 16
feast.infra.offline_stores.contrib.postgres_offline_store.postgres, 85
feast.infra.offline_stores.contrib.postgres_offline_store.postgres_source, 23
feast.infra.offline_stores.contrib.spark_offline_store.spark, 83
feast.infra.offline_stores.contrib.spark_offline_store.spark_source, 21
feast.infra.offline_stores.file, 71
feast.infra.offline_stores.file_source, 24
feast.infra.offline_stores.offline_store, 69
feast.infra.offline_stores.redshift, 77
feast.infra.offline_stores.redshift_source, 17
feast.infra.offline_stores.snowflake, 80
feast.infra.offline_stores.snowflake_source, 18
feast.infra.online_stores.online_store, 89
feast.infra.passthrough_provider, 65
feast.infra.provider, 63
feast.on_demand_feature_view, 31
feast.registry, 41
feast.registry_store, 55
feast.repo_config, 11
feast.stream_feature_view, 33

INDEX

A

account (*feast.infra.offline_stores.snowflake.SnowflakeOfflineStoreConfig attribute*), 82
aggregations (*feast.stream_feature_view.StreamFeatureView attribute*), 34
apply() (*feast.feature_store.FeatureStore method*), 1
apply_data_source() (*feast.registry.BaseRegistry method*), 41
apply_data_source() (*feast.registry.Registry method*), 47
apply_entity() (*feast.registry.BaseRegistry method*), 41
apply_entity() (*feast.registry.Registry method*), 48
apply_feature_service() (*feast.registry.BaseRegistry method*), 41
apply_feature_service() (*feast.registry.Registry method*), 48
apply_feature_view() (*feast.registry.BaseRegistry method*), 41
apply_feature_view() (*feast.registry.Registry method*), 48
apply_list_mapping() (*in module feast.feature_store*), 10
apply_materialization() (*feast.registry.BaseRegistry method*), 41
apply_materialization() (*feast.registry.Registry method*), 48
apply_saved_dataset() (*feast.registry.BaseRegistry method*), 42
apply_saved_dataset() (*feast.registry.Registry method*), 48
apply_validation_reference() (*feast.registry.BaseRegistry method*), 42
apply_validation_reference() (*feast.registry.Registry method*), 48
AwsProvider (*class in feast.infra.aws*), 67

B

BaseRegistry (*class in feast.registry*), 41
batch_source (*feast.feature_view.FeatureView attribute*), 29
BatchMaterializationEngine (*class in feast.infra.materialization*), 103
BigQueryLoggingDestination (*class in feast.infra.offline_stores.bigquery_source*), 16
BigQueryOfflineStore (*class in feast.infra.offline_stores.bigquery*), 73
BigQueryOfflineStoreConfig (*class in feast.infra.offline_stores.bigquery*), 75
BigQueryRetrievalJob (*class in feast.infra.offline_stores.bigquery*), 75
BigQuerySource (*class in feast.infra.offline_stores.bigquery_source*), 16
blob_export_location (*feast.infra.offline_stores.snowflake.SnowflakeOfflineStoreConfig attribute*), 82
block_until_done() (*in module feast.infra.offline_stores.bigquery*), 76
build_point_in_time_query() (*in module feast.infra.offline_stores.contrib.postgres_offline_store.postgres*), 88

C

cache_ttl_seconds (*feast.repo_config.RegistryConfig attribute*), 11
cluster_id (*feast.infra.offline_stores.redshift.RedshiftOfflineStoreConfig attribute*), 79
commit() (*feast.registry.BaseRegistry method*), 42
commit() (*feast.registry.Registry method*), 49
config (*feast.feature_store.FeatureStore attribute*), 2
config_path (*feast.infra.offline_stores.snowflake.SnowflakeOfflineStoreCo attribute*), 82
create_saved_dataset() (*feast.feature_store.FeatureStore method*), 2
created_timestamp (*feast.entity.Entity attribute*), 27
created_timestamp (*feast.feature_service.FeatureService attribute*), 39

D

database (*feast.infra.offline_stores.redshift.RedshiftOfflineStoreConfig*

attribute), 79
database (*feast.infra.offline_stores.redshift_source.RedshiftSource property*), 17
database (*feast.infra.offline_stores.snowflake.SnowflakeOfflineStoreConfig attribute*), 82
database (*feast.infra.offline_stores.snowflake_source.SnowflakeSource property*), 18
dataset (*feast.infra.offline_stores.bigquery.BigQueryOfflineStoreConfig attribute*), 75
DataSource (*class in feast.data_source*), 13
delete_data_source() (*feast.registry.BaseRegistry method*), 42
delete_data_source() (*feast.registry.Registry method*), 49
delete_entity() (*feast.registry.BaseRegistry method*), 42
delete_entity() (*feast.registry.Registry method*), 49
delete_feature_service() (*feast.feature_store.FeatureStore method*), 2
delete_feature_service() (*feast.registry.BaseRegistry method*), 42
delete_feature_service() (*feast.registry.Registry method*), 49
delete_feature_view() (*feast.feature_store.FeatureStore method*), 2
delete_feature_view() (*feast.registry.BaseRegistry method*), 43
delete_feature_view() (*feast.registry.Registry method*), 49
delete_saved_dataset() (*feast.registry.BaseRegistry method*), 43
delete_saved_dataset() (*feast.registry.Registry method*), 49
delete_validation_reference() (*feast.registry.BaseRegistry method*), 43
delete_validation_reference() (*feast.registry.Registry method*), 50
description (*feast.data_source.RequestSource attribute*), 14
description (*feast.entity.Entity attribute*), 27
description (*feast.feature_service.FeatureService attribute*), 39
description (*feast.feature_view.FeatureView attribute*), 30
description (*feast.on_demand_feature_view.OnDemandFeatureView attribute*), 32
description (*feast.stream_feature_view.StreamFeatureView attribute*), 34
dtype (*feast.feature.Feature property*), 37

