

Curl

Introduction

Last updated: 2024-05-13

Using IBM Watson Machine Learning, you can build analytic models and neural networks, trained with your own data, that you can deploy for use in applications. Watson Machine Learning provides a full range of tools and services, so you can build, train, and deploy Machine Learning models. Choose from tools that fully automate the training process for rapid prototyping to tools that give you complete control to create a model that matches your needs.

For more information about how to use IBM Watson Machine Learning (WML), see [here](#).

There is a specialized python library that is available to access this REST API [here](#).

Endpoint URLs

The following URL represents the base URLs for the Watson Machine Learning API endpoints. When you call the API, use the URL and add the path for each method to form the complete API endpoint for your requests.

- Dallas: <https://us-south.ml.cloud.ibm.com>
- London - <https://eu-gb.ml.cloud.ibm.com>
- Frankfurt - <https://eu-de.ml.cloud.ibm.com>
- Tokyo - <https://jp-tok.ml.cloud.ibm.com>

Example request to a Dallas endpoint:

```
curl -H "Authorization: Bearer {token}" -X {request_method}
"https://us-south.ml.cloud.ibm.com/{method_endpoint}"
```



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Required only

This API uses IBM Cloud Identity and Access Management (IAM) to authenticate requests.

 in API requests.

IAM authentication. Replace `{token}` and `{url}/{method}` with your service credentials.

```
curl -H "Authorization:Bearer {token}" -X "{url}/{method}"
```



Authorization: Bearer {token}

For example, if the token is `tzLbqWhyALQawBg5TjRIf5sAznhrKQyvBFFaZbtF60m5` in the service credentials, include the credentials in your call like this:

```
curl -H "Authorization:Bearer  
tzLbqWhyALQawBg5TjRIf5sAznhrKQyvBFFaZbtF60m5" -X "https://us-  
south.ml.cloud.ibm.com/ml/v4/models"
```



Error handling

This API uses standard HTTP response codes to indicate whether a method completed successfully. A `200` type response indicates success. A `400` type response indicates a failure, and a `500` type response indicates an internal system error.

HTTP Code	Description	Recovery
<code>200</code>	Success	The request was successful.
<code>400</code>	Bad Request	The input parameters in the request body are either incomplete, or in the wrong format, or some other input validation failed. Be sure to include all required parameters in your request and check the request body.
<code>401</code>	Unauthorized	You are not authorized to make this request. Log in and try again or provide a valid token. See Authenticating with IAM tokens for instructions on logging in. If this error persists, contact the account owner to check your permissions.
<code>403</code>	Forbidden	The supplied authentication is not authorized.

HTTP Code	Description	Recovery
404	Not Found	The requested resource could not be found.

Error response

Name	Description
trace	An identifier that can be used to trace the request. This can be set using <code>X-Global-Transaction-Id</code> .
errors	The list of errors.

Errors

Name	Description
code	A simple string code that should convey the general sense of the error.
message	The message that describes the error.
more_info	A reference to a more detailed explanation when available.

Additional headers

Some additional headers might be required to make successful requests to the API. Those additional headers are described below.

An optional transaction ID can be passed to your request, which can be useful for tracking calls through multiple services using one identifier. The header key must be set to `X-Global-Transaction-Id` and the value is anything that you choose.

If there is not a transaction ID that is passed in, then one is generated randomly.

Versioning

API requests require a version parameter that takes a date in the format `version=YYYY-MM-DD`. See [API Handbook](#) for more details about date based API versioning. When there is a change to the API in a

[backwards-incompatible way](#)[↗], there will be a new version date published. Send the version parameter with every API request.

The service uses the API version for the date you specify or the most recent version before that date. It is not recommended defaulting to the current date. Instead, specify a date that matches a version that is compatible with your app and do not change it until your app is ready for a later version.

Deployed Version Dates

2021-05-01

The [creation of deployment jobs](#) is now fully asynchronous. What this means is that the creation of the job will not return the `platform_jobs` section in the response, instead poll the job using the [deployment-jobs-get](#) operation until the `platform_jobs` section is provided in the response.

Data References

Accessing data in a remote location (such as a Cloud Object Storage bucket, or an SQL/no-SQL database) requires the use of `connection_asset` or `data_asset` reference types. These reference types are created within a space or a project and are referenced in WML requests to represent input data and results locations. These types contain two parameter objects, `connection` and `location`, which require different values to be supplied based on the reference type. Using a `data_asset`, requires an `href` to be supplied to the `location` object whereas using a `connection_asset` requires the `connection_id` for the `connection` object and different `location` fields depending on the data source type, see [Data reference Description](#)[↗] for details.

Example `data_asset` payload:

```
"training_data_references": [{
  "type": "data_asset",
  "location": {
    "href": "/v2/assets/<asset_id>?space_id=<space_id>"
  }
}]
```

Example `connection_asset` payload:

```
"training_data_references": [{
  "type": "connection_asset",
  "connection": {
    "id": "<connection_guid>"
  },
  "location": {
    "<wdp-properties depending on the type>"
  }
}]
```

Example `url` payload (Decision Optimization only):

```
"training_data_references": {
  "type": "url",
  "id": "diet_food.csv",
  "connection": {
    "verb": "GET",
    "url": "https://myserver.com/diet_food.csv",
    "headers": {
      "Content-Type": "application/x-www-form-urlencoded"
    }
  },
  "location": {
  }
}
```

Activity Tracker events

You can monitor API activity within your account by using the IBM Cloud Activity Tracker service. Whenever an API method is called, an event is generated that you can then track and audit from within Activity Tracker. The specific event type is listed for each individual method.

For more information about how to track Watson Machine Learning activity, see [Auditing events for Watson Machine Learning](#).

Methods

Create a new WML deployment

Create a new deployment, the parameters specifying the deployment type are `online` and `batch`. These parameters are mutually exclusive, specify only one of these when creating a deployment. Use `hybrid_pipeline_hardware_specs` only when creating a `batch` deployment job of a hybrid pipeline in order to specify compute configuration for each pipeline node. For all other `batch` deployment cases use `hardware_spec` to specify compute configuration. The `hybrid_pipeline_hardware_specs` and `hardware_spec` are mutually exclusive, specify only one of these when creating a deployment. For `batch` deployments, `hardware_spec.num_nodes` parameter is not currently supported. For `online` deployments, `hardware_spec` cannot be specified at the time of creation, `hardware_spec.num_nodes` parameter is not supported as part of `POST /ml/v4/deployments` API request, but it can be updated using `PATCH /ml/v4/deployments/<deployment id>`. For `online` deployments, `serving_name` can be provided in `online.parameters`. The serving name can have the characters `[a-z,0-9,_]` and must not be more than 36 characters. The `serving_name` can be used in the prediction URL in place of the `deployment_id`. See the documentation [supported frameworks](#) for details about which frameworks can be used in a deployment.

POST /ml/v4/deployments



Request

Query Parameters

version

Required *

date

The version date for the API of the form `YYYY-MM-DD`.

Example: `2023-07-07`

Request Body

Required *

deployment_entity_request

The deployment entity.

space_id

Required *

string

The space that contains the resource.

Possible values: length = 36, Value must match regular expression

`[a-zA-Z0-9-]*`

Example: `3fc54cf1-252f-424b-b52d-5cdd9814987f`

custom

User defined properties specified as key-value pairs.

Examples: [View](#)

> [object](#)

asset

A reference to a resource.

> [Rel](#)

hardware_spec

A hardware specification.

> [HardwareSpec](#)

hybrid_pipeline_hardware_specs

Hybrid pipeline hardware specification.

> [hybrid_pipeline_hardware_specs](#)

online

Indicates that this is an online deployment. An empty object has to be specified. If the online scoring schema has a `type` of `DataFrame` then the scoring payload will be converted to a `Pandas` data frame.

> [OnlineRequest](#)

batch

Indicates that this is a batch deployment. An empty object has to be specified.

> [BatchRequest](#)

tags

string[]

Tags that can be used when searching for resources.

Examples: [View](#)**name**

string

The name of the deployment.

Example: `customer_churn`**description**

string

A description of the deployment.

Example: `Customer churn prediction model deployment`**Post request,**

```
curl --location --request POST 'https://us-south.ml.cloud.ibm.com/ml/v4/deployments?version=2020-09-01' --data-raw '{
  "space_id": "3fc54cf1-252f-424b-b52d-5cdd9814987f",
  "tags": [
    "dev",
    "TF"
  ],
  "name": "customer_churn",
  "description": "Customer churn prediction model deployment",
  "custom": "<object>",
  "asset": {
    "id": "4cedab6d-e8e4-4214-b81a-2ddb122db2ab",
    "rev": "2"
  },
  "hardware_spec": {
    "id": "4cedab6d-e8e4-4214-b81a-2ddb122db2ab",
    "rev": "2",
    "name": "<string>",
    "num_nodes": "<integer>"
  },
  "hybrid_pipeline_hardware_specs": [
    {
      "node_runtime_id": "auto_ai.kb",
      "hardware_spec": {
        "id": "4cedab6d-e8e4-4214-b81a-2ddb122db2ab",
        "rev": "2",
        "name": "<string>",
        "num_nodes": "<integer>"
      }
    }
  ]
}
```

```

        "node_runtime_id": "auto_ai.kb",
        "hardware_spec": {
            "id": "4cedab6d-e8e4-4214-b81a-2ddb122db2ab",
            "rev": "2",
            "name": "<string>",
            "num_nodes": "<integer>"
        }
    },
    "online": {
        "parameters": "<object>"
    },
    "batch": {
        "parameters": "<object>"
    },
    "r_shiny": {
        "authentication": "members_of_deployment_space",
        "parameters": "<object>"
    },
}

```

Response

Response Body	A deployment resource.
deployment_resource	
metadata Common metadata for a resource where <code>project_id</code> or <code>space_id</code> must be present. Examples: View > ResourceMeta	
entity The definition of the deployment. > deployment_entity	
Status Code	
202	Deployment created.
400	Bad request, the response body should contain the reason.
401	Unauthorized.

403	Forbidden, an authentication error including trying to access an unauthorized space or project.
404	The specified resource was not found.

No Sample Response

This method does not specify any sample responses.

Retrieve the deployments

Retrieve the list of deployments for the specified space.

GET /ml/v4/deployments




Request


Query Parameters

version Required [*] date	The version date for the API of the form <code>YYYY-MM-DD</code> . Example: <code>2023-07-07</code>
space_id string	Retrieves the deployments that belong to this space. Example: <code>2ae804f8-fa85-4106-8228-cbc7e408ad79</code>
serving_name string	Retrieves the deployment, if any, that contains this <code>serving_name</code> . Example: <code>churn</code>
tag.value string	Retrieves only the resources with the given tag value.
asset_id string	Retrieves only the resources with the given asset_id, asset_id would be either model_id or function_id.
name string	Retrieves only the resources with the given name.

type string	Retrieves the resources filtered with the given type. Allowed values are <code>model</code> , <code>function</code> , <code>py_script</code> and <code>do</code> .
state string	Retrieves the resources filtered by state. Allowed values are <code>initializing</code> , <code>updating</code> , <code>ready</code> and <code>failed</code> .
stats boolean	Returns stats about deployments within a space or across spaces if it is set to true. This query parameter cannot be combined with any other except for 'space_id'.
conflict boolean	Returns whether serving_name is available for use or not. This query parameter cannot be combined with any other except for 'serving_name'. Default: <code>false</code>

Get request, 

```
curl --location --request GET 'https://us-south.ml.cloud.ibm.com/ml/v4/deployments?space_id=<string>&tag.value=<string>&asset_id=<string>&version=2020-09-01'
```



Response

Response Body <code>deployment_resources</code>	The deployment resources.
limit Always included [*] integer	The number of items to return in each page. Possible values: $1 \leq \text{value} \leq 200$ Example: <code>10</code>
first Always included [*] > PaginationFirst	The reference to the first item in the current page.
total_count integer	The total number of resources. Computed explicitly only when 'total_count=true' query parameter is present. This is in order to avoid performance penalties.

Example: 1

next

A reference to the first item of the next page, if any.

> [PaginationNext](#)

resources

A list of deployment resources. This will be empty if 'stats' query parameter is passed with 'true'.

> [deployment_resource\[\]](#)

system

System details including warnings and stats. This will get populated only if 'stats' query parameter is passed with 'true'.

> [object](#)

Status Code

200	OK.
204	serving_name is available for use. Returned when serving_name and conflict query parameters are used.
400	Bad request, the response body should contain the reason.
401	Unauthorized.
403	Forbidden, an authentication error including trying to access an unauthorized space or project.
404	The specified resource was not found.
409	Returned when serving_name and conflict query parameters are used. The response body will contain the reason.

No Sample Response

This method does not specify any sample responses.

Retrieve the deployment details

Retrieve the deployment details with the specified identifier.

GET /ml/v4/deployments/{deployment_id}

Request

Path Parameters	
<div><div>deployment_id</div><div>Required *</div><div>string</div></div>	<div>The deployment id.</div>
Query Parameters	
<div><div>version</div><div>Required *</div><div>date</div></div>	<div>The version date for the API of the form <code>YYYY-MM-DD</code>.</div> <div>Example: <code>2023-07-07</code></div>
<div><div>space_id</div><div>Required *</div><div>string</div></div>	<div>Retrieves the deployments of assets that belong to this space.</div> <div>Example: <code>2ae804f8-fa85-4106-8228-cbc7e408ad79</code></div>

Get request,

curl --location "{url}/v4/deployments/{deployment_id}"

Response

<div><div>Response Body</div><div>deployment_resource</div></div>	<div>A deployment resource.</div>
<div>metadata</div>	<div>Common metadata for a resource where <code>project_id</code> or <code>space_id</code> must be present.</div>

Examples: [View](#)

> [ResourceMeta](#)

entity

The definition of the deployment.

> [deployment_entity](#)

Status Code

200	Deployment details.
400	Bad request, the response body should contain the reason.
401	Unauthorized.
403	Forbidden, an authentication error including trying to access an unauthorized space or project.
404	The specified resource was not found.

No Sample Response

This method does not specify any sample responses.

Delete the deployment

Delete the deployment with the specified identifier.

```
DELETE /ml/v4/deployments/{deployment_id}
```



Request

Path Parameters

deployment_id

The deployment id.

Required *

string

Query Parameters

version

Required *

date

The version date for the API of the form YYYY-MM-DD .

Example: 2023-07-07

space_id

Required *

string

Retrieves the deployments of assets that belong to this space.

Example: 2ae804f8-fa85-4106-8228-cbc7e408ad79

Delete request,



```
curl --location --request DELETE 'https://us-south.ml.cloud.ibm.com/ml/v4/deployments/:deployment_id?space_id=<string>&version=2020-09-01'
```



Response

Status Code

204

Deployment deleted.

400

Bad request, the response body should contain the reason.

401

Unauthorized.

404

The specified resource was not found.

No Sample Response

This method does not specify any sample responses.

Update the deployment metadata

Update the deployment metadata. The following parameters of deployment metadata are supported for the patch operation.

- `/tags` - `/name` - `/description` - `/custom` - `/hardware_spec` - `/hybrid_pipeline_hardware_specs` - `/asset` - `/online/parameters` In case of online deployments, using PATCH operation of `/ml/v4/deployments`, users can update the number of copies of an online deployment. Users can specify the desired value of number of copies in `hardware_spec.num_nodes` parameter. As `hardware_spec.name` or `hardware_spec.id` is mandatory for `hardware_spec` schema, a valid value such as `XS`, `S` must be specified for `hardware_spec.name` parameter as part of PATCH request. Alternatively, users can also specify a valid ID of a hardware specification in `hardware_spec.id` parameter. However, changes related to `hardware_spec.name` or `hardware_spec.id` specified in PATCH operation will not be applied for online deployments.
In case of batch deployments, using PATCH operation of `/ml/v4/deployments`, users can update the hardware specification so that subsequent batch deployment jobs can make use of the updated compute configurations. To update the compute configuration, users must specify a valid value for either `hardware_spec.name` or `hardware_spec.id` of the hardware specification that suits their requirement. In the batch deployment context, `hardware_spec.num_nodes` parameter is not currently supported.
When 'asset' is patched with id/rev:
- Deployment with the patched id/rev is started. - With an asynchronous deployment (`version` greater than [2021-05-01](#)), 202 response code will be returned and one can poll the deployment for the status.
- If any failures, deployment will be reverted back to the previous id/rev and the failure message will be captured in 'failures' field in the response.

In the case of an online deployment, the PATCH operation with path specified as `/online/parameters` can be used to update the `serving_name`.

PATCH `/ml/v4/deployments/{deployment_id}`

Request

Path Parameters	
deployment_id Required * string	The deployment id.
Query Parameters	
version Required * date	The version date for the API of the form <code>YYYY-MM-DD</code> . Example: <code>2023-07-07</code>

space_id Required * string	Retrieves the deployments of assets that belong to this space. Example: 2ae804f8-fa85-4106-8228-cbc7e408ad79
Request Body Required * JsonPatchOperation[]	The json patch.
op Required * string	The operation to be performed. Allowable values: [add , remove , replace]
path Required * string	The pointer that identifies the field that is the target of the operation.
value string	The value to be used within the operation.

Patch request, ^

```
curl --location --request PATCH 'https://us-south.ml.cloud.ibm.com/ml/v4/deployments/:deployment_id?space_id=<string>&version=2020-09-01' --data-raw '[
  {
    "op": "<string>",
    "path": "<string>",
    "value": "<object>"
  },
  {
    "op": "<string>",
    "path": "<string>",
    "value": "<object>"
  }
]'
```

Response

Response Body deployment_resource	A deployment resource.
---	------------------------

metadata

Common metadata for a resource where `project_id` or `space_id` must be present.

Examples: [View](#)

> [ResourceMeta](#)

entity

The definition of the deployment.

> [deployment_entity](#)

Status Code

202	Deployment accepted
400	Bad request, the response body should contain the reason.
401	Unauthorized.
403	Forbidden, an authentication error including trying to access an unauthorized space or project.
404	The specified resource was not found.

No Sample Response

This method does not specify any sample responses.

Execute a synchronous deployment prediction

Execute a synchronous prediction for the deployment with the specified identifier. If a `serving_name` is used then it must match the `serving_name` that is returned in the `inference` field.

```
POST /ml/v4/deployments/{deployment_id}/predictions
```



Request

Path Parameters

deployment_id

Required *

string

The `deployment_id` can be either the `deployment_id` that identifies the deployment or a `serving_name` that allows a predefined URL to be used to post a prediction.

Query Parameters

version

Required *

date

The version date for the API of the form `YYYY-MM-DD`.

Example: `2023-07-07`

Request Body

Required *

sync_scoring_data

The scoring data.

input_data

Required *

> [SyncScoringDataItem\[\]](#)

The input data.

scoring_parameters

> [ScoringParameters](#)

Parameters that can be used to control the prediction request.

Post request,

```
curl --location --request POST 'https://us-south.ml.cloud.ibm.com/ml/v4/deployments/:deployment_id/predictions?version=2020-09-01' --data-raw '{
  "input_data": [
    {
      "id": "<string>",
      "fields": [
        "<string>",
        "<string>"
      ],
      "values": [
        [
          "<object>",
          "<object>"
        ],
        [
          "<object>"
        ]
      ]
    }
  ]
}
```

```
        "<object>"
      ]
    ],
    {
      "id": "<string>",
      "fields": [
        "<string>",
        "<string>"
      ],
      "values": [
        [
          "<object>",
          "<object>"
        ],
        [
          "<object>",
          "<object>"
        ]
      ]
    }
  ]
}
```

Response

Response Body sync_scoring_data_results		Scoring results.
predictions > scoring_payload[]		The predictions.
Status Code		
200	Scoring response.	
400	Bad request, the response body should contain the reason.	
401	Unauthorized.	
403	Forbidden, an authentication error including trying to access an unauthorized space or project.	

No Sample Response

This method does not specify any sample responses.

Retrieve the deployment jobs

Retrieve the status of the current jobs. The system will apply a max limit of jobs retained by the system as we cannot accumulate an infinite number of jobs. Only most recent 300 jobs (system configurable) will be preserved. Older jobs will be purged by the system.

```
GET /ml/v4/deployment_jobs
```



Request

Query Parameters

version

Required *

date

The version date for the API of the form `YYYY-MM-DD`.Example: `2023-07-07`**space_id**

Required *

string

Retrieves the deployment jobs that belong to this space.

tag.value

string

Retrieves only the jobs with these tags (comma separated).

state

string

Filter based on on the deployment job state: queued, running, completed, failed etc.

deployment_id

string

Filter based on the deployment_id.

include

string

Retrieves only fields from `decision_optimization` and `scoring` section mentioned as comma separated values as output response fields. Retrieves all the fields if not mentioned.

Get request,



```
curl --location --request GET 'https://us-south.ml.cloud.ibm.com/ml/v4/deployment_jobs?space_id=<string>&tag.value=<string>&state=<string>&deployment_id=<string>&version=2020-09-01'
```

Response

Response Body	
jobs_resources	The information related to the jobs.
limit Always included * integer	The number of items to return in each page. Possible values: $1 \leq \text{value} \leq 200$ Example: 10
first Always included * > PaginationFirst	The reference to the first item in the current page.
total_count integer	The total number of resources. Computed explicitly only when 'total_count=true' query parameter is present. This is in order to avoid performance penalties. Example: 1
next > PaginationNext	A reference to the first item of the next page, if any.
resources > jobs_resource[]	A list of jobs.
Status Code	
200	Jobs response.
400	Bad request, the response body should contain the reason.

401	Unauthorized.
403	Forbidden, an authentication error including trying to access an unauthorized space or project.
404	The specified resource was not found.

No Sample Response

This method does not specify any sample responses.

Start an asynchronous deployment job

Start a deployment job asynchronously. This can perform batch scoring, streaming, or other types of batch operations, such as solving a Decision Optimization problem. Depending on the `version` date passed, the `platform_jobs` section in the response may or may not be populated. Use the GET call to retrieve the deployment job, this GET call will eventually populate the `platform_jobs` section. Refer to the `version date` description for more details.

POST `/ml/v4/deployment_jobs`



Request

Query Parameters

version

Required *
`date`

The version date for the API of the form `YYYY-MM-DD`.

Example: `2023-07-07`

retention

string

Defines number of days to retain the job meta. Job meta will be auto deleted after that. Value '-1' sets the meta to be never auto deleted. accepted values are positive integer and '-1'. The default value if the parameter is not passed is '30' days.

Request Body

The request body contains information about the batch deployment

Required ^{*}
job_entity_request

job that is described in more detail below.

The `deployment` is a reference to the deployment associated with the deployment job or deployment job definition.

The `scoring` and `decision_optimization` properties are mutually exclusive. Specify only one of these when submitting a batch deployment job, one of these fields must be defined.

Use `hybrid_pipeline_hardware_specs` only in a batch deployment job of a hybrid pipeline in order to specify compute configuration for each pipeline node. For all other cases use `hardware_spec` to specify compute configuration.

In case of output data references where the data asset is a remote database, users can specify if the batch deployment output must be appended to the table or if the table is to be truncated and output data updated. The

`output_data_references.location.write_mode` parameter can be used to for this purpose. The values `truncate` or `append` can be specified for

`output_data_references.location.write_mode` parameter.

- Specifying `truncate` as value will truncate the table and the batch output data will be inserted.
- Specifying `append` as value will insert the batch output data to the remote database table.
- The `write_mode` parameter is applicable only for `output_data_references` parameter.
- The `write_mode` parameter will be applicable only for remote database related data assets. This parameter will not be applicable for local data assets or a COS based data asset.

space_id

Required ^{*}
string

The space that contains the resource.

Possible values: length = 36, Value must match regular expression `[a-zA-Z0-9-]*`

Example: `3fc54cf1-252f-424b-b52d-5cdd9814987f`

name

Required ^{*}
string

The name of the resource.

Example: `my-resource`

deployment

Required ^{*}
> [SimpleRel](#)

A reference to a resource.

description

A description of the resource.

string

Example: `This is my first resource.`

tags

string[]

A list of tags for this resource.

Examples: [View](#)

custom

object

User defined properties.

hardware_spec

A hardware specification.

> [HardwareSpec](#)

hybrid_pipeline_hardware_specs

Hybrid pipeline hardware specification.

> [hybrid_pipeline_hardware_specs](#)

scoring

Details about the input/output data and other properties to be used for a batch deployment job of a model, Python Function or a Python Scripts.

Use `input_data` property to specify the input data for batch processing as part of the job's payload. The `input_data` property is mutually exclusive with `input_data_references` property, only use one of these. When `input_data` is specified, the processed output of batch deployment job will be available in `scoring.predictions` parameter in the deployment job response. `input_data` property is not supported for batch deployment of Python Scripts.

Use `input_data_references` property to specify the details pertaining to the remote source where the input data for batch deployment job is available. The `input_data_references` must be used with `output_data_references`. The `input_data_references` property is mutually exclusive with `input_data` property, only use one of these. The `input_data_references` property is not supported for batch deployment job of Spark models and Python Functions.

Use `output_data_references` property to specify the details pertaining to the remote source where the input data for batch deployment job is available. `output_data_references` must be used with `input_data_references`. The `output_data_references` property is not supported for batch deployment job of Spark models and Python Functions.

> [job_scoring_request](#)

decision_optimization

Details about the input/output data and other properties to be used for a batch deployment job of a Decision Optimization problem. You

can find more information in [Deploying Decision Optimization](#) documentation. Use the `solve_parameters` as named value pairs to control the Decision Optimization solve behavior. Use the `input_data` and `output_data` properties to specify respectively input and output data for batch processing as part of the job's payload. Use the `input_data_references` and `output_data_references` properties to specify respectively input and output data for batch processing as remote data sources.

