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# Feast Documentation

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**CHAPTER  
ONE**

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**CLIENT**



## DATA SOURCE

```
class feast.data_source.BigQueryOptions(table_ref: str)
    DataSource BigQuery options used to source features from BigQuery query
classmethod from_proto(bigquery_options_proto: BigQueryOptions)
    Creates a BigQueryOptions from a protobuf representation of a BigQuery option

    Parameters
        bigquery_options_proto – A protobuf representation of a DataSource

    Returns
        Returns a BigQueryOptions object based on the bigquery_options protobuf

property table_ref
    Returns the table ref of this BQ table

to_proto() → BigQueryOptions
    Converts an BigQueryOptionsProto object to its protobuf representation.

    Returns
        BigQueryOptionsProto protobuf

class feast.data_source.BigQuerySource(event_timestamp_column: str, table_ref: str,
                                         created_timestamp_column: Optional[str] = "", field_mapping:
                                         Optional[Dict[str, str]] = None, date_partition_column:
                                         Optional[str] = "")

property bigquery_options
    Returns the bigquery options of this data source

to_proto() → DataSource
    Converts an DataSourceProto object to its protobuf representation.

class feast.data_source.DataSource(event_timestamp_column: str, created_timestamp_column:
                                     Optional[str] = "", field_mapping: Optional[Dict[str, str]] = None,
                                     date_partition_column: Optional[str] = "")

    DataSource that can be used source features

property created_timestamp_column
    Returns the created timestamp column of this data source

property date_partition_column
    Returns the date partition column of this data source
```

### **property event\_timestamp\_column**

Returns the event timestamp column of this data source

### **property field\_mapping**

Returns the field mapping of this data source

### **static from\_proto(data\_source)**

Convert data source config in FeatureTable spec to a DataSource class object.

### **to\_proto()** → DataSource

Converts an DataSourceProto object to its protobuf representation.

### **class** feast.data\_source.**FileOptions**(file\_format: FileFormat, file\_url: str)

DataSource File options used to source features from a file

### **property file\_format**

Returns the file format of this file

### **property file\_url**

Returns the file url of this file

### **classmethod from\_proto**(file\_options\_proto: FileOptions)

Creates a FileOptions from a protobuf representation of a file option

#### **Parameters**

**file\_options\_proto** – a protobuf representation of a datasource

#### **Returns**

Returns a FileOptions object based on the file\_options protobuf

### **to\_proto()** → FileOptions

Converts an FileOptionsProto object to its protobuf representation.

#### **Returns**

FileOptionsProto protobuf

### **class** feast.data\_source.**FileSource**(event\_timestamp\_column: str, file\_format: FileFormat, file\_url: str, created\_timestamp\_column: Optional[str] = "", field\_mapping: Optional[Dict[str, str]] = None, date\_partition\_column: Optional[str] = "")

### **property file\_options**

Returns the file options of this data source

### **to\_proto()** → DataSource

Converts an DataSourceProto object to its protobuf representation.

### **class** feast.data\_source.**KafkaOptions**(bootstrap\_servers: str, message\_format: StreamFormat, topic: str)

DataSource Kafka options used to source features from Kafka messages

### **property bootstrap\_servers**

Returns a comma-separated list of Kafka bootstrap servers

### **classmethod from\_proto**(kafka\_options\_proto: KafkaOptions)

Creates a KafkaOptions from a protobuf representation of a kafka option

#### **Parameters**

**kafka\_options\_proto** – A protobuf representation of a DataSource

**Returns**

Returns a `BigQueryOptions` object based on the `kafka_options` protobuf

**property message\_format**

Returns the data format that is used to encode the feature data in Kafka messages

**to\_proto()** → `KafkaOptions`

Converts an `KafkaOptionsProto` object to its protobuf representation.

