

Final Project: API Spec

CS 493: Cloud Application Development

Fall 2021 - Naomi Grant

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Data Model

The app stores three kinds of entities in Datastore, Boats, Loads, and Users.

Boats (Protected – connected to user)

Property	Data Type	Required	Valid Values
id	Integer	True	N/A - Datastore automatically generates it.
name	String	True	"Lil Maggie"
type	String	True	"Kayak"
length	Integer	True	6
loads	Array	False	Generated when loads are added [{"id": id}, {"id": id}, ...]
owner	String	True	user_id of the user logged in (from "sub" property of JWT)

Loads (Unprotected)

Property	Data Type	Required	Valid Values
id	Integer	True	N/A - Datastore automatically generates it.
volume	Integer	True	99
carrier	Object	False	The boat carrying the load {"id": id, "name": name }
content	String	True	"Cat treats"
creation_date	String	True	"11/20/2021"

Users

Property	Data Type	Valid Values
id	Integer	N/A - Datastore automatically generates it.
user_id	String	Unique ID of the user. This corresponds to the value of "sub" from the JWT. (Ex: "auth0 abc123")

Relationship between non-user entities	Loads can be placed onto boats. A load can only be on one boat at a time, but a single boat can have many loads.
Unique Identifier for a user	Corresponds to the value of "sub" from the JWT.
If a request needs to supply a user identifier, what needs to be specified by the person making the request	jwt1 and jwt2 are needed, but user_id1 and user_id2 are not needed. JWT and user_id can be retrieved from the page shown after you log in.
How your application maps a supplied JWT to the identifier of a user	JWT is used as the bearer token in a request and then the "sub" property is retrieved from this.
Relationship between user entity and non-user entity	User owns boats. When a user creates a boat, they are the owner of that boat and are the only one that can access it.

Create a Boat

Allows you to create a new boat.

POST /boats

Request

Path Parameters

None

Protected

True

Request Body

Required

Request Body Format

JSON

Request JSON Attributes

Name	Description	Required?
name	The name of the boat.	Yes
type	The type of the boat. E.g., Sailboat, Catamaran, etc.	Yes
length	Length of the boat in feet.	Yes

Request Body Example

```
{
  "name": "Lil Maggie",
  "type": "Kayak",
  "length": 6
}
```

Response

Response Body Format

JSON

Response Statuses

Outcome	Status Code	Notes
Success	201 Created	
Failure	400 Bad Request	If the request is missing any of the 3 required attributes, the boat must not be created, and 400 status code must be returned.
Failure	401 Unauthorized	The JWT is missing or invalid.
Failure	406 Not Acceptable	Request does not accept 'application/json' in the Accept header.

Response Examples

- Datastore will automatically generate an ID and store it with the entity being created. Your app must send back this value in the response body as shown in the example.

- The `self` attribute will contain the live link to the REST resource corresponding to this boat. In other words, this is the URL to get this newly created boat. You must not store the `self` attribute in Datastore

Success

Status: 201 Created

```
{
  "id": "5783106137096192",
  "name": "Lil Maggie",
  "type": "Kayak",
  "length": 6,
  "owner": "auth0|61906f96a9ee100071806cf6",
  "self": "https://hw9-grantn.uw.r.appspot.com/boats/5783106137096192"
}
```

Failure

Status: 400 Bad Request

```
{
  "Error": "The request object is missing at least one of the required attributes"
}
```

Status: 401 Unauthorized

```
{
  "Error": "Missing or invalid JWT"
}
```

Status: 406 Not Acceptable

```
{
  "Error": "Not an acceptable MIME type"
}
```

View all Boats

View all the boats. This will implement pagination and return 5 boats per page, with a 'next' link to get to the next page of results (last page shouldn't have a 'next' link though).

GET /boats

Request

Path Parameters

None

Protected

True

Request Body

None

Response

Response Body Format

JSON

Response Statuses

Outcome	Status Code	Notes
Success	200 OK	
Failure	401 Unauthorized	The JWT is missing or invalid.
Failure	406 Not Acceptable	Request does not accept 'application/json' in the Accept header.