> `job_decision_optimization_request`

Post example,

```
curl --location --request POST 'https://us-south.ml.cloud.ibm.com/ml/v4/deployment_jobs?version=2020-09-01' --data-raw '{
  "space_id": "3fc54cf1-252f-424b-b52d-5cdd9814987f",
  "name": "my-resource",
  "deployment": {
    "id": "4cedab6d-e8e4-4214-b81a-2ddb122db2ab"
  },
  "hardware_spec": {
    "id": "4cedab6d-e8e4-4214-b81a-2ddb122db2ab",
    "rev": "2",
    "name": "string",
    "num_nodes": 2
  },
  "scoring": {
    "input_data": [
      {
        "id": "string",
        "type": "target",
        "fields": [
          "string"
        ],
        "values": [
          [
            {
              }
            ]
          ],
        "targets": [
          [
            {
              }
            ]
          ]
        ]
      }
    ]
  }
}
```

```

        }
    ]
}
],
"output_data_reference":{
    "id":"string",
    "type":"s3",
    "connection":{

    }
},
"evaluations":[
    {
        "id":"string",
        "input_target":"string",
        "metrics_names":[
            "auroc",
            "accuracy"
        ]
    }
]
}
}'

```

```

echo "D0 Payload Example"
curl --location --request POST 'https://us-south.ml.cloud.ibm.com/ml/v4/deployment_jobs?version=2020-09-01' --data-raw '{
    "name":"test-job",
    "space_id":"dcfb2ae2-1733-11ec-9621-0242ac130002",
    "deployment":{
        "id":"e672c9e0-1733-11ec-9621-0242ac130002"
    },
    "decision_optimization":{
        "solve_parameters":{
            "oaas.logAttachmentName":"log.txt",
            "oaas.logTailEnabled":"true"
        },
        "input_data":[
            {
                "id": "data.bin",
                "content": "VGhlIGNvbnRlbnQgb2YgbXkgZGF0YSBmaWx1Lgo="
            },
            {
                "id": "tuples.csv",
                "fields": ["Name", "Value"],
                "values": [    ["name1", 1],

```

```
        ["name2", 11934]
      ]}
    },
  ],
  "input_data_references": [
    {
      "id": "c1.mod",
      "type": "data_asset",
      "location": {
        "href": "/v2/assets/ec45babbc-1733-11ec-9621-0242ac130002?space_id=dcfb2ae2-1733-11ec-9621-0242ac130002"
      }
    }
  ],
  "output_data": [
    {
      "id": ".*\\.\\.*"
    }
  ]
}'
```

Response

<div>Response Body</div> <div>jobs_resource</div>		The information related to the job.
<div>metadata</div> <div>> ResourceMeta</div>		<div>Common metadata for a resource where <code>project_id</code> or <code>space_id</code> must be present.</div> <div>Examples: View</div>
<div>entity</div> <div>> job_status_entity</div>		Information about the platform job assets related to this execution.
<div>Status Code</div>		
202	Accepted	
400	Bad request, the response body should contain the reason.	
401	Unauthorized.	

403	Forbidden, an authentication error including trying to access an unauthorized space or project.
404	The specified resource was not found.

No Sample Response

This method does not specify any sample responses.

Cancel the deployment job

Cancel the specified deployment job.

```
DELETE /ml/v4/deployment_jobs/{job_id}
```



Request

Path Parameters

job_id
Required *
string

The id of the job.

Query Parameters

version
Required *
date

The version date for the API of the form `YYYY-MM-DD`.
Example: `2023-07-07`

space_id
Required *
string

Cancel the deployment job that belong to this space.

hard_delete
boolean

Set to true in order to also delete the job metadata information.

Delete request,



```
curl --location --request DELETE 'https://us-south.ml.cloud.ibm.com/ml/v4/deployment_jobs/:job_id?space_id=<string>&hard_delete=<boolean>&version=2020-09-01'
```

Response

Status Code

204	Success.
400	Bad request, the response body should contain the reason.
401	Unauthorized.
403	Forbidden, an authentication error including trying to access an unauthorized space or project.
404	The specified resource was not found.

No Sample Response

This method does not specify any sample responses.

Retrieve the deployment job

Retrieve the deployment job. The predicted data bound to this job_id is going to be kept around for a limited time based on the service configuration.

```
GET /ml/v4/deployment_jobs/{job_id}
```



Request

Path Parameters	
job_id Required * string	The id of the job.
Query Parameters	
version Required * <u>date</u>	The version date for the API of the form <code>YYYY-MM-DD</code> . Example: <code>2023-07-07</code>
space_id Required * string	Retrieve the deployment job that belong to this space.
include string	Retrieves only fields from <code>decision_optimization</code> and <code>scoring</code> section mentioned as comma separated values as output response fields. Retrieves all the fields if not mentioned.

Get request, ^

```
curl --location --request GET 'https://us-south.ml.cloud.ibm.com/ml/v4/deployment_jobs/:job_id?space_id=<string>&version=2020-09-01'
```

📄

Response

Response Body	
jobs_resource	The information related to the job.
metadata	Common metadata for a resource where <code>project_id</code> or <code>space_id</code> must be present. Examples: View
> ResourceMeta	
entity	Information about the platform job assets related to this execution.

> [job_status_entity](#)

Status Code

200	Jobs response.
400	Bad request, the response body should contain the reason.
401	Unauthorized.
403	Forbidden, an authentication error including trying to access an unauthorized space or project.
404	The specified resource was not found.

No Sample Response

This method does not specify any sample responses.

Create a new deployment job definition

Create a new deployment job definition with the given payload. A deployment job definition represents the deployment metadata information in order to create a batch job in WML. This contains the same metadata used by the `/ml/v4/deployment_jobs` endpoint. This means that when submitting batch deployment jobs the user can either provide the job definition inline or reference a job definition in a query parameter.

```
POST /ml/v4/deployment_job_definitions
```



Auditing

Calling this method generates the following auditing event.

- `pm-20.job.create`

Request

Query Parameters

version

Required *

date

The version date for the API of the form YYYY-MM-DD .

Example: 2023-07-07

Request Body

Required *

job_entity_request

Payload for creating the deployment job definition.

space_id

Required *

string

The space that contains the resource.

Possible values: length = 36, Value must match regular expression`[a-zA-Z0-9-]*`

Example: 3fc54cf1-252f-424b-b52d-5cdd9814987f

name

Required *

string

The name of the resource.

Example: my-resource

deployment

Required *

> [SimpleRel](#)

A reference to a resource.

description

string

A description of the resource.

Example: This is my first resource.

tags

string[]

A list of tags for this resource.

Examples: [View](#)**custom**

object

User defined properties.

hardware_spec> [HardwareSpec](#)

A hardware specification.

hybrid_pipeline_hardware_specs> [hybrid_pipeline_hardware_specs](#)

Hybrid pipeline hardware specification.

scoring

Details about the input/output data and other properties to be used for a batch deployment job of a model, Python Function or a Python Scripts.

Use `input_data` property to specify the input data for batch processing as part of the job's payload. The `input_data` property is mutually exclusive with `input_data_references` property, only

use one of these. When `input_data` is specified, the processed output of batch deployment job will be available in `scoring.predictions` parameter in the deployment job response. `input_data` property is not supported for batch deployment of Python Scripts.

Use `input_data_references` property to specify the details pertaining to the remote source where the input data for batch deployment job is available. The `input_data_references` must be used with `output_data_references`. The

`input_data_references` property is mutually exclusive with `input_data` property, only use one of these. The `input_data_references` property is not supported for batch deployment job of Spark models and Python Functions.

Use `output_data_references` property to specify the details pertaining to the remote source where the input data for batch deployment job is available. `output_data_references` must be used with `input_data_references`. The `output_data_references` property is not supported for batch deployment job of Spark models and Python Functions.

> [job_scoring_request](#)

decision_optimization

Details about the input/output data and other properties to be used for a batch deployment job of a Decision Optimization problem. You can find more information in [Deploying Decision Optimization](#) documentation. Use the `solve_parameters` as named value pairs to control the Decision Optimization solve behavior. Use the `input_data` and `output_data` properties to specify respectively input and output data for batch processing as part of the job's payload. Use the `input_data_references` and `output_data_references` properties to specify respectively input and output data for batch processing as remote data sources.

> [job_decision_optimization_request](#)

Post request,

```
curl -X POST 'https://us-south.ml.cloud.ibm.com/ml/v4/deployment_job_definitions?version=2020-09-01' --data-raw '{
  "space_id": "3fc54cf1-252f-424b-b52d-5cdd9814987f",
  "name": "my-resource",
  "description": "This is my first resource.",
  "tags": [
```

```

        "t1",
        "t2"
    ],
    "deployment": {
        "value": "<Error: Too many levels of nesting to fake this
schema>"
    },
    "custom": {
        "value": "<Error: Too many levels of nesting to fake this
schema>"
    },
    "hardware_spec": {
        "value": "<Error: Too many levels of nesting to fake this
schema>"
    },
    "hybrid_pipeline_hardware_specs": {
        "value": "<Error: Too many levels of nesting to fake this
schema>"
    },
    "scoring": {
        "value": "<Error: Too many levels of nesting to fake this
schema>"
    },
    "decision_optimization": {
        "value": "<Error: Too many levels of nesting to fake this
schema>"
    }
}

```

Response

Response Body

The information for a deployment job definition.

`job_resource`

metadata

Always included *

Common metadata for a resource where `project_id` or `space_id` must be present.

Examples: [View](#)

> [ResourceMeta](#)

entity

Always included *

Details about the batch deployment job.

The `deployment` is a reference to the deployment associated with the deployment job or deployment job definition.

The `scoring` and `decision_optimization` properties are mutually exclusive. Specify only one of these when submitting a batch deployment job.

Use `hybrid_pipeline_hardware_specs` only in a batch deployment job of a hybrid pipeline in order to specify compute configuration for each pipeline node. For all other cases use `hardware_spec` to specify compute configuration.

In case of output data references where the data asset is a remote database, users can specify if the batch deployment output must be appended to the table or if the table is to be truncated and output data updated.

`output_data_references.location.write_mode` parameter can be used to for this purpose. The values `truncate` or `append` can be specified for

`output_data_references.location.write_mode` parameter.

- Specifying `truncate` as value will truncate the table and the batch output data will be inserted.
- Specifying `append` as value will insert the batch output data to the remote database table.
- The `write_mode` parameter is applicable only for `output_data_references` parameter.
- The `write_mode` parameter will be applicable only for remote database related data assets. This parameter will not be applicable for local data asset or COS based data asset.

> [job_entity](#)

system

Optional details coming from the service and related to the API call or the associated resource.

> [SystemDetails](#)

Status Code

201	Deployment job definition created
400	Bad request, the response body should contain the reason.
401	Unauthorized.
403	Forbidden, an authentication error including trying to access an unauthorized space or project.
404	The specified resource was not found.

No Sample Response

This method does not specify any sample responses.

Retrieve the deployment job definitions

Retrieve the deployment job definitions for the specified space.

```
GET /m1/v4/deployment_job_definitions
```



Auditing

Calling this method generates the following auditing event.

- `pm-20.job.list`

Request

Query Parameters

version

Required ^{*}
date

The version date for the API of the form `YYYY-MM-DD`.

Example: `2023-07-07`

space_id

Required ^{*}
string

The space that contains the resource.

Example: `63dc4cf1-252f-424b-b52d-5cdd9814987f`

start

string

Token required for token-based pagination. This token cannot be determined by end user. It is generated by the service and it is set in the href available in the `next` field.

limit

integer

How many resources should be returned. By default limit is 100. Max limit allowed is 200.

Possible values: $1 \leq \text{value} \leq 200$

Default: `100`

Example: `50`

tag.value

string

Return only the resources with the given tag values, separated by **or** or **and** to support multiple tags.

Example: `tf2.0 or tf2.1`

search

string

Returns only resources that match this search string. The path to the field must be the complete path to the field, and this field must be one of the indexed fields for this resource type. Note that the search string must be URL encoded.

Possible values: length ≥ 1

Get request,

```
curl -X GET 'https://us-south.ml.cloud.ibm.com/ml/v4/deployment_job_definitions?space_id=<string>&start=<string>&limit=100&tag.value=<string>&version=2020-09-01'
```

Response

Response Body`job_resources`

A paginated list of deployment job definitions.

limit

Always included *

integer

The number of items to return in each page.

Possible values: $1 \leq \text{value} \leq 200$

Example: `10`

first

Always included *

> [PaginationFirst](#)

The reference to the first item in the current page.

total_count

integer

The total number of resources. Computed explicitly only when 'total_count=true' query parameter is present. This is in order to avoid performance penalties.

Example: `1`

next

A reference to the first item of the next page, if any.

> [PaginationNext](#)

resources

A list of deployment job definitions.

> [job_resource\[\]](#)

system

Optional details coming from the service and related to the API call or the associated resource.

> [SystemDetails](#)

Status Code

200	OK
400	Bad request, the response body should contain the reason.
401	Unauthorized.
403	Forbidden, an authentication error including trying to access an unauthorized space or project.
404	The specified resource was not found.

No Sample Response

This method does not specify any sample responses.

Retrieve the deployment job definition

Retrieve the deployment job definition with the specified identifier. If `rev` query parameter is provided, `rev=latest` will fetch the latest revision. A call with `rev={revision_number}` will fetch the given revision_number record.

```
GET /ml/v4/deployment_job_definitions/{job_definition_id}
```



Auditing

Calling this method generates the following auditing event.

- `pm-20.job.read`

Request

Path Parameters	
job_definition_id Required * string	Deployment job definition identifier. Example: <code>212fadf1-252f-424b-b52d-5cdd98ecfa0</code>
Query Parameters	
version Required * date	The version date for the API of the form <code>YYYY-MM-DD</code> . Example: <code>2023-07-07</code>
space_id Required * string	The space that contains the resource. Example: <code>63dc4cf1-252f-424b-b52d-5cdd9814987f</code>
rev string	The revision number of the resource. Example: <code>2</code>

Get request,



```
curl -X GET 'https://us-south.ml.cloud.ibm.com/ml/v4/deployment_job_definitions/:job_definition_id?space_id=<string>&rev=<string>&version=2020-09-01'
```

Response

Response Body <code>job_resource</code>	The information for a deployment job definition.
metadata Always included *	Common metadata for a resource where <code>project_id</code> or <code>space_id</code> must be present.

entity

Always included *

Details about the batch deployment job.

The `deployment` is a reference to the deployment associated with the deployment job or deployment job definition.

The `scoring` and `decision_optimization` properties are mutually exclusive. Specify only one of these when submitting a batch deployment job.

Use `hybrid_pipeline_hardware_specs` only in a batch deployment job of a hybrid pipeline in order to specify compute configuration for each pipeline node. For all other cases use `hardware_spec` to specify compute configuration.

In case of output data references where the data asset is a remote database, users can specify if the batch deployment output must be appended to the table or if the table is to be truncated and output data updated.

`output_data_references.location.write_mode` parameter can be used to for this purpose. The values `truncate` or `append` can be specified for

`output_data_references.location.write_mode` parameter.

- Specifying `truncate` as value will truncate the table and the batch output data will be inserted.
- Specifying `append` as value will insert the batch output data to the remote database table.
- The `write_mode` parameter is applicable only for `output_data_references` parameter.
- The `write_mode` parameter will be applicable only for remote database related data assets. This parameter will not be applicable for local data asset or COS based data asset.

system

Optional details coming from the service and related to the API call or the associated resource.

Status Code**200**

OK

400

Bad request, the response body should contain the reason.

401	Unauthorized.
403	Forbidden, an authentication error including trying to access an unauthorized space or project.
404	The specified resource was not found.

No Sample Response

This method does not specify any sample responses.

Update the deployment job definition

Update the deployment job definition with the provided patch data. The following fields can be patched:

- `/tags`
- `/name`
- `/description`
- `/custom`
- `/deployment`

```
PATCH /m1/v4/deployment_job_definitions/{job_definition_id}
```



Auditing

Calling this method generates the following auditing event.

- `pm-20.job.update`

Request

Path Parameters

job_definition_id

Required *

string

Deployment job definition identifier.

Example: `212fadf1-252f-424b-b52d-5cdd98ecfa0`

Query Parameters

version

Required *

date

The version date for the API of the form `YYYY-MM-DD`.

Example: `2023-07-07`

space_id

Required *

string

The space that contains the resource.

Example: `63dc4cf1-252f-424b-b52d-5cdd9814987f`

Request Body

Required *

JsonPatchOperation[]

Input For Patch. This is the patch body which corresponds to the JavaScript Object Notation (JSON) Patch standard (RFC 6902).

op

Required *

string

The operation to be performed.

Allowable values: [`add`, `remove`, `replace`]

path

Required *

string

The pointer that identifies the field that is the target of the operation.

value

string

The value to be used within the operation.

Patch request,

```
curl -X PATCH 'https://us-south.ml.cloud.ibm.com/ml/v4/deployment_job_definitions/:job_definition_id?space_id=<string>&version=2020-09-01' --data-raw '[
  {
    "op": "<string>",
    "path": "<string>",
    "value": "<object>"
  },
  {
    "op": "<string>",
    "path": "<string>",
    "value": "<object>"
  }
]'
```

Response

Response Body

job_resource

The information for a deployment job definition.

metadata

Always included *

Common metadata for a resource where `project_id` or `space_id` must be present.

Examples: [View](#)

> [ResourceMeta](#)

entity

Always included *

Details about the batch deployment job.

The `deployment` is a reference to the deployment associated with the deployment job or deployment job definition.

The `scoring` and `decision_optimization` properties are mutually exclusive. Specify only one of these when submitting a batch deployment job.

Use `hybrid_pipeline_hardware_specs` only in a batch deployment job of a hybrid pipeline in order to specify compute configuration for each pipeline node. For all other cases use `hardware_spec` to specify compute configuration.

In case of output data references where the data asset is a remote database, users can specify if the batch deployment output must be appended to the table or if the table is to be truncated and output data updated.

`output_data_references.location.write_mode` parameter can be used to for this purpose. The values `truncate` or `append` can be specified for

`output_data_references.location.write_mode` parameter.

- Specifying `truncate` as value will truncate the table and the batch output data will be inserted.
- Specifying `append` as value will insert the batch output data to the remote database table.
- The `write_mode` parameter is applicable only for `output_data_references` parameter.
- The `write_mode` parameter will be applicable only for remote database related data assets. This parameter will not be applicable for local data asset or COS based data asset.

> [job_entity](#)

system

Optional details coming from the service and related to the API call or the associated resource.

> [SystemDetails](#)

Status Code

200	Deployment job definition has been patched successfully
400	Bad request, the response body should contain the reason.
401	Unauthorized.
403	Forbidden, an authentication error including trying to access an unauthorized space or project.
404	The specified resource was not found.

No Sample Response

This method does not specify any sample responses.

Delete the deployment job definition

Delete the deployment job definition with the specified identifier. This will delete all revisions of this deployment job definition as well. For each revision all attachments will also be deleted.

```
DELETE /ml/v4/deployment_job_definitions/{job_definition_id}
```



Auditing

Calling this method generates the following auditing event.

- `pm-20.job.delete`

Request

Path Parameters

job_definition_id Required * string	Deployment job definition identifier. Example: 212fadf1-252f-424b-b52d-5cdd98ecfa0
Query Parameters	
version Required * date	The version date for the API of the form YYYY-MM-DD . Example: 2023-07-07
space_id Required * string	The space that contains the resource. Example: 63dc4cf1-252f-424b-b52d-5cdd9814987f

Delete request, ^

```
curl -X DELETE 'https://us-south.ml.cloud.ibm.com/ml/v4/deployment_job_definitions/:job_definition_id?space_id=<string>&version=2020-09-01'
```

□

Response

Status Code	
204	Deployment job definition deleted
400	Bad request, the response body should contain the reason.
401	Unauthorized.
403	Forbidden, an authentication error including trying to access an unauthorized space or project.
404	The specified resource was not found.

No Sample Response

This method does not specify any sample responses.

Create a new deployment job definition revision

Create a new deployment job definition revision. The current metadata and content for `job_definition_id` will be taken and a new revision created.

POST `/ml/v4/deployment_job_definitions/{job_definition_id}/revisions`



Auditing

Calling this method generates the following auditing event.

- `pm-20.job.create`

Request

Path Parameters

job_definition_id

Required ^{*}
string

Deployment job definition identifier.

Example: `212fadf1-252f-424b-b52d-5cdd98ecfa0`

Query Parameters

version

Required ^{*}
date

The version date for the API of the form `YYYY-MM-DD`.

Example: `2023-07-07`

Request Body

Required ^{*}
`job_revision_entity_request`

The details for the revision.

Examples: [View](#)

space_id

Required ^{*}
string

The space that contains the resource.

Possible values: length = 36, Value must match regular expression

`[a-zA-Z0-9-]*`

Example: `3fc54cf1-252f-424b-b52d-5cdd9814987f`

commit_message

string

An optional commit message for the revision.

Post request,

```
curl -X POST 'https://us-south.ml.cloud.ibm.com/ml/v4/deployment_job_definitions/:job_definition_id/revisions?version=2020-09-01' --data-raw '{
  "space_id": "3fc54cf1-252f-424b-b52d-5cdd9814987f",
  "commit_message": "Updated for TF 2.0"
}'
```

Response

Response Body

job_resource

The information for a deployment job definition.

metadata

Always included *

Common metadata for a resource where `project_id` or `space_id` must be present.

Examples: [View](#)

> [ResourceMeta](#)

entity

Always included *

Details about the batch deployment job.

The `deployment` is a reference to the deployment associated with the deployment job or deployment job definition.

The `scoring` and `decision_optimization` properties are mutually exclusive. Specify only one of these when submitting a batch deployment job.

Use `hybrid_pipeline_hardware_specs` only in a batch deployment job of a hybrid pipeline in order to specify compute configuration for each pipeline node. For all other cases use `hardware_spec` to specify compute configuration.

In case of output data references where the data asset is a remote database, users can specify if the batch deployment output must be appended to the table or if the table is to be truncated and output

data updated.

`output_data_references.location.write_mode` parameter can be used to for this purpose. The values `truncate` or `append` can be specified for

`output_data_references.location.write_mode` parameter.

- Specifying `truncate` as value will truncate the table and the batch output data will be inserted.
- Specifying `append` as value will insert the batch output data to the remote database table.
- The `write_mode` parameter is applicable only for `output_data_references` parameter.
- The `write_mode` parameter will be applicable only for remote database related data assets. This parameter will not be applicable for local data asset or COS based data asset.

> [job_entity](#)

system

Optional details coming from the service and related to the API call or the associated resource.

> [SystemDetails](#)

Status Code

201	Deployment job definition revision created
400	Bad request, the response body should contain the reason.
401	Unauthorized.
403	Forbidden, an authentication error including trying to access an unauthorized space or project.
404	The specified resource was not found.

No Sample Response

This method does not specify any sample responses.

Retrieve the deployment job definition revisions

Retrieve the deployment job definition revisions.

GET /m1/v4/deployment_job_definitions/{job_definition_id}/revisions

Auditing

Calling this method generates the following auditing event.

- pm-20.job.list

Request

Path Parameters	
<div>job_definition_id Required * string</div>	<div>Deployment job definition identifier. Example: 212fadf1-252f-424b-b52d-5cdd98ecfa0</div>
Query Parameters	
<div>version Required * date</div>	<div>The version date for the API of the form YYYY-MM-DD . Example: 2023-07-07</div>
<div>space_id Required * string</div>	<div>The space that contains the resource. Example: 63dc4cf1-252f-424b-b52d-5cdd9814987f</div>
<div>start string</div>	<div>Token required for token-based pagination. This token cannot be determined by end user. It is generated by the service and it is set in the href available in the next field.</div>
<div>limit integer</div>	<div>How many resources should be returned. By default limit is 100. Max limit allowed is 200. Possible values: 1 ≤ value ≤ 200 Default: 100 Example: 50</div>

Get request,



```
curl -X GET 'https://us-south.ml.cloud.ibm.com/ml/v4/deployment_job_definitions/:job_definition_id/revisions?space_id=<string>&start=<string>&limit=100&version=2020-09-01'
```

Response

Response Body	A paginated list of deployment job definitions.
job_resources	
limit Always included * integer	The number of items to return in each page. Possible values: $1 \leq \text{value} \leq 200$ Example: 10
first Always included * > PaginationFirst	The reference to the first item in the current page.
total_count integer	The total number of resources. Computed explicitly only when 'total_count=true' query parameter is present. This is in order to avoid performance penalties. Example: 1
next > PaginationNext	A reference to the first item of the next page, if any.
resources > job_resource[]	A list of deployment job definitions.
system > SystemDetails	Optional details coming from the service and related to the API call or the associated resource.
Status Code	
200	Deployment job definition revisions

400	Bad request, the response body should contain the reason.
401	Unauthorized.
403	Forbidden, an authentication error including trying to access an unauthorized space or project.
404	The specified resource was not found.

No Sample Response

This method does not specify any sample responses.

Create a new experiment

Create a new experiment with the given payload. An experiment represents an asset that captures a set of `pipeline` or `model definition` assets that will be trained at the same time on the same data set.

POST `/ml/v4/experiments`



Auditing

Calling this method generates the following auditing event.