E

ensure_request_data_values_exist() (*feast.feature_store.FeatureStore static method*), 2
ensure_valid() (*feast.feature_view.FeatureView method*), 30
entities (*feast.feature_view.FeatureView attribute*), 29
entities (*feast.stream_feature_view.StreamFeatureView attribute*), 33
Entity (*class in feast.entity*), 27
entity_columns (*feast.feature_view.FeatureView attribute*), 29
entity_key_serialization_version (*feast.repo_config.RepoConfig attribute*), 11

F

feast.data_source
    module, 13–15
feast.entity
    module, 27
feast.feature
    module, 37
feast.feature_service
    module, 39
feast.feature_store
    module, 1
feast.feature_view
    module, 29
feast.infra.aws
    module, 67
feast.infra.gcp
    module, 67
feast.infra.local
    module, 67
feast.infra.materialization
    module, 103
feast.infra.offline_stores.bigquery
    module, 73
feast.infra.offline_stores.bigquery_source
    module, 16
feast.infra.offline_stores.contrib.postgres_offline_store.
    module, 85
feast.infra.offline_stores.contrib.postgres_offline_store.
    module, 23
feast.infra.offline_stores.contrib.spark_offline_store.spa
    module, 83
feast.infra.offline_stores.contrib.spark_offline_store.spa
    module, 21
feast.infra.offline_stores.file
    module, 71
feast.infra.offline_stores.file_source
    module, 24
feast.infra.offline_stores.offline_store
    module, 69
feast.infra.offline_stores.redshift

module, 77
feast.infra.offline_stores.redshift_source
module, 17
feast.infra.offline_stores.snowflake
module, 80
feast.infra.offline_stores.snowflake_source
module, 18
feast.infra.online_stores.online_store
module, 89
feast.infra.passthrough_provider
module, 65
feast.infra.provider
module, 63
feast.on_demand_feature_view
module, 31
feast.registry
module, 41
feast.registry_store
module, 55
feast.repo_config
module, 11
feast.stream_feature_view
module, 33
FeastConfigBaseModel (*class in feast.repo_config*), 11
FeastConfigError, 11
FeastObjectType (*class in feast.registry*), 47
Feature (*class in feast.feature*), 37
feature_server (*feast.repo_config.RepoConfig attribute*), 12
feature_view_projections (*feast.feature_service.FeatureService attribute*), 39
features (*feast.feature_view.FeatureView attribute*), 30
features (*feast.on_demand_feature_view.OnDemandFeatureView attribute*), 31
FeatureService (*class in feast.feature_service*), 39
FeatureStore (*class in feast.feature_store*), 1
FeatureView (*class in feast.feature_view*), 29
file_format (*feast.infra.offline_stores.contrib.spark_offline_store.spark_source.SparkSource property*), 21
FileLoggingDestination (*class in feast.infra.offline_stores.file_source*), 24
FileOfflineStore (*class in feast.infra.offline_stores.file*), 71
FileOfflineStoreConfig (*class in feast.infra.offline_stores.file*), 73
FileRetrievalJob (*class in feast.infra.offline_stores.file*), 73
FileSource (*class in feast.infra.offline_stores.file_source*), 24
flags (*feast.repo_config.RepoConfig attribute*), 12
from_proto() (*feast.data_source.DataSource static method*), 13
from_proto() (*feast.data_source.PushSource static method*), 15
from_proto() (*feast.data_source.RequestSource static method*), 14
from_proto() (*feast.entity.Entity class method*), 28
from_proto() (*feast.feature.Feature class method*), 37
from_proto() (*feast.feature_service.FeatureService class method*), 39
from_proto() (*feast.feature_view.FeatureView class method*), 30
from_proto() (*feast.infra.offline_stores.bigquery_source.BigQuerySource static method*), 16
from_proto() (*feast.infra.offline_stores.contrib.postgres_offline_store.pos static method*), 23
from_proto() (*feast.infra.offline_stores.contrib.spark_offline_store.spark_ static method*), 22
from_proto() (*feast.infra.offline_stores.file_source.FileSource static method*), 24
from_proto() (*feast.infra.offline_stores.redshift_source.RedshiftSource static method*), 17
from_proto() (*feast.infra.offline_stores.snowflake_source.SnowflakeSourc static method*), 18
from_proto() (*feast.on_demand_feature_view.OnDemandFeatureView class method*), 32
from_proto() (*feast.stream_feature_view.StreamFeatureView class method*), 34

