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Application deployed on GCP at: https://cs493mbfinalproject.wl.r.appspot.com

URL for Account Creation/Login: https://cs493mbfinalproject.wl.r.appspot.com

Final Project API Spec

CS 493: Cloud Application Development

Spring 2020

Oregon State University

Modified from Assignment 3 API Spec

Change log

Page	Change	Date
	Initial version.	6/6/2020

Data models

User

Name	Type	Description	Required?	Valid values
userId	String	The id of the user.	Yes/Automatically generated	"Sub" property of the JWT generated by GCP

Boat

Name	Type	Description	Required?	Valid values
id	String	The id of the boat.	Automatically generated	Random value generated by GCP
type	String	The type of the boat.	Yes	Any string value describing the type of the boat.
length	Integer	The length of the boat in meters.	Yes	Any integer value representing the length of the boat.
loads	Array of Load Objects	The Load Objects currently carried by the boat.	Yes	An empty array, or an array of Load objects where the objects contain two properties: -"id": the id of the Load object -"self": the canonical URL to that Load object
owner	String	The owner of the boat as identified by the "sub" property of that owner's JWT.	Automatically generated	The sub value accessed from the *express-jwt* middleware during the POST request.
self	String	The canonical URL representation of the Boat instance.	Automatically generated	The URL describing where the instance of the Boat entity can be found.

Load

Name	Type	Description	Required?	Valid values
id	String	The id of the load.	Automatically generated	Random value generated by GCP
weight	Integer	The weight of the load in kilograms.	Yes	Any integer value representing the weight of the boat.
content	String	The content of the load.	Yes	Any String value describing the content of the load.
delivery_date	String	The date on which the load is to be delivered.	Yes	Any future date corresponding to when the load is to be delivered.
carrier	Boat Object	The Boat instance currently carrying the load.	No	Null, or a Boat object instance where the object contains three properties: -"id": the id of the Boat object -"name": the name of the Boat object

				-"self": the canonical URL to that Boat object
self	String	The canonical URL representation of the Boat instance.	Automatically generated	The URL describing where the instance of the Boat entity can be found.

Description of relationship between Boats and Loads

Similar to Assignments 4 and 5, Boat instances have a one-to-many relationship with Load instances. Load instances can be placed on a Boat instance via a PUT request to the *boats/:boat_id/loads/:load_id* endpoint and removed from a Boat instance via a DELETE request to the *boats/:boat_id/loads/:load_id* endpoint.

Description of user entity

The user is represented in the application using the "sub" property of the JWT that is generated upon user account creation and login. Requests do not need to explicity specify unique identifiers for the user, because this information is contained within the "req.user.sub" property made available by the *express-jwt* middleware. This property functions as a mapping between the supplied JWT and user identity. Users are linked to Boat instances when they save them to GCP Datastore using a POST request to the */boats* endpoint. The particular User associated to a Boat instance is identified using the "owner" property of the Boat instance. Users can then modify the "name", "type", and "length" properties of the Boat instance using PUT/PATCH requests to the */boats/boat_id* endpoint. Users can also delete Boat instances using DELETE requests to the */boats/boat_id* endpoint.

Application Main Page
Allows for navigation to Application Welcome Page where a link is held for users to generate their credentials.

GET /

Authentication Information Display Page
Allows for redirection to a page displaying the user credentials after having a JWT generated by Google OAuth 2.0.

GET /oauth

View all Users
List all the users.

GET /users

Request
Request Parameters
None

Request Body
None

Response

Response Body Format

JSON

Response Statuses

Outcome	Status Code	Notes
Success	201 Created	
Failure	406 Not Acceptable	If the request's Accept header does not specify application/json as an accepted type, a 406 status code is returned without the user listings.

Response Examples

Success

```
Status: 200 OK

{
   "items": [
      {
         "id": "5139943911325696",
         "userId": "12391783719231231"
      },
      {
         "id": "5681150794137600",
         "userId": "12391783719222343"
      },
      {
         "id": "5739956077068288",
         "userId": "12391783719221122"
      }
   ]
}
```

Prohibited Requests to Users

The following endpoints related to the Users entity are not allowed by the API.