- `pm-20.experiment.create`

Request

Query Parameters	
version Required [*] <u>date</u>	The version date for the API of the form <code>YYYY-MM-DD</code> . Example: <code>2023-07-07</code>
Request Body Required [*] <u>experiment_entity_request</u>	Payload for creating the experiment. Either <code>space_id</code> or <code>project_id</code> has to be provided and is mandatory.

name Required * string	The name of the resource. Example: <code>my-resource</code>
project_id string	The project that contains the resource. Either <code>space_id</code> or <code>project_id</code> has to be given. Possible values: length = 36, Value must match regular expression <code>[a-zA-Z0-9-]*</code> Example: <code>12ac4cf1-252f-424b-b52d-5cdd9814987f</code>
space_id string	The space that contains the resource. Either <code>space_id</code> or <code>project_id</code> has to be given. Possible values: length = 36, Value must match regular expression <code>[a-zA-Z0-9-]*</code> Example: <code>3fc54cf1-252f-424b-b52d-5cdd9814987f</code>
description string	A description of the resource. Example: <code>This is my first resource.</code>
tags string[]	A list of tags for this resource. Examples: View
label_column string	The label column.
evaluation_definition > evaluation_definition	The optional evaluation definition.
training_references > training_reference[]	The optional training references used by the experiment.
custom > object	User defined properties specified as key-value pairs. Examples: View

Post request, ^

curl --location --request POST 'https://us-

□

south.ml.cloud.ibm.com/ml/v4/experiments?version=2020-09-01' --data-

```
raw '{
  "name": "my-resource",
  "project_id": "12ac4cf1-252f-424b-b52d-5cdd9814987f",
  "space_id": "3fc54cf1-252f-424b-b52d-5cdd9814987f",
  "description": "This is my first resource.",
  "tags": [
    "t1",
    "t2"
  ],
  "label_column": "<string>",
  "evaluation_definition": {
    "metrics": [
      {
        "name": "<string>",
        "maximize": "<boolean>"
      },
      {
        "name": "<string>",
        "maximize": "<boolean>"
      }
    ],
    "method": "binary"
  },
  "training_references": [
    {
      "pipeline": {
        "id": "4cedab6d-e8e4-4214-b81a-2ddb122db2ab",
        "rev": "2",
        "model_type": "<string>",
        "data_bindings": [
          {
            "data_reference_name": "<string>",
            "node_id": "<string>"
          },
          {
            "data_reference_name": "<string>",
            "node_id": "<string>"
          }
        ]
      },
      "nodes_parameters": [
        {
          "node_id": "<string>",
          "parameters": "<object>"
        },
        {
          "node_id": "<string>",
          "parameters": "<object>"
        }
      ]
    }
  ]
}
```

```

    ],
    "hardware_spec": {
      "id": "4cedab6d-e8e4-4214-b81a-2ddb122db2ab",
      "rev": "2",
      "name": "<string>",
      "num_nodes": "<integer>"
    },
    "hybrid_pipeline_hardware_specs": [
      {
        "node_runtime_id": "auto_ai.kb",
        "hardware_spec": {
          "id": "4cedab6d-e8e4-4214-b81a-
2ddb122db2ab",
          "rev": "2",
          "name": "<string>",
          "num_nodes": "<integer>"
        }
      },
      {
        "node_runtime_id": "auto_ai.kb",
        "hardware_spec": {
          "id": "4cedab6d-e8e4-4214-b81a-
2ddb122db2ab",
          "rev": "2",
          "name": "<string>",
          "num_nodes": "<integer>"
        }
      }
    ]
  },
  "model_definition": {
    "id": "4cedab6d-e8e4-4214-b81a-2ddb122db2ab"
  },
  "hyper_parameters_optimization": {
    "method": {
      "name": "random",
      "parameters": "<object>"
    },
    "hyper_parameters": [
      {
        "name": "learning_rate",
        "items": [
          0.005,
          0.1,
          0.11
        ]
      },
      {
        "name": "fc",

```

```

        "items": {
            "min_value": 9,
            "max_value": 10,
            "power": 2
        }
    }
]
},
{
    "pipeline": {
        "id": "4cedab6d-e8e4-4214-b81a-2ddb122db2ab",
        "rev": "2",
        "model_type": "<string>",
        "data_bindings": [
            {
                "data_reference_name": "<string>",
                "node_id": "<string>"
            },
            {
                "data_reference_name": "<string>",
                "node_id": "<string>"
            }
        ],
        "nodes_parameters": [
            {
                "node_id": "<string>",
                "parameters": "<object>"
            },
            {
                "node_id": "<string>",
                "parameters": "<object>"
            }
        ],
        "hardware_spec": {
            "id": "4cedab6d-e8e4-4214-b81a-2ddb122db2ab",
            "rev": "2",
            "name": "<string>",
            "num_nodes": "<integer>"
        },
        "hybrid_pipeline_hardware_specs": [
            {
                "node_runtime_id": "auto_ai.kb",
                "hardware_spec": {
                    "id": "4cedab6d-e8e4-4214-b81a-
2ddb122db2ab",
                    "rev": "2",
                    "name": "<string>",
                    "num_nodes": "<integer>"
                }
            }
        ]
    }
}

```

```

        }
    },
    {
        "node_runtime_id": "auto_ai.kb",
        "hardware_spec": {
            "id": "4cedab6d-e8e4-4214-b81a-
2ddb122db2ab",
            "rev": "2",
            "name": "<string>",
            "num_nodes": "<integer>"
        }
    }
]
},
"model_definition": {
    "id": "4cedab6d-e8e4-4214-b81a-2ddb122db2ab"
},
"hyper_parameters_optimization": {
    "method": {
        "name": "random",
        "parameters": "<object>"
    },
    "hyper_parameters": [
        {
            "name": "learning_rate",
            "items": [
                0.005,
                0.1,
                0.11
            ]
        },
        {
            "name": "fc",
            "items": {
                "min_value": 9,
                "max_value": 10,
                "power": 2
            }
        }
    ]
}
},
{
    "custom": "<object>"
}
]
{
    "custom": "<object>"
}

```


Response

Response Body	
experiment_resource	The information for an experiment.
<hr/>	
metadata Always included *	Common metadata for a resource where <code>project_id</code> or <code>space_id</code> must be present. Examples: View
> ResourceMeta	
<hr/>	
entity Always included *	The details of the experiment to be created.
> experiment_entity	
<hr/>	
system	Optional details coming from the service and related to the API call or the associated resource.
> SystemDetails	
<hr/>	
Status Code	
201	Experiment created
<hr/>	
400	Bad request, the response body should contain the reason.
<hr/>	
401	Unauthorized.
<hr/>	
403	Forbidden, an authentication error including trying to access an unauthorized space or project.
<hr/>	
404	The specified resource was not found.

No Sample Response

This method does not specify any sample responses.

Retrieve the experiments

Retrieve the experiments for the specified space or project.

```
GET /ml/v4/experiments
```



Auditing

Calling this method generates the following auditing event.

- `pm-20.experiment.list`

Request

Query Parameters

version

Required *

date

The version date for the API of the form `YYYY-MM-DD`.

Example: `2023-07-07`

space_id

string

The space that contains the resource. Either `space_id` or `project_id` query parameter has to be given.

Possible values: length = 36, Value must match regular expression

`[a-zA-Z0-9-]*`

Example: `63dc4cf1-252f-424b-b52d-5cdd9814987f`

project_id

string

The project that contains the resource. Either `space_id` or `project_id` query parameter has to be given.

Possible values: length = 36, Value must match regular expression

`[a-zA-Z0-9-]*`

Example: `a77190a2-f52d-4f2a-be3d-7867b5f46edc`

start

string

Token required for token-based pagination. This token cannot be determined by end user. It is generated by the service and it is set in the href available in the `next` field.

limit

integer

How many resources should be returned. By default limit is 100. Max limit allowed is 200.

Possible values: $1 \leq \text{value} \leq 200$

Default: `100`

Example: `50`

tag.value

string

Return only the resources with the given tag values, separated by `or` or `and` to support multiple tags.

Example: `tf2.0 or tf2.1`

search

string

Returns only resources that match this search string. The path to the field must be the complete path to the field, and this field must be one of the indexed fields for this resource type. Note that the search string must be URL encoded.

Possible values: length ≥ 1

Get request,

```
curl --location --request GET 'https://us-south.ml.cloud.ibm.com/ml/v4/experiments?space_id=<string>&project_id=<string>&start=<string>&limit=100&tag.value=<string>&version=2020-09-01'
```

Response

Response Body

experiment_resources

A paginated list of experiments.

limit

Always included *

integer

The number of items to return in each page.

Possible values: $1 \leq \text{value} \leq 200$

Example: `10`

first

Always included *

> [PaginationFirst](#)

The reference to the first item in the current page.

total_count

integer

The total number of resources. Computed explicitly only when 'total_count=true' query parameter is present. This is in order to avoid performance penalties.

Example: `1`

next

A reference to the first item of the next page, if any.

> [PaginationNext](#)

resources

A list of experiments.

> [experiment_resource\[\]](#)

system

Optional details coming from the service and related to the API call or the associated resource.

> [SystemDetails](#)

Status Code

200	OK
400	Bad request, the response body should contain the reason.
401	Unauthorized.
403	Forbidden, an authentication error including trying to access an unauthorized space or project.
404	The specified resource was not found.

No Sample Response

This method does not specify any sample responses.

Retrieve the experiment

Retrieve the experiment with the specified identifier. If `rev` query parameter is provided, `rev=latest` will fetch the latest revision. A call with `rev={revision_number}` will fetch the given revision_number record. Either `space_id` or `project_id` has to be provided and is mandatory.

```
GET /ml/v4/experiments/{experiment_id}
```



Auditing

Calling this method generates the following auditing event.

- `pm-20.experiment.read`

Request

Path Parameters

experiment_id

Required *
string

Experiment identifier.

Example: `63dc4cf1-252f-424b-b52d-5cdd9814987f`

Query Parameters

version

Required *
date

The version date for the API of the form `YYYY-MM-DD`.

Example: `2023-07-07`

space_id

string

The space that contains the resource. Either `space_id` or `project_id` query parameter has to be given.

Possible values: length = 36, Value must match regular expression `[a-zA-Z0-9-]*`

Example: `63dc4cf1-252f-424b-b52d-5cdd9814987f`

project_id

string

The project that contains the resource. Either `space_id` or `project_id` query parameter has to be given.

Possible values: length = 36, Value must match regular expression `[a-zA-Z0-9-]*`

Example: `a77190a2-f52d-4f2a-be3d-7867b5f46edc`

rev

string

The revision number of the resource.

Example: `2`

Example request

```
curl --location --request GET 'https://us-south.ml.cloud.ibm.com/ml/v4/experiments/:experiment_id?space_id=<string>&project_id=<string>&rev=<string>&version=2020-09-01'
```

Response

Response Body	
experiment_resource	The information for an experiment.
<hr/>	
metadata Always included *	Common metadata for a resource where <code>project_id</code> or <code>space_id</code> must be present. Examples: View
> ResourceMeta	
<hr/>	
entity Always included *	The details of the experiment to be created.
> experiment_entity	
<hr/>	
system	Optional details coming from the service and related to the API call or the associated resource.
> SystemDetails	
<hr/>	
Status Code	
200	OK
<hr/>	
400	Bad request, the response body should contain the reason.
<hr/>	
401	Unauthorized.
<hr/>	
403	Forbidden, an authentication error including trying to access an unauthorized space or project.
<hr/>	
404	The specified resource was not found.

No Sample Response

This method does not specify any sample responses.

Update the experiment

Update the experiment with the provided patch data. The following fields can be patched:

- `/tags`
- `/name`
- `/description`
- `/custom`

```
PATCH /ml/v4/experiments/{experiment_id}
```



Auditing

Calling this method generates the following auditing event.

- `pm-20.experiment.update`

Request

Path Parameters

experiment_id

Required *
string

Experiment identifier.

Example: `63dc4cf1-252f-424b-b52d-5cdd9814987f`

Query Parameters

version

Required *
date

The version date for the API of the form `YYYY-MM-DD`.

Example: `2023-07-07`

space_id

string

The space that contains the resource. Either `space_id` or `project_id` query parameter has to be given.

Possible values: length = 36, Value must match regular expression `[a-zA-Z0-9-]*`

Example: `63dc4cf1-252f-424b-b52d-5cdd9814987f`

project_id

string

The project that contains the resource. Either `space_id` or `project_id` query parameter has to be given.

Possible values: length = 36, Value must match regular expression `[a-zA-Z0-9-]*`

Example: `a77190a2-f52d-4f2a-be3d-7867b5f46edc`

Request Body

Required *

`JsonPatchOperation[]`

Input For Patch. This is the patch body which corresponds to the JavaScript Object Notation (JSON) Patch standard (RFC 6902).

op

Required *

string

The operation to be performed.

Allowable values: [`add` , `remove` , `replace`]

path

Required *

string

The pointer that identifies the field that is the target of the operation.

value

string

The value to be used within the operation.

Patch request,

```
curl --location --request PATCH 'https://us-south.ml.cloud.ibm.com/ml/v4/experiments/:experiment_id?space_id=<string>&project_id=<string>&version=2020-09-01' --data-raw '[
  {
    "op": "<string>",
    "path": "<string>",
    "value": "<object>"
  },
  {
    "op": "<string>",
    "path": "<string>",
    "value": "<object>"
  }
]'
```

Response

Response Body

`experiment_resource`

The information for an experiment.

metadata

Always included *

Common metadata for a resource where `project_id` or `space_id` must be present.

Examples: [View](#)

> [ResourceMeta](#)

entity

Always included *

The details of the experiment to be created.

> [experiment_entity](#)

system

Optional details coming from the service and related to the API call or the associated resource.

> [SystemDetails](#)

Status Code

200	Experiment has been patched successfully
400	Bad request, the response body should contain the reason.
401	Unauthorized.
403	Forbidden, an authentication error including trying to access an unauthorized space or project.
404	The specified resource was not found.

No Sample Response

This method does not specify any sample responses.

Delete the experiment

Delete the experiment with the specified identifier. This will delete all revisions of this experiment as well. For each revision all attachments will also be deleted.

DELETE /ml/v4/experiments/{experiment_id}



Auditing

Calling this method generates the following auditing event.

- `pm-20.experiment.delete`

Request

Path Parameters	
experiment_id Required * string	Experiment identifier. Example: <code>63dc4cf1-252f-424b-b52d-5cdd9814987f</code>
Query Parameters	
version Required * date	The version date for the API of the form <code>YYYY-MM-DD</code> . Example: <code>2023-07-07</code>
space_id string	The space that contains the resource. Either <code>space_id</code> or <code>project_id</code> query parameter has to be given. Possible values: length = 36, Value must match regular expression <code>[a-zA-Z0-9-]*</code> Example: <code>63dc4cf1-252f-424b-b52d-5cdd9814987f</code>
project_id string	The project that contains the resource. Either <code>space_id</code> or <code>project_id</code> query parameter has to be given. Possible values: length = 36, Value must match regular expression <code>[a-zA-Z0-9-]*</code> Example: <code>a77190a2-f52d-4f2a-be3d-7867b5f46edc</code>

Delete request,



```
curl --location --request DELETE 'https://us-south.ml.cloud.ibm.com/ml/v4/experiments/:experiment_id?space_id=<string>&project_id=<string>&version=2020-09-01'
```

Response

Status Code	
204	Experiment deleted
400	Bad request, the response body should contain the reason.
401	Unauthorized.
403	Forbidden, an authentication error including trying to access an unauthorized space or project.
404	The specified resource was not found.

No Sample Response

This method does not specify any sample responses.

Create a new experiment revision

Create a new experiment revision. The current metadata and content for `experiment_id` will be taken and a new revision created. Either `space_id` or `project_id` has to be provided and is mandatory.

```
POST /ml/v4/experiments/{experiment_id}/revisions
```



Auditing

Calling this method generates the following auditing event.

- `pm-20.experiment.create`

Request

Path Parameters	
<code>experiment_id</code>	Experiment identifier.

Required *
string

Example: 63dc4cf1-252f-424b-b52d-5cdd9814987f

Query Parameters

version

Required *
date

The version date for the API of the form YYYY-MM-DD .

Example: 2023-07-07

Request Body

Required *
experiment_revision_entity_request

The details for the revision.

Examples: [View](#)

space_id

string

The space that contains the resource. Either `space_id` or `project_id` has to be given.

Possible values: length = 36, Value must match regular expression `[a-zA-Z0-9-]*`

Example: 3fc54cf1-252f-424b-b52d-5cdd9814987f

project_id

string

The project that contains the resource. Either `space_id` or `project_id` has to be given.

Possible values: length = 36, Value must match regular expression `[a-zA-Z0-9-]*`

Example: 12ac4cf1-252f-424b-b52d-5cdd9814987f

commit_message

string

An optional commit message for the revision.

Post request,

```
curl --location --request POST 'https://us-south.ml.cloud.ibm.com/ml/v4/experiments/:experiment_id/revisions?version=2020-09-01' --data-raw '{
  "space_id": "3fc54cf1-252f-424b-b52d-5cdd9814987f",
  "commit_message": "Updated for TF 2.0"
}'
```

Response

Response Body	
experiment_resource	The information for an experiment.
metadata Always included *	Common metadata for a resource where <code>project_id</code> or <code>space_id</code> must be present. Examples: View
> ResourceMeta	
entity Always included *	The details of the experiment to be created.
> experiment_entity	
system	Optional details coming from the service and related to the API call or the associated resource.
> SystemDetails	
Status Code	
201	Experiment revision created
400	Bad request, the response body should contain the reason.
401	Unauthorized.
403	Forbidden, an authentication error including trying to access an unauthorized space or project.
404	The specified resource was not found.

No Sample Response

This method does not specify any sample responses.

Retrieve the experiment revisions

Retrieve the experiment revisions.

GET /ml/v4/experiments/{experiment_id}/revisions

Auditing

Calling this method generates the following auditing event.

- pm-20.experiment.list

Request

Path Parameters	
<div>experiment_id Required * string</div>	<div>Experiment identifier.</div> <div>Example: 63dc4cf1-252f-424b-b52d-5cdd9814987f</div>
Query Parameters	
<div>version Required * date</div>	<div>The version date for the API of the form YYYY-MM-DD .</div> <div>Example: 2023-07-07</div>
<div>space_id string</div>	<div>The space that contains the resource. Either space_id or project_id query parameter has to be given.</div> <div>Possible values: length = 36, Value must match regular expression [a-zA-Z0-9-]*</div> <div>Example: 63dc4cf1-252f-424b-b52d-5cdd9814987f</div>
<div>project_id string</div>	<div>The project that contains the resource. Either space_id or project_id query parameter has to be given.</div> <div>Possible values: length = 36, Value must match regular expression [a-zA-Z0-9-]*</div> <div>Example: a77190a2-f52d-4f2a-be3d-7867b5f46edc</div>
<div>start string</div>	<div>Token required for token-based pagination. This token cannot be determined by end user. It is generated by the service and it is set in the href available in the next field.</div>

limit

integer

How many resources should be returned. By default limit is 100. Max limit allowed is 200.

Possible values: $1 \leq \text{value} \leq 200$

Default: 100

Example: 50

Get request,

```
curl --location --request GET 'https://us-south.ml.cloud.ibm.com/ml/v4/experiments/:experiment_id/revisions?space_id=<string>&project_id=<string>&start=<string>&limit=100&version=2020-09-01'
```

Response

Response Body

experiment_resources

A paginated list of experiments.

limit

Always included *

integer

The number of items to return in each page.

Possible values: $1 \leq \text{value} \leq 200$

Example: 10

first

Always included *

> [PaginationFirst](#)

The reference to the first item in the current page.

total_count

integer

The total number of resources. Computed explicitly only when 'total_count=true' query parameter is present. This is in order to avoid performance penalties.

Example: 1

next

> [PaginationNext](#)

A reference to the first item of the next page, if any.

resources

A list of experiments.

> [experiment_resource\[\]](#)

system

Optional details coming from the service and related to the API call or the associated resource.

> [SystemDetails](#)

Status Code

200	Experiment revisions
400	Bad request, the response body should contain the reason.
401	Unauthorized.
403	Forbidden, an authentication error including trying to access an unauthorized space or project.
404	The specified resource was not found.

No Sample Response

This method does not specify any sample responses.

Create a new function

Create a new function with the given payload. A function is some code that can be deployed as an online, or batch deployment.

POST /ml/v4/functions



Auditing

Calling this method generates the following auditing event.

- `pm-20.function.create`

Request

Query Parameters

version

Required *

date

The version date for the API of the form `YYYY-MM-DD`.

Example: `2023-07-07`

Request Body

Required *

function_entity_request

Payload for creating the function. Either `space_id` or `project_id` has to be provided and is mandatory.

name

Required *

string

The name of the resource.

Example: `my-resource`

software_spec

Required *

> [software_spec_rel](#)

A software specification.

project_id

string

The project that contains the resource. Either `space_id` or `project_id` has to be given.

Possible values: length = 36, Value must match regular expression `[a-zA-Z0-9-]*`

Example: `12ac4cf1-252f-424b-b52d-5cdd9814987f`

space_id

string

The space that contains the resource. Either `space_id` or `project_id` has to be given.

Possible values: length = 36, Value must match regular expression `[a-zA-Z0-9-]*`

Example: `3fc54cf1-252f-424b-b52d-5cdd9814987f`

description

string

A description of the resource.

Example: `This is my first resource.`

tags

string[]


A list of tags for this resource.

Examples: [View](#)

type

string

Type of the function to be created. Only `python` type is supported as of now. If not specified, `python` is the default. Functions expect a gzip file that contains a python file that make up the function. Python functions specify what needs to be run when the function is deployed and what needs to be run when the scoring function is called. In other words, you are able to customize what preparation

WML does in the environment when you deploy the function, as well as what steps WML takes to generate the output when you call the API later on. The function consists of the outer function (any place that is not within the score function) and the inner score function. The code that sits in the outer function runs when the function is deployed, and the environment is then frozen and ready to be used whenever the online scoring or batch inline job processing API is called. The code that sits in the inner score function runs when the online scoring or batch inline job processing API is called, in the environment customized by the outer function. See [Deploying Python function](#)  for more details.

This is illustrated in the example below:

<python code used to set up the environment>

```
def score(payload):
    df_payload = pd.DataFrame(payload["values"])
    df_payload.columns = payload["fields"]
    ...
    output = {"result" : res}
    return output
```

return score

Default: `python`

Example: `python`

sample_scoring_input

Scoring data.

> [sync_scoring_data](#)

schemas

The schemas of the expected data.

> [object](#)

custom

User defined properties specified as key-value pairs.

Examples: [View](#)

> [object](#)

model_references

This is a list of references of the models that are used by this function, if any. These references are provided by the owner of the function and are used for usage tracking only.

> [model_reference\[\]](#)



```
curl -X POST 'https://us-south.ml.cloud.ibm.com/ml/v4/functions?
version=2020-09-01' --data-raw '{
  "name": "my-resource",
  "project_id": "12ac4cf1-252f-424b-b52d-5cdd9814987f",
  "space_id": "3fc54cf1-252f-424b-b52d-5cdd9814987f",
  "description": "This is my first resource.",
  "tags": [
    "t1",
    "t2"
  ],
  "software_spec": {
    "id": "4cedab6d-e8e4-4214-b81a-2ddb122db2ab",
    "rev": "2",
    "name": "...",
  },
  "type": "python",
  "sample_scoring_input": {
    "input_data": [
      {
        "id": "<string>",
        "fields": [
          {
            "name",
            "age",
            "occupation"
          }
        ],
        "values": [
          [
            "<object>",
            "<object>"
          ],
          [
            "<object>",
            "<object>"
          ]
        ]
      },
      {
        "id": "<string>",
        "fields": [
          {
            "name",
            "age",
            "occupation"
          }
        ]
      }
    ]
  }
}
```

```

        ],
        "values": [
            [
                "<object>",
                "<object>"
            ],
            [
                "<object>",
                "<object>"
            ]
        ]
    },
]
},
"schemas": {
    "input": [
        {
            "id": "<string>",
            "fields": [
                {
                    "name": "duration",
                    "type": "number"
                }
            ],
            "name": "<string>"
        },
        {
            "id": "<string>",
            "fields": [
                {
                    "name": "duration",
                    "type": "number"
                }
            ],
            "name": "<string>"
        }
    ],
    "output": [
        {
            "id": "<string>",
            "fields": [
                {
                    "name": "duration",
                    "type": "number"
                }
            ],
            "name": "<string>"
        },
        {

```

```
        "id": "<string>",
        "fields": [
            {
                "name": "duration",
                "type": "number"
            }
        ],
        "name": "<string>"
    }
}
],
},
"custom": "<object>"
}'
```

Response

Response Body	
function_resource	The information for a function.
<hr/>	
metadata Always included *	Common metadata for a resource where <code>project_id</code> or <code>space_id</code> must be present. Examples: View
<div>> ResourceMeta</div> <hr/>	
entity Always included *	The details of the function to be created.
<div>> function_entity</div> <hr/>	
system	Optional details coming from the service and related to the API call or the associated resource.
<div>> SystemDetails</div> <hr/>	
Status Code	
201	Function created
400	Bad request, the response body should contain the reason.
401	Unauthorized.

403	Forbidden, an authentication error including trying to access an unauthorized space or project.
404	The specified resource was not found.

No Sample Response

This method does not specify any sample responses.

Retrieve the functions

Retrieve the functions for the specified space or project.

```
GET /ml/v4/functions
```



Auditing

Calling this method generates the following auditing event.

- `pm-20.function.list`

Request

Query Parameters

version

Required ^{*}
date

The version date for the API of the form `YYYY-MM-DD`.

Example: `2023-07-07`

space_id

string

The space that contains the resource. Either `space_id` or `project_id` query parameter has to be given.

Possible values: length = 36, Value must match regular expression `[a-zA-Z0-9-]*`

Example: `63dc4cf1-252f-424b-b52d-5cdd9814987f`

project_id

string

The project that contains the resource. Either `space_id` or `project_id` query parameter has to be given.

Possible values: length = 36, Value must match regular expression

`[a-zA-Z0-9-]*`

Example: `a77190a2-f52d-4f2a-be3d-7867b5f46edc`

start

string

Token required for token-based pagination. This token cannot be determined by end user. It is generated by the service and it is set in the href available in the `next` field.

limit

integer

How many resources should be returned. By default limit is 100. Max limit allowed is 200.

Possible values: $1 \leq \text{value} \leq 200$

Default: `100`

Example: `50`

tag.value

string

Return only the resources with the given tag values, separated by `or` or `and` to support multiple tags.

Example: `tf2.0 or tf2.1`

search

string

Returns only resources that match this search string. The path to the field must be the complete path to the field, and this field must be one of the indexed fields for this resource type. Note that the search string must be URL encoded.

Possible values: length ≥ 1

Get request,

```
curl -X GET 'https://us-south.ml.cloud.ibm.com/ml/v4/functions?
space_id=<string>&project_id=<string>&start=
<string>&limit=100&tag.value=<string>&version=2020-09-01'
```



Response

Response Body

function_resources

A paginated list of functions.

limit

The number of items to return in each page.

Always included *

integer

Possible values: $1 \leq \text{value} \leq 200$

Example: 10

first

Always included *

> [PaginationFirst](#)

The reference to the first item in the current page.

total_count

integer

The total number of resources. Computed explicitly only when 'total_count=true' query parameter is present. This is in order to avoid performance penalties.

Example: 1

next

> [PaginationNext](#)

A reference to the first item of the next page, if any.

resources

> [function_resource\[\]](#)

A list of functions.

system

> [SystemDetails](#)

Optional details coming from the service and related to the API call or the associated resource.

Status Code

200

OK

400

Bad request, the response body should contain the reason.

401

Unauthorized.

403

Forbidden, an authentication error including trying to access an unauthorized space or project.

404

The specified resource was not found.

No Sample Response

This method does not specify any sample responses.

Retrieve the function

Retrieve the function with the specified identifier. If `rev` query parameter is provided, `rev=latest` will fetch the latest revision. A call with `rev={revision_number}` will fetch the given revision_number record. Either `space_id` or `project_id` has to be provided and is mandatory.

GET /ml/v4/functions/{function_id}

Auditing

Calling this method generates the following auditing event.

- `pm-20.function.read`

Request

Path Parameters	
<div>function_id Required * string</div>	<div>Function identifier.</div> <div>Example: <code>64dc8921-345f-234b-462d-78e41246987f</code></div>
Query Parameters	
<div>version Required * date</div>	<div>The version date for the API of the form <code>YYYY-MM-DD</code>.</div> <div>Example: <code>2023-07-07</code></div>
<div>space_id string</div>	<div>The space that contains the resource. Either <code>space_id</code> or <code>project_id</code> query parameter has to be given.</div> <div>Possible values: length = 36, Value must match regular expression <code>[a-zA-Z0-9-]*</code></div> <div>Example: <code>63dc4cf1-252f-424b-b52d-5cdd9814987f</code></div>
<div>project_id string</div>	<div>The project that contains the resource. Either <code>space_id</code> or <code>project_id</code> query parameter has to be given.</div> <div>Possible values: length = 36, Value must match regular expression <code>[a-zA-Z0-9-]*</code></div> <div>Example: <code>a77190a2-f52d-4f2a-be3d-7867b5f46edc</code></div>

rev
string

The revision number of the resource.

