Lab 2

New Attempt

Due Sep 26 by 11:59pm   **Points** 100   **Submitting** a file upload   **File Types** zip   **Available** after Sep 19 at 12am

---

CS-554 Lab 2

Redis

For this assignment, you will practice your usage of redis and async / await together.

You will create a Marvel API Express Server that caches the results in Redis. Your routes will just return JSON data.

You will be using the **Marvel API** ▣ **(https://developer.marvel.com)** . You will need to register and sign up for an API key. You will not be able to make requests to the API without signing up and getting an **API key** ▣ **(https://developer.marvel.com/account)** . You will use the **Characters** ▣ **(https://gateway.marvel.com/v1/public/characters? ts=1592417963445&apikey=a8f9ccf932bf29fd379ef00e11668673&hash=f061194023791a1593a0ea861a27da67)** , **Comics** ▣ **(https://gateway.marvel.com/v1/public/comics? ts=1592417963445&apikey=a8f9ccf932bf29fd379ef00e11668673&hash=f061194023791a1593a0ea861a27da67)** , and **Stories** ▣ **(https://gateway.marvel.com/v1/public/stories? ts=1592417963445&apikey=a8f9ccf932bf29fd379ef00e11668673&hash=f061194023791a1593a0ea861a27da67)** listings. Please look at the data returned so you know the schema of the data and the objects it returns (the links to Characters, Comics and Stories above work but using my API key. DO NOT use my API key. Please register for your own. You will need to compose the URL with your API key, a ts (time stamp) and a hash.

You can use the following code to construct the URL. (this example is for characters, you would do the same for series and comics) you can read more about AUTHORIZING AND SIGNING REQUESTS from the link below

https://developer.marvel.com/documentation/authorization ▣ **(https://developer.marvel.com/documentation/authorization)**

```
const md5 = require('blueimp-md5');
const publickey = 'your_public_key(API KEY) from Marvel dev portal';
const privatekey = 'your private key from Marvel dev portal';
const ts = new Date().getTime();
const stringToHash = ts + privatekey + publickey;
const hash = md5(stringToHash);
```

```
const baseUrl = 'https://gateway.marvel.com:443/v1/public/characters';
const url = baseUrl + '?ts=' + ts + '&apikey=' + publickey + '&hash=' + hash;
```

Your cache

You will cache your data in Redis for this assignment after it has been accessed; you should not cache all data by default. When a request is made to one of the routes, you will first check to see if it is already stored in the cache. If it is, you will serve it from the cache. If it's not stored in the cache, you will then make a request to the Marvel API to get the data, store it in the cache for the next time it is accessed and will respond with the JSON data.

Your Routes

You will have 4 routes.

```
/api/characters/:id
```

This route will do two things:

1) Check if the character has a cache entry in redis. If so, render the result from that cache entry

2) If not, query the data from the Marvel API for the Character and fail the request if they are not found, or send JSON and cache the result if they are found.

You will insert everything in the `"results"` **property returned from the API. You'll notice** `results` **is an array, even through there is only one character in the results. You can just take** `results[0]` **Again, LOOK at the data returned from the API. It's always important to understand the data schema when you pull data from an API.**

If the character is found, then you will add their ID to a list of recently viewed character (this list allows duplicates!) ordered by most recent character that was accessed first. This list can be infinitely large.

```
/api/characters/history
```

This route will respond with an array of the last 20 characters that were accessed in the cache from the recently viewed list. **You can have duplicate characters in your 20 character list**.

For each character being printed out, you will print out their entire data returned from the API. You will insert everything in the `"results"` **property returned from the API. You'll notice** `results` **is an array, even through there is only one character in the results. You can just take** `results[0]` **Again, LOOK at the data returned from the API. It's always important to understand the data schema when you pull data from an API.**