Response Examples

Success

```
Status: 200 OK
{
  "total_items": 6,
  "items": [
    {
      "owner": "auth0|61906f96a9ee100071806cf6",
      "name": "Boat 2",
      "type": "Steamboat",
      "length": 120,
      "id": "4588473600180224",
      "self": "https://hw9-grantn.uw.r.appspot.com/boats/4588473600180224"
    },
    {
      "name": "Extra Boat",
      "type": "Speedboat",
      "length": 100,
      "owner": "auth0|61906f96a9ee100071806cf6",
      "id": "4657206230253568",
      "self": "https://hw9-grantn.uw.r.appspot.com/boats/4657206230253568"
    },
    {
      "owner": "auth0|61906f96a9ee100071806cf6",
```

```

        "type": "Yacht",
        "length": 140,
        "name": "Boat 4",
        "id": "5559695527903232",
        "self": "https://hw9-grantn.uw.r.appspot.com/boats/5559695527903232"
      },
      {
        "length": 140,
        "type": "Yacht",
        "name": "Boat 5",
        "owner": "auth0|61906f96a9ee100071806cf6",
        "id": "5714373507022848",
        "self": "https://hw9-grantn.uw.r.appspot.com/boats/5714373507022848"
      },
      {
        "type": "Canoe",
        "length": 12,
        "name": "Boat 3",
        "owner": "auth0|61906f96a9ee100071806cf6",
        "id": "6122645481324544",
        "self": "https://hw9-grantn.uw.r.appspot.com/boats/6122645481324544"
      }
    ],
    "next": "https://hw9-grantn.uw.r.appspot.com/boats?cursor=CikSI2o0enV3fmbH3OS1ncmFudG5yEQsSBEJvYXQYgICA6LeQ8AoMGAAGAA=="
  }
}

```

Failure

Status: 401 Unauthorized

```

{
  "Error": "Missing or invalid JWT"
}

```

Status: 406 Not Acceptable

```

{
  "Error": "Not an acceptable MIME type"
}

```

View a Boat

Allows you to view an existing boat

GET /boats/:boat_id

Request

Path Parameters

Name	Description
boat_id	ID of the boat

Protected

True

Request Body

None

Response

Response Body Format

JSON

Response Statuses

Outcome	Status Code	Notes
Success	200 OK	
Failure	401 Unauthorized	The JWT is missing or invalid.
Failure	403 Forbidden	Either the JWT is valid but boat_id is owned by someone else, or the JWT is valid but no boat with this boat_id exists.
Failure	406 Not Acceptable	Request does not accept 'application/json' in the Accept header.

Response Examples

Success

```
Status: 200 OK
{
  "id": "5503267274489856",
  "name": "Lil Maggie",
  "type": "Kayak",
  "length": 6,
  "owner": "auth0|61906f96a9ee100071806cf6",
  "loads": [
    {
      "id": "5562156376391680",
      "self": "https://hw9-grantn.uw.r.appspot.com/loads/5562156376391680"
    }
  ],
  "self": "https://hw9-grantn.uw.r.appspot.com/boats/5503267274489856"
}
```

Failure

```
Status: 401 Unauthorized
{
```

```
"Error": "Missing or invalid JWT"
}
```

Status: 403 Forbidden

```
{
  "Error": "No boat with this boat_id exists"
}
{
  "Error": "This boat is owned by someone else"
}
```

Status: 406 Not Acceptable

```
{
  "Error": "Not an acceptable MIME type"
}
```


Edit a Boat (PATCH)

Allows you to edit specific attributes of a boat.

PATCH /boats/:boat_id

Request

Path Parameters

Name	Description
boat_id	ID of the boat

Protected

True

Request Body

Required

Request Body Format

JSON

Request JSON Attributes

Name	Description	Required?
name	The name of the boat.	No
type	The type of the boat. E.g., Sailboat, Catamaran, etc.	No
length	Length of the boat in feet.	No

Request Body Example

```
{
  "name": "Boaty",
  "length": 100
}
```

Response

Response Body Format

JSON

Response Statuses

Outcome	Status Code	Notes
Success	200 OK	Successfully edited the boat.
Failure	400 Bad Request	If the request is empty or consists of attributes that are not name, type, or length, the load must not be created, and 400 status code must be returned.
Failure	401 Unauthorized	The JWT is missing or invalid.
Failure	403 Forbidden	Either the JWT is valid but boat_id is owned by someone else, or the JWT is valid but no boat with this boat_id exists.
Failure	406 Not Acceptable	Request does not accept 'application/json' in the Accept header.