G

GcpProvider (*class in feast.infra.gcp*), 67
gcs_staging_location (*feast.infra.offline_stores.bigquery.BigQueryOfflineStoreConfig attribute*), 75
get_data_source() (*feast.feature_store.FeatureStore method*), 2
get_data_source() (*feast.registry.BaseRegistry method*), 43
get_data_source() (*feast.registry.Registry method*), 50
get_entity() (*feast.feature_store.FeatureStore method*), 3
get_entity() (*feast.registry.BaseRegistry method*), 43
get_entity() (*feast.registry.Registry method*), 50
get_feature_server_endpoint() (*feast.feature_store.FeatureStore method*), 3
get_feature_server_endpoint() (*feast.infra.aws.AwsProvider method*), 67
get_feature_server_endpoint() (*feast.infra.provider.Provider method*), 63
get_feature_service() (*feast.feature_store.FeatureStore method*), 3
get_feature_service() (*feast.registry.BaseRegistry method*), 44

get_feature_service() (*feast.registry.Registry method*), 50
get_feature_view() (*feast.feature_store.FeatureStore method*), 3
get_feature_view() (*feast.registry.BaseRegistry method*), 44
get_feature_view() (*feast.registry.Registry method*), 50
get_historical_features() (*feast.feature_store.FeatureStore method*), 3
get_infra() (*feast.registry.BaseRegistry method*), 44
get_infra() (*feast.registry.Registry method*), 50
get_needed_request_data() (*feast.feature_store.FeatureStore static method*), 4
get_on_demand_feature_view() (*feast.feature_store.FeatureStore method*), 4
get_on_demand_feature_view() (*feast.registry.BaseRegistry method*), 44
get_on_demand_feature_view() (*feast.registry.Registry method*), 51
get_online_features() (*feast.feature_store.FeatureStore method*), 5
get_registry_proto() (*feast.registry_store.RegistryStore method*), 55
get_request_feature_view() (*feast.registry.BaseRegistry method*), 44
get_request_feature_view() (*feast.registry.Registry method*), 51
get_saved_dataset() (*feast.feature_store.FeatureStore method*), 5
get_saved_dataset() (*feast.registry.BaseRegistry method*), 45
get_saved_dataset() (*feast.registry.Registry method*), 51
get_stream_feature_view() (*feast.feature_store.FeatureStore method*), 6
get_stream_feature_view() (*feast.registry.BaseRegistry method*), 45
get_stream_feature_view() (*feast.registry.Registry method*), 51
get_table_column_names_and_types() (*feast.data_source.DataSource method*), 13
get_table_column_names_and_types() (*feast.data_source.PushSource method*), 15
get_table_column_names_and_types() (*feast.data_source.RequestSource method*), 14
get_table_column_names_and_types() (*feast.infra.offline_stores.bigquery_source.BigQuerySource method*), 16
get_table_column_names_and_types() (*feast.infra.offline_stores.contrib.postgres_offline_store.postgres_ method*), 24
get_table_column_names_and_types() (*feast.infra.offline_stores.contrib.spark_offline_store.spark_source method*), 22
get_table_column_names_and_types() (*feast.infra.offline_stores.file_source.FileSource method*), 25
get_table_column_names_and_types() (*feast.infra.offline_stores.redshift_source.RedshiftSource method*), 17
get_table_column_names_and_types() (*feast.infra.offline_stores.snowflake_source.SnowflakeSource method*), 18
get_table_query_string() (*feast.data_source.DataSource method*), 13
get_table_query_string() (*feast.data_source.PushSource method*), 15
get_table_query_string() (*feast.data_source.RequestSource method*), 15
get_table_query_string() (*feast.infra.offline_stores.bigquery_source.BigQuerySource method*), 16
get_table_query_string() (*feast.infra.offline_stores.contrib.postgres_offline_store.postgres_ method*), 24
get_table_query_string() (*feast.infra.offline_stores.contrib.spark_offline_store.spark_source method*), 22
get_table_query_string() (*feast.infra.offline_stores.file_source.FileSource method*), 25
get_table_query_string() (*feast.infra.offline_stores.redshift_source.RedshiftSource method*), 17
get_table_query_string() (*feast.infra.offline_stores.snowflake_source.SnowflakeSource method*), 18
get_validation_reference() (*feast.feature_store.FeatureStore method*), 6
get_validation_reference() (*feast.registry.BaseRegistry method*), 45
get_validation_reference() (*feast.registry.Registry method*), 51
go_feature_retrieval (*feast.repo_config.RepoConfig*

attribute), 12
go_feature_serving (*feast.repo_config.RepoConfig attribute*), 12

I

iam_role (*feast.infra.offline_stores.redshift.RedshiftOfflineStoreConfig attribute*), 79
infer_features() (*feast.on_demand_feature_view.OnDemandFeatureView method*), 32
ingest_df() (*feast.infra.passthrough_provider.PassthroughProvider method*), 65
ingest_df() (*feast.infra.provider.Provider method*), 63
ingest_df_to_offline_store() (*feast.infra.passthrough_provider.PassthroughProvider method*), 65
ingest_df_to_offline_store() (*feast.infra.provider.Provider method*), 63
is_valid() (*feast.entity.Entity method*), 28

J

join_key (*feast.entity.Entity attribute*), 27
join_keys (*feast.entity.Entity attribute*), 27
join_keys (*feast.feature_view.FeatureView property*), 30