**Returns**

`KafkaOptionsProto` protobuf

**property topic**

Returns the Kafka topic to collect feature data from

```
class feast.data_source.KafkaSource(event_timestamp_column: str, bootstrap_servers: str,
                                   message_format: StreamFormat, topic: str,
                                   created_timestamp_column: Optional[str] = "", field_mapping:
                                   Optional[Dict[str, str]] = {}, date_partition_column: Optional[str] =
                                   "")
```

**property kafka\_options**

Returns the kafka options of this data source

**to\_proto()** → `DataSource`

Converts an `DataSourceProto` object to its protobuf representation.

```
class feast.data_source.KinesisOptions(record_format: StreamFormat, region: str, stream_name: str)
```

`DataSource` Kinesis options used to source features from Kinesis records

**classmethod from\_proto**(kinesis\_options\_proto: `KinesisOptions`)

Creates a `KinesisOptions` from a protobuf representation of a kinesis option

**Parameters**

**kinesis\_options\_proto** – A protobuf representation of a `DataSource`

**Returns**

Returns a `KinesisOptions` object based on the `kinesis_options` protobuf

**property record\_format**

Returns the data format used to encode the feature data in the Kinesis records.

**property region**

Returns the AWS region of Kinesis stream

**property stream\_name**

Returns the Kinesis stream name to obtain feature data from

**to\_proto()** → `KinesisOptions`

Converts an `KinesisOptionsProto` object to its protobuf representation.

**Returns**

`KinesisOptionsProto` protobuf

```
class feast.data_source.KinesisSource(event_timestamp_column: str, created_timestamp_column: str,
                                       record_format: StreamFormat, region: str, stream_name: str,
                                       field_mapping: Optional[Dict[str, str]] = {},
                                       date_partition_column: Optional[str] = "")
```

**property** `kinesis_options`

Returns the kinesis options of this data source

**to\_proto()** → DataSource

Converts an DataSourceProto object to its protobuf representation.

**class** `feast.data_source.SourceType(value)`

DataSource value type. Used to define source types in DataSource.

## ENTITY

```
class feast.entity.Entity(name: str, description: str, value_type: ValueType, labels:
    Optional[MutableMapping[str, str]] = None)
```

Represents a collection of entities and associated metadata.

**property created\_timestamp**

Returns the created\_timestamp of this entity

**property description**

Returns the description of this entity

**classmethod from\_dict(entity\_dict)**

Creates an entity from a dict

**Parameters**

**entity\_dict** – A dict representation of an entity

**Returns**

Returns a EntityV2 object based on the entity dict

**classmethod from\_proto(entity\_proto: Entity)**

Creates an entity from a protobuf representation of an entity

**Parameters**

**entity\_proto** – A protobuf representation of an entity

**Returns**

Returns a EntityV2 object based on the entity protobuf

**classmethod from\_yaml(yml: str)**

Creates an entity from a YAML string body or a file path

**Parameters**

**yml** – Either a file path containing a yaml file or a YAML string

**Returns**

Returns a EntityV2 object based on the YAML file

**is\_valid()**

Validates the state of a entity locally. Raises an exception if entity is invalid.

**property labels**

Returns the labels of this entity. This is the user defined metadata defined as a dictionary.

**property last\_updated\_timestamp**

Returns the last\_updated\_timestamp of this entity

**property name**

Returns the name of this entity

**to\_dict()** → Dict

Converts entity to dict

**Returns**

Dictionary object representation of entity

**to\_proto()** → Entity

Converts an entity object to its protobuf representation

**Returns**

EntityV2Proto protobuf

**to\_spec\_proto()** → EntitySpecV2

Converts an EntityV2 object to its protobuf representation. Used when passing EntitySpecV2 object to Feast request.

**Returns**

EntitySpecV2 protobuf

**to\_yaml()**

Converts an entity to a YAML string.

**Returns**

Entity string returned in YAML format

**property value\_type**

Returns the type of this entity

## FEATURE TABLE

```
class feast.feature_table.FeatureTable(name: str, entities: List[str], features: List[Feature],  
                                         batch_source: Optional[Union[BigQuerySource, FileSource]] =  
                                         None, stream_source: Optional[Union[KafkaSource,  
                                         KinesisSource]] = None, max_age: Optional[Duration] = None,  
                                         labels: Optional[MutableMapping[str, str]] = None,  
                                         online_store: Optional[OnlineStore] = None)
```

Represents a collection of features and associated metadata.

**add\_feature**(feature: Feature)

Adds a new feature to the feature table.