Example: `2`

Get request,



```
curl -X GET 'https://us-south.ml.cloud.ibm.com/ml/v4/functions/:function_id?space_id=<string>&project_id=<string>&rev=<string>&version=2020-09-01'
```

Response

Response Body
`function_resource`

The information for a function.

metadata

Always included *

Common metadata for a resource where `project_id` or `space_id` must be present.

Examples: [View](#)

> [ResourceMeta](#)

entity

Always included *

The details of the function to be created.

> [function_entity](#)

system

Optional details coming from the service and related to the API call or the associated resource.

> [SystemDetails](#)

Status Code

200

OK

400

Bad request, the response body should contain the reason.

401

Unauthorized.

403	Forbidden, an authentication error including trying to access an unauthorized space or project.
404	The specified resource was not found.

No Sample Response

This method does not specify any sample responses.

Update the function

Update the function with the provided patch data. The following fields can be patched:

- `/tags`
- `/name`
- `/description`
- `/custom`

```
PATCH /ml/v4/functions/{function_id}
```



Auditing

Calling this method generates the following auditing event.

- `pm-20.function.update`

Request

Path Parameters

function_id

Required *

string

Function identifier.

Example: `64dc8921-345f-234b-462d-78e41246987f`

Query Parameters

version

Required *

date

The version date for the API of the form YYYY-MM-DD .

Example: 2023-07-07

space_id

string

The space that contains the resource. Either space_id or project_id query parameter has to be given.

Possible values: length = 36, Value must match regular expression [a-zA-Z0-9-]*

Example: 63dc4cf1-252f-424b-b52d-5cdd9814987f

project_id

string

The project that contains the resource. Either space_id or project_id query parameter has to be given.

Possible values: length = 36, Value must match regular expression [a-zA-Z0-9-]*

Example: a77190a2-f52d-4f2a-be3d-7867b5f46edc

Request Body

Required *

JsonPatchOperation[]

Input For Patch. This is the patch body which corresponds to the JavaScript Object Notation (JSON) Patch standard (RFC 6902).

op

Required *

string

The operation to be performed.

Allowable values: [add , remove , replace]**path**

Required *

string

The pointer that identifies the field that is the target of the operation.

value

string

The value to be used within the operation.

Patch request,

```
curl -X PATCH 'https://us-south.ml.cloud.ibm.com/ml/v4/functions/:function_id?space_id=
<string>&project_id=<string>&version=2020-09-01' --data-raw '[
  {
    "op": "<string>",
    "path": "<string>",
    "value": "<object>"
  },
  {
```

```
    "op": "<string>",
    "path": "<string>",
    "value": "<object>"
  }
]
```

Response

Response Body	
function_resource	The information for a function.
<hr/>	
metadata Always included *	Common metadata for a resource where <code>project_id</code> or <code>space_id</code> must be present. Examples: View
> ResourceMeta	
<hr/>	
entity Always included *	The details of the function to be created.
> function_entity	
<hr/>	
system	Optional details coming from the service and related to the API call or the associated resource.
> SystemDetails	
<hr/>	
Status Code	
200	Function has been patched successfully
400	Bad request, the response body should contain the reason.
401	Unauthorized.
403	Forbidden, an authentication error including trying to access an unauthorized space or project.
404	The specified resource was not found.

This method does not specify any sample responses.

Delete the function

Delete the function with the specified identifier. This will delete all revisions of this function as well. For each revision all attachments will also be deleted.

```
DELETE /ml/v4/functions/{function_id}
```



Auditing

Calling this method generates the following auditing event.

- `pm-20.function.delete`

Request

Path Parameters

function_id

Required *

string

Function identifier.

Example: `64dc8921-345f-234b-462d-78e41246987f`

Query Parameters

version

Required *

date

The version date for the API of the form `YYYY-MM-DD`.

Example: `2023-07-07`

space_id

string

The space that contains the resource. Either `space_id` or `project_id` query parameter has to be given.

Possible values: length = 36, Value must match regular expression `[a-zA-Z0-9-]*`

Example: `63dc4cf1-252f-424b-b52d-5cdd9814987f`

project_id

string

The project that contains the resource. Either `space_id` or `project_id` query parameter has to be given.

Possible values: length = 36, Value must match regular expression

`[a-zA-Z0-9-]*`

Example: `a77190a2-f52d-4f2a-be3d-7867b5f46edc`

Delete request,



```
curl -X DELETE 'https://us-south.ml.cloud.ibm.com/ml/v4/functions/:function_id?space_id=<string>&project_id=<string>&version=2020-09-01'
```

Response

Status Code	
204	Function deleted
400	Bad request, the response body should contain the reason.
401	Unauthorized.
403	Forbidden, an authentication error including trying to access an unauthorized space or project.
404	The specified resource was not found.

No Sample Response

This method does not specify any sample responses.

Create a new function revision

Create a new function revision. The current metadata and content for `function_id` will be taken and a new revision created. Either `space_id` or `project_id` has to be provided and is mandatory.



Auditing

Calling this method generates the following auditing event.

- `pm-20.function.create`

Request

Path Parameters

function_id

Required *
string

Function identifier.

Example: `64dc8921-345f-234b-462d-78e41246987f`

Query Parameters

version

Required *
date

The version date for the API of the form `YYYY-MM-DD`.

Example: `2023-07-07`

Request Body

Required *
`function_revision_entity_request`

The details for the revision.

Examples: [View](#)

space_id

string

The space that contains the resource. Either `space_id` or `project_id` has to be given.

Possible values: length = 36, Value must match regular expression `[a-zA-Z0-9-]*`

Example: `3fc54cf1-252f-424b-b52d-5cdd9814987f`

project_id

string

The project that contains the resource. Either `space_id` or `project_id` has to be given.

Possible values: length = 36, Value must match regular expression `[a-zA-Z0-9-]*`

Example: `12ac4cf1-252f-424b-b52d-5cdd9814987f`

commit_message

string

An optional commit message for the revision.

Post request,



```
curl -X POST 'https://us-south.ml.cloud.ibm.com/ml/v4/functions/:function_id/revisions?version=2020-09-01' --data-raw '{
  "space_id": "3fc54cf1-252f-424b-b52d-5cdd9814987f",
  "commit_message": "Updated for TF 2.0"
}'
```

Response

Response Body function_resource

The information for a function.

metadata

Always included *

Common metadata for a resource where `project_id` or `space_id` must be present.

Examples: [View](#)

> [ResourceMeta](#)

entity

Always included *

The details of the function to be created.

> [function_entity](#)

system

Optional details coming from the service and related to the API call or the associated resource.

> [SystemDetails](#)

Status Code

201	Function revision created
400	Bad request, the response body should contain the reason.
401	Unauthorized.
403	Forbidden, an authentication error including trying to access an unauthorized space or project.

No Sample Response

This method does not specify any sample responses.

Retrieve the function revisions

Retrieve the function revisions.

```
GET /ml/v4/functions/{function_id}/revisions
```



Auditing

Calling this method generates the following auditing event.

- `pm-20.function.list`

Request

Path Parameters

function_id

Required *

string

Function identifier.

Example: `64dc8921-345f-234b-462d-78e41246987f`

Query Parameters

version

Required *

date

The version date for the API of the form `YYYY-MM-DD`.

Example: `2023-07-07`

space_id

string

The space that contains the resource. Either `space_id` or `project_id` query parameter has to be given.

Possible values: length = 36, Value must match regular expression

`[a-zA-Z0-9-]*`

Example: 63dc4cf1-252f-424b-b52d-5cdd9814987f

project_id

string

The project that contains the resource. Either `space_id` or `project_id` query parameter has to be given.

Possible values: length = 36, Value must match regular expression `[a-zA-Z0-9-]*`

Example: a77190a2-f52d-4f2a-be3d-7867b5f46edc

start

string

Token required for token-based pagination. This token cannot be determined by end user. It is generated by the service and it is set in the href available in the `next` field.

limit

integer

How many resources should be returned. By default limit is 100. Max limit allowed is 200.

Possible values: $1 \leq \text{value} \leq 200$

Default: 100

Example: 50

Get request,

```
curl -X GET 'https://us-south.ml.cloud.ibm.com/ml/v4/functions/:function_id/revisions?space_id=<string>&project_id=<string>&start=<string>&limit=100&version=2020-09-01'
```

Response

Response Body

function_resources

A paginated list of functions.

limit

Always included *
integer

The number of items to return in each page.

Possible values: $1 \leq \text{value} \leq 200$

Example: 10

first

Always included *

> [PaginationFirst](#)

The reference to the first item in the current page.

total_count

integer

The total number of resources. Computed explicitly only when 'total_count=true' query parameter is present. This is in order to avoid performance penalties.

Example: [1](#)

next

A reference to the first item of the next page, if any.

> [PaginationNext](#)

resources

A list of functions.

> [function_resource\[\]](#)

system

Optional details coming from the service and related to the API call or the associated resource.

> [SystemDetails](#)

Status Code**200**

Function revisions

400

Bad request, the response body should contain the reason.

401

Unauthorized.

403

Forbidden, an authentication error including trying to access an unauthorized space or project.

404

The specified resource was not found.

No Sample Response

This method does not specify any sample responses.

Upload the function code

Upload the function code. Functions expect a zip file that contains a python file that make up the function. Python functions specify what needs to be run when the function is deployed and what needs to be run

when the scoring function is called. In other words, you are able to customize what preparation WML does in the environment when you deploy the function, as well as what steps WML takes to generate the output when you call the API later on. The function consists of the outer function (any place that is not within the score function) and the inner score function. The code that sits in the outer function runs when the function is deployed, and the environment is then frozen and ready to be used whenever the online scoring or batch inline job processing API is called. The code that sits in the inner score function runs when the online scoring or batch inline job processing API is called, in the environment customized by the outer function. See [Deploying Python function](#) for more details. This is illustrated in the example below:

...python code used to set up the environment...

```
def score(payload):
    df_payload = pd.DataFrame(payload[values])
    df_payload.columns = payload[fields]
    ...
    output = {result : res}
    return output
```

return score

```
PUT /ml/v4/functions/{function_id}/code
```



Auditing

Calling this method generates the following auditing event.

- `pm-20.function.add`

Request

Path Parameters

function_id

Required *

string

Function identifier.

Example: `64dc8921-345f-234b-462d-78e41246987f`

Query Parameters

version

Required *

date

The version date for the API of the form `YYYY-MM-DD`.

Example: `2023-07-07`

space_id string	The space that contains the resource. Either <code>space_id</code> or <code>project_id</code> query parameter has to be given. Possible values: length = 36, Value must match regular expression <code>[a-zA-Z0-9-]*</code> Example: <code>63dc4cf1-252f-424b-b52d-5cdd9814987f</code>
project_id string	The project that contains the resource. Either <code>space_id</code> or <code>project_id</code> query parameter has to be given. Possible values: length = 36, Value must match regular expression <code>[a-zA-Z0-9-]*</code> Example: <code>a77190a2-f52d-4f2a-be3d-7867b5f46edc</code>
Request Body Required * application/gzip binary	A gzip file containing code files.

Put request,

```
curl -X PUT 'https://us-south.ml.cloud.ibm.com/ml/v4/functions/:function_id/code?space_id=<string>&project_id=<string>&version=2020-09-01'
```

Response

Response Body content_metadata	The metadata related to the attachment.
attachment_id Always included * string	The content id for the attachment. Example: <code>fd45606f-8098-459c-8961-32b136123fgc</code>
content_format Always included * string	The type of the content. Example: <code>native</code>
name string	The name of the attachment. Example: <code>my_attachment</code>

pipeline_node_id

string

The `pipeline_node_id` that corresponds to this content.Example: `fg094cf1-252f-424b-b52d-5cdd981a981e`**deployment_id**

string

The `deployment_id` that corresponds to this content.Example: `12345cf1-252f-424b-b52d-5cdd981a1234`**persisted**

boolean

This will be set to `true` if the content has been persisted. If this content was part of the import process and the upload of the content failed then the message can be found in the `warnings` field of the `system_details` that are returned with the model details.

Example: `true`**Status Code**

201	Function code uploaded
400	Bad request, the response body should contain the reason.
401	Unauthorized.
403	Forbidden, an authentication error including trying to access an unauthorized space or project.
404	The specified resource was not found.

No Sample Response

This method does not specify any sample responses.

Download the function code

Download the function code. It is possible to get the `code` for a given revision of the `function`. Functions expect a zip file that contains a python file that make up the function. Python functions specify what needs to be run when the function is deployed and what needs to be run when the scoring function is called. In other words, you are able to customize what preparation WML does in the environment when you deploy the function, as well as what steps WML takes to generate the output when you call the API later on. The function consists of the outer function (any place that is not within the score function) and the inner score

function. The code that sits in the outer function runs when the function is deployed, and the environment is then frozen and ready to be used whenever the online scoring or batch inline job processing API is called. The code that sits in the inner score function runs when the online scoring or batch inline job processing API is called, in the environment customized by the outer function. See [Deploying Python function](#) for more details. This is illustrated in the example below:

...python code used to set up the environment...

```
def score(payload):
    df_payload = pd.DataFrame(payload[values])
    df_payload.columns = payload[fields]
    ...
    output = {result : res}
    return output

return score
```

GET `/ml/v4/functions/{function_id}/code`

Auditing

Calling this method generates the following auditing event.

- pm-20.function.read

Request

Path Parameters	
<div>function_id Required * string</div>	<div>Function identifier. Example: 64dc8921-345f-234b-462d-78e41246987f</div>
Query Parameters	
<div>version Required * date</div>	<div>The version date for the API of the form YYYY-MM-DD . Example: 2023-07-07</div>
<div>space_id string</div>	<div>The space that contains the resource. Either space_id or project_id query parameter has to be given. Possible values: length = 36, Value must match regular expression</div>

[a-zA-Z0-9-]*

Example: 63dc4cf1-252f-424b-b52d-5cdd9814987f

project_id

string

The project that contains the resource. Either `space_id` or `project_id` query parameter has to be given.

Possible values: length = 36, Value must match regular expression

[a-zA-Z0-9-]*

Example: a77190a2-f52d-4f2a-be3d-7867b5f46edc

rev

string

The revision number of the resource.

Example: 2

Get request,

```
curl -X GET 'https://us-south.ml.cloud.ibm.com/ml/v4/functions/:function_id/code?space_id=<string>&project_id=<string>&rev=<string>&version=2020-09-01'
```

Response

Response Body

binary

Status Code

200	OK.
400	Bad request, the response body should contain the reason.
401	Unauthorized.
403	Forbidden, an authentication error including trying to access an unauthorized space or project.
404	The specified resource was not found.

No Sample Response

This method does not specify any sample responses.

Retrieve the service instances

Retrieve the service instances. Either `space_id` or `project_id` query parameter is mandatory but both can be provided.

GET `/ml/v4/instances`



Request

Query Parameters

version

Required *

date

The version date for the API of the form `YYYY-MM-DD`.

Example: `2023-07-07`

space_id

string[]

Return resources pertaining to any `space_id` listed. Either `space_id` or `project_id` query parameter is mandatory but both can be provided.

project_id

string[]

Return resources pertaining to any `project_id` listed. Either `space_id` or `project_id` query parameter is mandatory but both can be provided.

start

string

Token required for token-based pagination. This token cannot be determined by end user. It is generated by the service and it is set in the href available in the `next` field.

limit

integer

How many resources should be returned. By default limit is 100. Max limit allowed is 200.

Possible values: $1 \leq \text{value} \leq 200$

Default: `100`

Example: `50`

consumption_details

boolean

Only if `consumption_details` is set to `true` each instance `entity.consumption.details` part is available in response.

Default: `false`

Example: `true`

Get request,



```
curl --location --request GET 'https://us-south.ml.cloud.ibm.com/ml/v4/instances?space_id=<string>,<string>&project_id=<string>,<string>&start=<string>&limit=100&version=2020-09-01'
```

Response

Response Body
`instance_resources`

Information for paging when querying resources.

limit

Always included ^{*}
integer

The number of items to return in each page.

Possible values: $1 \leq \text{value} \leq 200$

Example: `10`

first

Always included ^{*}
> [PaginationFirst](#)

The reference to the first item in the current page.

total_count

integer

The total number of resources. Computed explicitly only when 'total_count=true' query parameter is present. This is in order to avoid performance penalties.

Example: `1`

next

> [PaginationNext](#)

A reference to the first item of the next page, if any.

resources

> [instance_resource\[\]](#)

Status Code

200	OK.
400	Bad request, the response body should contain the reason.
401	Unauthorized.
403	Forbidden, an authentication error including trying to access an unauthorized space or project.
404	The specified resource was not found.

No Sample Response

This method does not specify any sample responses.

Retrieve the service instance

Retrieve the service instance details.

```
GET /ml/v4/instances/{instance_id}
```



Request

Path Parameters

instance_id

Required *

string

The instance identifier.

Query Parameters

version

Required *

date

The version date for the API of the form `YYYY-MM-DD`.

Example: `2023-07-07`

space_id

Defines authorization context that allows a space member to perform

string	this operation. Example: 63dc4cf1-252f-424b-b52d-5cdd9814987f
project_id string	Defines authorization context that allows a project member to perform this operation. Example: 63dc4cf1-252f-424b-b52d-5cdd9814987f
consumption_details boolean	Only if <code>consumption_details</code> is set to <code>true</code> the instance <code>entity.consumption.details</code> part is available in response. Default: false Example: true

Get request, ^

curl --location --request GET 'https://us-south.ml.cloud.ibm.com/ml/v4/instances/:instance_id?space_id=63dc4cf1-252f-424b-b52d-5cdd9814987f&project_id=63dc4cf1-252f-424b-b52d-5cdd9814987f&version=2020-09-01'

❏

Response

Response Body instance_resource	
metadata	Common metadata for a resource. Examples: View
> ResourceMetaBase	
entity	
> instance_resource_entity	
Status Code	
200	OK.
400	Bad request, the response body should contain the reason.

401	Unauthorized.
403	Forbidden, an authentication error including trying to access an unauthorized space or project.
404	The specified resource was not found.

No Sample Response

This method does not specify any sample responses.

Create a new model

Create a new model with the given payload. A model represents a machine learning model asset. If a 202 status is returned then the model will be ready when the `content_import_state` in the model status (/ml/v4/models/{model_id}) is `completed`. If `content_import_state` is not used then a 201 status is returned.

POST /ml/v4/models



Auditing

Calling this method generates the following auditing event.

- `pm-20.model.create`

Request

Query Parameters

version

Required *

date

The version date for the API of the form `YYYY-MM-DD`.


Example: `2023-07-07`

Request Body

Required *

model_entity_request

Payload for creating the model. Either `space_id` or `project_id` has to be provided and is mandatory.

name Required * string	The name of the resource. Example: <code>my-resource</code>
type Required * string	The model type. The supported model types can be found in the documentation here  Example: <code>tensorflow_1.5</code>
software_spec Required * > software_spec_rel	A software specification.
project_id string	The project that contains the resource. Either <code>space_id</code> or <code>project_id</code> has to be given. Possible values: length = 36, Value must match regular expression <code>[a-zA-Z0-9-]*</code> Example: <code>12ac4cf1-252f-424b-b52d-5cdd9814987f</code>
space_id string	The space that contains the resource. Either <code>space_id</code> or <code>project_id</code> has to be given. Possible values: length = 36, Value must match regular expression <code>[a-zA-Z0-9-]*</code> Example: <code>3fc54cf1-252f-424b-b52d-5cdd9814987f</code>
description string	A description of the resource. Example: <code>This is my first resource.</code>
tags string[]	A list of tags for this resource. Examples: View
pipeline > Rel	A reference to a resource.
model_definition > model_definition_id	The model definition.
hyper_parameters object	Hyper parameters used for training this model.
domain string	User provided domain name for this model. For example: sentiment, entity, visual-recognition, finance, retail, real estate etc.


training_data_references	The training data that was used to create this model.
DataConnectionReference[]	
test_data_references	The holdout/test datasets.
DataConnectionReference[]	
schemas	<p>If the prediction schemas are provided here then they take precedent over any schemas provided in the data references. Note that data references contain the schema for the associated data and this object contains the schema(s) for the associated prediction, if any. In the case that the prediction input data matches exactly the schema of the training data references then the prediction schema can be omitted. However it is highly recommended to always specify the prediction schemas using this field.</p>
object	
label_column string	The name of the label column.
transformed_label_column string	The name of the label column seen by the estimator, which may have been transformed by the previous transformers in the pipeline. This is not necessarily the same column as the <code>label_column</code> in the initial data set.
size	This will be used by scoring to record the size of the model.
object	
metrics	Metrics that can be returned by an operation.
Metric[]	
custom	User defined properties specified as key-value pairs.
Examples: View	
object	
user_defined_objects	<p>User defined objects referenced by the model. For any user defined class or function used in the model, its name, as referenced in the model, must be specified as the <code>key</code> and its fully qualified class or function name must be specified as the <code>value</code>. This is applicable for <code>Tensorflow 2.X</code> models serialized in <code>H5</code> format using the <code>tf.keras</code> API.</p>
Examples: View	
object	

hybrid_pipeline_software_specs

The list of the software specifications that are used by the pipeline that generated this model, if the model was generated by a pipeline.

> [software_spec_rel\[\]](#)

model_version

Optional metadata that can be used to provide information about this model that can be tracked with IBM AI Factsheets. See [Using AI Factsheets](#)  for more details.

> [object](#)

training_id

string

Deprecated: this is replaced by `training.id`. This field can be used to store the `id` of the training job that was used to produce this model.

Example: `b8e64f4b-ead1-47f3-abf6-8247b2826763`

data_preprocessing

An optional array which contains the data preprocessing transformations that were executed by the training job that created this model.

Examples: [View](#)

> [DataPreprocessingTransformation\[\]](#)

training

Information about the training job that created this model.

> [training_details](#)

content_location

Details about the attachments that should be uploaded with this model.

> [content_location](#)

Post request,

```
curl -X POST 'https://us-south.ml.cloud.ibm.com/ml/v4/models?
version=2020-09-01' --data-raw '{
  "name": "my-resource",
  "project_id": "12ac4cf1-252f-424b-b52d-5cdd9814987f",
  "space_id": "3fc54cf1-252f-424b-b52d-5cdd9814987f",
  "description": "This is my first resource.",
  "tags": [
    "t1",
    "t2"
  ],
  "type": "tensorflow_1.5",
```

```
"software_spec": {
  "id": "4cedab6d-e8e4-4214-b81a-2ddb122db2ab",
  "rev": "2",
  "name": "...",
},
"pipeline": {
  "id": "4cedab6d-e8e4-4214-b81a-2ddb122db2ab",
  "rev": "2"
},
"model_definition": {
  "id": "4cedab6d-e8e4-4214-b81a-2ddb122db2ab"
},
"hyper_parameters": "<object>",
"domain": "<string>",
"training_data_references": [
  {
    "type": "<string>",
    "id": "<string>",
    "connection": "<object>",
    "location": "<object>",
    "schema": {
      "id": "<string>",
      "fields": [
        {
          "name": "duration",
          "type": "number"
        }
      ],
      "name": "<string>"
    }
  },
  {
    "type": "<string>",
    "id": "<string>",
    "connection": "<object>",
    "location": "<object>",
    "schema": {
      "id": "<string>",
      "fields": [
        {
          "name": "duration",
          "type": "number"
        }
      ],
      "name": "<string>"
    }
  }
],
"schemas": {
```

```

    "input": [
      {
        "id": "<string>",
        "fields": [
          {
            "name": "duration",
            "type": "number"
          }
        ],
        "name": "<string>"
      },
      {
        "id": "<string>",
        "fields": [
          {
            "name": "duration",
            "type": "number"
          }
        ],
        "name": "<string>"
      }
    ],
    "output": [
      {
        "id": "<string>",
        "fields": [
          {
            "name": "duration",
            "type": "number"
          }
        ],
        "name": "<string>"
      },
      {
        "id": "<string>",
        "fields": [
          {
            "name": "duration",
            "type": "number"
          }
        ],
        "name": "<string>"
      }
    ]
  },
  "label_column": "<string>",
  "transformed_label_column": "<string>",
  "size": {
    "in_memory": "<number>",

```

```

        "content": "<number>"
    },
    "metrics": [
        {
            "timestamp": {
                "value": "<Error: Too many levels of nesting to fake
this schema>"
            },
            "iteration": {
                "value": "<Error: Too many levels of nesting to fake
this schema>"
            },
            "ml_metrics": {
                "value": "<Error: Too many levels of nesting to fake
this schema>"
            },
            "context": {
                "value": "<Error: Too many levels of nesting to fake
this schema>"
            }
        },
        {
            "timestamp": {
                "value": "<Error: Too many levels of nesting to fake
this schema>"
            },
            "iteration": {
                "value": "<Error: Too many levels of nesting to fake
this schema>"
            },
            "ml_metrics": {
                "value": "<Error: Too many levels of nesting to fake
this schema>"
            },
            "context": {
                "value": "<Error: Too many levels of nesting to fake
this schema>"
            }
        }
    ],
    "custom": "<object>",
    "content_location": {
        "type": "s3",
        "contents": [
            {
                "content_format": "pipeline-node",
                "file_name": "P1_automl.zip",
                "location": "fd45606f-8098-459c-8961-
32b136123fgc/assets/fd45606f-8098-459c-8961-

```

```

32b136123fgc_P1_fold_output/resources/wml_model/P1_automl.zip",
    "pipeline_node_id": "automl"
  },
  {
    "content_format": "pipeline-node",
    "file_name": "P1_automl.zip",
    "location": "fd45606f-8098-459c-8961-
32b136123fgc/assets/fd45606f-8098-459c-8961-
32b136123fgc_P1_fold_output/resources/wml_model/P1_automl.zip",
    "pipeline_node_id": "automl"
  }
],
"connection": "<object>",
"location": "<object>"
}
}'

```

Response

Response Body	
<code>model_resource</code>	The information for a model.
metadata Always included *	Common metadata for a resource where <code>project_id</code> or <code>space_id</code> must be present. Examples: View ResourceMeta
entity Always included *	Information related to the upload of the model content. object
system	Optional details coming from the service and related to the API call or the associated resource. SystemDetails
Status Code	
201	Model created

202	Model accepted, this is returned in the case that <code>content_location</code> was provided in the request entity and so the model was created but the attachments are still being uploaded. In this case the model will not be ready until the <code>content_import_state</code> in the model status (<code>/ml/v4/models/{model_id}</code>) is <code>completed</code> .
400	Bad request, the response body should contain the reason.
401	Unauthorized.
403	Forbidden, an authentication error including trying to access an unauthorized space or project.
404	The specified resource was not found.

No Sample Response

This method does not specify any sample responses.

Retrieve the models

Retrieve the models for the specified space or project.

```
GET /ml/v4/models
```



Auditing

Calling this method generates the following auditing event.