L

labels (*feast.feature.Feature property*), 37
last_updated_timestamp (*feast.entity.Entity attribute*), 27
last_updated_timestamp (*feast.feature_service.FeatureService attribute*), 39
list_data_sources() (*feast.feature_store.FeatureStore method*), 6
list_data_sources() (*feast.registry.BaseRegistry method*), 45
list_data_sources() (*feast.registry.Registry method*), 52
list_entities() (*feast.feature_store.FeatureStore method*), 6
list_entities() (*feast.registry.BaseRegistry method*), 45
list_entities() (*feast.registry.Registry method*), 52
list_feature_services() (*feast.feature_store.FeatureStore method*), 6
list_feature_services() (*feast.registry.BaseRegistry method*), 45
list_feature_services() (*feast.registry.Registry method*), 52
list_feature_views() (*feast.feature_store.FeatureStore method*), 6
list_feature_views() (*feast.registry.BaseRegistry method*), 46
list_feature_views() (*feast.registry.Registry method*), 52
list_on_demand_feature_views() (*feast.feature_store.FeatureStore method*), 6
list_on_demand_feature_views() (*feast.registry.BaseRegistry method*), 46
list_on_demand_feature_views() (*feast.registry.Registry method*), 52
list_project_metadata() (*feast.registry.BaseRegistry method*), 46
list_project_metadata() (*feast.registry.Registry method*), 52
list_request_feature_views() (*feast.feature_store.FeatureStore method*), 6
list_request_feature_views() (*feast.registry.BaseRegistry method*), 46
list_request_feature_views() (*feast.registry.Registry method*), 53
list_saved_datasets() (*feast.registry.BaseRegistry method*), 46
list_saved_datasets() (*feast.registry.Registry method*), 53
list_stream_feature_views() (*feast.feature_store.FeatureStore method*), 6
list_stream_feature_views() (*feast.registry.BaseRegistry method*), 47
list_stream_feature_views() (*feast.registry.Registry method*), 53
list_validation_references() (*feast.registry.BaseRegistry method*), 47
list_validation_references() (*feast.registry.Registry method*), 53
LocalProvider (*class in feast.infra.local*), 67
location (*feast.infra.offline_stores.bigquery.BigQueryOfflineStoreConfig attribute*), 75

M

MaterializationJob (*class in feast.infra.materialization*), 103
MaterializationTask (*class in feast.infra.materialization*), 103
materialize() (*feast.feature_store.FeatureStore method*), 7
materialize() (*feast.infra.materialization.BatchMaterializationEngine method*), 103
materialize_incremental() (*feast.feature_store.FeatureStore method*), 7

metadata (*feast.infra.offline_stores.bigquery.BigQueryRetrievalJob property*), 76
metadata (*feast.infra.offline_stores.contrib.postgres_offline_store.postgres.PostgreSQLRetrievalJob property*), 88
metadata (*feast.infra.offline_stores.contrib.spark_offline_store.spark.SparkRetrievalJob property*), 85
metadata (*feast.infra.offline_stores.file.FileRetrievalJob property*), 73
metadata (*feast.infra.offline_stores.offline_store.RetrievalJob property*), 71
metadata (*feast.infra.offline_stores.redshift.RedshiftRetrievalJob property*), 79
metadata (*feast.infra.offline_stores.snowflake.SnowflakeRetrievalJob property*), 83
mode (*feast.stream_feature_view.StreamFeatureView attribute*), 34
module
    feast.data_source, 13–15
    feast.entity, 27
    feast.feature, 37
    feast.feature_service, 39
    feast.feature_store, 1
    feast.feature_view, 29
    feast.infra.aws, 67
    feast.infra.gcp, 67
    feast.infra.local, 67
    feast.infra.materialization, 103
    feast.infra.offline_stores.bigquery, 73
    feast.infra.offline_stores.bigquery_source, 16
    feast.infra.offline_stores.contrib.postgres_offline_store.postgres, 85
    feast.infra.offline_stores.contrib.postgres_offline_store.postgres_source, 23
    feast.infra.offline_stores.contrib.spark_offline_store.spark, 83
    feast.infra.offline_stores.contrib.spark_offline_store.spark_source, 21
    feast.infra.offline_stores.file, 71
    feast.infra.offline_stores.file_source, 24
    feast.infra.offline_stores.offline_store, 69
    feast.infra.offline_stores.redshift, 77
    feast.infra.offline_stores.redshift_source, 17
    feast.infra.offline_stores.snowflake, 80
    feast.infra.offline_stores.snowflake_source, 18
    feast.infra.online_stores.online_store, 89
    feast.infra.passthrough_provider, 65
    feast.infra.provider, 63
    feast.on_demand_feature_view, 31
    feast.registry, 41
    feast.registry_store, 55
    feast.repo_config, 61
    feast.stream_feature_view, 33
most_recent_end_time() (*feast.feature_view.FeatureView property*), 30

N

name (*feast.data_source.RequestSource attribute*), 14
name (*feast.entity.Entity attribute*), 27
name (*feast.feature.Feature property*), 37
name (*feast.feature_service.FeatureService attribute*), 39
name (*feast.feature_view.FeatureView attribute*), 29
name (*feast.on_demand_feature_view.OnDemandFeatureView attribute*), 31
name (*feast.stream_feature_view.StreamFeatureView attribute*), 33

