

Beyond the Cache with Redis + Node.js

Redis





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Developer Advocate

Redis

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github.com/guyroyse

guy.dev



Assumptions

I am assuming that...

...you know modern JavaScript.

...you have a basic understanding of Express.

...you know absolutely nothing about Redis.

What Will We Cover?

We will cover...

- ...installing Redis and RedisInsight.
- ...using Redis commands directly.
- ...using Redis from Node.js.
- ...using JSON & Search.



A photograph of a Bigfoot-like creature with dark brown fur and a large head, peeking out from behind a thick tree trunk in a forest setting.

What Are We Doing Here?

We're building a Bigfoot Tracker API

This is a **workshop**, not a talkshop.

express



Redis

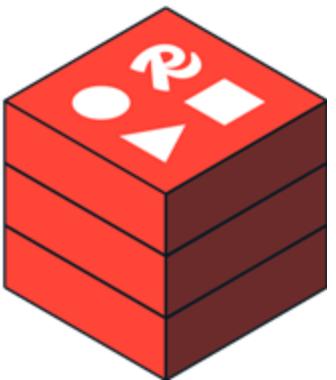
redis

Redis Community Edition

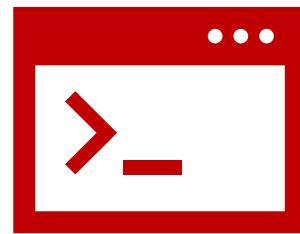


Has the data structures we know and love and more.
Makes an excellent cache, database, or session store.
Clustering requires a fair bit of work.

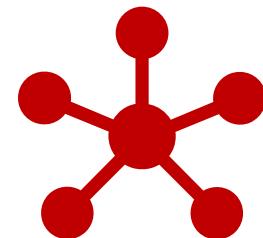
Redis is Extensible



+

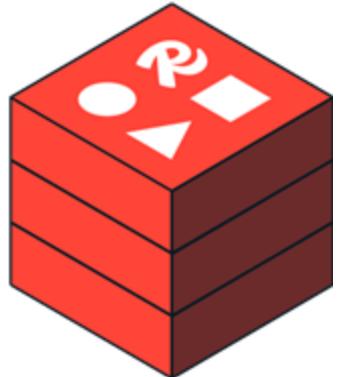


Commands

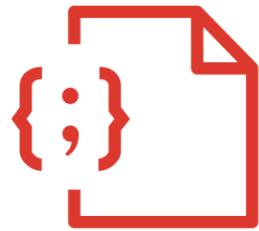


Data Structures

We've Implemented a Few



+



JSON



Search



Time Series



Probabilistic

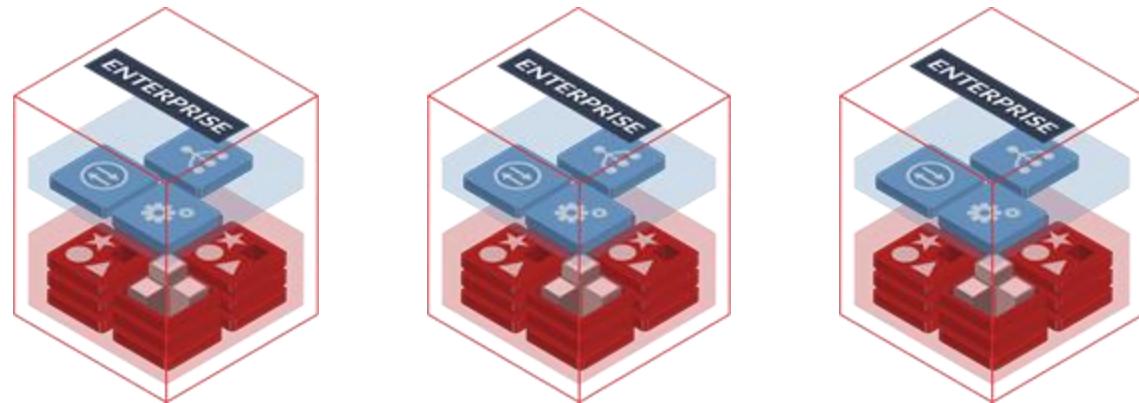
Redis Cloud & Redis Software

Includes all the modules.

Takes care of the clustering and high availability for you.

Easy to use proxy hides the clustering details from us developers.

On Prem or in the Cloud.

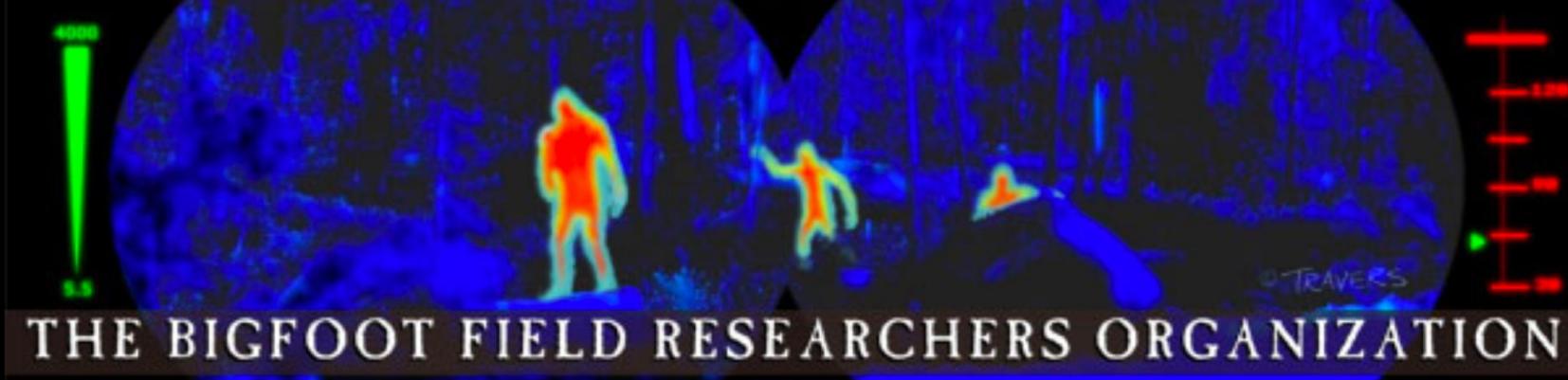




Total: 5		<1 min	
HASH	a:hash	No limit	80 B
JSON	some:json	No limit	104 B
LIST	a:list	No limit	166 B
SET	a:set	No limit	408 B
STRING	a:string	No limit	102 B

	some:json		
104 B	Length: 4	TTL: No limit	<1 min
{			
"alfa" : "foo"			
"bravo" : 42			
"charlie" : true			
"delta" : null			
}	+		

**Where Are We
Gonna Get Bigfoot
Data?**



THE BIGFOOT FIELD RESEARCHERS ORGANIZATION

Founded in 1995 -- The only scientific research organization exploring the bigfoot/sasquatch mystery.

Contact us at ContactUs@BFRO.NET or Phone (408) 634-BFRO [408-634-2376]

The Comprehensive Sightings Database



Bigfoot Town Hall
Meetings in USA & Canada



Tim Renner
@timothyrenner

Following

FOLLOWERS FOLLOWING LIBRARY
443 **8** **5**

I do geo data science at HomeAway. Autistic.
Obsessed with weird data.