- `pm-20.model.list`

Request

Query Parameters

version

Required *

date

The version date for the API of the form `YYYY-MM-DD` .

Example: `2023-07-07`

space_id

string

The space that contains the resource. Either `space_id` or `project_id` query parameter has to be given.

Possible values: length = 36, Value must match regular expression `[a-zA-Z0-9-]*`

Example: `63dc4cf1-252f-424b-b52d-5cdd9814987f`

project_id

string

The project that contains the resource. Either `space_id` or `project_id` query parameter has to be given.

Possible values: length = 36, Value must match regular expression `[a-zA-Z0-9-]*`

Example: `a77190a2-f52d-4f2a-be3d-7867b5f46edc`

start

string

Token required for token-based pagination. This token cannot be determined by end user. It is generated by the service and it is set in the href available in the `next` field.

limit

integer

How many resources should be returned. By default limit is 100. Max limit allowed is 200.

Possible values: $1 \leq \text{value} \leq 200$

Default: `100`

Example: `50`

tag.value

string

Return only the resources with the given tag values, separated by `or` or `and` to support multiple tags.

Example: `tf2.0 or tf2.1`

search

string

Returns only resources that match this search string. The path to the field must be the complete path to the field, and this field must be one of the indexed fields for this resource type. Note that the search string must be URL encoded.

Possible values: length ≥ 1

Get request,

```
curl -X GET 'https://us-south.ml.cloud.ibm.com/ml/v4/models?space_id=<string>&project_id=<string>&start=<string>&limit=100&tag.value=<string>&software_spec=<string>&version=2020-09-01'
```



Response

Response Body	
model_resources	A paginated list of models.
limit Always included * integer	The number of items to return in each page. Possible values: $1 \leq \text{value} \leq 200$ Example: 10
first Always included * > PaginationFirst	The reference to the first item in the current page.
total_count integer	The total number of resources. Computed explicitly only when 'total_count=true' query parameter is present. This is in order to avoid performance penalties. Example: 1
next > PaginationNext	A reference to the first item of the next page, if any.
resources > model_resource[]	A list of models.
system > SystemDetails	Optional details coming from the service and related to the API call or the associated resource.
Status Code	
200	OK
400	Bad request, the response body should contain the reason.
401	Unauthorized.
403	Forbidden, an authentication error including trying to access an unauthorized space or project.
404	The specified resource was not found.

No Sample Response

This method does not specify any sample responses.

Retrieve the model

Retrieve the model with the specified identifier. If `rev` query parameter is provided, `rev=latest` will fetch the latest revision. A call with `rev={revision_number}` will fetch the given revision_number record. Either `space_id` or `project_id` has to be provided and is mandatory.

```
GET /ml/v4/models/{model_id}
```



Auditing

Calling this method generates the following auditing event.

- `pm-20.model.read`

Request

Path Parameters

model_id

Required *

string

Model identifier.

Example: `63dc4cf1-252f-424b-b52d-5cdd9814987f`

Query Parameters

version

Required *

date

The version date for the API of the form `YYYY-MM-DD`.

Example: `2023-07-07`

space_id

string

The space that contains the resource. Either `space_id` or `project_id` query parameter has to be given.

Possible values: length = 36, Value must match regular expression `[a-zA-Z0-9-]*`

Example: 63dc4cf1-252f-424b-b52d-5cdd9814987f

project_id

string

The project that contains the resource. Either `space_id` or `project_id` query parameter has to be given.

Possible values: length = 36, Value must match regular expression `[a-zA-Z0-9-]*`

Example: a77190a2-f52d-4f2a-be3d-7867b5f46edc

rev

string

The revision number of the resource.

Example: 2

Get request,

```
curl -X GET 'https://us-south.ml.cloud.ibm.com/ml/v4/models/:model_id?space_id=<string>&project_id=<string>&rev=<string>&version=2020-09-01'
```



Response

Response Body

model_resource

The information for a model.

metadata

Always included *

Common metadata for a resource where `project_id` or `space_id` must be present.

Examples: [View](#)

> [ResourceMeta](#)

entity

Always included *

Information related to the upload of the model content.

> [object](#)

system

Optional details coming from the service and related to the API call or the associated resource.

> [SystemDetails](#)

Status Code

200	OK
400	Bad request, the response body should contain the reason.
401	Unauthorized.
403	Forbidden, an authentication error including trying to access an unauthorized space or project.
404	The specified resource was not found.

No Sample Response

This method does not specify any sample responses.

Update the model

Update the model with the provided patch data. The following fields can be patched:

- `/tags`
- `/name`
- `/description`
- `/custom`
- `/software_spec` (operation `replace` only)
- `/model_version` (operation `add` and `replace` only)

```
PATCH /ml/v4/models/{model_id}
```



Auditing

Calling this method generates the following auditing event.

- `pm-20.model.update`

Request

Path Parameters

model_id

Required *
string

Model identifier.

Example: 63dc4cf1-252f-424b-b52d-5cdd9814987f

Query Parameters

version

Required *
date

The version date for the API of the form YYYY-MM-DD .

Example: 2023-07-07

space_id

string

The space that contains the resource. Either space_id or project_id query parameter has to be given.

Possible values: length = 36, Value must match regular expression [a-zA-Z0-9-]*

Example: 63dc4cf1-252f-424b-b52d-5cdd9814987f

project_id

string

The project that contains the resource. Either space_id or project_id query parameter has to be given.

Possible values: length = 36, Value must match regular expression [a-zA-Z0-9-]*

Example: a77190a2-f52d-4f2a-be3d-7867b5f46edc

Request Body

Required *
JsonPatchOperation[]

Input For Patch. This is the patch body which corresponds to the JavaScript Object Notation (JSON) Patch standard (RFC 6902).

op

Required *
string

The operation to be performed.

Allowable values: [add , remove , replace]

path

Required *
string

The pointer that identifies the field that is the target of the operation.

value

string

The value to be used within the operation.



```
curl -X PATCH 'https://us-south.ml.cloud.ibm.com/ml/v4/models/:model_id?space_id=
<string>&project_id=<string>&version=2020-09-01' --data-raw '[
  {
    "op": "<string>",
    "path": "<string>",
    "value": "<object>"
  },
  {
    "op": "<string>",
    "path": "<string>",
    "value": "<object>"
  }
]'
```

Response

Response Body	
model_resource	The information for a model.
metadata Always included *	Common metadata for a resource where <code>project_id</code> or <code>space_id</code> must be present. Examples: View
> ResourceMeta	
entity Always included *	Information related to the upload of the model content.
> object	
system	Optional details coming from the service and related to the API call or the associated resource.
> SystemDetails	
Status Code	
200	Model has been patched successfully
400	Bad request, the response body should contain the reason.
401	Unauthorized.

403	Forbidden, an authentication error including trying to access an unauthorized space or project.
404	The specified resource was not found.

No Sample Response

This method does not specify any sample responses.

Delete the model

Delete the model with the specified identifier. This will delete all revisions of this model as well. For each revision all attachments will also be deleted.

```
DELETE /ml/v4/models/{model_id}
```



Auditing

Calling this method generates the following auditing event.

- `pm-20.model.delete`

Request

Path Parameters

model_id

Required *

string

Model identifier.

Example: `63dc4cf1-252f-424b-b52d-5cdd9814987f`

Query Parameters

version

Required *

date

The version date for the API of the form `YYYY-MM-DD`.

Example: `2023-07-07`

space_id

string

The space that contains the resource. Either `space_id` or `project_id` query parameter has to be given.

Possible values: length = 36, Value must match regular expression `[a-zA-Z0-9-]*`

Example: `63dc4cf1-252f-424b-b52d-5cdd9814987f`

project_id

string

The project that contains the resource. Either `space_id` or `project_id` query parameter has to be given.

Possible values: length = 36, Value must match regular expression `[a-zA-Z0-9-]*`

Example: `a77190a2-f52d-4f2a-be3d-7867b5f46edc`

Delete request,

```
curl -X DELETE 'https://us-south.ml.cloud.ibm.com/ml/v4/models/:model_id?space_id=<string>&project_id=<string>&version=2020-09-01'
```

Response

Status Code

204	Model deleted
400	Bad request, the response body should contain the reason.
401	Unauthorized.
403	Forbidden, an authentication error including trying to access an unauthorized space or project.
404	The specified resource was not found.

No Sample Response

This method does not specify any sample responses.

Create a new model revision

Create a new model revision. The current metadata and content for `model_id` will be taken and a new revision created. Either `space_id` or `project_id` has to be provided and is mandatory.

POST /ml/v4/models/{model_id}/revisions

Auditing

Calling this method generates the following auditing event.

- `pm-20.model.create`

Request

Path Parameters	
<div>model_id Required * string</div>	<div>Model identifier. Example: <code>63dc4cf1-252f-424b-b52d-5cdd9814987f</code></div>
Query Parameters	
<div>version Required * date</div>	<div>The version date for the API of the form <code>YYYY-MM-DD</code>. Example: <code>2023-07-07</code></div>
<div>Request Body Required * <code>model_revision_entity_request</code></div>	<div>The details for the revision. Examples: View</div>
<div>space_id string</div>	<div>The space that contains the resource. Either <code>space_id</code> or <code>project_id</code> has to be given. Possible values: length = 36, Value must match regular expression <code>[a-zA-Z0-9-]*</code> Example: <code>3fc54cf1-252f-424b-b52d-5cdd9814987f</code></div>

project_id

string

The project that contains the resource. Either `space_id` or `project_id` has to be given.

Possible values: length = 36, Value must match regular expression `[a-zA-Z0-9-]*`

Example: `12ac4cf1-252f-424b-b52d-5cdd9814987f`

commit_message

string

An optional commit message for the revision.

Post request

```
curl -X POST 'https://us-south.ml.cloud.ibm.com/ml/v4/models/:model_id/revisions?version=2020-09-01' --data-raw '{
  "space_id": "3fc54cf1-252f-424b-b52d-5cdd9814987f",
  "commit_message": "Updated for TF 2.0"
}'
```

Response

Response Body`model_resource`

The information for a model.

metadata

Always included *

Common metadata for a resource where `project_id` or `space_id` must be present.

Examples: [View](#)

> [ResourceMeta](#)

entity

Always included *

Information related to the upload of the model content.

> [object](#)

system

Optional details coming from the service and related to the API call or the associated resource.

> [SystemDetails](#)

Status Code	
201	Model revision created
400	Bad request, the response body should contain the reason.
401	Unauthorized.
403	Forbidden, an authentication error including trying to access an unauthorized space or project.
404	The specified resource was not found.


No Sample Response

This method does not specify any sample responses.

Retrieve the model revisions

Retrieve the model revisions.

GET /ml/v4/models/{model_id}/revisions



Auditing

Calling this method generates the following auditing event.

- pm-20.model.list

Request

Path Parameters	
model_id Required * string	Model identifier. Example: 63dc4cf1-252f-424b-b52d-5cdd9814987f

Query Parameters

version

Required *

date

The version date for the API of the form `YYYY-MM-DD`.

Example: `2023-07-07`

space_id

string

The space that contains the resource. Either `space_id` or `project_id` query parameter has to be given.

Possible values: length = 36, Value must match regular expression `[a-zA-Z0-9-]*`

Example: `63dc4cf1-252f-424b-b52d-5cdd9814987f`

project_id

string

The project that contains the resource. Either `space_id` or `project_id` query parameter has to be given.

Possible values: length = 36, Value must match regular expression `[a-zA-Z0-9-]*`

Example: `a77190a2-f52d-4f2a-be3d-7867b5f46edc`

start

string

Token required for token-based pagination. This token cannot be determined by end user. It is generated by the service and it is set in the href available in the `next` field.

limit

integer

How many resources should be returned. By default limit is 100. Max limit allowed is 200.

Possible values: $1 \leq \text{value} \leq 200$

Default: `100`

Example: `50`

Get request,

```
curl -X GET 'https://us-south.ml.cloud.ibm.com/ml/v4/models/:model_id/revisions?space_id=<string>&project_id=<string>&start=<string>&limit=100&version=2020-09-01'
```

Response

Response Body	
model_resources	A paginated list of models.
limit Always included * integer	The number of items to return in each page. Possible values: $1 \leq \text{value} \leq 200$ Example: 10
first Always included * > PaginationFirst	The reference to the first item in the current page.
total_count integer	The total number of resources. Computed explicitly only when 'total_count=true' query parameter is present. This is in order to avoid performance penalties. Example: 1
next > PaginationNext	A reference to the first item of the next page, if any.
resources > model_resource[]	A list of models.
system > SystemDetails	Optional details coming from the service and related to the API call or the associated resource.
Status Code	
200	Model revisions
400	Bad request, the response body should contain the reason.
401	Unauthorized.
403	Forbidden, an authentication error including trying to access an unauthorized space or project.
404	The specified resource was not found.

This method does not specify any sample responses.

Retrieve the model content metadata list

Retrieve the content metadata list for the specified model attachments.

```
GET /ml/v4/models/{model_id}/content
```



Auditing

Calling this method generates the following auditing event.

- `pm-20.model.list`

Request

Path Parameters

model_id

Required *

string

Model identifier.

Example: `63dc4cf1-252f-424b-b52d-5cdd9814987f`

Query Parameters

version

Required *

date

The version date for the API of the form `YYYY-MM-DD`.

Example: `2023-07-07`

space_id

string

The space that contains the resource. Either `space_id` or `project_id` query parameter has to be given.

Possible values: length = 36, Value must match regular expression `[a-zA-Z0-9-]*`

Example: `63dc4cf1-252f-424b-b52d-5cdd9814987f`

project_id

string

The project that contains the resource. Either `space_id` or `project_id` query parameter has to be given.

Possible values: length = 36, Value must match regular expression

[a-zA-Z0-9-]*

Example: a77190a2-f52d-4f2a-be3d-7867b5f46edc

rev

string

The revision number of the resource.

Example: 2

name

string

List only attachments with the given name.

Example: my_model

content_format

string

This is the format of the content. Any value can be used for the format and is there to be able to easily find content by format.

Example: native

Get request,

```
curl -X GET 'https://us-south.ml.cloud.ibm.com/ml/v4/models/:model_id/content?space_id=<string>&project_id=<string>&rev=<string>&name=<string>&content_format=<string>&version=2020-09-01'
```

Response

Response Body

all_content_metadata

The metadata related to the attachments.

total_count

Always included *

integer

The number of attachments associated with the resource.

Example: 1

attachments

Always included *

> [content_metadata\[\]](#)

The metadata related to the attachment.

Status Code

200

OK

400	Bad request, the response body should contain the reason.
401	Unauthorized.
403	Forbidden, an authentication error including trying to access an unauthorized space or project.
404	The specified resource was not found.

No Sample Response

This method does not specify any sample responses.

Upload the model content

Upload the content for the specified model.

```
PUT /ml/v4/models/{model_id}/content
```



Auditing

Calling this method generates the following auditing event.

- `pm-20.model.add`

Request

Custom Headers	
Content-Type string	Allowable values: [<code>application/zip</code> , <code>application/json</code> , <code>text/plain</code> , <code>application/xml</code>]
Path Parameters	
model_id	Model identifier.

Required *
string

Example: 63dc4cf1-252f-424b-b52d-5cdd9814987f

Query Parameters

version

Required *
date

The version date for the API of the form YYYY-MM-DD .

Example: 2023-07-07

content_format

Required *
string

This is the format of the content. Any value can be used for the format and is there to be able to easily find content by format.

Example: native

space_id

string

The space that contains the resource. Either space_id or project_id query parameter has to be given.

Possible values: length = 36, Value must match regular expression [a-zA-Z0-9-]*

Example: 63dc4cf1-252f-424b-b52d-5cdd9814987f

project_id

string

The project that contains the resource. Either space_id or project_id query parameter has to be given.

Possible values: length = 36, Value must match regular expression [a-zA-Z0-9-]*

Example: a77190a2-f52d-4f2a-be3d-7867b5f46edc

pipeline_node_id

string

Returns only resources that match this pipeline_node_id , this is only relevant if content_format is pipeline-node .

Example: 62344cf1-252f-424b-b52d-5cdd9814aacd

deployment_id

string

Returns only resources that match this deployment_id , this is only relevant if content_format is coreml .

Example: 62344cf1-252f-424b-b52d-5cdd9814aacd

name

string

Provide the name of the attachment.

Example: my_models

Request Body

Required *
application/zip
binary

models file

Examples: [View](#)

Put request,



```
curl -X PUT 'https://us-south.ml.cloud.ibm.com/ml/v4/models/:model_id/content?content_format=<string>&space_id=<string>&project_id=<string>&pipeline_node_id=<string>&name=<string>&version=2020-09-01' --data-raw '<object>'
```

Response

Response Body	
content_metadata	The metadata related to the attachment.
attachment_id Always included * string	The content id for the attachment. Example: fd45606f-8098-459c-8961-32b136123fgc
content_format Always included * string	The type of the content. Example: native
name string	The name of the attachment. Example: my_attachment
pipeline_node_id string	The pipeline_node_id that corresponds to this content. Example: fg094cf1-252f-424b-b52d-5cdd981a981e
deployment_id string	The deployment_id that corresponds to this content. Example: 12345cf1-252f-424b-b52d-5cdd981a1234
persisted boolean	This will be set to true if the content has been persisted. If this content was part of the import process and the upload of the content failed then the message can be found in the warnings field of the system_details that are returned with the model details. Example: true
Status Code	
201	Model content uploaded

400	Bad request, the response body should contain the reason.
401	Unauthorized.
403	Forbidden, an authentication error including trying to access an unauthorized space or project.
404	The specified resource was not found.

No Sample Response

This method does not specify any sample responses.

Download the model content

Download the model content.

GET /ml/v4/models/{model_id}/content/{attachment_id}



Auditing

Calling this method generates the following auditing event.

- pm-20.model.read

Request

Custom Headers	
Accept string	Allowable values: [application/zip , application/gzip , application/json , text/plain , application/xml]
Path Parameters	
model_id	Model identifier.

Required * string	Example: 63dc4cf1-252f-424b-b52d-5cdd9814987f
attachment_id Required * string	Identifier for the attachment for resources that support separate content. Example: 63dc4cf1-252f-424b-b52d-5cdd9814987f
Query Parameters	
version Required * date	The version date for the API of the form YYYY-MM-DD . Example: 2023-07-07
space_id string	The space that contains the resource. Either space_id or project_id query parameter has to be given. Possible values: length = 36, Value must match regular expression [a-zA-Z0-9-]* Example: 63dc4cf1-252f-424b-b52d-5cdd9814987f
project_id string	The project that contains the resource. Either space_id or project_id query parameter has to be given. Possible values: length = 36, Value must match regular expression [a-zA-Z0-9-]* Example: a77190a2-f52d-4f2a-be3d-7867b5f46edc
rev string	The revision number of the resource. Example: 2

Get request,

```
curl -X GET 'https://us-south.ml.cloud.ibm.com/ml/v4/models/:model_id/content/:attachment_id?space_id=<string>&project_id=<string>&rev=<string>&version=2020-09-01'
```

Response

Response Body	Arbitrary zip file.
---------------	---------------------

binary	
Status Code	
200	Downloaded
400	Bad request, the response body should contain the reason.
401	Unauthorized.
403	Forbidden, an authentication error including trying to access an unauthorized space or project.
404	The specified resource was not found.

Example responses	
Status 200	^

Delete the model content

Delete the content for the specified model.

`DELETE /ml/v4/models/{model_id}/content/{attachment_id}`

Auditing

Calling this method generates the following auditing event.

- `pm-20.model.delete`

Request

Path Parameters	
model_id Required * string	Model identifier. Example: <code>63dc4cf1-252f-424b-b52d-5cdd9814987f</code>

attachment_id

Required *

string

Identifier for the attachment for resources that support separate content.

Example: 63dc4cf1-252f-424b-b52d-5cdd9814987f

Query Parameters

version

Required *

date

The version date for the API of the form YYYY-MM-DD .

Example: 2023-07-07

space_id

string

The space that contains the resource. Either space_id or project_id query parameter has to be given.

Possible values: length = 36, Value must match regular expression [a-zA-Z0-9-]*

Example: 63dc4cf1-252f-424b-b52d-5cdd9814987f

project_id

string

The project that contains the resource. Either space_id or project_id query parameter has to be given.

Possible values: length = 36, Value must match regular expression [a-zA-Z0-9-]*

Example: a77190a2-f52d-4f2a-be3d-7867b5f46edc

Delete request,

```
curl -X DELETE 'https://us-south.ml.cloud.ibm.com/ml/v4/models/:model_id/content/:attachment_id?space_id=<string>&project_id=<string>&version=2020-09-01'
```

Response

Status Code

204 Model content deleted

400 Bad request, the response body should contain the reason.

401 Unauthorized.

403	Forbidden, an authentication error including trying to access an unauthorized space or project.
404	The specified resource was not found.

No Sample Response

This method does not specify any sample responses.

Download the model content that matches a certain criteria

Download the model content identified by the provided criteria. If more than one attachment is found for the given filter then a 400 error is returned. If there are no attachments that match the filter then a 404 error is returned. If there are no filters then, if there is a single attachment, the attachment content will be returned otherwise a 400 or 404 error will be returned as described above. This method is just a shortcut for getting the attachment metadata and then downloading by attachment id.

```
GET /ml/v4/models/{model_id}/download
```



Auditing

Calling this method generates the following auditing event.

- pm-20.model.read

Request

Custom Headers

Accept

string

Allowable values: [application/zip , application/gzip , application/json , text/plain , application/xml]

Path Parameters

model_id

Required *

string

Model identifier.

Example: 63dc4cf1-252f-424b-b52d-5cdd9814987f

Query Parameters**version**

Required *

date

The version date for the API of the form YYYY-MM-DD .

Example: 2023-07-07

space_id

string

The space that contains the resource. Either space_id or project_id query parameter has to be given.

Possible values: length = 36, Value must match regular expression

[a-zA-Z0-9-]*

Example: 63dc4cf1-252f-424b-b52d-5cdd9814987f

project_id

string

The project that contains the resource. Either space_id or project_id query parameter has to be given.

Possible values: length = 36, Value must match regular expression

[a-zA-Z0-9-]*

Example: a77190a2-f52d-4f2a-be3d-7867b5f46edc

rev

string

The revision number of the resource.

Example: 2

pipeline_node_id

string

Returns only resources that match this pipeline_node_id , this is only relevant if content_format is pipeline-node .

Example: 62344cf1-252f-424b-b52d-5cdd9814aacd

deployment_id

string

Returns only resources that match this deployment_id , this is only relevant if content_format is coreml .

Example: 62344cf1-252f-424b-b52d-5cdd9814aacd

name

string

Match an attachment with this name.

Example: my_model

content_format

string

This is the format of the content. Any value can be used for the format and is there to be able to easily find content by format.

Example: native

Get request,

```
curl -X GET 'https://us-south.ml.cloud.ibm.com/ml/v4/models/:model_id/download?space_id=<string>&project_id=<string>&rev=<string>&pipeline_node_id=<string>&name=<string>&content_format=<string>&version=2020-09-01'
```

Response

Response Body
binary

Arbitrary **zip** file.

Status Code

200	Downloaded
400	Bad request, the response body should contain the reason.
401	Unauthorized.
403	Forbidden, an authentication error including trying to access an unauthorized space or project.
404	The specified resource was not found.

Example responses

Status 200

Create a new model definition

Create a new model definition with the given payload. A model definition represents the code that is used to train one or more models.

POST /ml/v4/model_definitions

Auditing

Calling this method generates the following auditing event.

- `pm-20.model_definition.create`

Request

Query Parameters	
<div>version Required * date</div>	<div>The version date for the API of the form <code>YYYY-MM-DD</code> . Example: <code>2023-07-07</code></div>
<div>Request Body Required * <code>model_definition_entity_request</code></div>	<div>Payload for creating the model definition. Either <code>space_id</code> or <code>project_id</code> has to be provided and is mandatory.</div>
<div>name Required * string</div>	<div>The name of the resource. Example: <code>my-resource</code></div>
<div>version Required * string</div>	<div>The package version.</div>
<div>platform Required * > <code>object</code></div>	
<div>project_id string</div>	<div>The project that contains the resource. Either <code>space_id</code> or <code>project_id</code> has to be given. Possible values: length = 36, Value must match regular expression <code>[a-zA-Z0-9-]*</code> Example: <code>12ac4cf1-252f-424b-b52d-5cdd9814987f</code></div>
<div>space_id string</div>	<div>The space that contains the resource. Either <code>space_id</code> or <code>project_id</code> has to be given. Possible values: length = 36, Value must match regular expression <code>[a-zA-Z0-9-]*</code> Example: <code>3fc54cf1-252f-424b-b52d-5cdd9814987f</code></div>

description

string

A description of the resource.

Example: `This is my first resource.`

tags

string[]

A list of tags for this resource.

Examples: [View](#)

command

string

The command used to run the model.

software_spec

A software specification.

> [software_spec_rel](#)

custom

User defined properties specified as key-value pairs.

Examples: [View](#)

> [object](#)

Post request,



```
curl -X POST 'https://us-south.ml.cloud.ibm.com/ml/v4/model_definitions?version=2020-09-01' --data-raw '{
  "name": "my-resource",
  "project_id": "12ac4cf1-252f-424b-b52d-5cdd9814987f",
  "space_id": "3fc54cf1-252f-424b-b52d-5cdd9814987f",
  "description": "This is my first resource.",
  "tags": [
    "t1",
    "t2"
  ],
  "version": "<string>",
  "platform": {
    "name": "<string>",
    "versions": [
      "<string>",
      "<string>"
    ]
  },
  "command": "<string>",
  "custom": "<object>"
}'
```

Response

Response Body	
model_definition_resource	The information for a model definition.
<hr/>	
metadata Always included *	Common metadata for a resource where <code>project_id</code> or <code>space_id</code> must be present. Examples: View
> ResourceMeta	
<hr/>	
entity Always included *	The definition of a model. The <code>software_spec</code> is used only for training. Either <code>space_id</code> or <code>project_id</code> has to be provided and is mandatory.
> model_definition_entity	
<hr/>	
system	Optional details coming from the service and related to the API call or the associated resource.
> SystemDetails	
<hr/>	
Status Code	
201	Model definition created
<hr/>	
400	Bad request, the response body should contain the reason.
<hr/>	
401	Unauthorized.
<hr/>	
403	Forbidden, an authentication error including trying to access an unauthorized space or project.
<hr/>	
404	The specified resource was not found.

No Sample Response

This method does not specify any sample responses.

Retrieve the model definitions

Retrieve the model definitions for the specified space or project.

```
GET /ml/v4/model_definitions
```



Auditing

Calling this method generates the following auditing event.

- `pm-20.model_definition.list`

Request

Query Parameters

version

Required *

date

The version date for the API of the form `YYYY-MM-DD`.