For example, if character 1011334 was accessed , then character 1009146, then character 1009149, then character 1009146, then character 1011031, you would output:

```
[
{

"id": 1011031,

"name": "Agent X (Nijo)",

"description": "Originally a partner of the mind-altering assassin Black Swan, Nijo spied on Deadpool as part of the Swan's plan to exact revenge for Deadp
ool falsely taking credit for the Swan's assassination of the Four Winds crime family, which included Nijo's brother.",

"modified": "1969-12-31T19:00:00-0500",

"thumbnail": {

"path": "http://i.annihil.us/u/prod/marvel/i/mg/b/40/image_not_available",

"extension": "jpg"

},

"resourceURI": "http://gateway.marvel.com/v1/public/characters/1011031",

"comics": {

"available": 18,

"collectionURI": "http://gateway.marvel.com/v1/public/characters/1011031/comics",
```

```
"items": [{

"resourceURI": "http://gateway.marvel.com/v1/public/comics/17702",

"name": "Agent X (2002) #1"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/comics/17709",

"name": "Agent X (2002) #2"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/comics/17710",

"name": "Agent X (2002) #3"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/comics/17711",

"name": "Agent X (2002) #4"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/comics/17712",

"name": "Agent X (2002) #5"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/comics/17713",

"name": "Agent X (2002) #6"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/comics/17714",

"name": "Agent X (2002) #7"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/comics/17715",

"name": "Agent X (2002) #8"

}, {
```

```
"resourceURI": "http://gateway.marvel.com/v1/public/comics/17716",

"name": "Agent X (2002) #9"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/comics/17703",

"name": "Agent X (2002) #10"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/comics/17704",

"name": "Agent X (2002) #11"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/comics/17705",

"name": "Agent X (2002) #12"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/comics/17706",

"name": "Agent X (2002) #13"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/comics/17707",

"name": "Agent X (2002) #14"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/comics/394",

"name": "Agent X (2002) #15"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/comics/1649",

"name": "Cable & Deadpool (2004) #12"

}, {
```

"resourceURI": "http://gateway.marvel.com/v1/public/comics/21845",

"name": "Cable & Deadpool (2004) #46 (Zombie Variant)"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/comics/5761",

"name": "Cable & Deadpool Vol. 2: The Burnt Offering (Trade Paperback)"

}],

"returned": 18

},

"series": {

"available": 3,

"collectionURI": "http://gateway.marvel.com/v1/public/characters/1011031/series",

"items": [{

"resourceURI": "http://gateway.marvel.com/v1/public/series/459",

"name": "Agent X (2002 - 2004)"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/series/693",

"name": "Cable & Deadpool (2004 - 2008)"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/series/1338",

"name": "Cable & Deadpool Vol. 2: The Burnt Offering (2007)"

}],

"returned": 3

},

"stories": {

"available": 23,

```
"collectionURI": "http://gateway.marvel.com/v1/public/characters/1011031/stories",

"items": [{

"resourceURI": "http://gateway.marvel.com/v1/public/stories/1135",

"name": "AGENT X (2002) #15",

"type": "cover"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/stories/2484",

"name": "CABLE & DEADPOOL (2004) #12",

"type": "cover"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/stories/37514",

"name": "AGENT X (2002) #1",

"type": "cover"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/stories/37515",

"name": "Dead Man's Switch Part One",

"type": "interiorStory"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/stories/37516",

"name": "AGENT X (2002) #10",

"type": "cover"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/stories/37518",

"name": "AGENT X (2002) #11",
```

```
"type": "cover"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/stories/37521",

"name": "AGENT X (2002) #13",

"type": "cover"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/stories/37523",

"name": "AGENT X (2002) #14",

"type": "cover"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/stories/37525",

"name": "AGENT X (2002) #2",

"type": "cover"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/stories/37526",

"name": "Dead Man's Switch Part Two",

"type": "interiorStory"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/stories/37527",

"name": "AGENT X (2002) #3",

"type": "cover"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/stories/37528",

"name": "Dead Man's Switch Part Three",

"type": "interiorStory"
```

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/stories/37529",

"name": "AGENT X (2002) #4",

"type": "cover"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/stories/37530",

"name": "Dead Man's Switch Part Four",

"type": "interiorStory"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/stories/37531",

"name": "AGENT X (2002) #5",

"type": "cover"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/stories/37532",

"name": "Dead Man's Switch Part Five",

"type": "interiorStory"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/stories/37533",

"name": "AGENT X (2002) #6",

"type": "cover"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/stories/37534",

"name": "Dead Man's Switch Part Six",

"type": "interiorStory"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/stories/37535",

"name": "AGENT X (2002) #7",

"type": "cover"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/stories/67703",

"name": "AGENT X (2002) #12",

"type": "cover"

}],

"returned": 20

},

"events": {

"available": 0,

"collectionURI": "http://gateway.marvel.com/v1/public/characters/1011031/events",

"items": [],

"returned": 0

},

"urls": [{

"type": "detail",

"url": "http://marvel.com/characters/101/agent_x?utm_campaign=apiRef&utm_source=a8f9ccf932bf29fd379ef00e11668673"

}, {

"type": "wiki",

"url": "http://marvel.com/universe/Agent_X_(Nijo)?utm_campaign=apiRef&utm_source=a8f9ccf932bf29fd379ef00e11668673"

}, {

"type": "comiclink",

"url": "http://marvel.com/comics/characters/1011031/agent_x_nijo?utm_campaign=apiRef&utm_source=a8f9ccf932bf29fd379ef00e11668673"