HomeAway
 [http://timothyrenner.github.io](https://timothyrenner.github.io)

1-5 of 5

Any ▾ Sort ▾



Haunted Places

OPEN

Haunted places in the United States pulled from the Shadowlands Haunted Places Index.

Dataset • Updated Jan 28 • Public Domain License

[paranormal, geography](#)

4 Comment



Bigfoot Sightings

OPEN

Full text and geocoded sighting reports from the Bigfoot Field Researchers Organization (BFRO).

Dataset • Updated Dec 2, 2017 • Public Domain License

[geography, clustering, sasquatch](#)

59 Comment



UFO Sightings

OPEN

Full text and geocoded UFO sighting reports from the National UFO Research Center (NUFORC).

Dataset • Updated Oct 25, 2017 • Public Domain License

[ufo, paranormal, geography](#)

13 Comment

RECENT COMMENTS

Regarding the UFO sightings - MUFON is probably a good place to start - <http://www.mufon.com/> It's possible they have a direct download available.
in Understanding Bigfoot Sightings/Understanding Bigfoot Sightings

Is the timestamp field in the CSV file incomplete? I was messing with this a while back and it seemed okay to me, but I didn't dig in too deep.
in Understanding Bigfoot Sightings/Analysis

Also, there's code for mapping sightings out in this notebook: https://github.com/timothyrenner/bfro_sightings_data/tree/master/notebooks I did a clustering analysis for my blog too:
<https://timothyrenner.github.io/datascience/2017/06/30/finding-bigfoot.html>
in Understanding Bigfoot Sightings/Understanding Bigfoot Sightings

@ninja The JSON file has state and county fields, and it joins to the geolocated reports on the report number. That might be easier than a spatial join against a county/state shapefile.
in Understanding Bigfoot Sightings/Understanding Bigfoot Sightings

I'm glad you like it - I'm happy to join the conversation!
in Bigfoot Sightings/BFRO Sightings data

Bigfoot Field Researchers Organization Data

ID	8086
Date	15-Jan-1958
Title	A series of large, human-like footprints are found on a farm near Wayne National Forest
Observed	While during some yard chores, we noticed a series of tracks going into the hollow on our property. Upon examination...
Classification	Class B
County	Noble
State	Ohio
Latitude	39.63382
Longitude	-81.40079
Location Details	Closest town was Harriettsville. Closest main road is State Route 145. Right on the border of Noble and Washington Counties.

Dark Sky Weather Data

High/Mid/Low Temperature	34.0 / 30.0 / 26.0 °F
Humidity & Dew Point	93% / 31.2°F
Cloud Cover	100%
Moon Phase	86%
Precipitation Intensity	6.7 mm/hr
Precipitation Probability	100%
Precipitation Type	snow
Air Pressure	1011.09 millibars
Summary	Light snow (< 1 in.) starting in the afternoon.
UV Index	1
Visibility	2.62 miles
Wind Bearing/Speed	344° @ 10.12 mph

Getting Started



Full Instructions on GitHub

**[github.com/guyroyse/
beyond-the-cache*](https://github.com/guyroyse/beyond-the-cache)**

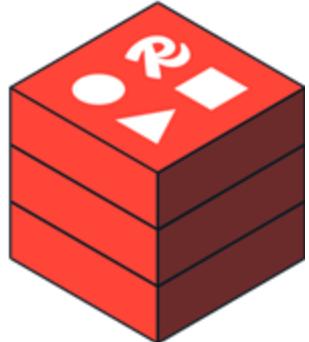
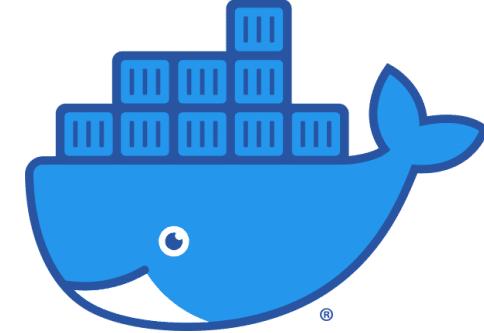
* This link will never give you up nor let you down.

Let's Take a Look Around

Redis



Installing Redis Community Edition



Redis

```
docker run -d --name redis -p 6379:6379 redis:8.0-M02
```



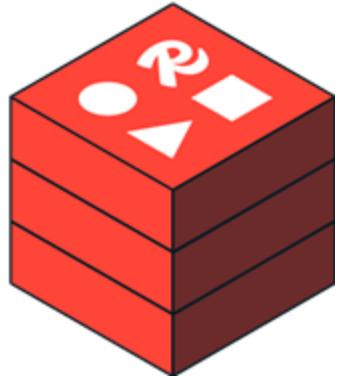
Redis Insight

Download from <https://redis.io/insight/>.

Install from the Microsoft Store or the App Store.

Start Your Redis!

01-INSTALLATION.md



An Introduction to Redis

What is Redis?

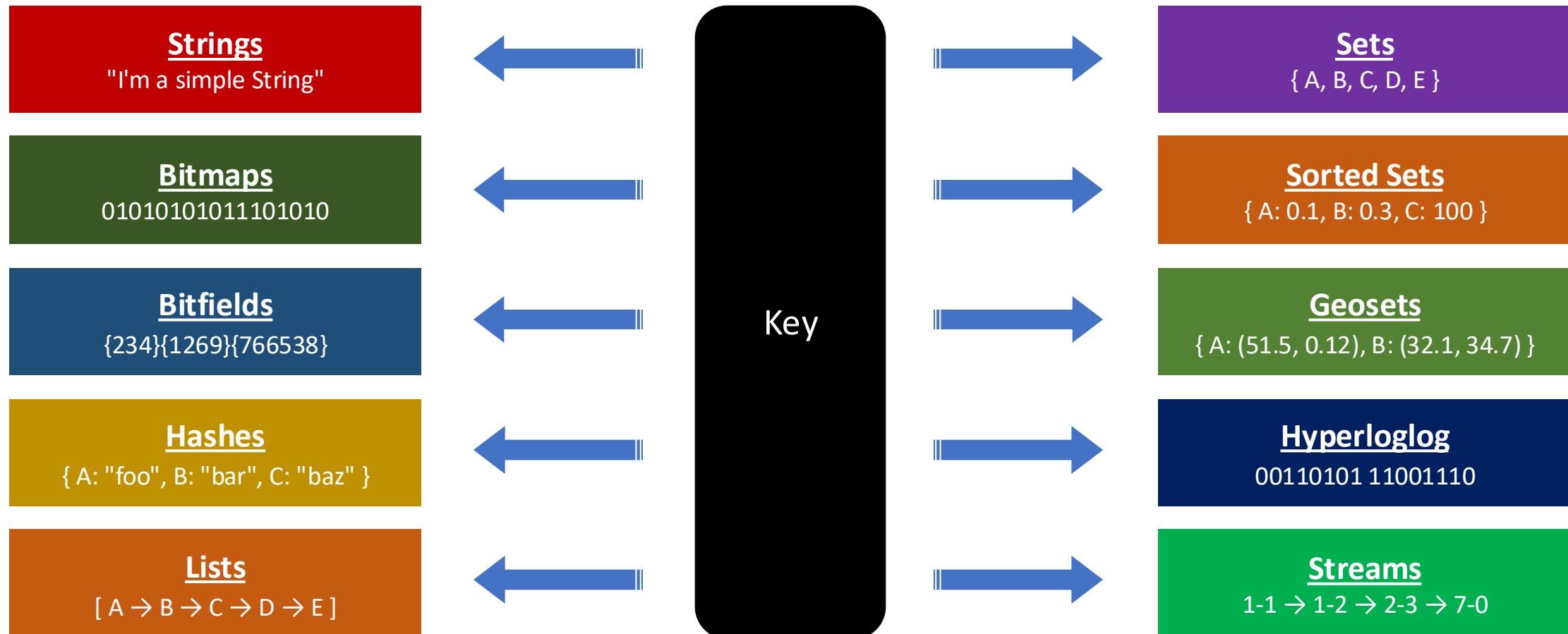
It's a cache.