O

offline_write_batch() (*feast.infra.offline_stores.bigquery.BigQueryOfflineStore static method*), 73
offline_write_batch() (*feast.infra.offline_stores.file.FileOfflineStore static method*), 71
offline_write_batch() (*feast.infra.offline_stores.offline_store.OfflineStore static method*), 69
offline_write_batch() (*feast.infra.offline_stores.redshift.RedshiftOfflineStore static method*), 77
offline_write_batch() (*feast.infra.offline_stores.snowflake.SnowflakeOfflineStore static method*), 80
OfflineStore (*class in feast.infra.offline_stores.offline_store*), 69
on_demand_feature_view() (*in module feast.on_demand_feature_view*), 32
OnDemandFeatureView (*class in feast.on_demand_feature_view*), 31
online (*feast.feature_view.FeatureView attribute*), 30
online (*feast.stream_feature_view.StreamFeatureView attribute*), 34
online_read() (*feast.infra.online_stores.online_store.OnlineStore method*), 89
online_read() (*feast.infra.passthrough_provider.PassthroughProvider method*), 65
online_read() (*feast.infra.provider.Provider method*), 63
online_write_batch() (*feast.infra.online_stores.online_store.OnlineStore method*), 89

online_write_batch() (*feast.infra.passthrough_provider.PassthroughProvider method*), 65
online_write_batch() (*feast.infra.provider.Provider method*), 63
OnlineStore (*class in feast.infra.online_stores.online_store*), 89
owner (*feast.data_source.RequestSource attribute*), 14
owner (*feast.entity.Entity attribute*), 27
owner (*feast.feature_service.FeatureService attribute*), 39
owner (*feast.feature_view.FeatureView attribute*), 30
owner (*feast.on_demand_feature_view.OnDemandFeatureView attribute*), 32
owner (*feast.stream_feature_view.StreamFeatureView attribute*), 34

P

PassthroughProvider (*class in feast.infra.passthrough_provider*), 65
password (*feast.infra.offline_stores.snowflake.SnowflakeOfflineStoreConfig attribute*), 82
path (*feast.infra.offline_stores.contrib.spark_offline_store.spark_source.SparkSource property*), 22
path (*feast.infra.offline_stores.file_source.FileSource property*), 25
path (*feast.repo_config.RegistryConfig attribute*), 11
persist() (*feast.infra.offline_stores.bigquery.BigQueryRetrievalJob method*), 76
persist() (*feast.infra.offline_stores.contrib.postgres_offline_store.postgres.PostgreSQLRetrievalJob method*), 88
persist() (*feast.infra.offline_stores.contrib.spark_offline_store.spark.SparkRetrievalJob method*), 85
persist() (*feast.infra.offline_stores.file.FileRetrievalJob method*), 73
persist() (*feast.infra.offline_stores.offline_store.RetrievalJob method*), 71
persist() (*feast.infra.offline_stores.redshift.RedshiftRetrievalJob method*), 79
persist() (*feast.infra.offline_stores.snowflake.SnowflakeRetrievalJob method*), 83
plan() (*feast.feature_store.FeatureStore method*), 8
plan() (*feast.infra.online_stores.online_store.OnlineStore method*), 90
plan_infra() (*feast.infra.local.LocalProvider method*), 67
plan_infra() (*feast.infra.provider.Provider method*), 63
PostgreSQLOfflineStore (*class in feast.infra.offline_stores.contrib.postgres_offline_store.postgres*), 85
PostgreSQLOfflineStoreConfig (*class in feast.infra.offline_stores.contrib.postgres_offline_store.postgres*), 86
PostgreSQLRetrievalJob (*class in feast.infra.offline_stores.contrib.postgres_offline_store.postgres*), 88
PostgreSQLSource (*class in feast.infra.offline_stores.contrib.postgres_offline_store.postgres_s*, 23
project (*feast.feature_store.FeatureStore property*), 8
project (*feast.repo_config.RepoConfig attribute*), 12
project_id (*feast.infra.offline_stores.bigquery.BigQueryOfflineStoreConfi attribute*), 75
proto() (*feast.registry.BaseRegistry method*), 47
proto() (*feast.registry.Registry method*), 53
Provider (*class in feast.infra.provider*), 63
provider (*feast.repo_config.RepoConfig attribute*), 12
pull_all_from_table_or_query() (*feast.infra.offline_stores.bigquery.BigQueryOfflineStore static method*), 74
pull_all_from_table_or_query() (*feast.infra.offline_stores.contrib.postgres_offline_store.postgres.P static method*), 85
pull_all_from_table_or_query() (*feast.infra.offline_stores.contrib.spark_offline_store.spark.Spark static method*), 83
pull_all_from_table_or_query() (*feast.infra.offline_stores.file.FileOfflineStore static method*), 71
pull_all_from_table_or_query() (*feast.infra.offline_stores.offline_store.OfflineStore static method*), 69
pull_all_from_table_or_query() (*feast.infra.offline_stores.redshift.RedshiftOfflineStore static method*), 77
pull_all_from_table_or_query() (*feast.infra.offline_stores.snowflake.SnowflakeOfflineStore static method*), 80
pull_latest_from_table_or_query() (*feast.infra.offline_stores.bigquery.BigQueryOfflineStore static method*), 74
pull_latest_from_table_or_query() (*feast.infra.offline_stores.contrib.postgres_offline_store.postgres.P static method*), 86
pull_latest_from_table_or_query() (*feast.infra.offline_stores.contrib.spark_offline_store.spark.Spark static method*), 83
pull_latest_from_table_or_query() (*feast.infra.offline_stores.file.FileOfflineStore static method*), 72
pull_latest_from_table_or_query() (*feast.infra.offline_stores.offline_store.OfflineStore static method*), 70
pull_latest_from_table_or_query() (*feast.infra.offline_stores.redshift.RedshiftOfflineStore static method*), 78
pull_latest_from_table_or_query()