POST /users
PUT /users
PATCH /users
DELETE /users

Request

Request Parameters

N/A

Request Body

N/A

Response

Response Body Format

N/A

Response Statuses

Outcome	Status Code	Notes
Failure	405 Not Allowed	If the type of request to /users is not allowed, a 405 status code is returned.

Create a Boat (Protected Resource)

Allows you to create a new boat.

POST /boats

Request

Request Parameters

None

Request Body

Required

Request Body Format

JSON

Request JSON Attributes

Name	Type	Description	Required?
name	String	The name of the boat.	Yes
type	String	The type of the boat. E.g., Sailboat, Catamaran, etc.	Yes
length	Integer	Length of the boat in feet.	Yes
loads	Array	Loads currently carried by the boat	Yes

Request Body Example

```
{
  "name": "Sea Witch",
  "type": "Catamaran",
  "length": 28,
  "loads": [],
}
```

Response

Response Body Format

JSON for 201, 403, and 406 Status Codes

HTML via express-jwt middleware for 401 Status Code

Response Statuses

Outcome	Status Code	Notes
Success	201 Created	
Failure	401 Unauthorized	If the request is missing the JWT, the boat is not created and a 401 status code is returned.

Failure	403 Forbidden	If the request contains an invalid JWT, the boat is not created and a 403 status code is returned.
Failure	406 Not Acceptable	If the request's Accept header does not specify application/json as an accepted type, the boat is not created and a 406 status code is returned.

Success

```
Status: 201 Created

{
  "id": "324987329843",
  "name": "Sea Witch",
  "type": "Catamaran",
  "length": 28,
  "owner": "12321987938211",
  "loads": [],
  "self": "https://cs493mbfinalproject.wl.r.appspot.com/boats/324987329843"
}
```

Failure

Status: 401 Unauthorized

```html
<!DOCTYPE html>
<html lang="en">

<head>
    <meta charset="utf-8">
    <title>Error</title>
</head>

<body>
    <pre>Unauthorized</pre>
</body>

</html>
```

Status: 403 Forbidden

```
{
    "Error": "Access to the specified boat from this account is forbidden"
}
```

Status: 406 Not Acceptable

```
{
    "Error": "Application/JSON data not specified as acceptable in header"
}
```

View a Boat (Protected Resource)

Allows you to get an existing boat

GET /boats/:boat_id

Request

Request Parameters

Name	Type	Description	Required?
boat_id	String	ID of the boat	Yes

Request Body

None

Response

Response Body Format

JSON for 201, 403, and 406 Status Codes

HTML via express-jwt middleware for 401 Status Code

Response Statuses

Outcome	Status Code	Notes
Success	201 Created	
Failure	401 Unauthorized	If the request is missing the JWT, a 401 status code is returned without the boat.
Failure	403 Forbidden	If the request contains an invalid JWT, a 403 status code is returned without the boat.
Failure	406 Not Acceptable	If the request's Accept header does not specify application/json as an accepted type, a 406 status code is returned without the boat.

Response Examples

Success

```
Status: 200 OK

{
  "id": "324987329843",
  "name": "Sea Witch",
  "type": "Catamaran",
  "length": 28,
  "owner": "12321987938211",
  "loads": [],
  "self": "https://cs493mbfinalproject.wl.r.appspot.com/boats/324987329843"
}
```

Failure

```
Status: 401 Unauthorized


<!DOCTYPE html>
<html lang="en">


<head>
    <meta charset="utf-8">
```

```
    <title>Error</title>
</head>

<body>
    <pre>Unauthorized</pre>
</body>

</html>
```

Status: 403 Forbidden

{
    "Error": "Access to the specified boat from this account is forbidden"
}

Status: 406 Not Acceptable

{
    "Error": "Application/JSON data not specified as acceptable in header"
}

View all Boats (Protected Resource)

List all the boats for a given user as identified by the express-jwt middleware. The results are paginated with a limit of five per page.