Example: `2023-07-07`

space_id

string

The space that contains the resource. Either `space_id` or `project_id` query parameter has to be given.

Possible values: length = 36, Value must match regular expression

`[a-zA-Z0-9-]*`

Example: `63dc4cf1-252f-424b-b52d-5cdd9814987f`

project_id

string

The project that contains the resource. Either `space_id` or `project_id` query parameter has to be given.

Possible values: length = 36, Value must match regular expression

`[a-zA-Z0-9-]*`

Example: `a77190a2-f52d-4f2a-be3d-7867b5f46edc`

start

string

Token required for token-based pagination. This token cannot be determined by end user. It is generated by the service and it is set in the href available in the `next` field.

limit

integer

How many resources should be returned. By default limit is 100. Max limit allowed is 200.

Possible values: $1 \leq \text{value} \leq 200$

Default: `100`

Example: `50`

tag.value

string

Return only the resources with the given tag values, separated by **or** or **and** to support multiple tags.

Example: `tf2.0 or tf2.1`

search

string

Returns only resources that match this search string. The path to the field must be the complete path to the field, and this field must be one of the indexed fields for this resource type. Note that the search string must be URL encoded.

Possible values: length ≥ 1

Get request,

```
curl -X GET 'https://us-south.ml.cloud.ibm.com/ml/v4/model_definitions?space_id=<string>&project_id=<string>&start=<string>&limit=100&tag.value=<string>&version=2020-09-01'
```

Response

Response Body`model_definition_resources`

A paginated list of model definitions.

limit

Always included *

integer

The number of items to return in each page.

Possible values: $1 \leq \text{value} \leq 200$

Example: `10`

first

Always included *

> [PaginationFirst](#)

The reference to the first item in the current page.

total_count

integer

The total number of resources. Computed explicitly only when 'total_count=true' query parameter is present. This is in order to avoid performance penalties.

Example: `1`

next

A reference to the first item of the next page, if any.

> [PaginationNext](#)

resources

A list of model definitions.

> [model_definition_resource\[\]](#)

system

Optional details coming from the service and related to the API call or the associated resource.

> [SystemDetails](#)

Status Code

200	OK
400	Bad request, the response body should contain the reason.
401	Unauthorized.
403	Forbidden, an authentication error including trying to access an unauthorized space or project.
404	The specified resource was not found.

No Sample Response

This method does not specify any sample responses.

Retrieve the model definition

Retrieve the model definition with the specified identifier. If `rev` query parameter is provided, `rev=latest` will fetch the latest revision. A call with `rev={revision_number}` will fetch the given revision_number record. Either `space_id` or `project_id` has to be provided and is mandatory.

```
GET /ml/v4/model_definitions/{model_definition_id}
```



Auditing

Calling this method generates the following auditing event.

- `pm-20.model_definition.read`

Request

Path Parameters

model_definition_id

Required *
string

Model definition identifier.

Example: `63dc4cf1-252f-424b-b52d-5cdd9814987f`

Query Parameters

version

Required *
date

The version date for the API of the form `YYYY-MM-DD`.

Example: `2023-07-07`

space_id

string

The space that contains the resource. Either `space_id` or `project_id` query parameter has to be given.

Possible values: length = 36, Value must match regular expression `[a-zA-Z0-9-]*`

Example: `63dc4cf1-252f-424b-b52d-5cdd9814987f`

project_id

string

The project that contains the resource. Either `space_id` or `project_id` query parameter has to be given.

Possible values: length = 36, Value must match regular expression `[a-zA-Z0-9-]*`

Example: `a77190a2-f52d-4f2a-be3d-7867b5f46edc`

rev

string

The revision number of the resource.

Example: `2`

Get request,

```
curl -X GET 'https://us-south.ml.cloud.ibm.com/ml/v4/model_definitions/:model_definition_id?space_id=<string>&project_id=<string>&rev=<string>&version=2020-09-01'
```

Response

Response Body	
model_definition_resource	The information for a model definition.
metadata Always included *	Common metadata for a resource where <code>project_id</code> or <code>space_id</code> must be present. Examples: View
> ResourceMeta	
entity Always included *	The definition of a model. The <code>software_spec</code> is used only for training. Either <code>space_id</code> or <code>project_id</code> has to be provided and is mandatory.
> model_definition_entity	
system	Optional details coming from the service and related to the API call or the associated resource.
> SystemDetails	
Status Code	
200	OK
400	Bad request, the response body should contain the reason.
401	Unauthorized.
403	Forbidden, an authentication error including trying to access an unauthorized space or project.
404	The specified resource was not found.

No Sample Response

This method does not specify any sample responses.

Update the model definition

Update the model definition with the provided patch data. The following fields can be patched:

- `/tags`
- `/name`
- `/description`
- `/custom`

```
PATCH /ml/v4/model_definitions/{model_definition_id}
```

Auditing

Calling this method generates the following auditing event.

- `pm-20.model_definition.update`

Request

Path Parameters	
model_definition_id Required * string	Model definition identifier. Example: <code>63dc4cf1-252f-424b-b52d-5cdd9814987f</code>
Query Parameters	
version Required * date	The version date for the API of the form <code>YYYY-MM-DD</code> . Example: <code>2023-07-07</code>
space_id string	The space that contains the resource. Either <code>space_id</code> or <code>project_id</code> query parameter has to be given. Possible values: length = 36, Value must match regular expression <code>[a-zA-Z0-9-]*</code> Example: <code>63dc4cf1-252f-424b-b52d-5cdd9814987f</code>
project_id string	The project that contains the resource. Either <code>space_id</code> or <code>project_id</code> query parameter has to be given. Possible values: length = 36, Value must match regular expression <code>[a-zA-Z0-9-]*</code>

Example: `a77190a2-f52d-4f2a-be3d-7867b5f46edc`

Request Body

Required *

`JsonPatchOperation[]`

Input For Patch. This is the patch body which corresponds to the JavaScript Object Notation (JSON) Patch standard (RFC 6902).

op

Required *

string

The operation to be performed.

Allowable values: [`add` , `remove` , `replace`]

path

Required *

string

The pointer that identifies the field that is the target of the operation.

value

string

The value to be used within the operation.

Patch request,

```
curl -X PATCH 'https://us-south.ml.cloud.ibm.com/ml/v4/model_definitions/:model_definition_id?space_id=<string>&project_id=<string>&version=2020-09-01' --data-raw '[
  {
    "op": "<string>",
    "path": "<string>",
    "value": "<object>"
  },
  {
    "op": "<string>",
    "path": "<string>",
    "value": "<object>"
  }
]'
```

Response

Response Body

`model_definition_resource`

The information for a model definition.

metadata

Always included *

Common metadata for a resource where `project_id` or `space_id` must be present.

Examples: [View](#)

> [ResourceMeta](#)

entity

Always included *

The definition of a model. The `software_spec` is used only for training. Either `space_id` or `project_id` has to be provided and is mandatory.

> [model_definition_entity](#)

system

Optional details coming from the service and related to the API call or the associated resource.

> [SystemDetails](#)

Status Code

200	Model definition has been patched successfully
400	Bad request, the response body should contain the reason.
401	Unauthorized.
403	Forbidden, an authentication error including trying to access an unauthorized space or project.
404	The specified resource was not found.

No Sample Response

This method does not specify any sample responses.

Delete the model definition

Delete the model definition with the specified identifier. This will delete all revisions of this model definition as well. For each revision all attachments will also be deleted.

DELETE /ml/v4/model_definitions/{model_definition_id}



Auditing

Calling this method generates the following auditing event.

- `pm-20.model_definition.delete`

Request

Path Parameters

model_definition_id

Required ^{*}
string

Model definition identifier.

Example: `63dc4cf1-252f-424b-b52d-5cdd9814987f`

Query Parameters

version

Required ^{*}
`date`

The version date for the API of the form `YYYY-MM-DD`.

Example: `2023-07-07`

space_id

string

The space that contains the resource. Either `space_id` or `project_id` query parameter has to be given.

Possible values: length = 36, Value must match regular expression `[a-zA-Z0-9-]*`

Example: `63dc4cf1-252f-424b-b52d-5cdd9814987f`

project_id

string

The project that contains the resource. Either `space_id` or `project_id` query parameter has to be given.

Possible values: length = 36, Value must match regular expression `[a-zA-Z0-9-]*`

Example: `a77190a2-f52d-4f2a-be3d-7867b5f46edc`

Delete request,



```
curl -X DELETE 'https://us-south.ml.cloud.ibm.com/ml/v4/model_definitions/:model_definition_id?space_id=<string>&project_id=<string>&version=2020-09-01'
```



Response

Status Code	
204	Model definition deleted
400	Bad request, the response body should contain the reason.
401	Unauthorized.
403	Forbidden, an authentication error including trying to access an unauthorized space or project.
404	The specified resource was not found.

No Sample Response

This method does not specify any sample responses.

Create a new model definition revision

Create a new model definition revision. The current metadata and content for `model_definition_id` will be taken and a new revision created. Either `space_id` or `project_id` has to be provided and is mandatory.

```
POST /ml/v4/model_definitions/{model_definition_id}/revisions
```



Auditing

Calling this method generates the following auditing event.

- `pm-20.model_definition.create`

Request

Path Parameters

model_definition_id

Required *

string

Model definition identifier.

Example: 63dc4cf1-252f-424b-b52d-5cdd9814987f

Query Parameters**version**

Required *

date

The version date for the API of the form YYYY-MM-DD .

Example: 2023-07-07

Request Body

Required *

model_definition_revision_entity_request

The details for the revision.

Examples: [View](#)**space_id**

string

The space that contains the resource. Either `space_id` or `project_id` has to be given.**Possible values:** length = 36, Value must match regular expression`[a-zA-Z0-9-]*`

Example: 3fc54cf1-252f-424b-b52d-5cdd9814987f

project_id

string

The project that contains the resource. Either `space_id` or `project_id` has to be given.**Possible values:** length = 36, Value must match regular expression`[a-zA-Z0-9-]*`

Example: 12ac4cf1-252f-424b-b52d-5cdd9814987f

commit_message

string

An optional commit message for the revision.

Post request,

```
curl -X POST 'https://us-south.ml.cloud.ibm.com/ml/v4/model_definitions/:model_definition_id/revisions?version=2020-09-01' --data-raw '{
  "space_id": "3fc54cf1-252f-424b-b52d-5cdd9814987f",
  "commit_message": "Updated for TF 2.0"
}'
```

Response

Response Body	
model_definition_resource	The information for a model definition.
metadata Always included *	Common metadata for a resource where <code>project_id</code> or <code>space_id</code> must be present. Examples: View > ResourceMeta
entity Always included *	The definition of a model. The <code>software_spec</code> is used only for training. Either <code>space_id</code> or <code>project_id</code> has to be provided and is mandatory. > model_definition_entity
system > SystemDetails	Optional details coming from the service and related to the API call or the associated resource.
Status Code	
201	Model definition revision created
400	Bad request, the response body should contain the reason.
401	Unauthorized.
403	Forbidden, an authentication error including trying to access an unauthorized space or project.
404	The specified resource was not found.

No Sample Response

This method does not specify any sample responses.

Retrieve the model definition revisions

Retrieve the model definition revisions.

GET /ml/v4/model_definitions/{model_definition_id}/revisions

Auditing

Calling this method generates the following auditing event.

- pm-20.model_definition.list

Request

Path Parameters	
model_definition_id Required * string	Model definition identifier. Example: 63dc4cf1-252f-424b-b52d-5cdd9814987f
Query Parameters	
version Required * date	The version date for the API of the form YYYY-MM-DD . Example: 2023-07-07
space_id string	The space that contains the resource. Either space_id or project_id query parameter has to be given. Possible values: length = 36, Value must match regular expression [a-zA-Z0-9-]* Example: 63dc4cf1-252f-424b-b52d-5cdd9814987f
project_id string	The project that contains the resource. Either space_id or project_id query parameter has to be given. Possible values: length = 36, Value must match regular expression [a-zA-Z0-9-]* Example: a77190a2-f52d-4f2a-be3d-7867b5f46edc
start string	Token required for token-based pagination. This token cannot be determined by end user. It is generated by the service and it is set in

the href available in the `next` field.

limit

integer

How many resources should be returned. By default limit is 100. Max limit allowed is 200.

Possible values: $1 \leq \text{value} \leq 200$

Default: `100`

Example: `50`

Get request,

```
curl -X GET 'https://us-south.ml.cloud.ibm.com/ml/v4/model_definitions/:model_definition_id/revisions?space_id=<string>&project_id=<string>&start=<string>&limit=100&version=2020-09-01'
```

Response

Response Body

`model_definition_resources`

A paginated list of model definitions.

limit

Always included *

integer

The number of items to return in each page.

Possible values: $1 \leq \text{value} \leq 200$

Example: `10`

first

Always included *

> [PaginationFirst](#)

The reference to the first item in the current page.

total_count

integer

The total number of resources. Computed explicitly only when 'total_count=true' query parameter is present. This is in order to avoid performance penalties.

Example: `1`

next

> [PaginationNext](#)

A reference to the first item of the next page, if any.

resources

A list of model definitions.

> [model_definition_resource\[\]](#)

system

Optional details coming from the service and related to the API call or the associated resource.

> [SystemDetails](#)

Status Code

200	Model definition revisions
400	Bad request, the response body should contain the reason.
401	Unauthorized.
403	Forbidden, an authentication error including trying to access an unauthorized space or project.
404	The specified resource was not found.

No Sample Response

This method does not specify any sample responses.

Upload the model definition model

Upload the model definition model. Model definitions for Deep Learning accept a zip file that contains one or more python files organized in any directory structure.

```
PUT /ml/v4/model_definitions/{model_definition_id}/model
```



Auditing

Calling this method generates the following auditing event.

- `pm-20.model_definition.add`

Request

Path Parameters

model_definition_id

Required *
string

Model definition identifier.

Example: 63dc4cf1-252f-424b-b52d-5cdd9814987f

Query Parameters

version

Required *
date

The version date for the API of the form YYYY-MM-DD .

Example: 2023-07-07

space_id

string

The space that contains the resource. Either space_id or project_id query parameter has to be given.

Possible values: length = 36, Value must match regular expression [a-zA-Z0-9-]*

Example: 63dc4cf1-252f-424b-b52d-5cdd9814987f

project_id

string

The project that contains the resource. Either space_id or project_id query parameter has to be given.

Possible values: length = 36, Value must match regular expression [a-zA-Z0-9-]*

Example: a77190a2-f52d-4f2a-be3d-7867b5f46edc

Request Body

Required *
application/gzip
binary

A gzip file containing code files.

Put request

```
curl -X PUT 'https://us-south.ml.cloud.ibm.com/ml/v4/model_definitions/:model_definition_id/model?space_id=<string>&project_id=<string>&version=2020-09-01'
```

Response

Response Body	
content_metadata	
The metadata related to the attachment.	
attachment_id Always included * string	The content id for the attachment. Example: <code>fd45606f-8098-459c-8961-32b136123fgc</code>
content_format Always included * string	The type of the content. Example: <code>native</code>
name string	The name of the attachment. Example: <code>my_attachment</code>
pipeline_node_id string	The <code>pipeline_node_id</code> that corresponds to this content. Example: <code>fg094cf1-252f-424b-b52d-5cdd981a981e</code>
deployment_id string	The <code>deployment_id</code> that corresponds to this content. Example: <code>12345cf1-252f-424b-b52d-5cdd981a1234</code>
persisted boolean	This will be set to <code>true</code> if the content has been persisted. If this content was part of the import process and the upload of the content failed then the message can be found in the <code>warnings</code> field of the <code>system_details</code> that are returned with the model details. Example: <code>true</code>
Status Code	
201	Model definition model uploaded
400	Bad request, the response body should contain the reason.
401	Unauthorized.
403	Forbidden, an authentication error including trying to access an unauthorized space or project.
404	The specified resource was not found.

This method does not specify any sample responses.

Download the model definition model

Download the model definition model. It is possible to get the `model` for a given revision of the `model definition`. Model definitions for Deep Learning accept a zip file that contains one or more python files organized in any directory structure.

```
GET /ml/v4/model_definitions/{model_definition_id}/model
```

Auditing

Calling this method generates the following auditing event.

- `pm-20.model_definition.read`

Request

Path Parameters	
model_definition_id Required * string	Model definition identifier. Example: <code>63dc4cf1-252f-424b-b52d-5cdd9814987f</code>
Query Parameters	
version Required * date	The version date for the API of the form <code>YYYY-MM-DD</code> . Example: <code>2023-07-07</code>
space_id string	The space that contains the resource. Either <code>space_id</code> or <code>project_id</code> query parameter has to be given. Possible values: length = 36, Value must match regular expression <code>[a-zA-Z0-9-]*</code> Example: <code>63dc4cf1-252f-424b-b52d-5cdd9814987f</code>
project_id string	The project that contains the resource. Either <code>space_id</code> or <code>project_id</code> query parameter has to be given.

Possible values: length = 36, Value must match regular expression

`[a-zA-Z0-9-]*`

Example: `a77190a2-f52d-4f2a-be3d-7867b5f46edc`

rev

string

The revision number of the resource.

Example: `2`

Get request,



```
curl -X GET 'https://us-south.ml.cloud.ibm.com/ml/v4/model_definitions/:model_definition_id/model?space_id=<string>&project_id=<string>&rev=<string>&version=2020-09-01'
```

Response

Response Body

binary

Status Code

200	OK.
400	Bad request, the response body should contain the reason.
401	Unauthorized.
403	Forbidden, an authentication error including trying to access an unauthorized space or project.
404	The specified resource was not found.

No Sample Response

This method does not specify any sample responses.

Create a new pipeline

Create a new pipeline with the given payload. A pipeline represents a hybrid-pipeline, as a JSON document, that is used to train one or more models.

POST /ml/v4/pipelines



Auditing

Calling this method generates the following auditing event.

- `pm-20.pipeline.create`

Request

Query Parameters

version

Required *

date

The version date for the API of the form `YYYY-MM-DD`.

Example: `2023-07-07`

Request Body

Required *

pipeline_entity_request

Payload for creating the pipeline. Either `space_id` or `project_id` has to be provided and is mandatory.

name

Required *

string

The name of the resource.

Example: `my-resource`

document

Required *

object

The pipeline document, see [pipeline-flow-v2-schema](#) for the schema definition.

project_id

string

The project that contains the resource. Either `space_id` or `project_id` has to be given.

Possible values: length = 36, Value must match regular expression

`[a-zA-Z0-9-]*`

Example: `12ac4cf1-252f-424b-b52d-5cdd9814987f`

space_id

The space that contains the resource. Either `space_id` or

string	<p><code>project_id</code> has to be given.</p> <p>Possible values: length = 36, Value must match regular expression <code>[a-zA-Z0-9-]*</code></p> <p>Example: <code>3fc54cf1-252f-424b-b52d-5cdd9814987f</code></p>
description string	<p>A description of the resource.</p> <p>Example: <code>This is my first resource.</code></p>
tags string[]	<p>A list of tags for this resource.</p> <p>Examples: View</p>
custom > object	<p>User defined properties specified as key-value pairs.</p> <p>Examples: View</p>

Post request,
^

```

curl -X POST 'https://us-south.ml.cloud.ibm.com/ml/v4/pipelines?
version=2020-09-01' --data-raw '{
  "name": "my-resource",
  "project_id": "12ac4cf1-252f-424b-b52d-5cdd9814987f",
  "space_id": "3fc54cf1-252f-424b-b52d-5cdd9814987f",
  "description": "This is my first resource.",
  "tags": [
    "t1",
    "t2"
  ],
  "document": "<object>",
  "custom": "<object>"
}'

```

Response

Response Body pipeline_resource	<p>The information for a pipeline.</p>
metadata Always included *	<p>Common metadata for a resource where <code>project_id</code> or <code>space_id</code> must be present.</p>

Examples: [View](#)

> [ResourceMeta](#)

entity

Always included *

The details of the pipeline to be created.

> [pipeline_entity](#)

system

Optional details coming from the service and related to the API call or the associated resource.

> [SystemDetails](#)

Status Code

201	Pipeline created
400	Bad request, the response body should contain the reason.
401	Unauthorized.
403	Forbidden, an authentication error including trying to access an unauthorized space or project.
404	The specified resource was not found.

No Sample Response

This method does not specify any sample responses.

Retrieve the pipelines

Retrieve the pipelines for the specified space or project.

```
GET /ml/v4/pipelines
```



Auditing

Calling this method generates the following auditing event.

- `pm-20.pipeline.list`

Request

Query Parameters

version

Required *

date

The version date for the API of the form `YYYY-MM-DD`.

Example: `2023-07-07`

space_id

string

The space that contains the resource. Either `space_id` or `project_id` query parameter has to be given.

Possible values: length = 36, Value must match regular expression `[a-zA-Z0-9-]*`

Example: `63dc4cf1-252f-424b-b52d-5cdd9814987f`

project_id

string

The project that contains the resource. Either `space_id` or `project_id` query parameter has to be given.

Possible values: length = 36, Value must match regular expression `[a-zA-Z0-9-]*`

Example: `a77190a2-f52d-4f2a-be3d-7867b5f46edc`

start

string

Token required for token-based pagination. This token cannot be determined by end user. It is generated by the service and it is set in the href available in the `next` field.

limit

integer

How many resources should be returned. By default limit is 100. Max limit allowed is 200.

Possible values: $1 \leq \text{value} \leq 200$

Default: `100`

Example: `50`

tag.value

string

Return only the resources with the given tag values, separated by `or` or `and` to support multiple tags.

Example: `tf2.0 or tf2.1`

search

string

Returns only resources that match this search string. The path to the field must be the complete path to the field, and this field must be one of the indexed fields for this resource type. Note that the search string must be URL encoded.

Possible values: length ≥ 1

Get request,

```
curl -X GET 'https://us-south.ml.cloud.ibm.com/ml/v4/pipelines?space_id=<string>&project_id=<string>&start=<string>&limit=100&tag.value=<string>&version=2020-09-01'
```

Response

Response Body pipeline_resources	A paginated list of pipelines.
limit Always included * integer	<p>The number of items to return in each page.</p> <p>Possible values: $1 \leq \text{value} \leq 200$</p> <p>Example: 10</p>
first Always included * > PaginationFirst	<p>The reference to the first item in the current page.</p>
total_count integer	<p>The total number of resources. Computed explicitly only when 'total_count=true' query parameter is present. This is in order to avoid performance penalties.</p> <p>Example: 1</p>
next > PaginationNext	<p>A reference to the first item of the next page, if any.</p>
resources > pipeline_resource[]	<p>A list of pipelines.</p>
system > SystemDetails	<p>Optional details coming from the service and related to the API call or the associated resource.</p>
Status Code	

200	OK
400	Bad request, the response body should contain the reason.
401	Unauthorized.
403	Forbidden, an authentication error including trying to access an unauthorized space or project.
404	The specified resource was not found.

No Sample Response

This method does not specify any sample responses.

Retrieve the pipeline

Retrieve the pipeline with the specified identifier. If `rev` query parameter is provided, `rev=latest` will fetch the latest revision. A call with `rev={revision_number}` will fetch the given revision_number record. Either `space_id` or `project_id` has to be provided and is mandatory.

GET /ml/v4/pipelines/{pipeline_id}

Auditing

Calling this method generates the following auditing event.

- `pm-20.pipeline.read`

Request

Path Parameters	
pipeline_id Required [*] string	Pipeline identifier. Example: <code>63dc4cf1-252f-424b-b52d-5cdd9814987f</code>

Query Parameters

version

Required *

date

The version date for the API of the form `YYYY-MM-DD`.

Example: `2023-07-07`

space_id

string

The space that contains the resource. Either `space_id` or `project_id` query parameter has to be given.

Possible values: length = 36, Value must match regular expression `[a-zA-Z0-9-]*`

Example: `63dc4cf1-252f-424b-b52d-5cdd9814987f`

project_id

string

The project that contains the resource. Either `space_id` or `project_id` query parameter has to be given.

Possible values: length = 36, Value must match regular expression `[a-zA-Z0-9-]*`

Example: `a77190a2-f52d-4f2a-be3d-7867b5f46edc`

rev

string

The revision number of the resource.

Example: `2`

Get request,

```
curl -X GET 'https://us-south.ml.cloud.ibm.com/ml/v4/pipelines/:pipeline_id?space_id=<string>&project_id=<string>&rev=<string>&version=2020-09-01'
```

Response

Response Body

pipeline_resource

The information for a pipeline.

metadata

Always included *

Common metadata for a resource where `project_id` or `space_id` must be present.

Examples: [View](#)

> [ResourceMeta](#)

entity

The details of the pipeline to be created.

Always included *

> [pipeline_entity](#)

system

Optional details coming from the service and related to the API call or the associated resource.

> [SystemDetails](#)

Status Code

200	OK
400	Bad request, the response body should contain the reason.
401	Unauthorized.
403	Forbidden, an authentication error including trying to access an unauthorized space or project.
404	The specified resource was not found.

No Sample Response

This method does not specify any sample responses.

Update the pipeline

Update the pipeline with the provided patch data. The following fields can be patched:

- [/tags](#)
- [/name](#)
- [/description](#)
- [/custom](#)

PATCH `/ml/v4/pipelines/{pipeline_id}`



Auditing

Calling this method generates the following auditing event.

- `pm-20.pipeline.update`

Request

Path Parameters	
pipeline_id Required * string	Pipeline identifier. Example: <code>63dc4cf1-252f-424b-b52d-5cdd9814987f</code>
Query Parameters	
version Required * date	The version date for the API of the form <code>YYYY-MM-DD</code> . Example: <code>2023-07-07</code>
space_id string	The space that contains the resource. Either <code>space_id</code> or <code>project_id</code> query parameter has to be given. Possible values: length = 36, Value must match regular expression <code>[a-zA-Z0-9-]*</code> Example: <code>63dc4cf1-252f-424b-b52d-5cdd9814987f</code>
project_id string	The project that contains the resource. Either <code>space_id</code> or <code>project_id</code> query parameter has to be given. Possible values: length = 36, Value must match regular expression <code>[a-zA-Z0-9-]*</code> Example: <code>a77190a2-f52d-4f2a-be3d-7867b5f46edc</code>
Request Body Required * <code>JsonPatchOperation[]</code>	Input For Patch. This is the patch body which corresponds to the JavaScript Object Notation (JSON) Patch standard (RFC 6902).
op Required * string	The operation to be performed. Allowable values: [<code>add</code> , <code>remove</code> , <code>replace</code>]
path	The pointer that identifies the field that is the target of the operation.

