COMP1835

Lab 3. Working with Redis database

Overview

In this lab you will work with different data types in Redis data store.

Lab 3.1 Ensure your Redis server is running.

1. Your Redis server should be started in your VM 1.

If not, you can always start Redis server by using : `$redis-server`

2. Check if Redis is working, by opening Redis client:

```
$redis-cli
```

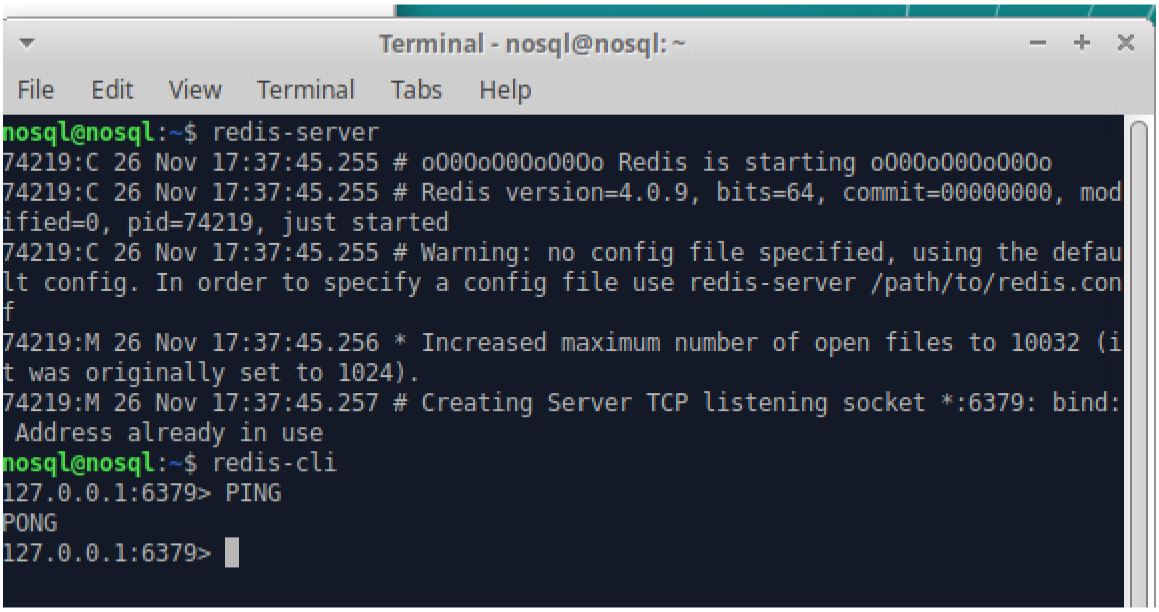
This will open a redis prompt.

```
redis 127.0.0.1:6379>
```

3. In the above prompt, 127.0.0.1 is your machine's IP address and 6379 is the port on which Redis server is running.

Now type the following **`PING`** command.

```
redis 127.0.0.1:6379> ping
PONG
```



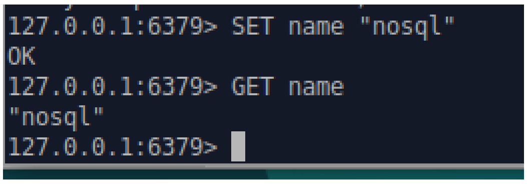
```
nosql@nosql:~$ redis-server
74219:C 26 Nov 17:37:45.255 # oO0OoO0OoO0Oo Redis is starting oO0OoO0OoO0Oo
74219:C 26 Nov 17:37:45.255 # Redis version=4.0.9, bits=64, commit=00000000, mod
ified=0, pid=74219, just started
74219:C 26 Nov 17:37:45.255 # Warning: no config file specified, using the defau
lt config. In order to specify a config file use redis-server /path/to/redis.con
f
74219:M 26 Nov 17:37:45.256 * Increased maximum number of open files to 10032 (i
t was originally set to 1024).
74219:M 26 Nov 17:37:45.257 # Creating Server TCP listening socket *:6379: bind:
 Address already in use
nosql@nosql:~$ redis-cli
127.0.0.1:6379> PING
PONG
127.0.0.1:6379>
```

This shows that Redis is successfully installed on your machine.