}]

}, {

"id": 1009146,

"name": "Abomination (Emil Blonsky)",

"description": "Formerly known as Emil Blonsky, a spy of Soviet Yugoslavian origin working for the KGB, the Abomination gained his powers after receiving a dose of gamma radiation similar to that which transformed Bruce Banner into the incredible Hulk.",

"modified": "2012-03-20T12:32:12-0400",

"thumbnail": {

"path": "http://i.annihil.us/u/prod/marvel/i/mg/9/50/4ce18691cbf04",

"extension": "jpg"

},

"resourceURI": "http://gateway.marvel.com/v1/public/characters/1009146",

"comics": {

"available": 54,

"collectionURI": "http://gateway.marvel.com/v1/public/characters/1009146/comics",

"items": [{

"resourceURI": "http://gateway.marvel.com/v1/public/comics/17547",

"name": "Avengers (1998) #61"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/comics/17548",

"name": "Avengers (1998) #62"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/comics/1098",

"name": "Avengers Vol. 1: World Trust (Trade Paperback)"

```
}, {

"resourceURI": "http://gateway.marvel.com/v1/public/comics/8557",

"name": "Earth X (1999) #7"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/comics/4241",

"name": "EARTH X TPB [NEW PRINTING] (Trade Paperback)"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/comics/20863",

"name": "Hulk (2008) #3"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/comics/2499",

"name": "Hulk: Destruction (2005) #4"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/comics/14424",

"name": "Hulk (1999) #24"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/comics/14425",

"name": "Hulk (1999) #25"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/comics/14428",

"name": "Hulk (1999) #28"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/comics/14450",

"name": "Hulk (1999) #50"
```

```
}, {

"resourceURI": "http://gateway.marvel.com/v1/public/comics/14451",

"name": "Hulk (1999) #51"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/comics/14453",

"name": "Hulk (1999) #53"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/comics/14454",

"name": "Hulk (1999) #54"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/comics/8948",

"name": "Incredible Hulk (1962) #137"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/comics/8982",

"name": "Incredible Hulk (1962) #171"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/comics/9005",

"name": "Incredible Hulk (1962) #194"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/comics/9006",

"name": "Incredible Hulk (1962) #195"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/comics/9007",

"name": "Incredible Hulk (1962) #196"

}, {
```

"resourceURI": "http://gateway.marvel.com/v1/public/comics/9011",

"name": "Incredible Hulk (1962) #200"

}],

"returned": 20

},

"series": {

"available": 27,

"collectionURI": "http://gateway.marvel.com/v1/public/characters/1009146/series",

"items": [{

"resourceURI": "http://gateway.marvel.com/v1/public/series/354",

"name": "Avengers (1998 - 2004)"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/series/158",

"name": "Avengers Vol. 1: World Trust (2003)"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/series/378",

"name": "Earth X (1999 - 2000)"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/series/1806",

"name": "EARTH X TPB [NEW PRINTING] (2006)"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/series/465",

"name": "Hulk (1999 - 2008)"

}, {

    "resourceURI": "http://gateway.marvel.com/v1/public/series/3374",

    "name": "Hulk (2008 - 2012)"

}, {

    "resourceURI": "http://gateway.marvel.com/v1/public/series/924",

    "name": "Hulk: Destruction (2005)"

}, {

    "resourceURI": "http://gateway.marvel.com/v1/public/series/2021",

    "name": "Incredible Hulk (1962 - 1999)"

}, {

    "resourceURI": "http://gateway.marvel.com/v1/public/series/2983",

    "name": "Incredible Hulk Annual (1976 - 1994)"

}, {

    "resourceURI": "http://gateway.marvel.com/v1/public/series/22424",

    "name": "Incredible Hulk Epic Collection: The Hulk Must Die (2017)"

}, {

    "resourceURI": "http://gateway.marvel.com/v1/public/series/212",

    "name": "Incredible Hulk Vol. 4: Abominable (2003)"

}, {

    "resourceURI": "http://gateway.marvel.com/v1/public/series/244",

    "name": "Incredible Hulk Vol. IV: Abominable (2003)"

}, {

    "resourceURI": "http://gateway.marvel.com/v1/public/series/8842",

    "name": "Incredible Hulks (2010 - 2011)"