Required *

string

value

The value to be used within the operation.

string

Patch request,



```
curl -X PATCH 'https://us-south.ml.cloud.ibm.com/ml/v4/pipelines/:pipeline_id?space_id=
<string>&project_id=<string>&version=2020-09-01' --data-raw '[
  {
    "op": "<string>",
    "path": "<string>",
    "value": "<object>"
  },
  {
    "op": "<string>",
    "path": "<string>",
    "value": "<object>"
  }
]'
```

Response

Response Body

pipeline_resource

The information for a pipeline.

metadata

Always included *

Common metadata for a resource where `project_id` or `space_id` must be present.

Examples: [View](#)

> [ResourceMeta](#)

entity

Always included *

The details of the pipeline to be created.

> [pipeline_entity](#)

system

Optional details coming from the service and related to the API call or the associated resource.

Status Code

200	Pipeline has been patched successfully
400	Bad request, the response body should contain the reason.
401	Unauthorized.
403	Forbidden, an authentication error including trying to access an unauthorized space or project.
404	The specified resource was not found.

No Sample Response

This method does not specify any sample responses.

Delete the pipeline

Delete the pipeline with the specified identifier. This will delete all revisions of this pipeline as well. For each revision all attachments will also be deleted.

```
DELETE /ml/v4/pipelines/{pipeline_id}
```



Auditing

Calling this method generates the following auditing event.

- `pm-20.pipeline.delete`

Request

Path Parameters

pipeline_id	Pipeline identifier.
--------------------	----------------------

Required *
string

Example: 63dc4cf1-252f-424b-b52d-5cdd9814987f

Query Parameters

version

Required *
date

The version date for the API of the form YYYY-MM-DD .

Example: 2023-07-07

space_id

string

The space that contains the resource. Either space_id or project_id query parameter has to be given.

Possible values: length = 36, Value must match regular expression [a-zA-Z0-9-]*

Example: 63dc4cf1-252f-424b-b52d-5cdd9814987f

project_id

string

The project that contains the resource. Either space_id or project_id query parameter has to be given.

Possible values: length = 36, Value must match regular expression [a-zA-Z0-9-]*

Example: a77190a2-f52d-4f2a-be3d-7867b5f46edc

Delete request,



```
curl -X DELETE 'https://us-south.ml.cloud.ibm.com/ml/v4/pipelines/:pipeline_id?space_id=<string>&project_id=<string>&version=2020-09-01'
```

Response

Status Code

204	Pipeline deleted
400	Bad request, the response body should contain the reason.
401	Unauthorized.
403	Forbidden, an authentication error including trying to access an unauthorized space or project.

404

The specified resource was not found.

No Sample Response

This method does not specify any sample responses.

Create a new pipeline revision

Create a new pipeline revision. The current metadata and content for `pipeline_id` will be taken and a new revision created. Either `space_id` or `project_id` has to be provided and is mandatory.

POST `/ml/v4/pipelines/{pipeline_id}/revisions`



Auditing

Calling this method generates the following auditing event.

- `pm-20.pipeline.create`

Request

Path Parameters

pipeline_id

Required *

string

Pipeline identifier.

Example: `63dc4cf1-252f-424b-b52d-5cdd9814987f`

Query Parameters

version

Required *

date

The version date for the API of the form `YYYY-MM-DD`.

Example: `2023-07-07`

Request Body

The details for the revision.

Required [*] pipeline_revision_entity_request		Examples: View
space_id string	The space that contains the resource. Either <code>space_id</code> or <code>project_id</code> has to be given. Possible values: length = 36, Value must match regular expression <code>[a-zA-Z0-9-]*</code> Example: <code>3fc54cf1-252f-424b-b52d-5cdd9814987f</code>	
project_id string	The project that contains the resource. Either <code>space_id</code> or <code>project_id</code> has to be given. Possible values: length = 36, Value must match regular expression <code>[a-zA-Z0-9-]*</code> Example: <code>12ac4cf1-252f-424b-b52d-5cdd9814987f</code>	
commit_message string	An optional commit message for the revision.	

Post request, ^

```
curl -X POST 'https://us-south.ml.cloud.ibm.com/ml/v4/pipelines/:pipeline_id/revisions?version=2020-09-01' --data-raw '{
  "space_id": "3fc54cf1-252f-424b-b52d-5cdd9814987f",
  "commit_message": "Updated for TF 2.0"
}'
```

❏

Response

Response Body pipeline_resource	The information for a pipeline.
metadata Always included [*]	Common metadata for a resource where <code>project_id</code> or <code>space_id</code> must be present. Examples: View
> ResourceMeta	

entity

Always included *

> [pipeline_entity](#)

The details of the pipeline to be created.

system

Optional details coming from the service and related to the API call or the associated resource.

> [SystemDetails](#)**Status Code**

201	Pipeline revision created
400	Bad request, the response body should contain the reason.
401	Unauthorized.
403	Forbidden, an authentication error including trying to access an unauthorized space or project.
404	The specified resource was not found.

No Sample Response

This method does not specify any sample responses.

Retrieve the pipeline revisions

Retrieve the pipeline revisions.

GET /ml/v4/pipelines/{pipeline_id}/revisions



Auditing

Calling this method generates the following auditing event.

- `pm-20.pipeline.list`

Request

Path Parameters

pipeline_id

Required *

string

Pipeline identifier.

Example: `63dc4cf1-252f-424b-b52d-5cdd9814987f`

Query Parameters

version

Required *

date

The version date for the API of the form `YYYY-MM-DD`.

Example: `2023-07-07`

space_id

string

The space that contains the resource. Either `space_id` or `project_id` query parameter has to be given.

Possible values: length = 36, Value must match regular expression `[a-zA-Z0-9-]*`

Example: `63dc4cf1-252f-424b-b52d-5cdd9814987f`

project_id

string

The project that contains the resource. Either `space_id` or `project_id` query parameter has to be given.

Possible values: length = 36, Value must match regular expression `[a-zA-Z0-9-]*`

Example: `a77190a2-f52d-4f2a-be3d-7867b5f46edc`

start

string

Token required for token-based pagination. This token cannot be determined by end user. It is generated by the service and it is set in the href available in the `next` field.

limit

integer

How many resources should be returned. By default limit is 100. Max limit allowed is 200.

Possible values: $1 \leq \text{value} \leq 200$

Default: `100`

Example: `50`



```
curl -X GET 'https://us-south.ml.cloud.ibm.com/ml/v4/pipelines/:pipeline_id/revisions?space_id=<string>&project_id=<string>&start=<string>&limit=100&version=2020-09-01'
```

Response

Response Body	
pipeline_resources	A paginated list of pipelines.
limit Always included * integer	<p>The number of items to return in each page.</p> <p>Possible values: $1 \leq \text{value} \leq 200$</p> <p>Example: 10</p>
first Always included * > PaginationFirst	<p>The reference to the first item in the current page.</p>
total_count integer	<p>The total number of resources. Computed explicitly only when 'total_count=true' query parameter is present. This is in order to avoid performance penalties.</p> <p>Example: 1</p>
next > PaginationNext	<p>A reference to the first item of the next page, if any.</p>
resources > pipeline_resource[]	<p>A list of pipelines.</p>
system > SystemDetails	<p>Optional details coming from the service and related to the API call or the associated resource.</p>
Status Code	
200	Pipeline revisions
400	Bad request, the response body should contain the reason.

401	Unauthorized.
403	Forbidden, an authentication error including trying to access an unauthorized space or project.
404	The specified resource was not found.

No Sample Response

This method does not specify any sample responses.

Create a new remote training system

Create a new remote training system with the given payload. A remote training system represents a remote system used by Federated Learning. This definition is necessary to control who can register to a federated learning job.

POST /ml/v4/remote_training_systems



Auditing

Calling this method generates the following auditing event.

- `pm-20.remote_training_system.create`

Request

Query Parameters	
version Required * date	The version date for the API of the form <code>YYYY-MM-DD</code> . Example: <code>2023-07-07</code>
Request Body Required * <code>remote_training_system_entity_request</code>	Payload for creating the remote training system. Either <code>space_id</code> or <code>project_id</code> has to be provided and is mandatory.

name

Required ^{*}
string

The name of the resource.

Example: `my-resource`

allowed_identities

Required ^{*}

The list of allowed identities that are allowed to access the remote system.

> [allowed_identity\[\]](#)

project_id

string

The project that contains the resource. Either `space_id` or `project_id` has to be given.

Possible values: length = 36, Value must match regular expression `[a-zA-Z0-9-]*`

Example: `12ac4cf1-252f-424b-b52d-5cdd9814987f`

space_id

string

The space that contains the resource. Either `space_id` or `project_id` has to be given.

Possible values: length = 36, Value must match regular expression `[a-zA-Z0-9-]*`

Example: `3fc54cf1-252f-424b-b52d-5cdd9814987f`

description

string

A description of the resource.

Example: `This is my first resource.`

tags

string[]

A list of tags for this resource.

Examples: [View](#)

organization

> [organization](#)

A remote organization.

remote_admin

> [remote_admin](#)

The details of the remote administrator for the organization and identities.

custom

> [object](#)

User defined properties specified as key-value pairs.

Examples: [View](#)

Response

Response Body	
<code>remote_training_system_resource</code>	The information for a remote training system.
<hr/>	
metadata Always included *	Common metadata for a resource where <code>project_id</code> or <code>space_id</code> must be present. Examples: View
> ResourceMeta	
<hr/>	
entity Always included *	The definition of a remote system used by Federated Learning.
> remote_training_system_entity	
<hr/>	
system	Optional details coming from the service and related to the API call or the associated resource.
> SystemDetails	
<hr/>	
Status Code	
201	Remote training system created
<hr/>	
400	Bad request, the response body should contain the reason.
<hr/>	
401	Unauthorized.
<hr/>	
403	Forbidden, an authentication error including trying to access an unauthorized space or project.
<hr/>	
404	The specified resource was not found.

No Sample Response

This method does not specify any sample responses.

Retrieve the remote training systems

Retrieve the remote training systems for the specified space or project.

```
GET /ml/v4/remote_training_systems
```



Auditing

Calling this method generates the following auditing event.

- `pm-20.remote_training_system.list`

Request

Query Parameters

version

Required *

date

The version date for the API of the form `YYYY-MM-DD`.

Example: `2023-07-07`

space_id

string

The space that contains the resource. Either `space_id` or `project_id` query parameter has to be given.

Possible values: length = 36, Value must match regular expression

`[a-zA-Z0-9-]*`

Example: `63dc4cf1-252f-424b-b52d-5cdd9814987f`

project_id

string

The project that contains the resource. Either `space_id` or `project_id` query parameter has to be given.

Possible values: length = 36, Value must match regular expression

`[a-zA-Z0-9-]*`

Example: `a77190a2-f52d-4f2a-be3d-7867b5f46edc`

start

string

Token required for token-based pagination. This token cannot be determined by end user. It is generated by the service and it is set in the href available in the `next` field.

limit

integer

How many resources should be returned. By default limit is 100. Max limit allowed is 200.

Possible values: $1 \leq \text{value} \leq 200$

Default: `100`

Example: `50`

tag.value

string

Return only the resources with the given tag values, separated by `or` or `and` to support multiple tags.

Example: `tf2.0 or tf2.1`

search

string

Returns only resources that match this search string. The path to the field must be the complete path to the field, and this field must be one of the indexed fields for this resource type. Note that the search string must be URL encoded.

Possible values: length ≥ 1

Response

Response Body`remote_training_system_resources`

A paginated list of remote training systems.

limit

Always included *

integer

The number of items to return in each page.

Possible values: $1 \leq \text{value} \leq 200$

Example: `10`

first

Always included *

> [PaginationFirst](#)

The reference to the first item in the current page.

total_count

integer

The total number of resources. Computed explicitly only when 'total_count=true' query parameter is present. This is in order to avoid performance penalties.

Example: `1`

next

> [PaginationNext](#)

A reference to the first item of the next page, if any.

resources

> [remote_training_system_resource\[\]](#)

A list of remote training systems.

system

Optional details coming from the service and related to the API call or the associated resource.

Status Code

200	OK
400	Bad request, the response body should contain the reason.
401	Unauthorized.
403	Forbidden, an authentication error including trying to access an unauthorized space or project.
404	The specified resource was not found.

No Sample Response

This method does not specify any sample responses.

Retrieve the remote training system

Retrieve the remote training system with the specified identifier. If `rev` query parameter is provided, `rev=latest` will fetch the latest revision. A call with `rev={revision_number}` will fetch the given revision_number record. Either `space_id` or `project_id` has to be provided and is mandatory.

```
GET /ml/v4/remote_training_systems/{remote_training_system_id}
```



Auditing

Calling this method generates the following auditing event.

- `pm-20.remote_training_system.read`

Request

Path Parameters

remote_training_system_id Required [*] string	Remote training system identifier. Example: 3067fdf1-252f-424b-b52d-5cdd981cae3
Query Parameters	
version Required [*] date	The version date for the API of the form YYYY-MM-DD . Example: 2023-07-07
space_id string	The space that contains the resource. Either space_id or project_id query parameter has to be given. Possible values: length = 36, Value must match regular expression [a-zA-Z0-9-]* Example: 63dc4cf1-252f-424b-b52d-5cdd9814987f
project_id string	The project that contains the resource. Either space_id or project_id query parameter has to be given. Possible values: length = 36, Value must match regular expression [a-zA-Z0-9-]* Example: a77190a2-f52d-4f2a-be3d-7867b5f46edc
rev string	The revision number of the resource. Example: 2

Response

Response Body remote_training_system_resource	The information for a remote training system.
metadata Always included [*]	Common metadata for a resource where project_id or space_id must be present. Examples: View
> ResourceMeta	

entity

The definition of a remote system used by Federated Learning.

Always included *

> [remote_training_system_entity](#)

system

Optional details coming from the service and related to the API call or the associated resource.

> [SystemDetails](#)

Status Code

200	OK
400	Bad request, the response body should contain the reason.
401	Unauthorized.
403	Forbidden, an authentication error including trying to access an unauthorized space or project.
404	The specified resource was not found.

No Sample Response

This method does not specify any sample responses.

Update the remote training system

Update the remote training system with the provided patch data. The following fields can be patched:

- [/tags](#)
- [/name](#)
- [/description](#)
- [/custom](#)
- [/organization](#)
- [/allowed_identities](#)
- [/remote_admin](#)

Auditing

Calling this method generates the following auditing event.

- `pm-20.remote_training_system.update`

Request

Path Parameters

remote_training_system_id

Required *

string

Remote training system identifier.

Example: `3067fdf1-252f-424b-b52d-5cdd981cae3`

Query Parameters

version

Required *

date

The version date for the API of the form `YYYY-MM-DD`.

Example: `2023-07-07`

space_id

string

The space that contains the resource. Either `space_id` or `project_id` query parameter has to be given.

Possible values: length = 36, Value must match regular expression `[a-zA-Z0-9-]*`

Example: `63dc4cf1-252f-424b-b52d-5cdd9814987f`

project_id

string

The project that contains the resource. Either `space_id` or `project_id` query parameter has to be given.

Possible values: length = 36, Value must match regular expression `[a-zA-Z0-9-]*`

Example: `a77190a2-f52d-4f2a-be3d-7867b5f46edc`

Request Body

Required *

`JsonPatchOperation[]`

Input For Patch. This is the patch body which corresponds to the JavaScript Object Notation (JSON) Patch standard (RFC 6902).

op

The operation to be performed.

Required *	Allowable values: [<code>add</code> , <code>remove</code> , <code>replace</code>]
string	
path	The pointer that identifies the field that is the target of the operation.
Required *	
string	
value	The value to be used within the operation.
string	

Response

Response Body	The information for a remote training system.
<code>remote_training_system_resource</code>	
metadata	Common metadata for a resource where <code>project_id</code> or <code>space_id</code> must be present.
Always included *	Examples: View
> ResourceMeta	
entity	The definition of a remote system used by Federated Learning.
Always included *	
> remote_training_system_entity	
system	Optional details coming from the service and related to the API call or the associated resource.
> SystemDetails	
Status Code	
200	Remote training system has been patched successfully
400	Bad request, the response body should contain the reason.
401	Unauthorized.
403	Forbidden, an authentication error including trying to access an unauthorized space or project.

No Sample Response

This method does not specify any sample responses.

Delete the remote training system

Delete the remote training system with the specified identifier. This will delete all revisions of this remote training system as well. For each revision all attachments will also be deleted.

```
DELETE /ml/v4/remote_training_systems/{remote_training_system_id}
```



Auditing

Calling this method generates the following auditing event.

- `pm-20.remote_training_system.delete`

Request

Path Parameters

remote_training_system_id

Required *

string

Remote training system identifier.

Example: `3067fdf1-252f-424b-b52d-5cdd981cae3`

Query Parameters

version

Required *

date

The version date for the API of the form `YYYY-MM-DD`.

Example: `2023-07-07`

space_id

string

The space that contains the resource. Either `space_id` or `project_id` query parameter has to be given.

Possible values: length = 36, Value must match regular expression

[a-zA-Z0-9-]*

Example: 63dc4cf1-252f-424b-b52d-5cdd9814987f

project_id

string

The project that contains the resource. Either `space_id` or `project_id` query parameter has to be given.

Possible values: length = 36, Value must match regular expression

[a-zA-Z0-9-]*

Example: a77190a2-f52d-4f2a-be3d-7867b5f46edc

Response

Status Code	
204	Remote training system deleted
400	Bad request, the response body should contain the reason.
401	Unauthorized.
403	Forbidden, an authentication error including trying to access an unauthorized space or project.
404	The specified resource was not found.

No Sample Response

This method does not specify any sample responses.

Create a new remote training system revision

Create a new remote training system revision. The current metadata and content for `remote_training_system_id` will be taken and a new revision created. Either `space_id` or `project_id` has to be provided and is mandatory.

POST

/ml/v4/remote_training_systems/{remote_training_system_id}/revisions



Auditing

Calling this method generates the following auditing event.

- `pm-20.remote_training_system.create`

Request

Path Parameters

remote_training_system_id

Required *
string

Remote training system identifier.

Example: `3067fdf1-252f-424b-b52d-5cdd981cae3`

Query Parameters

version

Required *
date

The version date for the API of the form `YYYY-MM-DD`.

Example: `2023-07-07`

Request Body

Required *

`remote_training_system_revision_entity_request`

The details for the revision.

Examples: [View](#)

space_id

string

The space that contains the resource. Either `space_id` or `project_id` has to be given.

Possible values: length = 36, Value must match regular expression `[a-zA-Z0-9-]*`

Example: `3fc54cf1-252f-424b-b52d-5cdd9814987f`

project_id

string

The project that contains the resource. Either `space_id` or `project_id` has to be given.

Possible values: length = 36, Value must match regular expression `[a-zA-Z0-9-]*`

Example: `12ac4cf1-252f-424b-b52d-5cdd9814987f`

commit_message

An optional commit message for the revision.

string

Response

Response Body	
remote_training_system_resource	The information for a remote training system.
metadata Always included *	Common metadata for a resource where <code>project_id</code> or <code>space_id</code> must be present. Examples: View
> ResourceMeta	
entity Always included *	The definition of a remote system used by Federated Learning.
> remote_training_system_entity	
system	Optional details coming from the service and related to the API call or the associated resource.
> SystemDetails	
Status Code	
201	Remote training system revision created
400	Bad request, the response body should contain the reason.
401	Unauthorized.
403	Forbidden, an authentication error including trying to access an unauthorized space or project.
404	The specified resource was not found.

No Sample Response

This method does not specify any sample responses.

Retrieve the remote training system revisions

Retrieve the remote training system revisions.

GET

/ml/v4/remote_training_systems/{remote_training_system_id}/revisions

Auditing

Calling this method generates the following auditing event.

- `pm-20.remote_training_system.list`

Request

Path Parameters	
<div>remote_training_system_id Required * string</div>	<div>Remote training system identifier.</div> <div>Example: <code>3067fdf1-252f-424b-b52d-5cdd981cae3</code></div>
Query Parameters	
<div>version Required * date</div>	<div>The version date for the API of the form <code>YYYY-MM-DD</code>.</div> <div>Example: <code>2023-07-07</code></div>
<div>space_id string</div>	<div>The space that contains the resource. Either <code>space_id</code> or <code>project_id</code> query parameter has to be given.</div> <div>Possible values: length = 36, Value must match regular expression <code>[a-zA-Z0-9-]*</code></div> <div>Example: <code>63dc4cf1-252f-424b-b52d-5cdd9814987f</code></div>
<div>project_id string</div>	<div>The project that contains the resource. Either <code>space_id</code> or <code>project_id</code> query parameter has to be given.</div> <div>Possible values: length = 36, Value must match regular expression <code>[a-zA-Z0-9-]*</code></div>

Example: `a77190a2-f52d-4f2a-be3d-7867b5f46edc`

start

string

Token required for token-based pagination. This token cannot be determined by end user. It is generated by the service and it is set in the href available in the `next` field.

limit

integer

How many resources should be returned. By default limit is 100. Max limit allowed is 200.

Possible values: $1 \leq \text{value} \leq 200$

Default: `100`

Example: `50`

Response

Response Body

`remote_training_system_resources`

A paginated list of remote training systems.

limit

Always included *

integer

The number of items to return in each page.

Possible values: $1 \leq \text{value} \leq 200$

Example: `10`

first

Always included *

> [PaginationFirst](#)

The reference to the first item in the current page.

total_count

integer

The total number of resources. Computed explicitly only when 'total_count=true' query parameter is present. This is in order to avoid performance penalties.

Example: `1`

next

> [PaginationNext](#)

A reference to the first item of the next page, if any.

resources

> [remote_training_system_resource\[\]](#)

A list of remote training systems.

system

Optional details coming from the service and related to the API call or the associated resource.

> [SystemDetails](#)

Status Code

200	Remote training system revisions
400	Bad request, the response body should contain the reason.
401	Unauthorized.
403	Forbidden, an authentication error including trying to access an unauthorized space or project.
404	The specified resource was not found.

No Sample Response

This method does not specify any sample responses.

Create a new WML training

Create a new WML training.

POST /ml/v4/trainings



Request

Query Parameters

version

Required *

date

The version date for the API of the form `YYYY-MM-DD`.

Example: `2023-07-07`

Request Body

Required *

`training_resource_entity_request`

The `training_data_references` contain the training datasets and the `results_reference` the connection where results will be stored.

`results_reference`

Required *

> [ObjectLocation](#)

The training results.

`experiment`

> [Rel](#)

A reference to a resource.

`pipeline`

> [pipeline_rel](#)

A pipeline. The `hardware_spec` is a reference to the hardware specification. The `hybrid_pipeline_hardware_specs` are used only when training a hybrid pipeline in order to specify compute requirement for each pipeline node.

`model_definition`

> [model_definition_rel](#)

A model. The `software_spec` is a reference to a software specification. The `hardware_spec` is a reference to a hardware specification.

`federated_learning`

> [federated_learning](#)

Federated Learning.

`training_data_references`

> [DataConnectionReference\[\]](#)

Training datasets.

`test_data_references`

> [DataConnectionReference\[\]](#)

The holdout/test datasets.

`custom`

> [object](#)

User defined properties specified as key-value pairs.

Examples: [View](#)

`tags`

`string[]`

A list of tags for this resource.

Examples: [View](#)

`name`

`string`

The name of the training.

Example: `my-training`

description

string

A description of the training.

Example: `My first training.`

space_id

string

The space that contains the resource. Either `space_id` or `project_id` has to be given.

Possible values: length = 36, Value must match regular expression `[a-zA-Z0-9-]*`

Example: `3fc54cf1-252f-424b-b52d-5cdd9814987f`

project_id

string

The project that contains the resource. Either `space_id` or `project_id` has to be given.

Possible values: length = 36, Value must match regular expression `[a-zA-Z0-9-]*`

Example: `12ac4cf1-252f-424b-b52d-5cdd9814987f`

post request,



```
curl --location --request POST 'https://us-south.ml.cloud.ibm.com/ml/v4/trainings?version=%3Cdate%3E' --data-raw '{
  "experiment": {
    "id": "4cedab6d-e8e4-4214-b81a-2ddb122db2ab",
    "rev": "2"
  },
  "pipeline": {
    "id": "4cedab6d-e8e4-4214-b81a-2ddb122db2ab",
    "rev": "2",
    "model_type": "<string>",
    "data_bindings": [
      {
        "data_reference_name": "<string>",
        "node_id": "<string>"
      },
      {
        "data_reference_name": "<string>",
        "node_id": "<string>"
      }
    ],
    "nodes_parameters": [
      {
        "node_id": "<string>",
        "parameters": "<object>"
      }
    ]
  }
}
```

```

    },
    {
        "node_id": "<string>",
        "parameters": "<object>"
    }
],
"hardware_spec": {
    "id": "4cedab6d-e8e4-4214-b81a-2ddb122db2ab",
    "rev": "2",
    "name": "<string>",
    "num_nodes": "<integer>"
},
"hybrid_pipeline_hardware_specs": [
    {
        "node_runtime_id": "auto_ai.kb",
        "hardware_spec": {
            "id": "4cedab6d-e8e4-4214-b81a-2ddb122db2ab",
            "rev": "2",
            "name": "<string>",
            "num_nodes": "<integer>"
        }
    },
    {
        "node_runtime_id": "auto_ai.kb",
        "hardware_spec": {
            "id": "4cedab6d-e8e4-4214-b81a-2ddb122db2ab",
            "rev": "2",
            "name": "<string>",
            "num_nodes": "<integer>"
        }
    }
],
"model_definition": {
    "id": "4cedab6d-e8e4-4214-b81a-2ddb122db2ab",
    "rev": "2",
    "model_type": "<string>",
    "hardware_spec": {
        "id": "4cedab6d-e8e4-4214-b81a-2ddb122db2ab",
        "rev": "2",
        "name": "<string>",
        "num_nodes": "<integer>"
    },
    "software_spec": {
        "id": "4cedab6d-e8e4-4214-b81a-2ddb122db2ab",
        "rev": "2",
        "name": "..."
    },
    "command": "<string>",

```

```

    "parameters": "<object>"
  },
  "training_data_references": [
    {
      "type": "<string>",
      "id": "<string>",
      "connection": "<object>",
      "location": "<object>",
      "schema": {
        "id": "<string>",
        "fields": [
          { "name": "duration",
            "type": "number" }
        ],
        "name": "<string>"
      }
    },
    {
      "type": "<string>",
      "id": "<string>",
      "connection": "<object>",
      "location": "<object>",
      "schema": {
        "id": "<string>",
        "fields": [
          { "name": "duration",
            "type": "number" }
        ],
        "name": "<string>"
      }
    }
  ],
  "results_reference": {
    "type": "<string>",
    "location": "<object>",
    "id": "<string>",
    "connection": "<object>"
  },
  "tags": [
    "t1",
    "t2"
  ],
  "name": "my-training",
  "description": "My first training.",
  "space_id": "3fc54cf1-252f-424b-b52d-5cdd9814987f",
  "project_id": "12ac4cf1-252f-424b-b52d-5cdd9814987f"
}

```

Response

Response Body	
training_resource	Training resource.
metadata	Common metadata for a resource where <code>project_id</code> or <code>space_id</code> must be present. Examples: View > ResourceMeta
entity	The <code>training_data_references</code> contain the training datasets and the <code>results_reference</code> the connection where results will be stored. > training_resource_entity
system	Optional details coming from the service and related to the API call or the associated resource. > SystemDetails
Status Code	
201	The training job has been created.
400	Bad request, the response body should contain the reason.
401	Unauthorized.
403	Forbidden, an authentication error including trying to access an unauthorized space or project.
404	The specified resource was not found.