It's a key-value store.

It's a memory-first, NoSQL database.

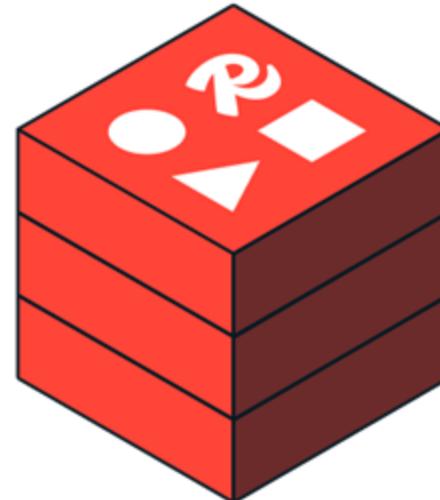
It's networked memory.

A Giant Hash Table



Redis Commands

```
PING  
SET foo bar  
GET foo  
SADD foo bar  
SMEMBERS foo  
HSET foo bar baz  
HGET foo bar  
LPUSH foo bar  
RPOP foo  
DEL foo  
QUIT
```



redis.io/commands

```
PONG  
OK  
"bar"  
(integer) 1  
    1) "bar"  
(integer) 1  
    "baz"  
(integer) 1  
    "bar"  
(integer) 1  
    OK
```

Let's Try A Few Commands!

RESP: The Wire Protocol



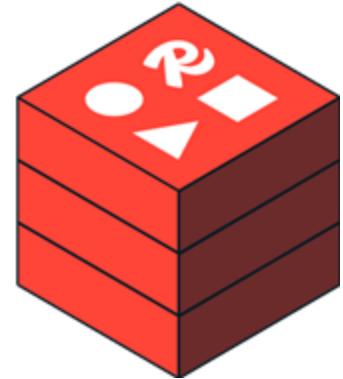
Sending RESP By Hand

```
echo -e \  
'*3\r\n$3\r\nSET\r\n$4\r\nmotd\r\n$10\r\nGreetings!\r\n' \  
| nc localhost 6379
```

+OK\r\n

```
nc -cv localhost 6379  
*2\r\n  
$3\r\n  
GET\r\n  
$4\r\n  
motd\r\n
```

\$10\r\n
Greetings!\r\n



**Let's Try
RESP By Hand!**

Removing Keys From Redis

DEL

```
> SET foo 1  
OK  
> DEL foo  
Memory freed  
(integer) 1  
> GET foo  
(nil)
```

UNLINK

```
> SET foo 1  
OK  
> UNLINK foo  
(integer) 1  
> GET foo  
(nil)  
...  
...  
...
```

Memory freed

EXPIRE

```
> SET foo 1  
OK  
> EXPIRE foo 10  
(integer) 1  
> GET foo  
"1"  
About 10 sec later...  
> GET foo  
(nil)
```

Eviction

```
> SET foo 1  
OK  
> SET bar 2  
OK  
> GET foo  
(nil)
```

**LRU*

Eviction Options

Eviction

```
> SET foo 1  
OK  
> SET bar 2  
OK  
> GET foo  
(nil)
```

*LRU

volatile-lru: Evict using approximated LRU, only keys with an expire set.

allkeys-lru: Evict any key using approximated LRU.

volatile-lfu: Evict using approximated LFU, only keys with an expire set.

allkeys-lfu: Evict any key using approximated LFU.

volatile-random: Remove a random key having an expire set.

allkeys-random: Remove a random key, any key.

volatile-ttl: Remove the key with the nearest expire time (minor TTL)

noeviction: Don't evict anything, just return an error on write operations.



Persistence

RDB

redis.conf

```
save 3600 1
save 300 100
save 60 10000
```

```
127.0.0.1> BGSAVE
```

AOF

redis.conf

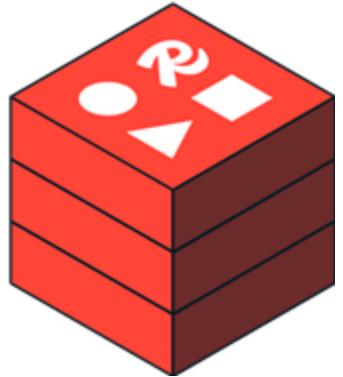
```
appendonly yes
appendfsync always | everysec | no
auto-aof-rewrite-percentage 100
auto-aof-rewrite-min-size 64mb
```

```
127.0.0.1> BGREWRITEAOF
```

Redis

Tell Redis What To Do

02-REDIS-BASICS.md
through
07-REDIS-SETS.md



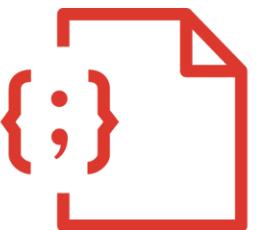
Building the Bigfoot Tracker API

How Are We Building This?

express



Redis



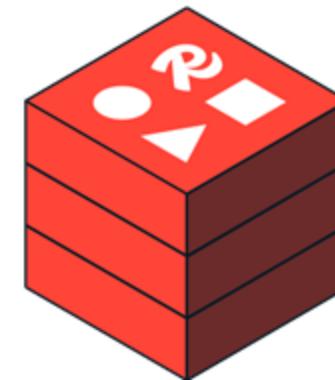
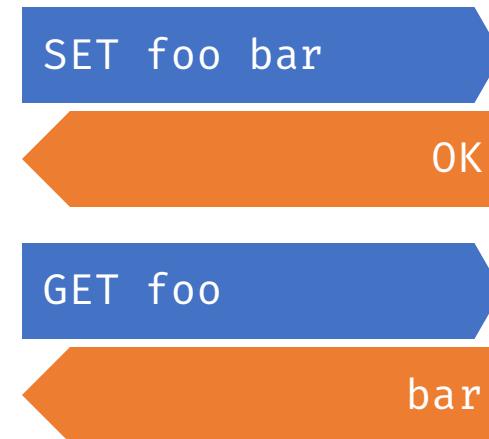
A Proper REST API

Method	URL	Description
GET	/sightings	Gets all the things. A collection.
POST	/sightings	Add a thing to the collection. <u>Not</u> idempotent.
GET	/sightings/12345	Get one of the things in the collection.
PUT	/sightings/12345	Adds or replaces a thing in the collection. Idempotent.
DELETE	/sightings/12345	Removes a thing.