}, {

    "resourceURI": "http://gateway.marvel.com/v1/public/series/2572",

```
"name": "Iron Man (1998 - 2004)"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/series/977",

"name": "Irredeemable Ant-Man (2006 - 2007)"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/series/2423",

"name": "Irredeemable Ant-Man Vol. 1: Low-Life (2007)"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/series/3722",

"name": "Killraven (2002 - 2003)"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/series/2437",

"name": "KILLRAVEN PREMIERE HC (2007)"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/series/32108",

"name": "Maestro: World War M (2022)"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/series/21675",

"name": "Marvel Cinematic Universe Guidebook: The Avengers Initiative (2017)"

}],

"returned": 20

},

"stories": {

"available": 64,
```

    "collectionURI": "http://gateway.marvel.com/v1/public/characters/1009146/stories",

    "items": [{

    "resourceURI": "http://gateway.marvel.com/v1/public/stories/4946",

    "name": "4 of 4 - 4XLS",

    "type": "cover"

    }, {

    "resourceURI": "http://gateway.marvel.com/v1/public/stories/5496",

    "name": "Irredeemable Ant-Man (2006) #1",

    "type": "cover"

    }, {

    "resourceURI": "http://gateway.marvel.com/v1/public/stories/12370",

    "name": "Cover #12370",

    "type": "cover"

    }, {

    "resourceURI": "http://gateway.marvel.com/v1/public/stories/12372",

    "name": "Whosoever Harms the Hulk..!",

    "type": "interiorStory"

    }, {

    "resourceURI": "http://gateway.marvel.com/v1/public/stories/18419",

    "name": "[none]",

    "type": "cover"

    }, {

    "resourceURI": "http://gateway.marvel.com/v1/public/stories/18420",

    "name": "The Stars Mine Enemy",

    "type": "interiorStory"

```
}, {

"resourceURI": "http://gateway.marvel.com/v1/public/stories/18488",

"name": "Incredible Hulk (1962) #171",

"type": "cover"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/stories/18489",

"name": "Revenge",

"type": ""

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/stories/18534",

"name": "Incredible Hulk (1962) #194",

"type": "cover"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/stories/18535",

"name": "The Day of the Locust!",

"type": "interiorStory"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/stories/18536",

"name": "Incredible Hulk (1962) #195",

"type": "cover"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/stories/18537",

"name": "Warfare In Wonderland!",

"type": "interiorStory"
```

```
}, {

"resourceURI": "http://gateway.marvel.com/v1/public/stories/18538",

"name": "Incredible Hulk (1962) #196",

"type": "cover"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/stories/18539",

"name": "The Abomination Proclamation!",

"type": "interiorStory"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/stories/18546",

"name": "Incredible Hulk (1962) #200",

"type": "cover"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/stories/18547",

"name": "An Intruder In the Mind!",

"type": "interiorStory"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/stories/18776",

"name": "Cover #18776",

"type": "cover"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/stories/18877",

"name": "Incredible Hulk (1962) #364",

"type": "cover"

}, {
```

"resourceURI": "http://gateway.marvel.com/v1/public/stories/18878",

"name": "Countdown Part 4: The Abomination",

"type": "interiorStory"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/stories/18881",

"name": "Incredible Hulk (1962) #366",

"type": "cover"

}],

"returned": 20

},

"events": {

"available": 1,

"collectionURI": "http://gateway.marvel.com/v1/public/characters/1009146/events",

"items": [{

"resourceURI": "http://gateway.marvel.com/v1/public/events/296",

"name": "Chaos War"

}],

"returned": 1

},

"urls": [{

"type": "detail",

"url": "http://marvel.com/characters/81/abomination?utm_campaign=apiRef&utm_source=a8f9ccf932bf29fd379ef00e11668673"

}, {

"type": "wiki",

"url": "http://marvel.com/universe/Abomination?utm_campaign=apiRef&utm_source=a8f9ccf932bf29fd379ef00e11668673"

}, {

"type": "comiclink",

"url": "http://marvel.com/comics/characters/1009146/abomination_emil_blonsky?utm_campaign=apiRef&utm_source=a8f9ccf932bf29fd379ef00e11668673"

}]

}, {

"id": 1009149,

"name": "Abyss",

"description": "",

"modified": "2014-04-29T14:10:43-0400",

"thumbnail": {

"path": "http://i.annihil.us/u/prod/marvel/i/mg/9/30/535feab462a64",

"extension": "jpg"

},

"resourceURI": "http://gateway.marvel.com/v1/public/characters/1009149",

"comics": {

"available": 8,

"collectionURI": "http://gateway.marvel.com/v1/public/characters/1009149/comics",

"items": [{

"resourceURI": "http://gateway.marvel.com/v1/public/comics/13943",

"name": "Uncanny X-Men (1981) #402"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/comics/13945",

"name": "Uncanny X-Men (1981) #404"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/comics/13946",

"name": "Uncanny X-Men (1981) #405"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/comics/13947",