Response Examples

Success

Status: 200 OK

```
{
  "id": 5503267274489856,
  "name": "Fluffy Sasha",
  "type": "Row boat",
  "length": 99,
  "owner": "auth0|61906f96a9ee100071806cf6",
  "loads": [
    {
      "id": "5562156376391680",
      "self": "https://hw9-grantn.uw.r.appspot.com/loads/5562156376391680"
    }
  ],
  "self": "https://hw9-grantn.uw.r.appspot.com/boats/5503267274489856"
}
```

Failure

Status: 400 Bad Request

```
{
  "Error": " The request object requires at least one of the following attributes:
name, type, or length "
}
```

Status: 401 Unauthorized

```
{
  "Error": "Missing or invalid JWT"
}
```

Status: 403 Forbidden

```
{
  "Error": "No boat with this boat_id exists"
}
{
  "Error": "This boat is owned by someone else"
}
```

Status: 406 Not Acceptable

```
{
  "Error": " Not an acceptable MIME type"
}
```

Edit a Boat (PUT)

Allows you to update a boat, changing all of its attributes at once.

PUT /boats/:boat_id

Request

Path Parameters

Name	Description
boat_id	ID of the boat

Protected

True

Request Body

Required

Request Body Format

JSON

Request JSON Attributes

Name	Description	Required?
name	The name of the boat.	Yes
type	The type of the boat. E.g., Sailboat, Catamaran, etc.	Yes
length	Length of the boat in feet.	Yes

Request Body Example

```
{
  "name": "Boaty",
  "type": "Catamaran",
  "length": 100
}
```

Response

Response Body Format

JSON

Response Statuses

Outcome	Status Code	Notes
Success	200 OK	
Failure	400 Bad Request	If the request is missing the required attributes, the boat must not be created, and 400 status code must be returned.
Failure	401 Unauthorized	The JWT is missing or invalid.
Failure	403 Forbidden	Either the JWT is valid but boat_id is owned by someone else, or the JWT is valid but no boat with this boat_id exists.
Failure	406 Not Acceptable	Request does not accept 'application/json' in the Accept header.

Response Examples

Success

Status: 200 OK

```
{
  "id": 5503267274489856,
  "name": "Fluffy Sasha",
  "type": "Canoe",
  "length": 99,
  "owner": "auth0|61906f96a9ee100071806cf6",
  "loads": [
    {
      "id": "5562156376391680",
      "self": "https://hw9-grantn.uw.r.appspot.com/loads/5562156376391680"
    }
  ],
  "self": "https://hw9-grantn.uw.r.appspot.com/boats/5503267274489856"
}
```

Failure

Status: 400 Bad Request

```
{
  "Error": "The request object is missing at least one of the required attributes"
}
```

Status: 401 Unauthorized

```
{
  "Error": "Missing or invalid JWT"
}
```

Status: 403 Forbidden

```
{
  "Error": "No boat with this boat_id exists"
}
{
  "Error": "This boat is owned by someone else"
}
```

Status: 406 Not Acceptable

```
{
  "Error": "Not an acceptable MIME type"
}
```

Delete a Boat

Allows you to delete a boat. Note that deleting a boat will unload any loads that were loaded on it.

DELETE /boats/:boat_id

Request

Path Parameters

Name	Description
boat_id	ID of the boat

Protected

True

Request Body

None

Response

No body

Response Body Format

Success: No body | Failure: JSON

Response Statuses

Outcome	Status Code	Notes
Success	204 No Content	
Failure	401 Unauthorized	The JWT is missing or invalid.
Failure	403 Forbidden	Either the JWT is valid but boat_id is owned by someone else, or the JWT is valid but no boat with this boat_id exists.