Lab 3.2 Working with strings.

Redis string is a sequence of bytes. Strings in Redis are binary safe, meaning they have a known length not determined by any special terminating characters. Thus, you can store anything up to 512 megabytes in one string.

1. Create a key-value pair name=nosql
   In the Terminal:



```
127.0.0.1:6379> SET name "nosql"
OK
127.0.0.1:6379> GET name
"nosql"
127.0.0.1:6379> 
```

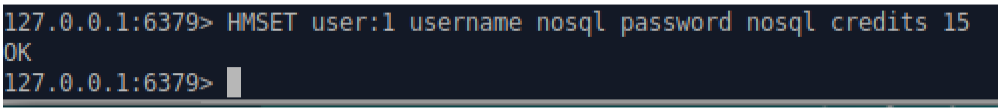
2. Create another key-value pair of your choice, where the value is a string.

Lab 3.3 Working with hashes.

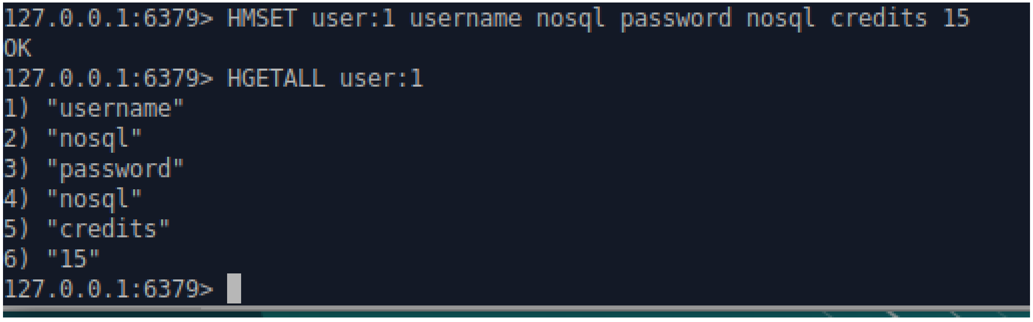
A Redis hash is a **collection of key value pairs**. Redis Hashes are maps between string fields and string values. Hence, they are used to represent objects.

1. Create a hash data type to store the user's object which contains basic information of the user. Here **HMSET, HGETALL** are commands for Redis, while **user − 1** is the key.

Every hash can store up to 2^{32} - 1 field-value pairs (more than 4 billion).



```
127.0.0.1:6379> HMSET user:1 username nosql password nosql credits 15
OK
127.0.0.1:6379> 
```

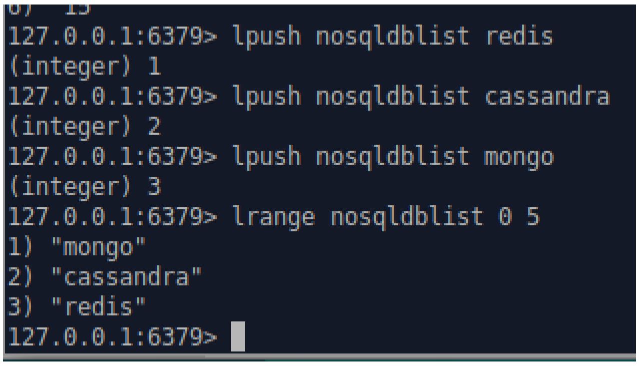


```
127.0.0.1:6379> HMSET user:1 username nosql password nosql credits 15
OK
127.0.0.1:6379> HGETALL user:1
1) "username"
2) "nosql"
3) "password"
4) "nosql"
5) "credits"
6) "15"
127.0.0.1:6379> 
```

Lab 3.4 Working with lists.