"name": "Uncanny X-Men (1981) #406"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/comics/13970",

"name": "Uncanny X-Men (1981) #429"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/comics/13972",

"name": "Uncanny X-Men (1981) #431"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/comics/12386",

"name": "X-Men: Alpha (1995) #1"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/comics/2539",

"name": "X-Men: The Complete Age of Apocalypse Epic Book 2 (Trade Paperback)"

}],

"returned": 8

},

"series": {

"available": 3,

"collectionURI": "http://gateway.marvel.com/v1/public/characters/1009149/series",

"items": [{

"resourceURI": "http://gateway.marvel.com/v1/public/series/2258",

"name": "Uncanny X-Men (1981 - 2011)"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/series/2104",

"name": "X-Men: Alpha (1995)"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/series/1583",

"name": "X-Men: The Complete Age of Apocalypse Epic Book 2 (2005)"

}],

"returned": 3

},

"stories": {

"available": 8,

"collectionURI": "http://gateway.marvel.com/v1/public/characters/1009149/stories",

"items": [{

"resourceURI": "http://gateway.marvel.com/v1/public/stories/26281",

"name": "A Beginning",

"type": "interiorStory"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/stories/28352",

"name": "Utility of Myth",

"type": "interiorStory"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/stories/28356",

"name": "Army Ants",

```
    "type": "interiorStory"

}, {

    "resourceURI": "http://gateway.marvel.com/v1/public/stories/28358",

    "name": "Ballroom Blitzkrieg",

    "type": "interiorStory"

}, {

    "resourceURI": "http://gateway.marvel.com/v1/public/stories/28360",

    "name": "Staring Contests are for Suckers",

    "type": "interiorStory"

}, {

    "resourceURI": "http://gateway.marvel.com/v1/public/stories/28407",

    "name": "The Draco Part One: Sins of the Father",

    "type": "interiorStory"

}, {

    "resourceURI": "http://gateway.marvel.com/v1/public/stories/28411",

    "name": "The Draco Part Three",

    "type": "interiorStory"

}, {

    "resourceURI": "http://gateway.marvel.com/v1/public/stories/28413",

    "name": "The Draco Part Four",

    "type": "interiorStory"

}],

"returned": 8

},
```

```
"events": {

"available": 1,

"collectionURI": "http://gateway.marvel.com/v1/public/characters/1009149/events",

"items": [{

"resourceURI": "http://gateway.marvel.com/v1/public/events/227",

"name": "Age of Apocalypse"

}],

"returned": 1

},

"urls": [{

"type": "detail",

"url": "http://marvel.com/characters/85/abyss?utm_campaign=apiRef&utm_source=a8f9ccf932bf29fd379ef00e11668673"

}, {

"type": "wiki",

"url": "http://marvel.com/universe/Abyss_(alien)?utm_campaign=apiRef&utm_source=a8f9ccf932bf29fd379ef00e11668673"

}, {

"type": "comiclink",

"url": "http://marvel.com/comics/characters/1009149/abyss?utm_campaign=apiRef&utm_source=a8f9ccf932bf29fd379ef00e11668673"

}]

}, {

"id": 1009146,

"name": "Abomination (Emil Blonsky)",

"description": "Formerly known as Emil Blonsky, a spy of Soviet Yugoslavian origin working for the KGB, the Abomination gained his powers after receiving a dose of gamma radiation similar to that which transformed Bruce Banner into the incredible Hulk.",

"modified": "2012-03-20T12:32:12-0400",
```

"thumbnail": {

"path": "http://i.annihil.us/u/prod/marvel/i/mg/9/50/4ce18691cbf04",

"extension": "jpg"

},

"resourceURI": "http://gateway.marvel.com/v1/public/characters/1009146",

"comics": {

"available": 54,

"collectionURI": "http://gateway.marvel.com/v1/public/characters/1009146/comics",

"items": [{

"resourceURI": "http://gateway.marvel.com/v1/public/comics/17547",

"name": "Avengers (1998) #61"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/comics/17548",

"name": "Avengers (1998) #62"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/comics/1098",

"name": "Avengers Vol. 1: World Trust (Trade Paperback)"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/comics/8557",

"name": "Earth X (1999) #7"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/comics/4241",

"name": "EARTH X TPB [NEW PRINTING] (Trade Paperback)"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/comics/20863",

    "name": "Hulk (2008) #3"

}, {

    "resourceURI": "http://gateway.marvel.com/v1/public/comics/2499",

    "name": "Hulk: Destruction (2005) #4"

}, {

    "resourceURI": "http://gateway.marvel.com/v1/public/comics/14424",

    "name": "Hulk (1999) #24"