No Sample Response

This method does not specify any sample responses.

Retrieve the list of trainings

Retrieve the list of trainings for the specified space or project.

GET /ml/v4/trainings



Request

Query Parameters

version

Required *
date

The version date for the API of the form `YYYY-MM-DD`.

Example: `2023-07-07`

start

string

Token required for token-based pagination. This token cannot be determined by end user. It is generated by the service and it is set in the href available in the `next` field.

limit

integer

How many resources should be returned. Default value is 100. Max value is 200.

Default: `100`

total_count

boolean

Compute the total count. May have performance impact.

tag.value

string

Return only the resources with the given tag value.

type

string

Filter based on 'pipeline' or 'experiment' trainings. Example: `type=pipeline`. If not provided, returns all the trainings.

state

string

Filter based on on the training job state: queued, running, completed, failed etc.

space_id

string

The space that contains the resource. Either `space_id` or `project_id` query parameter has to be given.

Possible values: length = 36, Value must match regular expression `[a-zA-Z0-9-]*`

Example: `63dc4cf1-252f-424b-b52d-5cdd9814987f`

project_id

The project that contains the resource. Either `space_id` or

string

`project_id` query parameter has to be given.

Possible values: length = 36, Value must match regular expression

`[a-zA-Z0-9-]*`

Example: `a77190a2-f52d-4f2a-be3d-7867b5f46edc`

parent_id

string

Return the training jobs that are sub-jobs of this parent_id job. The parent_id can be the experiment job ID.

Get request,

```
curl --location --request GET 'https://us-south.ml.cloud.ibm.com/ml/v4/trainings?start=<string>&limit=100&total_count=<boolean>&tag.value=<string>&type=<string>&state=<string>&space_id=<string>&project_id=<string>&parent_id=<string>&version=<string>'
```

Response

Response Body

training_resources

Information for paging when querying resources.

limit

Always included *

integer

The number of items to return in each page.

Possible values: $1 \leq \text{value} \leq 200$

Example: `10`

first

Always included *

> [PaginationFirst](#)

The reference to the first item in the current page.

total_count

integer

The total number of resources. Computed explicitly only when 'total_count=true' query parameter is present. This is in order to avoid performance penalties.

Example: `1`

next

> [PaginationNext](#)

A reference to the first item of the next page, if any.

resources

Training resource.

> [training_resource\[\]](#)

system

Optional details coming from the service and related to the API call or the associated resource.

> [SystemDetails](#)

Status Code

200	OK.
400	Bad request, the response body should contain the reason.
401	Unauthorized.
403	Forbidden, an authentication error including trying to access an unauthorized space or project.
404	The specified resource was not found.

No Sample Response

This method does not specify any sample responses.

Retrieve the training

Retrieve the training with the specified identifier. This call supports Web-Socket upgrade. However in order to preserve bandwidth, web-socket messages are not context complete. Meaning that a single web-socket message only reflects a message or metric happening in the context of a training job or sub-job (in case of experiment trainings or HPO/AutoML trainings). Hence the metadata property of a web-socket message contains a parent with the href information of the parent job that triggered this particular job. Also the metrics will be provided as they arrive from the backend runtime, and not as a cumulative list. In order to get the full view of the running training job the caller should do a regular GET call.

```
GET /ml/v4/trainings/{training_id}
```



Request

Path Parameters

training_id

Required *

string

The training identifier.

Query Parameters

version

Required *

date

The version date for the API of the form `YYYY-MM-DD`.

Example: `2023-07-07`

space_id

string

The space that contains the resource. Either `space_id` or `project_id` query parameter has to be given.

Possible values: length = 36, Value must match regular expression

`[a-zA-Z0-9-]*`

Example: `63dc4cf1-252f-424b-b52d-5cdd9814987f`

project_id

string

The project that contains the resource. Either `space_id` or `project_id` query parameter has to be given.

Possible values: length = 36, Value must match regular expression

`[a-zA-Z0-9-]*`

Example: `a77190a2-f52d-4f2a-be3d-7867b5f46edc`

Get request,

```
curl --location --request GET 'https://us-south.ml.cloud.ibm.com/ml/v4/trainings?start=<string>&limit=100&total_count=<boolean>&tag.value=<string>&type=<string>&state=<string>&space_id=<string>&project_id=<string>&parent_id=<string>&version=2020-09-01'
```

Response

Response Body

training_resource

Training resource.

metadata

Common metadata for a resource where `project_id` or `space_id` must be present.

Examples: [View](#)

> [ResourceMeta](#)

entity

The `training_data_references` contain the training datasets and the `results_reference` the connection where results will be stored.

> [training_resource_entity](#)

system

Optional details coming from the service and related to the API call or the associated resource.

> [SystemDetails](#)

Status Code

101	In case of web socket upgrade, the service messages emitted have the following shape.
200	OK.
400	Bad request, the response body should contain the reason.
401	Unauthorized.
403	Forbidden, an authentication error including trying to access an unauthorized space or project.
404	The specified resource was not found.

No Sample Response

This method does not specify any sample responses.

Cancel the training

Cancel the specified training and remove it.

```
DELETE /ml/v4/trainings/{training_id}
```



Request

Path Parameters

training_id

Required *

string

The training identifier.

Query Parameters

version

Required *

date

The version date for the API of the form `YYYY-MM-DD`.

Example: `2023-07-07`

space_id

string

The space that contains the resource. Either `space_id` or `project_id` query parameter has to be given.

Possible values: length = 36, Value must match regular expression `[a-zA-Z0-9-]*`

Example: `63dc4cf1-252f-424b-b52d-5cdd9814987f`

project_id

string

The project that contains the resource. Either `space_id` or `project_id` query parameter has to be given.

Possible values: length = 36, Value must match regular expression `[a-zA-Z0-9-]*`

Example: `a77190a2-f52d-4f2a-be3d-7867b5f46edc`

hard_delete

boolean

Set to true in order to also delete the job metadata information.

Delete request,



```
curl --location --request DELETE 'https://us-south.ml.cloud.ibm.com/ml/v4/trainings/:training_id?hard_delete=<boolean>&version=2020-09-01&space_id=<string>&project_id=<string>'
```



Response

Status Code	
204	Training cancelled.
400	Bad request, the response body should contain the reason.
401	Unauthorized.
403	Forbidden, an authentication error including trying to access an unauthorized space or project.
404	The specified resource was not found.

No Sample Response

This method does not specify any sample responses.

Create a new training definition

Create a new training definition with the given payload. A training definition represents the training meta-data necessary to start a training job.

POST /ml/v4/training_definitions



Auditing

Calling this method generates the following auditing event.

- pm-20.training_definition.create

Request

Query Parameters

version

Required *

date

The version date for the API of the form YYYY-MM-DD .

Example: 2023-07-07

Request Body

Required *

training_definition_entity_request

Payload for creating the training definition. Either `space_id` or `project_id` has to be provided and is mandatory.

name

Required *

string

The name of the resource.

Example: my-resource

results_reference

Required *

> [ObjectLocation](#)

The training results.

project_id

string

The project that contains the resource. Either `space_id` or `project_id` has to be given.

Possible values: length = 36, Value must match regular expression `[a-zA-Z0-9-]*`

Example: 12ac4cf1-252f-424b-b52d-5cdd9814987f

space_id

string

The space that contains the resource. Either `space_id` or `project_id` has to be given.

Possible values: length = 36, Value must match regular expression `[a-zA-Z0-9-]*`

Example: 3fc54cf1-252f-424b-b52d-5cdd9814987f

description

string

A description of the resource.

Example: This is my first resource.

tags

string[]

A list of tags for this resource.

Examples: [View](#)

experiment

> [Rel](#)

A reference to a resource.

pipeline

A pipeline. The `hardware_spec` is a reference to the hardware specification. The `hybrid_pipeline_hardware_specs` are used only when training a hybrid pipeline in order to specify compute requirement for each pipeline node.

> [pipeline_rel](#)

model_definition

A model. The `software_spec` is a reference to a software specification. The `hardware_spec` is a reference to a hardware specification.

> [model_definition_rel](#)

federated_learning

Federated Learning.

> [federated_learning](#)

training_data_references

Training datasets.

> [DataConnectionReference\[\]](#)

test_data_references

The holdout/test datasets.

> [DataConnectionReference\[\]](#)

custom

User defined properties specified as key-value pairs.

Examples: [View](#)

> [object](#)

Post request,



```
curl -X POST 'https://us-south.ml.cloud.ibm.com/ml/v4/training_definitions?version=2020-09-01'
--data-raw '{
  "name": "my-resource",
  "project_id": "12ac4cf1-252f-424b-b52d-5cdd9814987f",
  "space_id": "3fc54cf1-252f-424b-b52d-5cdd9814987f",
  "description": "This is my first resource.",
  "tags": [
    "t1",
    "t2"
  ],
  "experiment": {
    "id": "4cedab6d-e8e4-4214-b81a-2ddb122db2ab",
    "rev": "2"
  },
  "pipeline": {
    "id": "4cedab6d-e8e4-4214-b81a-2ddb122db2ab",
    "rev": "2",
    "model_type": "<string>",
    "data_bindings": [
      {
```

```

        "data_reference_name": "<string>",
        "node_id": "<string>"
    },
    {
        "data_reference_name": "<string>",
        "node_id": "<string>"
    }
],
"nodes_parameters": [
    {
        "node_id": "<string>",
        "parameters": "<object>"
    },
    {
        "node_id": "<string>",
        "parameters": "<object>"
    }
],
"hardware_spec": {
    "id": "4cedab6d-e8e4-4214-b81a-2ddb122db2ab",
    "rev": "2",
    "name": "<string>",
    "num_nodes": "<integer>"
},
"hybrid_pipeline_hardware_specs": [
    {
        "node_runtime_id": "auto_ai.kb",
        "hardware_spec": {
            "id": "4cedab6d-e8e4-4214-b81a-2ddb122db2ab",
            "rev": "2",
            "name": "<string>",
            "num_nodes": "<integer>"
        }
    },
    {
        "node_runtime_id": "auto_ai.kb",
        "hardware_spec": {
            "id": "4cedab6d-e8e4-4214-b81a-2ddb122db2ab",
            "rev": "2",
            "name": "<string>",
            "num_nodes": "<integer>"
        }
    }
],
},
"model_definition": {
    "id": "4cedab6d-e8e4-4214-b81a-2ddb122db2ab",
    "rev": "2",
    "model_type": "<string>",

```

```

    "hardware_spec": {
      "id": "4cedab6d-e8e4-4214-b81a-2ddb122db2ab",
      "rev": "2",
      "name": "<string>",
      "num_nodes": "<integer>"
    },
    "software_spec": {
      "id": "4cedab6d-e8e4-4214-b81a-2ddb122db2ab",
      "rev": "2",
      "name": "...",
    },
    "command": "<string>",
    "parameters": "<object>"
  },
  "training_data_references": [
    {
      "type": "<string>",
      "id": "<string>",
      "connection": "<object>",
      "location": "<object>",
      "schema": {
        "id": "<string>",
        "fields": [
          {
            "name": "duration",
            "type": "number"
          }
        ],
        "name": "<string>"
      }
    },
    {
      "type": "<string>",
      "id": "<string>",
      "connection": "<object>",
      "location": "<object>",
      "schema": {
        "id": "<string>",
        "fields": [
          {
            "name": "duration",
            "type": "number"
          }
        ],
        "name": "<string>"
      }
    }
  ],

```



```
    "results_reference": {
      "type": "<string>",
      "location": "<object>",
      "id": "<string>",
      "connection": "<object>"
    }
  }
```

Response

Response Body	
training_definition_resource	
The information for a training definition.	
metadata Always included *	Common metadata for a resource where <code>project_id</code> or <code>space_id</code> must be present. Examples: View
> ResourceMeta	
entity Always included *	The <code>training_data_references</code> contain the training datasets and the <code>results_reference</code> the connection where results will be stored.
> training_definition_entity	
system	Optional details coming from the service and related to the API call or the associated resource.
> SystemDetails	
Status Code	
201	Training definition created
400	Bad request, the response body should contain the reason.
401	Unauthorized.
403	Forbidden, an authentication error including trying to access an unauthorized space or project.
404	The specified resource was not found.

No Sample Response

This method does not specify any sample responses.

Retrieve the training definitions

Retrieve the training definitions for the specified space or project.

```
GET /ml/v4/training_definitions
```



Auditing

Calling this method generates the following auditing event.

- `pm-20.training_definition.list`

Request

Query Parameters

version

Required *

date

The version date for the API of the form `YYYY-MM-DD`.

Example: `2023-07-07`

space_id

string

The space that contains the resource. Either `space_id` or `project_id` query parameter has to be given.

Possible values: length = 36, Value must match regular expression `[a-zA-Z0-9-]*`

Example: `63dc4cf1-252f-424b-b52d-5cdd9814987f`

project_id

string

The project that contains the resource. Either `space_id` or `project_id` query parameter has to be given.

Possible values: length = 36, Value must match regular expression `[a-zA-Z0-9-]*`

Example: `a77190a2-f52d-4f2a-be3d-7867b5f46edc`

start string	Token required for token-based pagination. This token cannot be determined by end user. It is generated by the service and it is set in the href available in the <code>next</code> field.
limit integer	<p>How many resources should be returned. By default limit is 100. Max limit allowed is 200.</p> <p>Possible values: $1 \leq \text{value} \leq 200$</p> <p>Default: <code>100</code></p> <p>Example: <code>50</code></p>
tag.value string	<p>Return only the resources with the given tag values, separated by <code>or</code> or <code>and</code> to support multiple tags.</p> <p>Example: <code>tf2.0 or tf2.1</code></p>
search string	<p>Returns only resources that match this search string. The path to the field must be the complete path to the field, and this field must be one of the indexed fields for this resource type. Note that the search string must be URL encoded.</p> <p>Possible values: $\text{length} \geq 1$</p>

Get request,

```
curl -X GET 'https://us-south.ml.cloud.ibm.com/ml/v4/training_definitions?space_id=<string>&project_id=<string>&start=<string>&limit=100&tag.value=<string>&version=2020-09-01'
```

Response

Response Body training_definition_resources	A paginated list of training definitions.
limit Always included * integer	<p>The number of items to return in each page.</p> <p>Possible values: $1 \leq \text{value} \leq 200$</p> <p>Example: <code>10</code></p>
first	The reference to the first item in the current page.

Always included *

> [PaginationFirst](#)

total_count

integer

The total number of resources. Computed explicitly only when 'total_count=true' query parameter is present. This is in order to avoid performance penalties.

Example: [1](#)

next

A reference to the first item of the next page, if any.

> [PaginationNext](#)

resources

A list of training definitions.

> [training_definition_resource\[\]](#)

system

Optional details coming from the service and related to the API call or the associated resource.

> [SystemDetails](#)

Status Code

200

OK

400

Bad request, the response body should contain the reason.

401

Unauthorized.

403

Forbidden, an authentication error including trying to access an unauthorized space or project.

404

The specified resource was not found.

No Sample Response

This method does not specify any sample responses.

Retrieve the training definition

Retrieve the training definition with the specified identifier. If `rev` query parameter is provided, `rev=latest` will fetch the latest revision. A call with `rev={revision_number}` will fetch the given revision_number record. Either `space_id` or `project_id` has to be provided and is mandatory.

GET /ml/v4/training_definitions/{training_definition_id}

Auditing

Calling this method generates the following auditing event.

- `pm-20.training_definition.read`

Request

Path Parameters	
training_definition_id Required * string	Training definition identifier. Example: <code>63dc4cf1-252f-424b-b52d-5cdd9814987f</code>
Query Parameters	
version Required * <u>date</u>	The version date for the API of the form <code>YYYY-MM-DD</code> . Example: <code>2023-07-07</code>
space_id string	The space that contains the resource. Either <code>space_id</code> or <code>project_id</code> query parameter has to be given. Possible values: length = 36, Value must match regular expression <code>[a-zA-Z0-9-]*</code> Example: <code>63dc4cf1-252f-424b-b52d-5cdd9814987f</code>
project_id string	The project that contains the resource. Either <code>space_id</code> or <code>project_id</code> query parameter has to be given. Possible values: length = 36, Value must match regular expression <code>[a-zA-Z0-9-]*</code> Example: <code>a77190a2-f52d-4f2a-be3d-7867b5f46edc</code>
rev string	The revision number of the resource. Example: <code>2</code>

Get request,

```
curl -X GET 'https://us-south.ml.cloud.ibm.com/ml/v4/training_definitions/:training_definition_id?space_id=<string>&project_id=<string>&rev=<string>&version=2020-09-01'
```

Response

Response Body

training_definition_resource

The information for a training definition.

metadata

Always included *

Common metadata for a resource where `project_id` or `space_id` must be present.

Examples: [View](#)

> [ResourceMeta](#)

entity

Always included *

The `training_data_references` contain the training datasets and the `results_reference` the connection where results will be stored.

> [training_definition_entity](#)

system

Optional details coming from the service and related to the API call or the associated resource.

> [SystemDetails](#)

Status Code

200	OK
400	Bad request, the response body should contain the reason.
401	Unauthorized.
403	Forbidden, an authentication error including trying to access an unauthorized space or project.

No Sample Response

This method does not specify any sample responses.

Update the training definition

Update the training definition with the provided patch data. The following fields can be patched:

- `/tags`
- `/name`
- `/description`
- `/custom`
- `/federated_learning`

PATCH `/ml/v4/training_definitions/{training_definition_id}`



Auditing

Calling this method generates the following auditing event.

- `pm-20.training_definition.update`

Request

Path Parameters	
training_definition_id Required [*] string	Training definition identifier. Example: <code>63dc4cf1-252f-424b-b52d-5cdd9814987f</code>
Query Parameters	
version	The version date for the API of the form <code>YYYY-MM-DD</code> .

Required *
date

Example: 2023-07-07

space_id
string

The space that contains the resource. Either `space_id` or `project_id` query parameter has to be given.

Possible values: length = 36, Value must match regular expression `[a-zA-Z0-9-]*`

Example: 63dc4cf1-252f-424b-b52d-5cdd9814987f

project_id
string

The project that contains the resource. Either `space_id` or `project_id` query parameter has to be given.

Possible values: length = 36, Value must match regular expression `[a-zA-Z0-9-]*`

Example: a77190a2-f52d-4f2a-be3d-7867b5f46edc

Request Body
Required *
`JsonPatchOperation[]`

Input For Patch. This is the patch body which corresponds to the JavaScript Object Notation (JSON) Patch standard (RFC 6902).

op
Required *
string

The operation to be performed.

Allowable values: [`add` , `remove` , `replace`]

path
Required *
string

The pointer that identifies the field that is the target of the operation.

value
string

The value to be used within the operation.

Patch request,

```
curl -X PATCH 'https://us-south.ml.cloud.ibm.com/ml/v4/training_definitions/:training_definition_id?space_id=<string>&project_id=<string>&version=2020-09-01' --data-raw '[
  {
    "op": "<string>",
    "path": "<string>",
    "value": "<object>"
  },
  {
```



```
"op": "<string>",  
"path": "<string>",  
"value": "<object>"  
}  
'
```

Response

Response Body	
training_definition_resource	
The information for a training definition.	
metadata Always included *	Common metadata for a resource where <code>project_id</code> or <code>space_id</code> must be present. Examples: View
> ResourceMeta	
entity Always included *	The <code>training_data_references</code> contain the training datasets and the <code>results_reference</code> the connection where results will be stored.
> training_definition_entity	
system	Optional details coming from the service and related to the API call or the associated resource.
> SystemDetails	
Status Code	
200	Training definition has been patched successfully
400	Bad request, the response body should contain the reason.
401	Unauthorized.
403	Forbidden, an authentication error including trying to access an unauthorized space or project.
404	The specified resource was not found.

No Sample Response

This method does not specify any sample responses.

Delete the training definition

Delete the training definition with the specified identifier. This will delete all revisions of this training definition as well. For each revision all attachments will also be deleted.

```
DELETE /ml/v4/training_definitions/{training_definition_id}
```



Auditing

Calling this method generates the following auditing event.

- `pm-20.training_definition.delete`

Request

Path Parameters

training_definition_id

Required ^{*}
string

Training definition identifier.

Example: `63dc4cf1-252f-424b-b52d-5cdd9814987f`

Query Parameters

version

Required ^{*}
date

The version date for the API of the form `YYYY-MM-DD`.

Example: `2023-07-07`

space_id

string

The space that contains the resource. Either `space_id` or `project_id` query parameter has to be given.

Possible values: length = 36, Value must match regular expression `[a-zA-Z0-9-]*`

Example: `63dc4cf1-252f-424b-b52d-5cdd9814987f`

project_id

string

The project that contains the resource. Either `space_id` or `project_id` query parameter has to be given.

Possible values: length = 36, Value must match regular expression `[a-zA-Z0-9-]*`

Example: `a77190a2-f52d-4f2a-be3d-7867b5f46edc`

Delete request,



```
curl -X DELETE 'https://us-south.ml.cloud.ibm.com/ml/v4/training_definitions/:training_definition_id?space_id=<string>&project_id=<string>&version=2020-09-01'
```

Response

Status Code

204	Training definition deleted
400	Bad request, the response body should contain the reason.
401	Unauthorized.
403	Forbidden, an authentication error including trying to access an unauthorized space or project.
404	The specified resource was not found.

No Sample Response

This method does not specify any sample responses.

Create a new training definition revision

Create a new training definition revision. The current metadata and content for training_definition_id will be taken and a new revision created. Either `space_id` or `project_id` has to be provided and is mandatory.

POST /ml/v4/training_definitions/{training_definition_id}/revisions

Auditing

Calling this method generates the following auditing event.

- `pm-20.training_definition.create`

Request

Path Parameters	
training_definition_id Required * string	Training definition identifier. Example: <code>63dc4cf1-252f-424b-b52d-5cdd9814987f</code>
Query Parameters	
version Required * date	The version date for the API of the form <code>YYYY-MM-DD</code> . Example: <code>2023-07-07</code>
Request Body Required * training_definition_revision_entity_request	The details for the revision. Examples: View
space_id string	The space that contains the resource. Either <code>space_id</code> or <code>project_id</code> has to be given. Possible values: length = 36, Value must match regular expression <code>[a-zA-Z0-9-]*</code> Example: <code>3fc54cf1-252f-424b-b52d-5cdd9814987f</code>
project_id string	The project that contains the resource. Either <code>space_id</code> or <code>project_id</code> has to be given. Possible values: length = 36, Value must match regular expression <code>[a-zA-Z0-9-]*</code> Example: <code>12ac4cf1-252f-424b-b52d-5cdd9814987f</code>

commit_message

string

An optional commit message for the revision.

Post request,

```
curl -X POST 'https://us-south.ml.cloud.ibm.com/ml/v4/training_definitions/:training_definition_id/revisions?version=2020-09-01' --data-raw '{
  "space_id": "3fc54cf1-252f-424b-b52d-5cdd9814987f",
  "commit_message": "Updated for TF 2.0"
}'
```

Response

Response Body

training_definition_resource

The information for a training definition.

metadata

Always included *

Common metadata for a resource where `project_id` or `space_id` must be present.**Examples:** [View](#)> [ResourceMeta](#)**entity**

Always included *

The `training_data_references` contain the training datasets and the `results_reference` the connection where results will be stored.> [training_definition_entity](#)**system**

Optional details coming from the service and related to the API call or the associated resource.

> [SystemDetails](#)**Status Code****201**

Training definition revision created

400

Bad request, the response body should contain the reason.

401	Unauthorized.
403	Forbidden, an authentication error including trying to access an unauthorized space or project.
404	The specified resource was not found.

No Sample Response

This method does not specify any sample responses.

Retrieve the training definition revisions

Retrieve the training definition revisions.

```
GET /ml/v4/training_definitions/{training_definition_id}/revisions
```



Auditing

Calling this method generates the following auditing event.

- `pm-20.training_definition.list`

Request

Path Parameters

training_definition_id

Required *

string

Training definition identifier.

Example: `63dc4cf1-252f-424b-b52d-5cdd9814987f`

Query Parameters

version

Required *

date

The version date for the API of the form `YYYY-MM-DD`.

Example: `2023-07-07`

space_id

string

The space that contains the resource. Either `space_id` or `project_id` query parameter has to be given.

Possible values: length = 36, Value must match regular expression `[a-zA-Z0-9-]*`

Example: `63dc4cf1-252f-424b-b52d-5cdd9814987f`

project_id

string

The project that contains the resource. Either `space_id` or `project_id` query parameter has to be given.

Possible values: length = 36, Value must match regular expression `[a-zA-Z0-9-]*`

Example: `a77190a2-f52d-4f2a-be3d-7867b5f46edc`

start

string

Token required for token-based pagination. This token cannot be determined by end user. It is generated by the service and it is set in the href available in the `next` field.

limit

integer

How many resources should be returned. By default limit is 100. Max limit allowed is 200.

Possible values: $1 \leq \text{value} \leq 200$

Default: `100`

Example: `50`

Get request,

```
curl -X GET 'https://us-south.ml.cloud.ibm.com/ml/v4/training_definitions/:training_definition_id/revisions?space_id=<string>&project_id=<string>&start=<string>&limit=100&version=2020-09-01'
```

Response

Response Body

training_definition_resources

A paginated list of training definitions.

limit

The number of items to return in each page.

Always included *

integer

Possible values: $1 \leq \text{value} \leq 200$

Example: 10

first

Always included *

> [PaginationFirst](#)

The reference to the first item in the current page.

total_count

integer

The total number of resources. Computed explicitly only when 'total_count=true' query parameter is present. This is in order to avoid performance penalties.

Example: 1

next

> [PaginationNext](#)

A reference to the first item of the next page, if any.

resources

> [training_definition_resource\[\]](#)

A list of training definitions.

system

> [SystemDetails](#)

Optional details coming from the service and related to the API call or the associated resource.

Status Code

200

Training definition revisions

400

Bad request, the response body should contain the reason.

401

Unauthorized.

403

Forbidden, an authentication error including trying to access an unauthorized space or project.

404

The specified resource was not found.

No Sample Response

This method does not specify any sample responses.