Redis Lists are simply lists of strings, sorted by insertion order. You can add elements to a Redis List on the head or on the tail.

1. Create a list called **`nosqldblist`** as shown below:

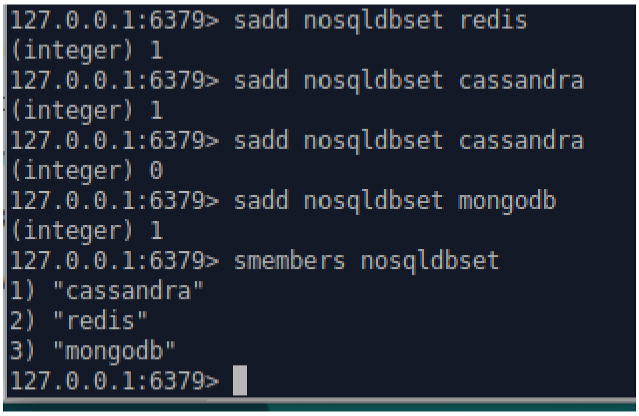


```
127.0.0.1:6379> lpush nosqldblist redis
(integer) 1
127.0.0.1:6379> lpush nosqldblist cassandra
(integer) 2
127.0.0.1:6379> lpush nosqldblist mongo
(integer) 3
127.0.0.1:6379> lrange nosqldblist 0 5
1) "mongo"
2) "cassandra"
3) "redis"
127.0.0.1:6379> 
```

Lab 3.5 Working with sets.

Redis Sets are an unordered collection of strings. In Redis, you can add, remove, and test for the existence of members in O(1) time complexity.

1. Create a set called **`nosqldbset`** as shows below:

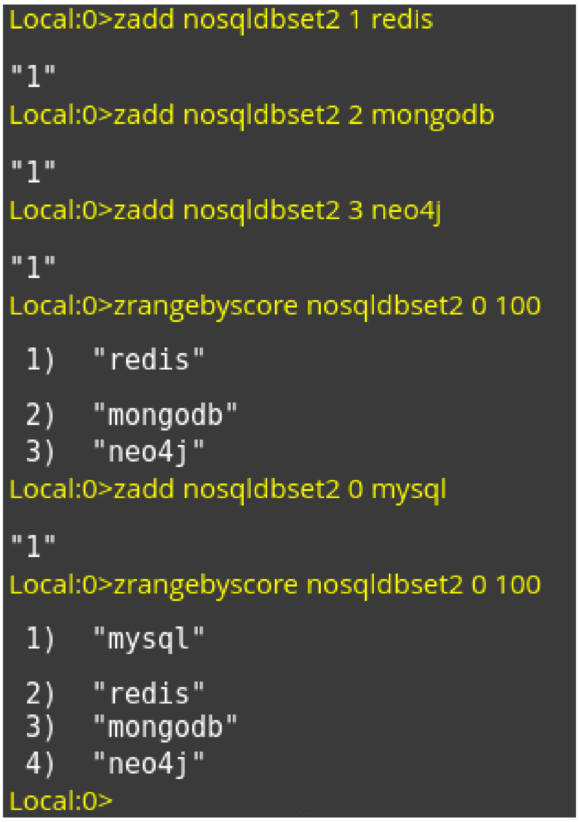


```
127.0.0.1:6379> sadd nosqldbset redis
(integer) 1
127.0.0.1:6379> sadd nosqldbset cassandra
(integer) 1
127.0.0.1:6379> sadd nosqldbset cassandra
(integer) 0
127.0.0.1:6379> sadd nosqldbset mongodb
(integer) 1
127.0.0.1:6379> smembers nosqldbset
1) "cassandra"
2) "redis"
3) "mongodb"
127.0.0.1:6379>
```

Lab 3.6 Working with Sorted Sets.