Response Examples

Success

Status: 204 No Content

Failure

<pre>Status: 401 Unauthorized { "Error": "Missing or invalid JWT" } Status: 403 Forbidden { "Error": "No boat with this boat_id exists" } { "Error": "This boat is owned by someone else" } Status: 406 Not Acceptable { "Error": "Not an acceptable MIME type" }</pre>

Create a Load

Allows you to create a new load. All newly created loads should begin unassigned to any boat.

POST /loads

Request

Path Parameters

None

Protected

False

Request Body

Required

Request Body Format

JSON

Request JSON Attributes

Name	Description	Required?
volume	The volume of the load, an integer.	Yes
content	What the load contains.	Yes
creation_date	Date that the load was created	Yes

Request Body Example

```
{
  "volume": 60,
  "content": "LEGO Blocks",
  "creation_date": "10/18/2021"
}
```

Response

Response Body Format

JSON

Response Statuses

Outcome	Status Code	Notes
Success	201 Created	
Failure	400 Bad Request	If the request is missing the required attributes, the load must not be created, and 400 status code must be returned.
Failure	406 Not Acceptable	Request does not accept 'application/json' in the Accept header.

Response Examples

Success

```
Status: 201 Created
{
  "id": "5562156376391680",
  "volume": 60,
```

```
"content": "Cat Treats",  
"creation_date": "10/18/2021",  
"self": "https://hw9-grantn.uw.r.appspot.com/loads/5562156376391680"  
}
```

Failure

Status: 400 Bad Request

```
{  
"Error": "The request object is missing at least one of the required attributes"  
}
```

Status: 406 Not Acceptable

```
{  
"Error": "Not an acceptable MIME type"  
}
```

View all Loads

View all the loads. It should implement pagination similar to view all boats, i.e., 3 loads per page and a 'next' link.

GET /loads

Request

Path Parameters

None

Protected

False

Request Body

None

Response

Response Body Format

JSON

Response Statuses

Outcome	Status Code	Notes
Success	200 OK	
Failure	406 Not Acceptable	Request does not accept 'application/json' in the Accept header.

Response Examples

Success

```
Status: 200 OK
{
  "total_items": 6,
  "items": [
    {
      "carrier": {
        "name": "Boat 1",
        "id": "6404120458035200"
      },
      "content": "Cat Beds",
      "creation_date": "10/16/2021",
      "volume": 79,
      "id": "4651482649460736",
      "self": "https://hw9-grantn.uw.r.appspot.com/loads/4651482649460736"
    },
    {
      "creation_date": "10/22/2021",
      "volume": 98,
      "carrier": {
        "id": "6404120458035200",
        "name": "Boat 1"
      },
      "content": "Cat Litter",
```



```

      "id": "4928811640553472",
      "self": "https://hw9-grantn.uw.r.appspot.com/loads/4928811640553472"
    },
    {
      "content": "Cat Sweaters",
      "volume": 112,
      "creation_date": "11/18/2021",
      "id": "4996745574481920",
      "self": "https://hw9-grantn.uw.r.appspot.com/loads/4996745574481920"
    },
    {
      "volume": 88,
      "creation_date": "10/20/2021",
      "carrier": {
        "id": "6404120458035200",
        "name": "Boat 1"
      },
      "content": "Canned Cat Food",
      "id": "6481069998080000",
      "self": "https://hw9-grantn.uw.r.appspot.com/loads/6481069998080000"
    },
    {
      "volume": 92,
      "carrier": {
        "name": "Boat 1",
        "id": "6404120458035200"
      },
      "content": "Cat Dishes",
      "creation_date": "11/12/2021",
      "id": "6486793578872832",
      "self": "https://hw9-grantn.uw.r.appspot.com/loads/6486793578872832"
    }
  ],
  "next": "https://hw9-grantn.uw.r.appspot.com/loads?cursor=CikSI2o0enV3fmh3OS1ncmFudG5yEQsSBExvYWQYgICAmMX2wgsMGAAgAA=="
}

```

Failure

```

Status: 406 Not Acceptable
{
  "Error": " Not an acceptable MIME type"
}

```

View a Load

Allows you to view an existing load.