}, {

    "resourceURI": "http://gateway.marvel.com/v1/public/comics/14425",

    "name": "Hulk (1999) #25"

}, {

    "resourceURI": "http://gateway.marvel.com/v1/public/comics/14428",

    "name": "Hulk (1999) #28"

}, {

    "resourceURI": "http://gateway.marvel.com/v1/public/comics/14450",

    "name": "Hulk (1999) #50"

}, {

    "resourceURI": "http://gateway.marvel.com/v1/public/comics/14451",

    "name": "Hulk (1999) #51"

}, {

    "resourceURI": "http://gateway.marvel.com/v1/public/comics/14453",

    "name": "Hulk (1999) #53"

}, {

    "resourceURI": "http://gateway.marvel.com/v1/public/comics/14454",

"name": "Hulk (1999) #54"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/comics/8948",

"name": "Incredible Hulk (1962) #137"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/comics/8982",

"name": "Incredible Hulk (1962) #171"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/comics/9005",

"name": "Incredible Hulk (1962) #194"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/comics/9006",

"name": "Incredible Hulk (1962) #195"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/comics/9007",

"name": "Incredible Hulk (1962) #196"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/comics/9011",

"name": "Incredible Hulk (1962) #200"

}],

"returned": 20

},

"series": {

"available": 27,

"collectionURI": "http://gateway.marvel.com/v1/public/characters/1009146/series",

```
"items": [{

"resourceURI": "http://gateway.marvel.com/v1/public/series/354",

"name": "Avengers (1998 - 2004)"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/series/158",

"name": "Avengers Vol. 1: World Trust (2003)"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/series/378",

"name": "Earth X (1999 - 2000)"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/series/1806",

"name": "EARTH X TPB [NEW PRINTING] (2006)"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/series/465",

"name": "Hulk (1999 - 2008)"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/series/3374",

"name": "Hulk (2008 - 2012)"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/series/924",

"name": "Hulk: Destruction (2005)"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/series/2021",

"name": "Incredible Hulk (1962 - 1999)"
```

```
    }, {

    "resourceURI": "http://gateway.marvel.com/v1/public/series/2983",

    "name": "Incredible Hulk Annual (1976 - 1994)"

    }, {

    "resourceURI": "http://gateway.marvel.com/v1/public/series/22424",

    "name": "Incredible Hulk Epic Collection: The Hulk Must Die (2017)"

    }, {

    "resourceURI": "http://gateway.marvel.com/v1/public/series/212",

    "name": "Incredible Hulk Vol. 4: Abominable (2003)"

    }, {

    "resourceURI": "http://gateway.marvel.com/v1/public/series/244",

    "name": "Incredible Hulk Vol. IV: Abominable (2003)"

    }, {

    "resourceURI": "http://gateway.marvel.com/v1/public/series/8842",

    "name": "Incredible Hulks (2010 - 2011)"

    }, {

    "resourceURI": "http://gateway.marvel.com/v1/public/series/2572",

    "name": "Iron Man (1998 - 2004)"

    }, {

    "resourceURI": "http://gateway.marvel.com/v1/public/series/977",

    "name": "Irredeemable Ant-Man (2006 - 2007)"

    }, {

    "resourceURI": "http://gateway.marvel.com/v1/public/series/2423",

    "name": "Irredeemable Ant-Man Vol. 1: Low-Life (2007)"

    }, {
```

```
"resourceURI": "http://gateway.marvel.com/v1/public/series/3722",

"name": "Killraven (2002 - 2003)"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/series/2437",

"name": "KILLRAVEN PREMIERE HC (2007)"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/series/32108",

"name": "Maestro: World War M (2022)"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/series/21675",

"name": "Marvel Cinematic Universe Guidebook: The Avengers Initiative (2017)"

}],

"returned": 20

},

"stories": {

"available": 64,

"collectionURI": "http://gateway.marvel.com/v1/public/characters/1009146/stories",

"items": [{

"resourceURI": "http://gateway.marvel.com/v1/public/stories/4946",

"name": "4 of 4 - 4XLS",

"type": "cover"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/stories/5496",

"name": "Irredeemable Ant-Man (2006) #1",
```

    "type": "cover"

  }, {

  "resourceURI": "http://gateway.marvel.com/v1/public/stories/12370",

  "name": "Cover #12370",

  "type": "cover"

  }, {

  "resourceURI": "http://gateway.marvel.com/v1/public/stories/12372",

  "name": "Whosoever Harms the Hulk..!",

  "type": "interiorStory"

  }, {

  "resourceURI": "http://gateway.marvel.com/v1/public/stories/18419",

  "name": "[none]",

  "type": "cover"