(*feast.infra.offline_stores.snowflake.SnowflakeOfflineStore static method*), 81
push() (*feast.feature_store.FeatureStore method*), 8
PushMode (*class in feast.data_source*), 14
PushSource (*class in feast.data_source*), 15

Q

query (*feast.infra.offline_stores.contrib.spark_offline_store.spark_source.SparkSource property*), 22
query (*feast.infra.offline_stores.redshift_source.RedshiftSource property*), 17
query (*feast.infra.offline_stores.snowflake_source.SnowflakeSource property*), 19

R

RedshiftLoggingDestination (*class in feast.infra.offline_stores.redshift_source*), 17
RedshiftOfflineStore (*class in feast.infra.offline_stores.redshift*), 77
RedshiftOfflineStoreConfig (*class in feast.infra.offline_stores.redshift*), 78
RedshiftRetrievalJob (*class in feast.infra.offline_stores.redshift*), 79
RedshiftSource (*class in feast.infra.offline_stores.redshift_source*), 17
refresh() (*feast.registry.BaseRegistry method*), 47
refresh() (*feast.registry.Registry method*), 53
refresh_registry() (*feast.feature_store.FeatureStore method*), 9
region (*feast.infra.offline_stores.redshift.RedshiftOfflineStoreConfig attribute*), 79
Registry (*class in feast.registry*), 47
registry (*feast.feature_store.FeatureStore property*), 9
registry (*feast.repo_config.RepoConfig attribute*), 12
registry_store_type (*feast.repo_config.RegistryConfig attribute*), 11
registry_type (*feast.repo_config.RegistryConfig attribute*), 11
RegistryConfig (*class in feast.repo_config*), 11
RegistryStore (*class in feast.registry_store*), 55
repo_path (*feast.feature_store.FeatureStore attribute*), 9
RepoConfig (*class in feast.repo_config*), 11
RequestSource (*class in feast.data_source*), 14
RetrievalJob (*class in feast.infra.offline_stores.offline_store*), 70
retrieve_feature_service_logs() (*feast.infra.passthrough_provider.PassthroughProvider method*), 65
retrieve_feature_service_logs() (*feast.infra.provider.Provider method*), 64
retrieve_saved_dataset() (*feast.infra.passthrough_provider.PassthroughProvider method*), 66
retrieve_saved_dataset() (*feast.infra.provider.Provider method*), 64
role (*feast.infra.offline_stores.snowflake.SnowflakeOfflineStoreConfig attribute*), 82

S

s3_staging_location (*feast.infra.offline_stores.redshift.RedshiftOfflineStoreConfig attribute*), 79
schema (*feast.data_source.RequestSource attribute*), 14
schema (*feast.feature_view.FeatureView attribute*), 29
schema (*feast.infra.offline_stores.redshift_source.RedshiftSource property*), 17
schema (*feast.infra.offline_stores.snowflake_source.SnowflakeSource property*), 19
schema (*feast.stream_feature_view.StreamFeatureView attribute*), 33
schema_ (*feast.infra.offline_stores.snowflake.SnowflakeOfflineStoreConfig attribute*), 82
serve() (*feast.feature_store.FeatureStore method*), 9
serve_transformations() (*feast.feature_store.FeatureStore method*), 9
serve_ui() (*feast.feature_store.FeatureStore method*), 9
SnowflakeLoggingDestination (*class in feast.infra.offline_stores.snowflake_source*), 18
SnowflakeOfflineStore (*class in feast.infra.offline_stores.snowflake*), 80
SnowflakeOfflineStoreConfig (*class in feast.infra.offline_stores.snowflake*), 81
SnowflakeRetrievalJob (*class in feast.infra.offline_stores.snowflake*), 82
SnowflakeSource (*class in feast.infra.offline_stores.snowflake_source*), 18
source (*feast.feature_view.FeatureView attribute*), 30
source (*feast.stream_feature_view.StreamFeatureView attribute*), 33
source_datatype_to_feast_value_type() (*feast.data_source.DataSource static method*), 14
source_datatype_to_feast_value_type() (*feast.data_source.PushSource static method*), 15
source_datatype_to_feast_value_type() (*feast.data_source.RequestSource static method*), 15
source_datatype_to_feast_value_type() (*feast.infra.offline_stores.bigquery_source.BigQuerySource static method*), 16
source_datatype_to_feast_value_type() (*feast.infra.offline_stores.contrib.postgres_offline_store.postgres_source static method*), 24