Talking to Redis from JavaScript



npm install redis



github.com/redis/node-redis

Using Node Redis

```
import { createClient } from 'redis'

const url = 'redis://alice:foobared@awesome.redis.server:6380'
const redis = createClient({ url })
```

Redis URLs

redis://alice:foobared@awesome.redis.server:6380



USER



PASSWORD



HOSTNAME



PORT

redis://:foobared@awesome.redis.server:6380

redis://awesome.redis.server:6380

redis://awesome.redis.server

Connecting All the Ways

```
const redis = createClient()

const redis = createClient({
  url: 'redis://alice:foobared@awesome.redis.server:6380'
})

const redis = createClient({
  socket: {
    host: 'awesome.redis.server',
    port: 6380
  },
  username: 'alice',
  password: 'foobared'
})
```

Property	Description
url	redis[s]://[[username][:password]@][host][:port][/db-number] (see redis and rediss IANA registration for more details)
socket	Socket connection properties. Unlisted net.connect properties (and tls.connect) are also supported
socket.port	Redis server port
socket.host	Redis server hostname
socket.family	IP Stack version (one of 4 6 0)
socket.path	Path to the UNIX Socket
socket.connectTimeout	Connection Timeout (in milliseconds)
socket.noDelay	Toggle Nagle's algorithm
socket.keepAlive	Toggle keep-alive functionality
socket.tls	See explanation and examples below
socket.reconnectStrategy	A function containing the Reconnect Strategy logic
username	ACL username (see ACL guide)
password	ACL password or the old "--requirepass" password
name	Connection name (see CLIENT SETNAME)
database	Redis database number (see SELECT command)
modules	Included Redis Modules
scripts	Script definitions (see Lua Scripts)
functions	Function definitions (see Functions)
commandsQueueMaxLength	Maximum length of the client's internal command queue
disableOfflineQueue	Disables offline queuing, see FAQ
readonly	Connect in READONLY mode
legacyMode	Maintain some backwards compatibility (see the Migration Guide)
isolationPoolOptions	See the Isolated Execution Guide

Using Node Redis

```
import { createClient } from 'redis'

const url = 'redis://alice:foobared@awesome.redis.server:6380'
const redis = createClient({ url })

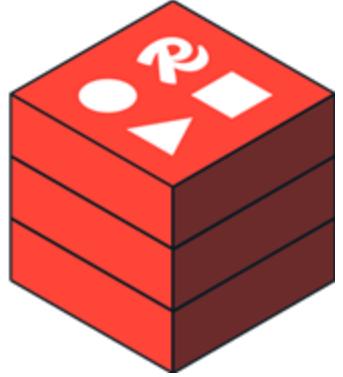
await redis.connect()

await redis.set('foo', 'bar')

const foo = await redis.get('foo')
```

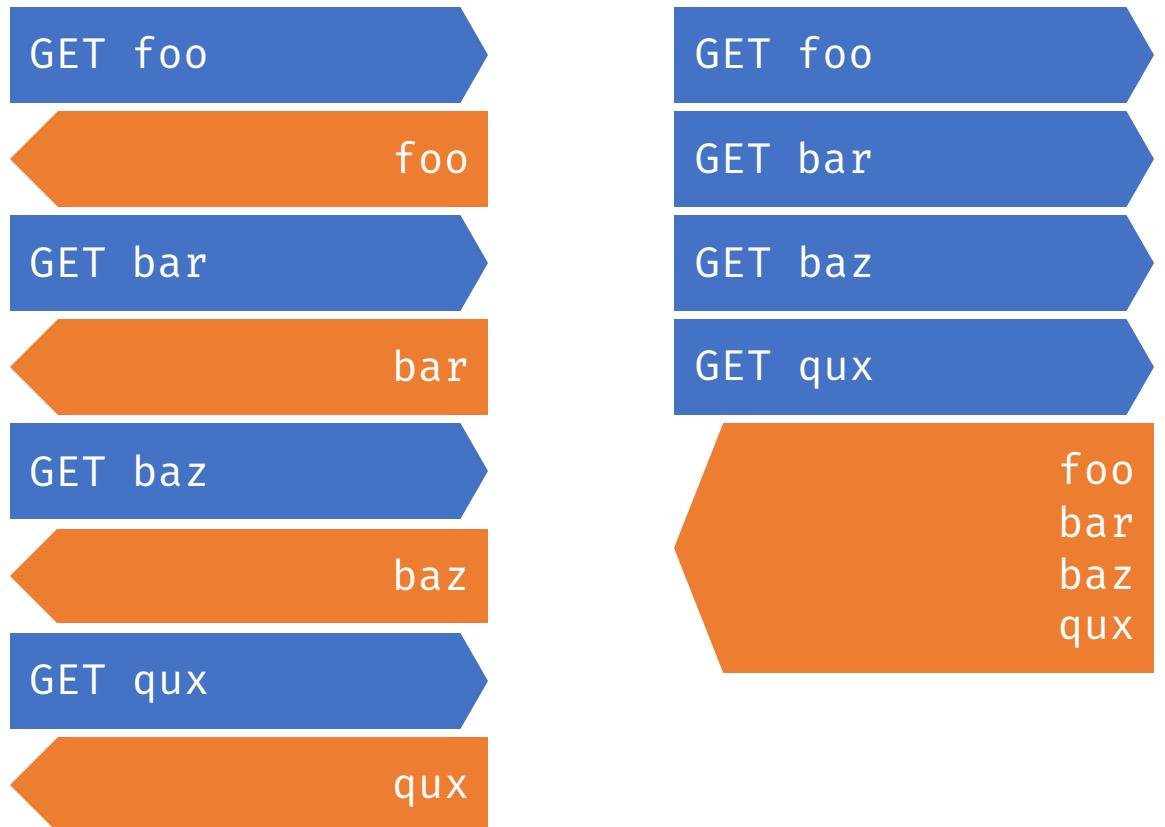
Start Building Your API

08-API-SETUP.md
through
12-NODE-REDIS-HASHES.md



Pipelining & Transactions

Pipelining



Redis



Pipelining with Node Redis

```
redis.set('foo', 'foo')
redis.set('bar', 'bar')
redis.set('baz', 'baz')
redis.set('qux', 'qux')

redis.set('foo', 'foo')
redis.set('bar', 'bar')
redis.set('baz', 'baz')
await redis.set('qux', 'qux')

const results = await Promise.all([
  redis.get('foo'),
  redis.get('bar'),
  redis.get('baz'),
  redis.get('qux')
])
```

Redis



Transactions

Transactions...

- ...must happen on the same connection.
- ...queue a series of commands.
- ...execute atomically.



Transaction Commands

MULTI: Starts a transaction.

EXEC: Executes the queued commands.

DISCARD: Discards the queued commands.

WATCH: Starts an optimistic lock on a key.

UNWATCH: Removed a lock on a key.