GET /boats

Request

Request Parameters

None

Request Body

None

Response

Response Body Format

JSON

Response Statuses

Outcome	Status Code	Notes
Success	201 Created	
Failure	401 Unauthorized	If the request is missing the JWT, a 401 status code is returned without the boat listings.
Failure	406 Not Acceptable	If the request's Accept header does not specify application/json as an accepted type, a 406 status code is returned without the boat listings.

Response Examples

Success

```
Status: 200 OK

{
   "items": [
     {
        "type": "Merchant ship",
        "loads": [],
        "length": 91,
        "name": "HMS Bounty",
        "id": "5139943911325696",
        "owner": "12391783719231231",
        "self": "https://cs493mbfinalproject.wl.r.appspot.com/boats/5139943911325696"
     },
     {
        "name": "Merchant ship",
        "type": "HMS Bounty",
        "loads": [],
        "length": 91,
        "id": "5681150794137600",
        "owner": "12391783719231231",
```

```
            "self": " https://cs493mbfinalproject.wl.r.appspot.com/boats/5681150794137600"
        },
        {
            "type": "Merchant ship",
            "loads": [],
            "length": 91,
            "name": "HMS Bounty",
            "id": "5739956077068288",
            "owner": "12391783719231231",
            "self": " https://cs493mbfinalproject.wl.r.appspot.com/boats/5739956077068288"
        },
        {
            "type": "Merchant ship",
            "loads": [],
            "length": 91,
            "name": "HMS Bounty",
            "id": "5739956077068288",
            "owner": "12391783719231231",
            "self": " https://cs493mbfinalproject.wl.r.appspot.com/boats/5739956077068288"
        },
        {
            "type": "Merchant ship",
            "loads": [],
            "length": 91,
            "name": "HMS Bounty",
            "id": "5739956077068288",
            "owner": "12391783719231231",
            "self": " https://cs493mbfinalproject.wl.r.appspot.com/boats/5739956077068288"
        }
    ],
    "next": " https://cs493mbfinalproject.wl.r.appspot.com
/boats?cursor=Ci8SKWoUbX5jczQ5M21iYXNzaWdubWVudDRyEQsSBEJvYXQYglCA2NqOmQoMGAAgA
A==",
    "totalRecords": 6
}
```

Completely Update a Boat (Protected Resource)

Allows you to update all properties of a boat.

PUT /boats/:boat_id

Request

Request Parameters

Name	Type	Description	Required?
boat_id	String	ID of the boat	Yes

Request Body

Required

Request Body Format

JSON

Request JSON Attributes

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

Request Body Example

```
{
  "name": "Sea Witch",
  "type": "Catamaran",
  "length": 28,
}
```

Response

Response Body Format

JSON for 200, 403, and 406 Status Codes

HTML via express-jwt middleware for 401 Status Code

Response Statuses

Outcome	Status Code	Notes
Success	200 OK	
Failure	401 Unauthorized	If the request is missing the JWT, the boat is not updated and a 401 status code is returned.
Failure	403 Forbidden	If the request contains an invalid JWT, the boat is not updated and a 403 status code is returned.
Failure	406 Not Acceptable	If the request's Accept header does not specify application/json as an accepted type, the boat is not updated and a 406 status code is returned.

Success

```
Status: 200 OK

{
  "id": "324987329843",
  "name": "Sea Witch",
  "type": "Catamaran",
  "length": 28,
  "owner": "1232198793821133",
  "loads": [],
  "self": "https://cs493mbfinalproject.wl.r.appspot.com/boats/324987329843"
}
```

Failure

```
Status: 401 Unauthorized

<!DOCTYPE html>
```

```html
<html lang="en">

<head>
    <meta charset="utf-8">
    <title>Error</title>
</head>

<body>
    <pre>Unauthorized</pre>
</body>

</html>
```

Status: 403 Forbidden

{
   "Error": "Access to the specified boat from this account is forbidden"
}

Status: 406 Not Acceptable

{
   "Error": "Application/JSON data not specified as acceptable in header"
}

Partially Update a Boat (Protected Resource)

Allows you to update some or all properties of a boat.