GET /loads/:load_id

Request

Path Parameters

Name	Description
load_id	ID of the load

Protected

False

Request Body

None

Response

Response Body Format

JSON

Response Statuses

Outcome	Status Code	Notes
Success	200 OK	
Failure	404 Not Found	No load with this load_id exists
Failure	406 Not Acceptable	Request does not accept 'application/json' in the Accept header.

Response Examples

Success

```
Status: 200 OK
{
  "id": "5562156376391680",
  "volume": 98,
  "carrier": {
    "id": "5503267274489856",
    "name": "Lil Maggie",
    "self": "https://hw9-grantn.uw.r.appspot.com/boats/5503267274489856"
  },
  "content": "Cat Treats",
  "creation_date": "11/20/2021",
  "self": "https://hw9-grantn.uw.r.appspot.com/loads/5562156376391680"
}
```

Failure

```
Status: 404 Not Found
{
  "Error": "No load with this load_id exists"
}
Status: 406 Not Acceptable
{
  "Error": "Not an acceptable MIME type"
}
```

}

Edit a Load (PATCH)

Allows you to edit specific attributes of a load.

PATCH /loads/:load_id

Request

Path Parameters

Name	Description
load_id	ID of the load

Protected

False

Request Body

Required

Request Body Format

JSON

Request JSON Attributes

Name	Description	Required?
volume	The volume of the load, an integer.	No
content	What the load contains.	No
creation_date	Date that the load was created	No

Request Body Example

```
{
  "volume": 98,
  "creation_date": "11/20/2021"
}
```

Response

Response Body Format

JSON

Response Statuses

Outcome	Status Code	Notes
Success	200 OK	Successfully edited the load.
Failure	400 Bad Request	If the request is empty or consists of attributes that are not volume, content, or creation_date, the load must not be created, and 400 status code must be returned.
Failure	404 Not Found	No load with this load_id exists.
Failure	406 Not Acceptable	Request does not accept 'application/json' in the Accept header.

Response Examples

Success

```
Status: 200 OK
{
  "id": 5562156376391680,
```

```
    "volume": 98,  
    "content": "Cat Treats",  
    "creation_date": "11/20/2021",  
    "carrier": {  
      "name": "Boat 1",  
      "id": "6404120458035200"  
    },  
    "self": "https://hw9-grantn.uw.r.appspot.com/loads/5562156376391680"  
  }  
}
```

Failure

Status: 400 Bad Request

```
{  
  "Error": "The request object requires at least one of the following attributes:  
volume, type, or creation_date"  
}
```

Status: 404 Not Found

```
{  
  "Error": "No load with this load_id exists"  
}
```

Status: 406 Not Acceptable

```
{  
  "Error": "Not an acceptable MIME type"  
}
```

Edit a Load (PUT)

Allows you to update a load, changing all of its attributes at once.

PUT /loads/:load_id

Request

Path Parameters

Name	Description
load_id	ID of the load

Protected

False

Request Body

Required

Request Body Format

JSON

Request JSON Attributes

Name	Description	Required?
volume	The volume of the load, an integer.	Yes
content	What the load contains.	Yes
creation_date	Date that the load was created	Yes

Request Body Example

```
{
  "volume": 97,
  "content": "Cat Treats",
  "creation_date": "11/20/2021"
}
```

Response

Response Body Format

JSON

Response Statuses

Outcome	Status Code	Notes
Success	200 OK	
Failure	400 Bad Request	If the request is missing the required attributes, the load must not be created, and 400 status code must be returned.
Failure	404 Not Found	No load with this load_id exists.
Failure	406 Not Acceptable	Request does not accept 'application/json' in the Accept header.