  }, {

  "resourceURI": "http://gateway.marvel.com/v1/public/stories/18420",

  "name": "The Stars Mine Enemy",

  "type": "interiorStory"

  }, {

  "resourceURI": "http://gateway.marvel.com/v1/public/stories/18488",

  "name": "Incredible Hulk (1962) #171",

  "type": "cover"

  }, {

  "resourceURI": "http://gateway.marvel.com/v1/public/stories/18489",

  "name": "Revenge",

  "type": ""

```
}, {

"resourceURI": "http://gateway.marvel.com/v1/public/stories/18534",

"name": "Incredible Hulk (1962) #194",

"type": "cover"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/stories/18535",

"name": "The Day of the Locust!",

"type": "interiorStory"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/stories/18536",

"name": "Incredible Hulk (1962) #195",

"type": "cover"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/stories/18537",

"name": "Warfare In Wonderland!",

"type": "interiorStory"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/stories/18538",

"name": "Incredible Hulk (1962) #196",

"type": "cover"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/stories/18539",

"name": "The Abomination Proclamation!",

"type": "interiorStory"
```

```
}, {

"resourceURI": "http://gateway.marvel.com/v1/public/stories/18546",

"name": "Incredible Hulk (1962) #200",

"type": "cover"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/stories/18547",

"name": "An Intruder In the Mind!",

"type": "interiorStory"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/stories/18776",

"name": "Cover #18776",

"type": "cover"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/stories/18877",

"name": "Incredible Hulk (1962) #364",

"type": "cover"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/stories/18878",

"name": "Countdown Part 4: The Abomination",

"type": "interiorStory"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/stories/18881",

"name": "Incredible Hulk (1962) #366",

"type": "cover"

}],
```

"returned": 20

},

"events": {

"available": 1,

"collectionURI": "http://gateway.marvel.com/v1/public/characters/1009146/events",

"items": [{

"resourceURI": "http://gateway.marvel.com/v1/public/events/296",

"name": "Chaos War"

}],

"returned": 1

},

"urls": [{

"type": "detail",

"url": "http://marvel.com/characters/81/abomination?utm_campaign=apiRef&utm_source=a8f9ccf932bf29fd379ef00e11668673"

}, {

"type": "wiki",

"url": "http://marvel.com/universe/Abomination?utm_campaign=apiRef&utm_source=a8f9ccf932bf29fd379ef00e11668673"

}, {

"type": "comiclink",

"url": "http://marvel.com/comics/characters/1009146/abomination_emil_blonsky?utm_campaign=apiRef&utm_source=a8f9ccf932bf29fd379ef00e11668673"

}]

}, {

"id": 1011334,

"name": "3-D Man",

"description": "",

"modified": "2014-04-29T14:18:17-0400",

"thumbnail": {

"path": "http://i.annihil.us/u/prod/marvel/i/mg/c/e0/535fecbbb9784",

"extension": "jpg"

},

"resourceURI": "http://gateway.marvel.com/v1/public/characters/1011334",

"comics": {

"available": 12,

"collectionURI": "http://gateway.marvel.com/v1/public/characters/1011334/comics",

"items": [{

"resourceURI": "http://gateway.marvel.com/v1/public/comics/21366",

"name": "Avengers: The Initiative (2007) #14"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/comics/24571",

"name": "Avengers: The Initiative (2007) #14 (SPOTLIGHT VARIANT)"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/comics/21546",

"name": "Avengers: The Initiative (2007) #15"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/comics/21741",

"name": "Avengers: The Initiative (2007) #16"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/comics/21975",

"name": "Avengers: The Initiative (2007) #17"

```
}, {

"resourceURI": "http://gateway.marvel.com/v1/public/comics/22299",

"name": "Avengers: The Initiative (2007) #18"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/comics/22300",

"name": "Avengers: The Initiative (2007) #18 (ZOMBIE VARIANT)"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/comics/22506",

"name": "Avengers: The Initiative (2007) #19"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/comics/8500",

"name": "Deadpool (1997) #44"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/comics/10223",

"name": "Marvel Premiere (1972) #35"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/comics/10224",

"name": "Marvel Premiere (1972) #36"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/comics/10225",

"name": "Marvel Premiere (1972) #37"

}],

"returned": 12

},
```

"series": {

"available": 3,

"collectionURI": "http://gateway.marvel.com/v1/public/characters/1011334/series",

"items": [{

"resourceURI": "http://gateway.marvel.com/v1/public/series/1945",

"name": "Avengers: The Initiative (2007 - 2010)"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/series/2005",

"name": "Deadpool (1997 - 2002)"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/series/2045",