**property batch\_source**

Returns the batch source of this feature table

**property created\_timestamp**

Returns the created\_timestamp of this feature table

**property entities**

Returns the entities of this feature table

**property features**

Returns the features of this feature table

**classmethod from\_dict**(ft\_dict)

Creates a feature table from a dict

**Parameters**

**ft\_dict** – A dict representation of a feature table

**Returns**

Returns a FeatureTable object based on the feature table dict

**classmethod from\_proto**(feature\_table\_proto: FeatureTable)

Creates a feature table from a protobuf representation of a feature table

**Parameters**

**feature\_table\_proto** – A protobuf representation of a feature table

**Returns**

Returns a FeatureTableProto object based on the feature table protobuf

**classmethod from\_yaml**(yaml: str)

Creates a feature table from a YAML string body or a file path

**Parameters**

**yaml** – Either a file path containing a yaml file or a YAML string

### Returns

Returns a FeatureTable object based on the YAML file

### is\_valid()

Validates the state of a feature table locally. Raises an exception if feature table is invalid.

### property labels

Returns the labels of this feature table. This is the user defined metadata defined as a dictionary.

### property last\_updated\_timestamp

Returns the last\_updated\_timestamp of this feature table

### property max\_age

Returns the maximum age of this feature table. This is the total maximum amount of staleness that will be allowed during feature retrieval for each specific feature that is looked up.

### property name

Returns the name of this feature table

### property online\_store

Returns the online store of this feature table

### property stream\_source

Returns the stream source of this feature table

### to\_dict() → Dict

Converts feature table to dict

### Returns

Dictionary object representation of feature table

### to\_proto() → FeatureTable

Converts a feature table object to its protobuf representation

### Returns

FeatureTableProto protobuf

### to\_spec\_proto() → FeatureTableSpec

Converts an FeatureTableProto object to its protobuf representation. Used when passing FeatureTableSpecProto object to Feast request.

### Returns

FeatureTableSpecProto protobuf

### to\_yaml()

Converts a feature table to a YAML string.

### Returns

Feature table string returned in YAML format

## FEATURE

---

```
class feast.feature.Feature(name: str, dtype: ValueType, labels: Optional[MutableMapping[str, str]] = None)
```

Feature field type

**property dtype:** **ValueType**

Getter for data type of this field

**classmethod from\_proto**(feature\_proto: *FeatureSpecV2*)

**Parameters**

**feature\_proto** – FeatureSpecV2 protobuf object

**Returns**

Feature object

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

Getter for labels of this field

**property name**

Getter for name of this field

**to\_proto**() → *FeatureSpecV2*

Converts Feature object to its Protocol Buffer representation

```
class feast.feature.FeatureRef(name: str, feature_table: Optional[str] = None)
```

Feature Reference represents a reference to a specific feature.

**classmethod from\_proto**(proto: *FeatureReferenceV2*)

Construct a feature reference from the given FeatureReference proto Arg:

proto: Protobuf FeatureReference to construct from

**Returns**

FeatureRef that refers to the given feature

**classmethod from\_str**(feature\_ref\_str: *str*)

Parse the given string feature reference into FeatureRef model String feature reference should be in the format feature\_table:feature. Where “feature\_table” and “name” are the feature\_table name and feature name respectively. :param feature\_ref\_str: String representation of the feature reference

**Returns**

FeatureRef that refers to the given feature

**to\_proto()** → FeatureReferenceV2

Convert and return this feature table reference to protobuf. :returns: Protobuf representation of this feature table reference.