Response Examples

Success

```
Status: 200 OK
{
  "id": 5562156376391680,
```

```
"volume": 97,  
"content": "Cat Treats",  
"creation_date": "11/20/2021",  
"carrier": {  
  "name": "Boat 1",  
  "id": "6404120458035200"  
},  
"self": "https://hw9-grantn.uw.r.appspot.com/loads/5562156376391680"  
}
```

Failure

```
Status: 400 Bad Request  
{  
"Error": "The request object is missing at least one of the required attributes"  
}
```

```
Status: 404 Not Found  
{  
"Error": "No load with this load_id exists"  
}
```

```
Status: 406 Not Acceptable  
{  
"Error": "Not an acceptable MIME type"  
}
```

Delete a Load

Allows you to delete a load. Note that deleting a load should update the boat that was carrying it.

DELETE /loads/:load_id

Request

Path Parameters

Name	Description
load_id	ID of the load

Request Body

None

Protected

False

Response

No body

Response Body Format

Success: No body

Failure: JSON

Response Statuses

Outcome	Status Code	Notes
Success	204 No Content	
Failure	404 Not Found	No load with this load_id exists

Response Examples

Success

Status: 204 No Content

Failure

Status: 404 Not Found { "Error": "No load with this load_id exists" }
--

Assign a Load to a Boat

Load is assigned to a boat.

PUT /boats/:boat_id/loads/:load_id

Request

Path Parameters

Name	Description
load_id	ID of the load
boat_id	ID of the boat

Request Body

None

Protected

True

Response

No body

Response Body Format

Success: No body

Failure: JSON

Response Statuses

Outcome	Status Code	Notes
Success	204 No Content	Succeeds only if a boat exists with this boat_id, a load exists with this load_id and the load is not currently assigned to another boat.
Failure	401 Unauthorized	The JWT is missing or invalid.
Failure	403 Forbidden	JWT is valid and either the boat is owned by someone else or the load is already assigned to a boat.
Failure	404 Not Found	The specified boat and/or load does not exist

Response Examples

Success

Status: 204 No Content

Failure

<pre>Status: 401 Unauthorized { "Error": "Missing or invalid JWT" } Status: 403 Forbidden { "Error": "This boat is owned by someone else" } { "Error": "The load is already assigned to a boat"</pre>
--

```
}
```

Status: 404 Not Found

```
{
```

```
"Error": "The specified boat and/or load does not exist"
```

```
}
```

Comment

- A load cannot be assigned to multiple boats.

Remove a Load From a Boat

Load is removed from a boat.

DELETE /boats/:boat_id/loads/:load_id

Request

Path Parameters

Name	Description
load_id	ID of the load
boat_id	ID of the boat

Protected

True

Request Body

None

Response

No body

Response Body Format

Success: No body

Failure: JSON

Response Statuses

Outcome	Status Code	Notes
Success	204 No Content	Succeeds only if a boat exists with this boat_id, a load exists with this load_id and this boat had this load.
Failure	401 Unauthorized	The JWT is missing or invalid.
Failure	403 Forbidden	JWT is valid and either the boat is owned by someone else or the load is already assigned to a boat.
Failure	404 Not Found	A boat with this boat_id does not contain a load with this load_id

Response Examples

Success

Status: 204 No Content

Failure

<pre>Status: 401 Unauthorized { "Error": "Missing or invalid JWT" } Status: 403 Forbidden { "Error": "This boat is owned by someone else" } { "Error": "The load is already assigned to a boat"</pre>
--

```
}
```

Status: 404 Not Found

```
{
```

"Error": " A boat with this boat_id does not contain a load with this load_id"

```
}
```

View all Users

View all users. This does not have pagination.

GET /users

Request

Path Parameters

None

Protected

False

Request Body

None

Response

Response Body Format

JSON

Response Statuses

Outcome	Status Code	Notes
Success	200 OK	
Failure	406 Not Acceptable	Request does not accept 'application/json' in the Accept header.

Response Examples

Success

```
Status: 200 OK
[
  {
    "user_id": "auth0|61a5767310acae006ad9b7a5",
    "id": "4725190999146496"
  },
  {
    "user_id": "auth0|61906f96a9ee100071806cf6",
    "id": "4930474229104640"
  },
  {
    "user_id": "auth0|619065b8c49d5800691f844d",
    "id": "5841170504613888"
  }
]
```

Failure

```
Status: 406 Not Acceptable
{
  "Error": " Not an acceptable MIME type"
}
```