PATCH /boats/:boat_id

Request

Request Parameters

Name	Type	Description	Required?
boat_id	String	ID of the boat	Yes

Request Body
Required

Request Body Format
JSON

Request JSON Attributes

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

Request Body Example

```
{
  "name": "Sea Witch",
```

```
}
```

Response

Response Body Format

JSON for 200, 403, and 406 Status Codes

HTML via express-jwt middleware for 401 Status Code

Response Statuses

Outcome	Status Code	Notes
Success	200 OK	
Failure	401 Unauthorized	If the request is missing the JWT, the boat is not updated and a 401 status code is returned.
Failure	403 Forbidden	If the request contains an invalid JWT, the boat is not updated and a 403 status code is returned.
Failure	406 Not Acceptable	If the request's Accept header does not specify application/json as an accepted type, the boat is not updated and a 406 status code is returned.

Success

```
Status: 200 OK

{
  "id": "324987329843",
  "name": "Sea Witch",
  "type": "catamaran",
  "length": 100,
  "owner": "1232198793821133",
  "loads": [],
  "self": "https://cs493mbfinalproject.wl.r.appspot.com/boats/324987329843"
}
```

Failure

```
Status: 401 Unauthorized
```

```html
<!DOCTYPE html>
<html lang="en">

<head>
    <meta charset="utf-8">
    <title>Error</title>
</head>

<body>
    <pre>Unauthorized</pre>
</body>

</html>
```

```
Status: 403 Forbidden

{
   "Error": "Access to the specified boat from this account is forbidden"
```

```
}
```

Status: 406 Not Acceptable

```
{
    "Error": "Application/JSON data not specified as acceptable in header"
}
```

Delete a Boat (Protected Resource)

Allows you to remove a boat. Removing the boat also unloads any loads it was carrying.

DELETE /boats/:boat_id

Request

Request Parameters

Name	Type	Description	Required?
boat_id	String	ID of the boat	Yes

Request Body

None

Response

No body

Response Body Format

Success: No body

Failure:
HTML via express-jwt middleware for 401 Status Code
JSON for 403/406 Status Codes

Response Statuses

Outcome	Status Code	Notes
Success	204 No Content	
Failure	401 Unauthorized	If the request is missing the JWT, the boat is not deleted and a 401 status code is returned.
Failure	403 Forbidden	If the request contains an invalid JWT, the boat is not deleted and a 403 status code is returned.
Failure	406 Not Acceptable	If the request's Accept header does not specify application/json as an accepted type, the boat is not deleted and a 406 status code is returned.

Response Examples

Success

Status: 204 No Content

Failure

```
Status: 404 Not Found

{
    "Error": "No boat with this boat_id exists"
}
```

Create a Load (Unprotected Resource)

Allows you to create a load, where all new loads are not associated to any boat.

POST /loads

Request

Request Parameters

None

Request Body

Required

Request Body Format

JSON

Request JSON Attributes

Name	Type	Description	Required?
weight	Integer	The weight of the load in kg.	Yes
content	String	The contents of the load.	Yes
delivery_date	String	The date on which the load should be delivered.	Yes

Request Body Example

```
{
  "weight": 90
  "content": "paper towels"
  "delivery_date": "2/2/2021"
}
```

Response

JSON

Response Statuses

Outcome	Status Code	Notes
Success	201 Created	
Failure	406 Not Acceptable	If the request's Accept header does not specify application/json as an accepted type, the load is not created and a 406 status code is returned.

Response Examples

Success

```
Status: 201 Created

{
  "id": "324987375778",
  "content": "paper towels",
  "weight": 90,
  "delivery_date": "2/21/2021",
  "carrier": null,
  "self": "https://cs493mbfinalproject.wl.r.appspot.com/loads/324987375778"
```

```
}
```

Failure

```
Status: 406 Not Acceptable

{
    "Error":  "Application/JSON data not specified as acceptable in header"
}
```

View a Load (Unprotected Resource)

Allows you to get an existing load.

GET /load/:load_id

Request

Request Parameters

Name	Type	Description	Required?
load_id	String	ID of the load	Yes

Request Body

None

Response

Response Body Format

JSON

Response Statuses

Outcome	Status Code	Notes
Success	200 OK	
Failure	406 Not Acceptable	If the request's Accept header does not specify application/json as an accepted type, the load is not created and a 406 status code is returned.