A Simple Example

```
> MULTI  
OK
```

```
(TX)> SADD bigfoot:sightings:ohio 8086  
QUEUED
```

```
(TX)> INCR bigfoot:sightings:count  
QUEUED
```

```
(TX)> HSET bigfoot:sighting:8086 id 8086 state Ohio  
QUEUED
```

```
(TX)> EXEC  
1) (integer) 1  
2) (integer) 1  
3) (integer) 2
```



Discarding

```
> MULTI  
OK
```

```
(TX)> SADD bigfoot:sightings:ohio 8086  
QUEUED
```

```
(TX)> INCR bigfoot:sightings:count  
QUEUED
```

```
(TX)> HSET bigfoot:sighting:8086 id 8086 state Ohio  
QUEUED
```

```
(TX)> DISCARD  
OK
```



Syntactic Errors Fail

```
> MULTI  
OK
```

```
(TX)> SADD bigfoot:sightings:ohio 8086  
QUEUED
```

```
(TX)> INCR bigfoot:sightings:count  
QUEUED
```

```
(TX)> HSTE bigfoot:sighting:8086 id 8086 state Ohio  
(error) ERR unknown command `HSTE`, with args beginning  
with: `bigfoot:sighting:8086`, `id`, `8086`,  
`state`, `Ohio`,
```

```
(TX)> EXEC  
(error) EXECABORT Transaction discarded because of  
previous errors.
```



Semantic Errors Succeed

```
> MULTI  
OK
```

```
(TX)> SADD bigfoot:sightings:ohio 8086  
QUEUED
```

```
(TX)> INCR bigfoot:sightings:ohio  
QUEUED
```

```
(TX)> EXEC  
1) (integer) 1  
2) (error) WRONGTYPE Operation against a key holding  
the wrong kind of value
```



Watching for Changes

```
> WATCH bigfoot:sightings:ohio  
OK
```

```
> MULTI  
OK
```

```
(TX)> SADD bigfoot:sightings:ohio 8086  
QUEUED
```

```
(TX)> HSET bigfoot:sighting:8086 id 8086 state Ohio  
QUEUED
```

```
(TX)> EXEC  
1) (integer) 1  
2) (integer) 2
```





Redis

Changes Happen!



```
> WATCH bigfoot:sightings:ohio  
OK
```



```
> SADD bigfoot:sightings:ohio 8087  
(integer) 1
```



```
(TX)> SADD bigfoot:sightings:ohio 8086  
QUEUED
```

```
(TX)> INCR bigfoot:sightings:count  
QUEUED
```

```
(TX)> EXEC  
(nil)
```

Watching for Changes

```
> WATCH bigfoot:sightings:ohio  
OK
```

```
> MULTI  
OK
```

```
(TX)> SADD bigfoot:sightings:ohio 8086  
QUEUED
```

```
(TX)> HSET bigfoot:sighting:8086 id 8086 state Ohio  
QUEUED
```

```
(TX)> EXEC  
(nil)
```



Transaction Demo

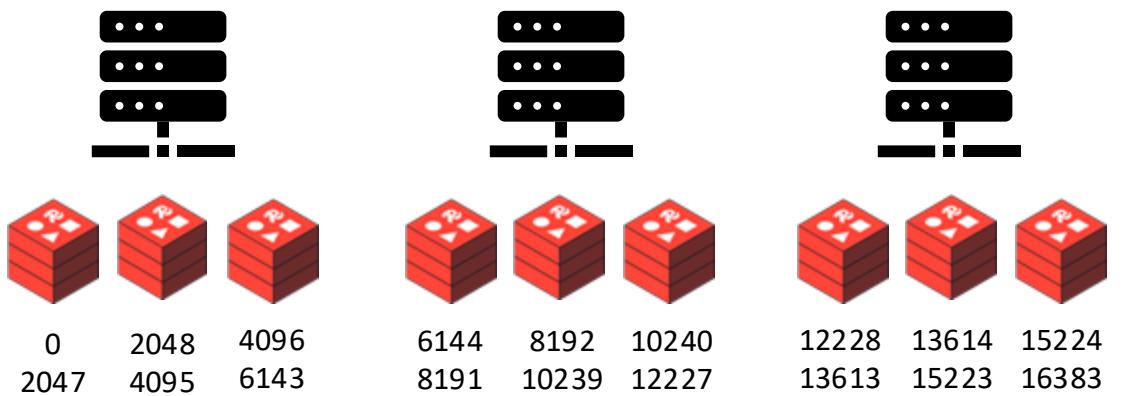
Redis Clusters

A cluster contains many **nodes**.

A nodes contain many **shards**.

A shard contains many **hash slots**.

There are always **16,384 hash slots** in a cluster.



Transactions cannot span hash slots.