source_datatype_to_feast_value_type() (*feast.infra.offline_stores.contrib.spark_offline_store.spark_source.SparkSource static method*), 22
source_datatype_to_feast_value_type() (*feast.infra.offline_stores.file_source.FileSource static method*), 25
source_datatype_to_feast_value_type() (*feast.infra.offline_stores.redshift_source.RedshiftSource static method*), 17
source_datatype_to_feast_value_type() (*feast.infra.offline_stores.snowflake_source.SnowflakeSource static method*), 19
source_feature_view_projections (*feast.on_demand_feature_view.OnDemandFeatureView attribute*), 31
source_request_sources (*feast.on_demand_feature_view.OnDemandFeatureView attribute*), 31
SourceType (*class in feast.data_source*), 14
spark_conf (*feast.infra.offline_stores.contrib.spark_offline_store.spark.SparkOfflineStoreConfig attribute*), 84
SparkOfflineStore (*class in feast.infra.offline_stores.contrib.spark_offline_store.spark*), 83
SparkOfflineStoreConfig (*class in feast.infra.offline_stores.contrib.spark_offline_store.spark*), 84
SparkRetrievalJob (*class in feast.infra.offline_stores.contrib.spark_offline_store.spark*), 84
SparkSource (*class in feast.infra.offline_stores.contrib.spark_offline_store.spark_source*), 21
SparkSourceFormat (*class in feast.infra.offline_stores.contrib.spark_offline_store.spark_source*), 22
storage_integration_name (*feast.infra.offline_stores.snowflake.SnowflakeOfflineStoreConfig attribute*), 82
stream_feature_view() (*in module feast.stream_feature_view*), 34
stream_source (*feast.feature_view.FeatureView attribute*), 29
StreamFeatureView (*class in feast.stream_feature_view*), 33
supports_remote_storage_export() (*feast.infra.offline_stores.bigquery.BigQueryRetrievalJob method*), 76
supports_remote_storage_export() (*feast.infra.offline_stores.file.FileRetrievalJob method*), 73
supports_remote_storage_export() (*feast.infra.offline_stores.offline_store.RetrievalJob method*), 71
supports_remote_storage_export() (*feast.infra.offline_stores.redshift.RedshiftRetrievalJob method*), 79
supports_remote_storage_export() (*feast.infra.offline_stores.snowflake.SnowflakeRetrievalJob method*), 83

T

table (*feast.infra.offline_stores.contrib.spark_offline_store.spark_source.SparkSource property*), 22
table (*feast.infra.offline_stores.redshift_source.RedshiftSource property*), 17
table (*feast.infra.offline_stores.snowflake_source.SnowflakeSource property*), 19
tags (*feast.data_source.RequestSource attribute*), 14
tags (*feast.entity.Entity attribute*), 27
tags (*feast.feature_service.FeatureService attribute*), 39
tags (*feast.feature_view.FeatureView attribute*), 30
tags (*feast.on_demand_feature_view.OnDemandFeatureView attribute*), 32
tags (*feast.stream_feature_view.StreamFeatureView attribute*), 34
teardown() (*feast.feature_store.FeatureStore method*), 9
teardown() (*feast.registry.Registry method*), 53
teardown() (*feast.registry_store.RegistryStore method*), 55
teardown_infra() (*feast.infra.aws.AwsProvider method*), 67
teardown_infra() (*feast.infra.materialization.BatchMaterializationEngine method*), 103
teardown_infra() (*feast.infra.passthrough_provider.PassthroughProvider method*), 66
teardown_infra() (*feast.infra.provider.Provider method*), 64
timestamp_field (*feast.stream_feature_view.StreamFeatureView attribute*), 34
to_arrow() (*feast.infra.offline_stores.offline_store.RetrievalJob method*), 71
to_bigquery() (*feast.infra.offline_stores.bigquery.BigQueryRetrievalJob method*), 76
to_data_source() (*feast.infra.offline_stores.bigquery_source.BigQueryLoggingDestination method*), 16
to_data_source() (*feast.infra.offline_stores.file_source.FileLoggingDestination method*), 24
to_data_source() (*feast.infra.offline_stores.redshift_source.RedshiftLoggingDestination method*), 17
to_data_source() (*feast.infra.offline_stores.snowflake_source.SnowflakeLoggingDestination method*), 18
to_df() (*feast.infra.offline_stores.offline_store.RetrievalJob method*), 71
to_dict() (*feast.registry.BaseRegistry method*), 47
to_dict() (*feast.registry.Registry method*), 54
to_proto() (*feast.data_source.DataSource method*), 14
to_proto() (*feast.data_source.PushSource method*), 15