Response Examples

Success

```
Status: 200 OK

{
  "id": "23956321",
  "weight": 90
  "content": "Cheerios",
  "delivery_date": "6/30/2020",
  "self": "https://cs493mbfinalproject.wl.r.appspot.com/loads/23956321"
}
```

Failure

```
Status: 406 Not Acceptable

{
    "Error": "Application/JSON data not specified as acceptable in header"
}
```

View all Loads (Unprotected Resource)

View all currently existing loads. Returned loads are paginated with a limit of five per page.

GET /loads

Request

Request Parameters

None

Request Body

None

Response

Response Body Format

JSON

Response Statuses

Outcome	Status Code	Notes
Success	200 OK	
Failure	406 Not Acceptable	If the request's Accept header does not specify application/json as an accepted type, the load is not created and a 406 status code is returned.

Response Examples

Success

```
Status: 200 OK

{
   "items": [
     {
        "content": "fresh produce",
        "weight": 10,
        "delivery_date": "5/1/2020",
        "id": "4824727671537664",
        "self": "https://cs493mbfinalproject.wl.r.appspot.com/loads/4824727671537664",
        "carrier": null
     },
     {
        "content": "fresh produce",
        "weight": 10,
        "delivery_date": "5/1/2020",
        "carrier": null,
        "id": "5088723339313152",
        "self": " https://cs493mbfinalproject.wl.r.appspot.com/loads/5088723339313152"
     },
     {
        "content": "fresh produce",
        "weight": 10,
```

```
            "delivery_date": "5/1/2020",
            "id": "5187754950393856",
            "self": "https://cs493mbfinalproject.wl.r.appspot.com/loads/5187754950393856",
            "carrier": null
        },
        {
            "content": "fresh produce",
            "weight": 10,
            "delivery_date": "5/1/2020",
            "id": "5187754950393856",
            "self": "https://cs493mbfinalproject.wl.r.appspot.com/loads/5187754950393856",
            "carrier": null
        },
        {
            "content": "fresh produce",
            "weight": 10,
            "delivery_date": "5/1/2020",
            "id": "5187754950393856",
            "self": "https://cs493mbfinalproject.wl.r.appspot.com/loads/5187754950393856",
            "carrier": null
        }
    ],
    "next": "https://cs493mbfinalproject.wl.r.appspot.com/loads?cursor=Ci8SKWoUbX5jczQ5M21iYXN
zaWdubWVudDRyEQsSBExvYWQYgICAmMXHmwkMGAAgAA==",
    "totalRecords": 6
}
```

Completely Update a Load (Unprotected Resource)

Allows you to update all properties of a load.

PUT /loads/:load_id

Request

Request Parameters

Name	Type	Description	Required?
load_id	String	ID of the load	Yes

Request Body
Required

Request Body Format
JSON

Request JSON Attributes

Name	Type	Description	Required?
content	String	The contents of the load.	Yes

weight	Integer	The weight of the load in kilograms.	Yes
delivery_date	String	The date on which the load is to be delivered	Yes

Request Body Example

```
{
  "content": "bananas",
  "weight": 80,
  "delivery_date": 9/4/2020,
}
```

Response

Response Body Format

JSON

Response Statuses

Outcome	Status Code	Notes
Success	200 OK	
Failure	406 Not Acceptable	If the request's Accept header does not specify application/json as an accepted type, the load is not updated and a 406 status code is returned.

Success

```
Status: 200 OK

{
  "id": "324987329843",
  "content": "bananas",
  "weight": 80,
  "delivery_date": 9/4/2020,
  "carrier": null,
  "self": "https://cs493mbfinalproject.wl.r.appspot.com/loads/324987329843"
}
```

Failure

```
Status: 406 Not Acceptable

{
    "Error": "Application/JSON data not specified as acceptable in header"
}
```

Partially Update a Load (Unprotected Resource)

Allows you to update all properties of a load.