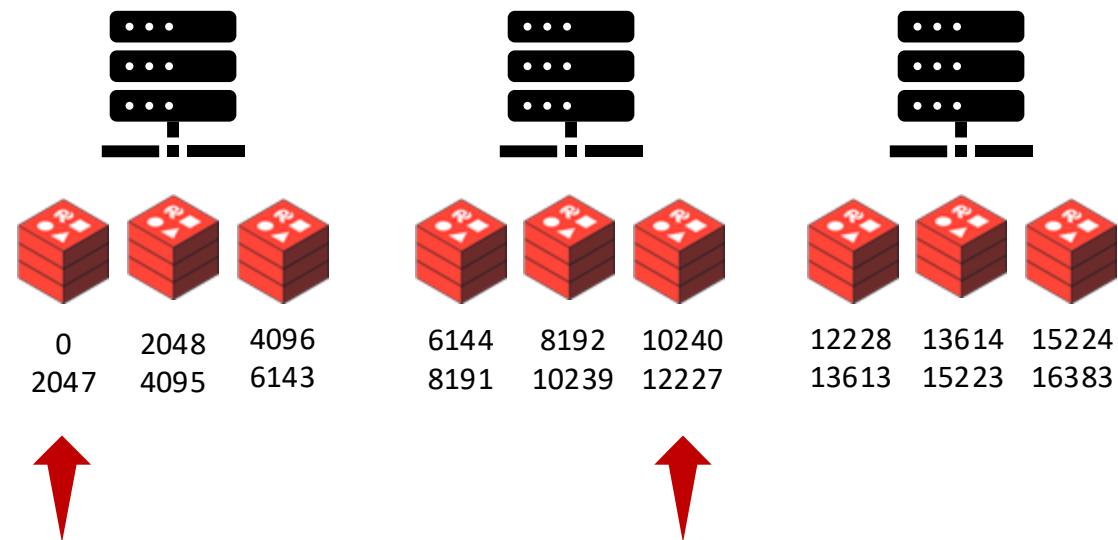
Computing Hash Slots

bigfoot:sightings:ohio

bigfoot:sightings:count

`CRC16('bigfoot:sightings:ohio') mod 16384 = 12194`

`CRC16('bigfoot:sightings:count') mod 16384 = 1827`

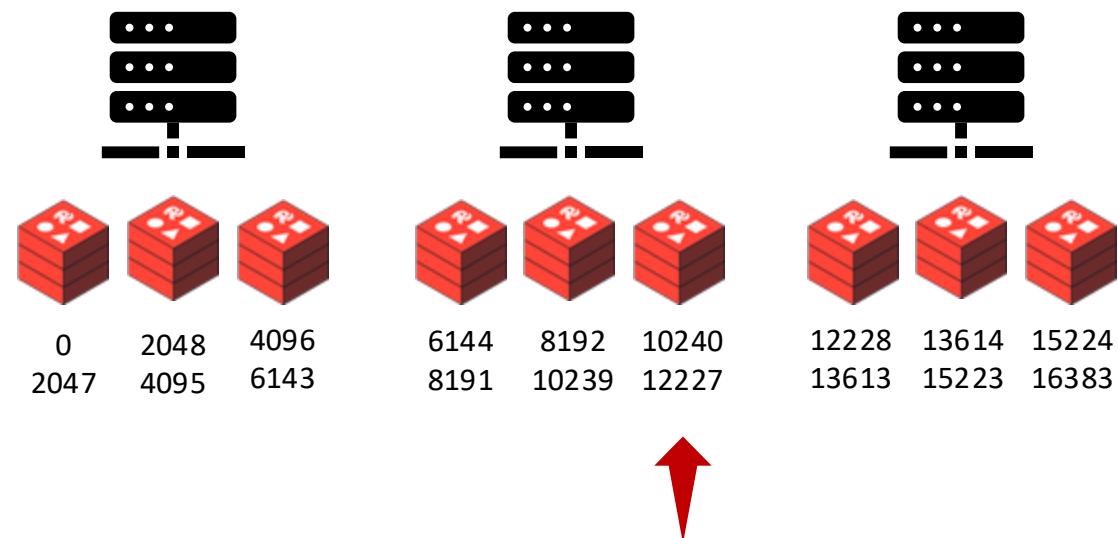


Keeping Keys Together

{bigfoot:sightings}:ohio

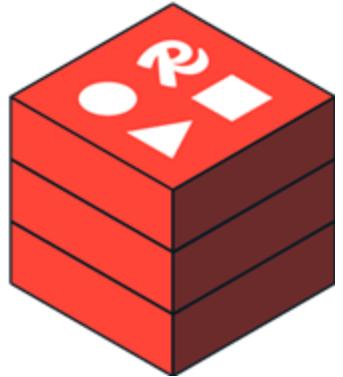
{bigfoot:sightings}:count

CRC16('bigfoot:sightings') mod 16384 = 11876



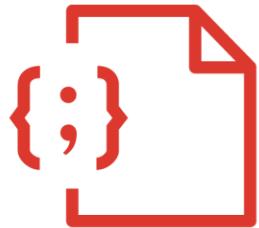
Add Transactions

13-TRANSACTIONS.md



JSON & Search

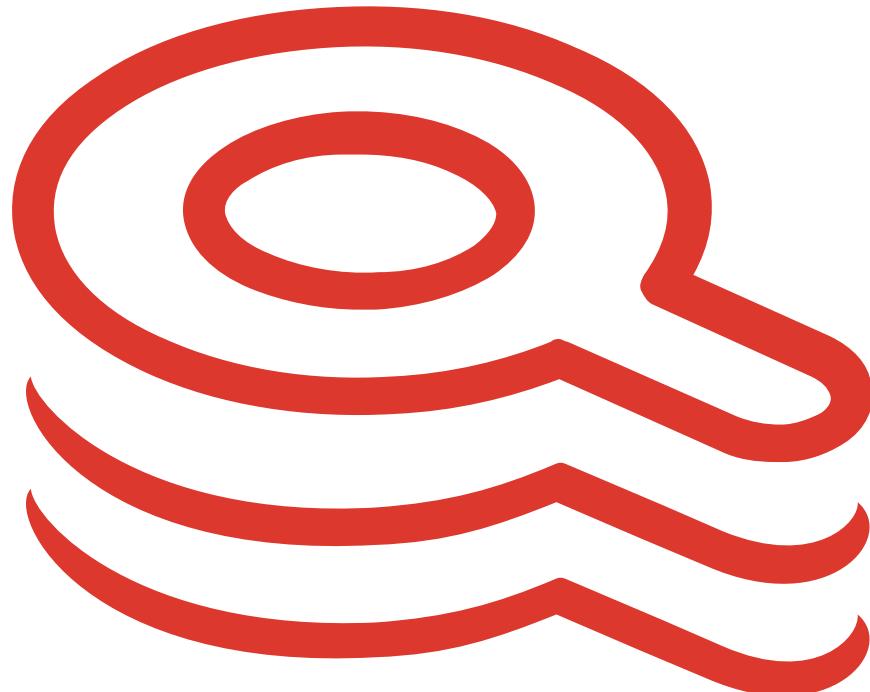
Using JSON



```
> JSON.SET foo $ '{ "bar":"bar", "baz":42, "qux":true }'  
OK  
  
> JSON.GET foo  
"{"bar":"bar", "baz":42, "qux":true}"  
  
> JSON.GET foo $  
"[ {"bar":"bar", "baz":42, "qux":true} ]"  
  
> JSON.GET foo $.bar  
"[\"bar\"]"  
  
> JSON.GET foo $.bar $.baz $.qux  
"{$.bar:[\"bar\"], $.baz:[42], $.qux:[true]}"
```

JSON Demo

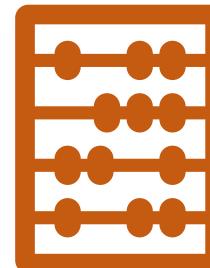
RediSearch



Indexing



Full-text search



Aggregation

Creating Indices with Search

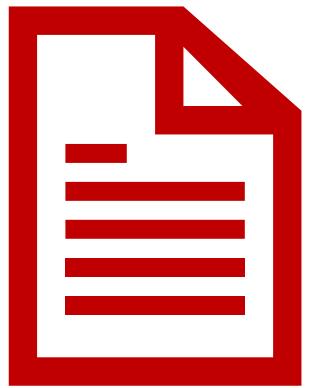
```
FT.CREATE bigfoot:sighting:index
  ON JSON
  PREFIX 1 bigfoot:sighting:
  SCHEMA
    $.observed AS observed TEXT
    $.state      AS state      TAG
    $.humidity   AS humidity  NUMERIC
    $.location   AS location  GEO
```

Find All the Bigfoots

```
FT.SEARCH bigfoot:sighting:index "*" index  
LIMIT 0 3 starting index number of results query  
RETURN 2 id state fields to return
```

- 
- 1) (integer) 4586
 - 2) "bigfoot:sighting:27167"
 - 3) 1) "id"
2) "27167"
 - 3) "state"
 - 4) "Mississippi"
 - 4) "bigfoot:sighting:20002"
 - 5) 1) "id"
2) "20002"
 - 3) "state"
 - 4) "Michigan"
 - 6) "bigfoot:sighting:28711"
 - 7) 1) "id"
2) "28711"
 - 3) "state"
 - 4) "Minnesota"