to_proto() (*feast.data_source.RequestSource method*), 15
to_proto() (*feast.entity.Entity method*), 28
to_proto() (*feast.feature.Feature method*), 37
to_proto() (*feast.feature_service.FeatureService method*), 39
to_proto() (*feast.feature_view.FeatureView method*), 30
to_proto() (*feast.infra.offline_stores.bigquery_source.BigQuerySource method*), 16
to_proto() (*feast.infra.offline_stores.contrib.postgres_offline_store.postgres_source.PostgreSQLSource method*), 24
to_proto() (*feast.infra.offline_stores.contrib.spark_offline_store.spark_source.SparkSource method*), 22
to_proto() (*feast.infra.offline_stores.file_source.FileSource method*), 25
to_proto() (*feast.infra.offline_stores.redshift_source.RedshiftSource method*), 17
to_proto() (*feast.infra.offline_stores.snowflake_source.SnowflakeSource method*), 19
to_proto() (*feast.on_demand_feature_view.OnDemandFeatureView method*), 32
to_proto() (*feast.stream_feature_view.StreamFeatureView method*), 34
to_redshift() (*feast.infra.offline_stores.redshift.RedshiftRetrievalJob method*), 79
to_remote_storage() (*feast.infra.offline_stores.bigquery.BigQueryRetrievalJob method*), 76
to_remote_storage() (*feast.infra.offline_stores.offline_store.RetrievalJob method*), 71
to_remote_storage() (*feast.infra.offline_stores.redshift.RedshiftRetrievalJob method*), 80
to_remote_storage() (*feast.infra.offline_stores.snowflake.SnowflakeRetrievalJob method*), 83
to_s3() (*feast.infra.offline_stores.redshift.RedshiftRetrievalJob method*), 80
to_snowflake() (*feast.infra.offline_stores.snowflake.SnowflakeRetrievalJob method*), 83
to_sql() (*feast.infra.offline_stores.bigquery.BigQueryRetrievalJob method*), 76
to_sql() (*feast.infra.offline_stores.snowflake.SnowflakeRetrievalJob method*), 83
ttl (*feast.feature_view.FeatureView attribute*), 29
ttl (*feast.stream_feature_view.StreamFeatureView attribute*), 33
type (*feast.infra.offline_stores.bigquery.BigQueryOfflineStoreConfig attribute*), 75
type (*feast.infra.offline_stores.contrib.spark_offline_store.spark.SparkOfflineStoreConfig attribute*), 84
type (*feast.infra.offline_stores.file.FileOfflineStoreConfig attribute*), 73
type (*feast.infra.offline_stores.redshift.RedshiftOfflineStoreConfig attribute*), 79
type (*feast.infra.offline_stores.snowflake.SnowflakeOfflineStoreConfig attribute*), 82

U

udf (*feast.on_demand_feature_view.OnDemandFeatureView attribute*), 32
udf (*feast.stream_feature_view.StreamFeatureView attribute*), 34
update() (*feast.infra.materialization.BatchMaterializationEngine method*), 62
update_infra() (*feast.infra.aws.AwsProvider method*), 67
update_infra() (*feast.infra.passthrough_provider.PassthroughProvider method*), 66
update_infra() (*feast.infra.provider.Provider method*), 64
update_infra() (*feast.registry.BaseRegistry method*), 47
update_infra() (*feast.registry.Registry method*), 54
update_registry_proto() (*feast.registry_store.RegistryStore method*), 55
user (*feast.infra.offline_stores.redshift.RedshiftOfflineStoreConfig attribute*), 79
user (*feast.infra.offline_stores.snowflake.SnowflakeOfflineStoreConfig attribute*), 82

V

validate() (*feast.data_source.DataSource method*), 14
validate() (*feast.data_source.PushSource method*), 15
validate() (*feast.data_source.RequestSource method*), 15
validate() (*feast.infra.offline_stores.bigquery_source.BigQuerySource method*), 16
validate() (*feast.infra.offline_stores.contrib.postgres_offline_store.postgres_source.PostgreSQLSource method*), 24
validate() (*feast.infra.offline_stores.contrib.spark_offline_store.spark_source.SparkSource method*), 22
validate() (*feast.infra.offline_stores.file_source.FileSource method*), 25
validate() (*feast.infra.offline_stores.redshift_source.RedshiftSource method*), 18
validate() (*feast.infra.offline_stores.snowflake_source.SnowflakeSource method*), 19
validate_logged_features() (*feast.feature_store.FeatureStore method*), 9
value_type (*feast.entity.Entity attribute*), 27
version() (*feast.feature_store.FeatureStore method*), 9

W

warehouse (*feast.infra.offline_stores.snowflake.SnowflakeOfflineStoreConfi*

attribute), 82
warehouse (*feast.infra.offline_stores.snowflake_source.SnowflakeSource property*), 19
with_join_key_map() (*feast.feature_view.FeatureView method*), 30
write_feature_service_logs() (*feast.infra.passthrough_provider.PassthroughProvider method*), 66
write_feature_service_logs() (*feast.infra.provider.Provider method*), 64
write_logged_features() (*feast.feature_store.FeatureStore method*), 9
write_logged_features() (*feast.infra.offline_stores.bigquery.BigQueryOfflineStore static method*), 75
write_logged_features() (*feast.infra.offline_stores.file.FileOfflineStore static method*), 72
write_logged_features() (*feast.infra.offline_stores.offline_store.OfflineStore static method*), 70
write_logged_features() (*feast.infra.offline_stores.redshift.RedshiftOfflineStore static method*), 78
write_logged_features() (*feast.infra.offline_stores.snowflake.SnowflakeOfflineStore static method*), 81
write_to_offline_store() (*feast.feature_store.FeatureStore method*), 10
write_to_online_store() (*feast.feature_store.FeatureStore method*), 10