## CONSTANTS

```
feast.constants.CONFIG_FEAST_ENV_VAR_PREFIX: str = 'FEAST_'
    Default prefix to Feast environmental variables
feast.constants.CONFIG_FILE_DEFAULT_DIRECTORY: str = '.feast'
    Default directory to Feast configuration file
feast.constants.CONFIG_FILE_NAME: str = 'config'
    Default Feast configuration file name
feast.constants.CONFIG_FILE_SECTION: str = 'general'
    Default section in Feast configuration file to specify options
class feast.constants.ConfigOptions
    Feast Configuration Options
    AUTH_PROVIDER: str = 'auth_provider'
        Authentication Provider - Google OpenID/OAuth
        Options: "google" / "oauth"
    AUTH_TOKEN: Optional[str] = 'auth_token'
        JWT Auth token for user authentication to Feast
    AZURE_BLOB_ACCOUNT_ACCESS_KEY: Optional[str] = 'azure_blob_account_access_key'
        Account access key for Azure blob storage_client
    AZURE_BLOB_ACCOUNT_NAME: Optional[str] = 'azure_blob_account_name'
        Account name for Azure blob storage_client
    BATCH_FEATURE_REQUEST_WAIT_TIME_SECONDS: str =
'batch_feature_request_wait_time_seconds'
        Time to wait for historical feature requests before timing out.
    BATCH_INGESTION_PRODUCTION_TIMEOUT: str = 'batch_ingestion_production_timeout'
        Default timeout when running batch ingestion
    CORE_ENABLE_SSL: str = 'core_enable_ssl'
        Enable or disable TLS/SSL to Feast Core
    CORE_SERVER_SSL_CERT: str = 'core_server_ssl_cert'
        Path to certificate(s) to secure connection to Feast Core
    CORE_URL: str = 'core_url'
        Default Feast Core URL
```

**DATAPROC\_CLUSTER\_NAME: Optional[str] = 'dataproc\_cluster\_name'**

Dataproc cluster to run Feast Spark Jobs in

**DATAPROC\_EXECUTOR\_CORES = 'dataproc\_executor\_cores'**

No. of executor cores for Dataproc cluster

**DATAPROC\_EXECUTOR\_INSTANCES = 'dataproc\_executor\_instances'**

No. of executor instances for Dataproc cluster

**DATAPROC\_EXECUTOR\_MEMORY = 'dataproc\_executor\_memory'**

No. of executor memory for Dataproc cluster

**DATAPROC\_PROJECT: Optional[str] = 'dataproc\_project'**

Project of Dataproc cluster

**DATAPROC\_REGION: Optional[str] = 'dataproc\_region'**

Region of Dataproc cluster

**DEADLETTER\_PATH: str = 'deadletter\_path'**

Ingestion Job DeadLetter Destination. The choice of storage is connected to the choice of SPARK\_LAUNCHER.

Eg. gs://some-bucket/output/, s3://some-bucket/output/, file:///data/subfolder/

**EMR\_CLUSTER\_ID: Optional[str] = 'emr\_cluster\_id'**

EMR cluster to run Feast Spark Jobs in

**EMR\_CLUSTER\_TEMPLATE\_PATH: Optional[str] = 'emr\_cluster\_template\_path'**

Template path of EMR cluster

**EMR\_LOG\_LOCATION: Optional[str] = 'emr\_log\_location'**

Log path of EMR cluster

**EMR\_REGION: Optional[str] = 'emr\_region'**

Region of EMR cluster

**ENABLE\_AUTH: str = 'enable\_auth'**

Enable user authentication to Feast Core

**GRPC\_CONNECTION\_TIMEOUT: str = 'grpc\_connection\_timeout'**

Default connection timeout to Feast Serving, Feast Core, and Feast Job Service (in seconds)

**GRPC\_CONNECTION\_TIMEOUT\_APPLY: str = 'grpc\_connection\_timeout\_apply'**

Default gRPC connection timeout when sending an ApplyFeatureTable command to Feast Core (in seconds)

**HISTORICAL\_FEATURE\_OUTPUT\_FORMAT: str = 'historical\_feature\_output\_format'**

File format of historical retrieval features

**HISTORICAL\_FEATURE\_OUTPUT\_LOCATION: Optional[str] = 'historical\_feature\_output\_location'**

File location of historical retrieval features

**INGESTION\_DROP\_INVALID\_ROWS = 'ingestion\_drop\_invalid\_rows'**

If set to true rows that do not pass custom validation (see feast.contrib.validation) won't be saved to Online Storage

**JOB\_SERVICE\_ENABLE\_CONTROL\_LOOP: str = 'job\_service\_enable\_control\_loop'**

Enable or disable control loop for Feast Job Service

---

**JOB\_SERVICE\_ENABLE\_SSL:** `str = 'job_service_enable_ssl'`  
Enable or disable TLS/SSL to Feast Job Service

**JOB\_SERVICE\_SERVER\_SSL\_CERT:** `str = 'job_service_server_ssl_cert'`  
Path to certificate(s) to secure connection to Feast Job Service