Four Ways to Find Bigfoot



Text



Tag



Numeric



Geo



Texting Bigfoot

```
> FT.CREATE bigfoot:sighting:index  
ON hash PREFIX 1 bigfoot:sighting:  
SCHEMA  
    title      TEXT  
    observed   TEXT
```

```
> FT.SEARCH bigfoot:sighting:index  
    "creek"  
    "creek river"  
    "creek ~river"  
    "creek | river"  
    "(creek | river) stream"  
    "(creek | river) -stream"  
    "@title:creek @observed:river"
```



Redis

Tagging Bigfoot

```
> FT.CREATE bigfoot:sighting:index  
ON hash PREFIX 1 bigfoot:sighting:  
SCHEMA  
state          TAG  
classification TAG
```

```
> FT.SEARCH bigfoot:sighting:index  
"@state:{ Ohio }"  
"@state:{ Ohio | Kentucky }"  
"@state:{ West Virginia }"  
"@classification:{ Class A }  
@classification:{ Class B }"
```



Numbering Bigfoot

```
> FT.CREATE bigfoot:sighting:index  
ON hash PREFIX 1 bigfoot:sighting:  
SCHEMA  
temperature_high NUMERIC  
temperature_low NUMERIC
```

```
> FT.SEARCH bigfoot:sighting:index  
"@temperature_high:[ 60 75 ]"  
"@temperature_high:[ 60 +inf ]"  
"@temperature_high:[ -inf 75 ]"  
"@temperature_high:[ -inf +inf ]"  
"@temperature_high:[ (60 (75 ]"
```



Locating Bigfoot

```
> FT.CREATE bigfoot:sighting:index  
ON hash PREFIX 1 bigfoot:sighting:  
SCHEMA  
location GEO
```

↙ longitude

-84.5120, 39.1031

latitude ↗



Locating Bigfoot

```
> FT.CREATE bigfoot:sighting:index  
ON hash PREFIX 1 bigfoot:sighting:  
SCHEMA  
location GEO
```

```
> FT.SEARCH bigfoot:sighting:index  
"@location:[ -84.5120 39.1031 50 mi ]"  
"@location:[ -84.5120 39.1031 100 ft ]"  
"@location:[ -84.5120 39.1031 25 m ]"  
"@location:[ -84.5120 39.1031 10 km ]"
```

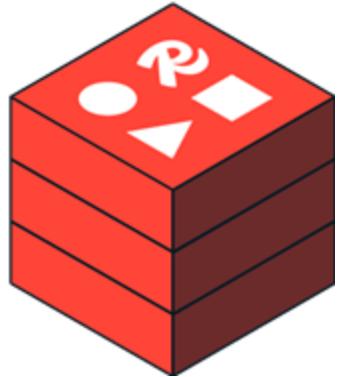
Search Demo

Some SQL Equivalents

SQL	RediSearch
WHERE x='foo' AND y='bar'	@x:foo @y:bar
WHERE x='foo' AND y!='bar'	@x:foo -@y:bar
WHERE x='foo' OR y='bar'	(@x:foo) (@y:bar)
WHERE x IN ('foo', 'bar','hello world')	@x:(foo bar "hello world")
WHERE y='foo' AND x NOT IN ('foo','bar')	@y:foo (-@x:foo) (-@x:bar)
WHERE x NOT IN ('foo','bar')	-@x:(foo bar)
WHERE num BETWEEN 10 AND 20	@num:[10 20]
WHERE num >= 10	@num:[10 +inf]
WHERE num > 10	@num:[(10 +inf]
WHERE num < 10	@num:[-inf (10]
WHERE num <= 10	@num:[-inf 10]
WHERE num < 10 OR num > 20	@num:[-inf (10] @num:[(20 +inf]
WHERE name LIKE 'john%'	@name:john*

Try JSON & Search

14-REDISJSON.md
through
19-NODE-REDIS-SEARCH.md



Introducing Redis OM

What Is Redis OM?

A layer of abstraction over Search & JSON

Built on top of Node Redis

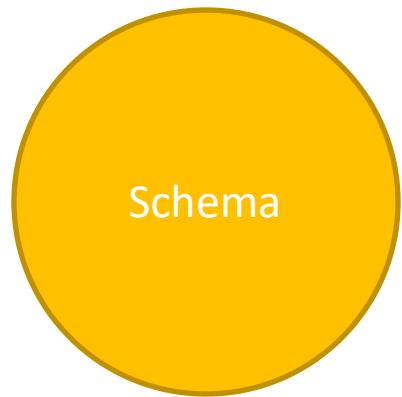
Supports index creation using **Schema**

Enables basic CRUD Operations using
Repository

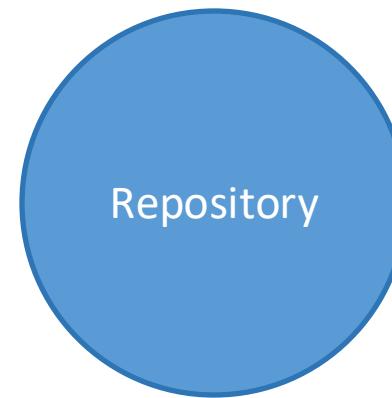
Provides a fluent search interface using
Search



Schemas & Repositories



Defines the structure of your data
Used to build indices for RedisSearch
Used to convert JavaScript types to and from Redis types



Provides CRUD operations for your data
Creates indices for search
Initiates search using RedisSearch



npm install redis-om

redisōM

Creating a Schema

```
const schema = new Schema('sighting', {  
  reportId: { type: 'string' },  
  tags: { type: 'string[]' },  
  verified: { type: 'boolean' },  
  
  description: { type: 'text' },  
  
  witnesses: { type: 'number' },  
  date: { type: 'date' },  
  
  location: { type: 'point' }  
})
```

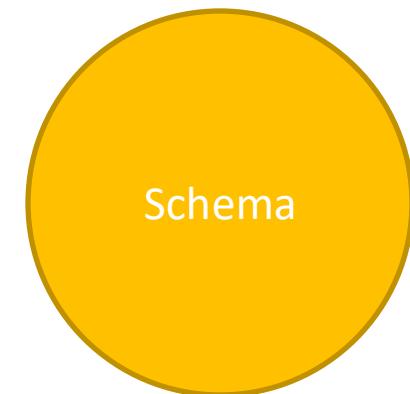
prefixes keys
in Redis

maps to
TAG

maps to
TEXT

maps to
NUMERIC

maps to
GEO



JSONPath is Implied

```
const schema = new Schema('sighting', {  
  reportId: { type: 'string', path: '$.reportId' },  
  tags: { type: 'string[]', path: '$.tags[*]' },  
  verified: { type: 'boolean', path: '$.verified' },  
  description: { type: 'text', path: '$.description' },  
  witnesses: { type: 'number', path: '$.witnesses' },  
  date: { type: 'date', path: '$.date' },  
  location: { type: 'point', path: '$.location' }  
})
```

note the array



Can Be Renamed and Nested

```
const schema = new Schema('sighting', {  
  reportId: { type: 'string', path: '$.id' },  
  tags: { type: 'string[]', path: '$.tags[*].name' },  
  verified: { type: 'boolean', path: '$.verified' },  
  
  description: { type: 'text', path: '$.description' },  
  witnesses: { type: 'number', path: '$.details.witnesses' },  
  date: { type: 'date', path: '$.details.date' },  
  
  location: { type: 'point', path: '$.location' }  
})
```

The code is annotated with three blue arrows pointing to specific parts:

- A curved arrow points to the `reportId` field with the label "renamed".
- A curved arrow points to the `tags` field with the label "array of objects".
- A curved arrow points to the `witnesses` and `date` fields with the label "nested objects".