"name": "Marvel Premiere (1972 - 1981)"

}],

"returned": 3

},

"stories": {

"available": 21,

"collectionURI": "http://gateway.marvel.com/v1/public/characters/1011334/stories",

"items": [{

"resourceURI": "http://gateway.marvel.com/v1/public/stories/19947",

"name": "Cover #19947",

"type": "cover"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/stories/19948",

"name": "The 3-D Man!",

```
"type": "interiorStory"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/stories/19949",

"name": "Cover #19949",

"type": "cover"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/stories/19950",

"name": "The Devil's Music!",

"type": "interiorStory"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/stories/19951",

"name": "Cover #19951",

"type": "cover"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/stories/19952",

"name": "Code-Name: The Cold Warrior!",

"type": "interiorStory"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/stories/47184",

"name": "AVENGERS: THE INITIATIVE (2007) #14",

"type": "cover"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/stories/47185",

"name": "Avengers: The Initiative (2007) #14 - Int",
```

```
"type": "interiorStory"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/stories/47498",

"name": "AVENGERS: THE INITIATIVE (2007) #15",

"type": "cover"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/stories/47499",

"name": "Avengers: The Initiative (2007) #15 - Int",

"type": "interiorStory"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/stories/47792",

"name": "AVENGERS: THE INITIATIVE (2007) #16",

"type": "cover"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/stories/47793",

"name": "Avengers: The Initiative (2007) #16 - Int",

"type": "interiorStory"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/stories/48361",

"name": "AVENGERS: THE INITIATIVE (2007) #17",

"type": "cover"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/stories/48362",

"name": "Avengers: The Initiative (2007) #17 - Int",

"type": "interiorStory"
```

```
}, {

"resourceURI": "http://gateway.marvel.com/v1/public/stories/49103",

"name": "AVENGERS: THE INITIATIVE (2007) #18",

"type": "cover"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/stories/49104",

"name": "Avengers: The Initiative (2007) #18 - Int",

"type": "interiorStory"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/stories/49106",

"name": "Avengers: The Initiative (2007) #18, Zombie Variant - Int",

"type": "interiorStory"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/stories/49888",

"name": "AVENGERS: THE INITIATIVE (2007) #19",

"type": "cover"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/stories/49889",

"name": "Avengers: The Initiative (2007) #19 - Int",

"type": "interiorStory"

}, {

"resourceURI": "http://gateway.marvel.com/v1/public/stories/54371",

"name": "Avengers: The Initiative (2007) #14, Spotlight Variant - Int",

"type": "interiorStory"
```

```
    }],
    "returned": 20
  },
  "events": {
    "available": 1,
    "collectionURI": "http://gateway.marvel.com/v1/public/characters/1011334/events",
    "items": [{
      "resourceURI": "http://gateway.marvel.com/v1/public/events/269",
      "name": "Secret Invasion"
    }],
    "returned": 1
  },
  "urls": [{
    "type": "detail",
    "url": "http://marvel.com/comics/characters/1011334/3-d_man?utm_campaign=apiRef&utm_source=a8f9ccf932bf29fd379ef00e11668673"
  }, {
    "type": "wiki",
    "url": "http://marvel.com/universe/3-D_Man_(Chandler)?utm_campaign=apiRef&utm_source=a8f9ccf932bf29fd379ef00e11668673"
  }, {
    "type": "comiclink",
    "url": "http://marvel.com/comics/characters/1011334/3-d_man?utm_campaign=apiRef&utm_source=a8f9ccf932bf29fd379ef00e11668673"
  }]
}
]
```

```
/api/comics/:id
```

This route will do two things:

1) Check if the comic has a cache entry in redis. If so, render the result from that cache entry

2) If not, query the data from the Marvel API for the Comic and fail the request if it is not found, or send JSON and cache the result if they are found.

You will insert everything in the `"results"` **property returned from the API. You'll notice** `results` **is an array, even through there is only one comic in the results. You can just take** `results[0]` **Again, LOOK at the data returned from the API. It's always important to understand the data schema when you pull data from an API.**

```
/api/stories/:id
```

This route will do two things:

1) Check if the story has a cache entry in redis. If so, render the result from that cache entry

2) If not, query the data from the Marvel API for the Story and fail the request if it is not found, or send JSON and cache the result if they are found.

You will insert everything in the `"results"` **property returned from the API. You'll notice** `results` **is an array, even through there is only one story in the results. You can just take** `results[0]` **Again, LOOK at the data returned from the API. It's always important to understand the data schema when you pull data from an API.**

General Requirements

1. Remember to submit your `package.json` file but **not** your `node_modules` folder.