PATCH /loads/:load_id

Request

Request Parameters

Name	Type	Description	Required?
load_id	String	ID of the load	Yes

Request Body

Required

Request Body Format

JSON

Request JSON Attributes

Name	Type	Description	Required?
content	String	The contents of the load.	No
weight	Integer	The weight of the load in kilograms.	No
delivery_date	String	The date on which the load is to be delivered.	No

Request Body Example

```
{
   "content": "oranges",
}
```

Response

Response Body Format

JSON

Response Statuses

Outcome	Status Code	Notes
Success	200 OK	
Failure	406 Not Acceptable	If the request's Accept header does not specify application/json as an accepted type, the load is not updated and a 406 status code is returned.

Success

```
Status: 200 OK

{
  "id": "324987329843",
  "content": "oranges",
  "weight": 80,
  "delivery_date": 9/4/2020,
  "carrier": null,
  "self": "https://cs493mbfinalproject.wl.r.appspot.com/loads/324987329843"
}
```

Failure

```
Status: 406 Not Acceptable

{
   "Error": "Application/JSON data not specified as acceptable in header"
}
```

Delete a Load (Unprotected Resource)

Allows you to remove a load. This action updates the carrier boat to indicate that the load is no longer present.

```
DELETE /loads/:load_id
```

Request

Request Parameters

None

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	406 Not Acceptable	If the request's Accept header does not specify application/json as an accepted type, the load is not deleted and a 406 status code is returned.

Response Examples

Success

```
Status: 204 No Content
```

Failure

```
Status: 406 Not Acceptable

{
    "Error": "Application/JSON data not specified as acceptable in header"
}
```

Assign a Load to a Boat (Protected Resource)

Allows a load to be associated to a boat via the load's "carrier" property and removes the load from the list of loads carried by that boat.

PUT /boats/:boat_id/loads/:load_id

Request

Request Parameters

None

Request Body

None

Response

No body

Response Body Format

Success: No body

Failure:

JSON for 201 and 403 Status Codes

HTML via express-jwt middleware for 401 Status Code

Response Statuses

Outcome	Status Code	Notes
Success	204 No Content	Succeeds only if a boat and load with specified ids exist and the load is not currently assigned to a boat.
Failure	401 Unauthorized	If the request is missing the JWT, the load is not assigned and a 401 status code is returned.
Failure	403 Forbidden	If the request contains an invalid JWT, the load is not assigned and a 403 status code is returned.
Failure	403 Forbidden	If the specified load is already assigned to a boat, the load is not reassigned.

Response Examples

Success

Status: 204 No Content

Failure

Status: 401 Unauthorized

```
<!DOCTYPE html>
<html lang="en">

<head>
    <meta charset="utf-8">
    <title>Error</title>
</head>

<body>
    <pre>Unauthorized</pre>
```

```
</body>

</html>
```

Status: 403 Forbidden
 	
{
  "Error": "Access to the specified boat from this account is forbidden"
}

Status: 403 Forbidden
 	
{
  "Error": "The load is already associated to a boat"
}

Remove a Load from a Boat (Protected Resource)

Allows a load to be removed from a boat via the load's "carrier property" and removes the load from the list of loads carried by that boat.

DELETE /boat/:boat_id/loads/:load_id

Request

Request Parameters

None

Request Body

None

Response

No body

Response Body Format

Success: No body

Failure:
JSON for 201 and 403 Status Codes
HTML via express-jwt middleware for 401 Status Code

Response Statuses

Outcome	Status Code	Notes
Success	204 No Content	Succeeds only if a boat and load with specified ids exist.
Failure	401 Unauthorized	If the request is missing the JWT, the load is not removed from the boat and a 401 status code is returned.
Failure	403 Forbidden	If the request contains an invalid JWT, the load is not removed from the boat and a 403 status code is returned.

Response Examples

Success

Status: 204 No Content

Status: 401 Unauthorized

```html
<!DOCTYPE html>
<html lang="en">

<head>
    <meta charset="utf-8">
    <title>Error</title>
</head>

<body>
    <pre>Unauthorized</pre>
</body>

</html>
```

Status: 403 Forbidden

```
{
  "Error": "Access to the specified boat from this account is forbidden"
}
```