Missing Fields



Missing fields are saved but not indexed and converted to the extent possible

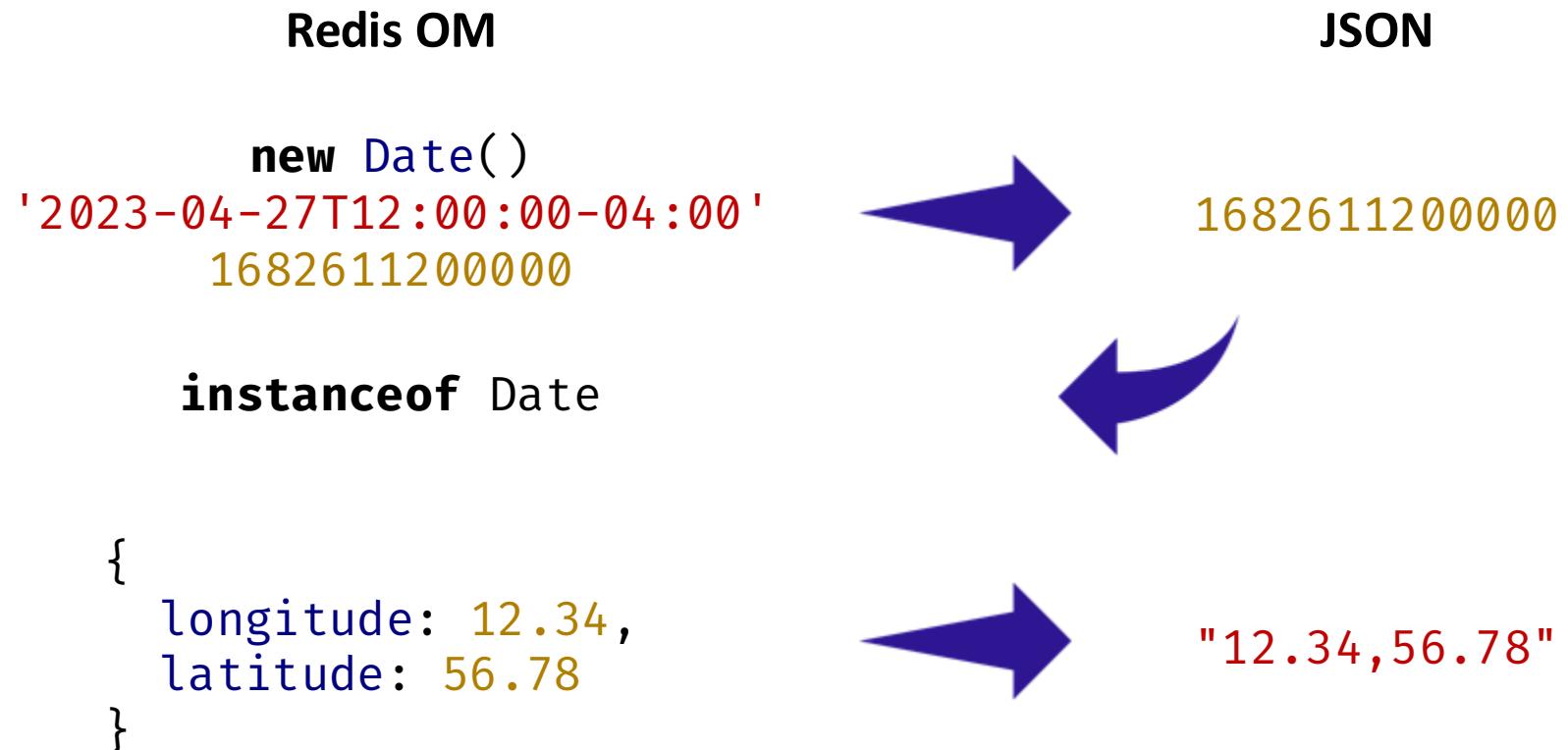
Strings are Strings

Numbers are Numbers

Booleans are Booleans

Dates & Points are special

If A Date or Point is Defined



If A Point or Date is Missing

Redis OM

```
new Date()  
'2023-04-27T12:00:00-04:00'
```

1682611200000

```
{  
    longitude: 12.34,  
    latitude: 56.78  
}
```

JSON

```
1682611200000  
'2023-04-27T12:00:00-04:00'
```

1682611200000

```
{  
    longitude: 12.34,  
    latitude: 56.78  
}
```

Creating Repositories

```
const repository = new Repository(schema, redis)

let sighting = {
  reportId: "12345",
  tags: [ "creek", "woodlands" ],
  verified: false,
  description: "I saw Bigfoot in the woods",
  witnesses : 2,
  date: '2023-04-27',
  location: {
    longitude: 12.34,
    latitude: 56.78
  }
}

sighting = await repository.save(sighting)
```

What is an Entity?

```
sighting.reportId      // "12345"  
sighting.tags          // [ "creek", "woodlands" ]  
sighting.verified      // false  
sighting.description   // "I saw Bigfoot in the woods"  
sighting.witnesses     // 2  
sighting.location     // { longitude: 12.34, latitude: 56.78 }  
  
sighting.date          // instanceof Date  
  
sighting[EntityId]     // "01FJYWEYRHYFT8YTEGQBABJ43J"
```

Can I Use My Own EntityID?

```
sighting = await repository.save("12345", sighting)
```

Calling Save Again

```
sighting[EntityId] // "12345"  
  
sighting.tags.push('spring')  
sighting.description = "I saw Bigfoot at Walmart buy size 17s"  
sighting.verified = true  
  
sighting = await repository.save(sighting)
```

Saving an Entity with an EntityID does an upsert

Fetching & Removing

```
const sighting = await repository.fetch("12345")
```

```
await repository.remove("12345")
```



Indexing & Finding All The Things

```
await repository.createIndex()
```

creates (or recreates)
the index

```
redis.local:6389> FT.CREATE bigfoot:sighting:index  
ON JSON  
PREFIX 1 bigfoot:sighting:  
SCHEMA
```

...

creates a **Search**
instance

```
const sightings = await repository.search().return.all()
```

```
redis.local:6379> FT.SEARCH bigfoot:sighting:index "*"
```

triggers
the search

Finding Some of the Things

```
const sightings = await repository.search()
  .where('reportId').equals('12345')           // string
  .and('witnesses').is.greaterThan(1)          // number
  .and('verified').is.false()                  // boolean
  .and('date').is.after('2023-04-27')         // date
  .and('tags').contains('woodlands')           // string[]
  .and('description').matches('creek')        // full-text search
  .and('location').inRadius(
    circle => circle.origin(12.34, 56.78).radius(10).miles)
  .return.all()
```

Full documentation at github.com/redis/redis-om-node/.

Try Redis OM

20-REDIS-OM-BASICS.md

through

21-REDIS-OM-SEARCHING.md



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Redis

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Thanks for Attending!

Realis