**JOB\_SERVICE\_URL:** `Optional[str] = 'job_service_url'`  
Default Feast Job Service URL

**OAUTH\_AUDIENCE:** `Optional[str] = 'oauth_audience'`  
OAuth intended recipients

**OAUTH\_CLIENT\_ID:** `Optional[str] = 'oauth_client_id'`  
OAuth client ID

**OAUTH\_CLIENT\_SECRET:** `Optional[str] = 'oauth_client_secret'`  
OAuth client secret

**OAUTH\_GRANT\_TYPE:** `Optional[str] = 'oauth_grant_type'`  
OAuth grant type

**OAUTH\_TOKEN\_REQUEST\_URL:** `Optional[str] = 'oauth_token_request_url'`  
OAuth token request url

**PROJECT:** `str = 'project'`  
Feast project namespace to use

**REDIS\_HOST:** `str = 'redis_host'`  
Default Redis host

**REDIS\_PORT:** `str = 'redis_port'`  
Default Redis port

**REDIS\_SSL:** `str = 'redis_ssl'`  
Enable or disable TLS/SSL to Redis

**S3\_ENDPOINT\_URL:** `Optional[str] = 's3_endpoint_url'`  
Endpoint URL for S3 storage\_client

**SERVING\_ENABLE\_SSL:** `str = 'serving_enable_ssl'`  
Enable or disable TLS/SSL to Feast Serving

**SERVING\_SERVER\_SSL\_CERT:** `str = 'serving_server_ssl_cert'`  
Path to certificate(s) to secure connection to Feast Serving

**SERVING\_URL:** `str = 'serving_url'`  
Default Feast Serving URL

**SPARK\_BQ\_MATERIALIZATION\_DATASET:** `Optional[str] = 'spark_bq_materialization_dataset'`  
The dataset id where the materialized view of BigQuerySource is going to be created by default, use the same dataset where view is located

**SPARK\_BQ\_MATERIALIZATION\_PROJECT:** `Optional[str] = 'spark_bq_materialization_project'`  
The project id where the materialized view of BigQuerySource is going to be created by default, use the same project where view is located

**SPARK\_HOME:** `Optional[str] = 'spark_home'`  
Directory where Spark is installed

**SPARK\_INGESTION\_JAR:** `str = 'spark_ingestion_jar'`

Feast Spark Job ingestion jar file. The choice of storage is connected to the choice of SPARK\_LAUNCHER.

Eg. “dataproc” (http and gs), “emr” (http and s3), “standalone” (http and file)

**SPARK\_LAUNCHER:** `Optional[str] = 'spark_launcher'`

Spark Job launcher. The choice of storage is connected to the choice of SPARK\_LAUNCHER.

Options: “standalone”, “dataproc”, “emr”

**SPARK\_STAGING\_LOCATION:** `Optional[str] = 'spark_staging_location'`

Feast Spark Job ingestion jobs staging location. The choice of storage is connected to the choice of SPARK\_LAUNCHER.

Eg. gs://some-bucket/output/, s3://some-bucket/output/, file:///data/subfolder/

**SPARK\_STANDALONE\_MASTER:** `str = 'spark_standalone_master'`

Spark resource manager master url

**STATSD\_ENABLED:** `str = 'statsd_enabled'`

Enable or disable StatsD

**STATSD\_HOST:** `Optional[str] = 'statsd_host'`

Default StatsD port

**STATSD\_PORT:** `Optional[str] = 'statsd_port'`

Default StatsD port

**STENCIL\_URL:** `str = 'stencil_url'`

ProtoRegistry Address (currently only Stencil Server is supported as registry) <https://github.com/gojekfarm/stencil>

**TELEMETRY = 'telemetry'**

Telemetry enabled

`feast.constants.DATETIME_COLUMN:` `str = 'datetime'`

Default datetime column name for point-in-time join

`feast.constants.FEAST_CONFIG_FILE_ENV:` `str = 'FEAST_CONFIG'`

Environmental variable to specify Feast configuration file location

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