Redis Sorted Sets are similar to Redis Sets, non-repeating collections of Strings. The difference is, every member of a Sorted Set is associated with a score, that is used in order to take the sorted set ordered, from the smallest to the greatest score. While members are unique, the scores may be repeated.

1. Create a sorted set called **`nosqldbset2`** as shown below:



```
Local:0>zadd nosqldbset2 1 redis

"1"
Local:0>zadd nosqldbset2 2 mongodb

"1"
Local:0>zadd nosqldbset2 3 neo4j

"1"
Local:0>zrangebyscore nosqldbset2 0 100

 1)  "redis"

 2)  "mongodb"
 3)  "neo4j"
Local:0>zadd nosqldbset2 0 mysql

"1"
Local:0>zrangebyscore nosqldbset2 0 100

 1)  "mysql"

 2)  "redis"
 3)  "mongodb"
 4)  "neo4j"
Local:0>
```

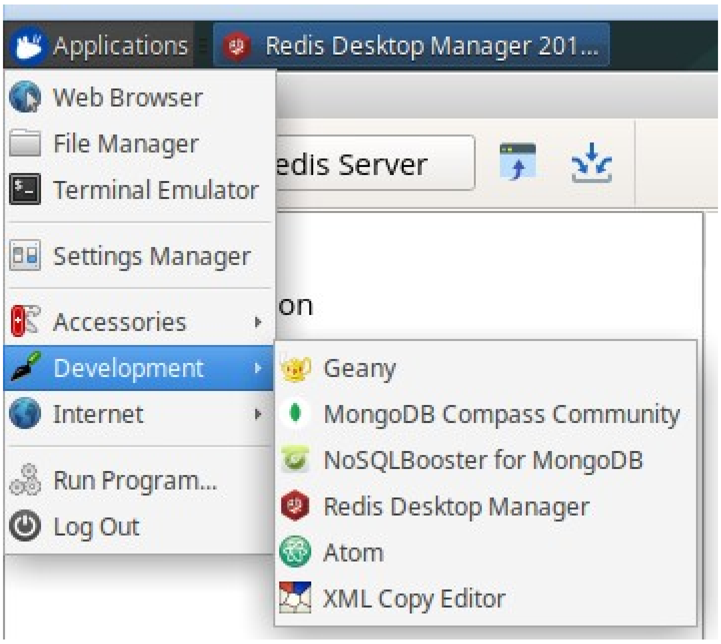
Retrieving All Existing Keys
To get a list of all current keys that exist, simply use the **KEYS** command:

```
127.0.0.1:6379> KEYS *
```

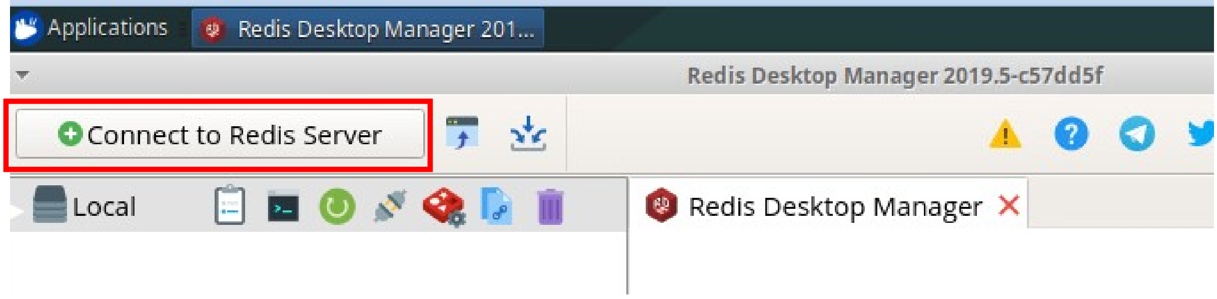
The syntax following **KEYS** can be used to search for specific words or phrases within the key, or the exact match as well. Here we want all keys that contain the text 'title':

```
127.0.0.1:6379> KEYS *nosql*
```

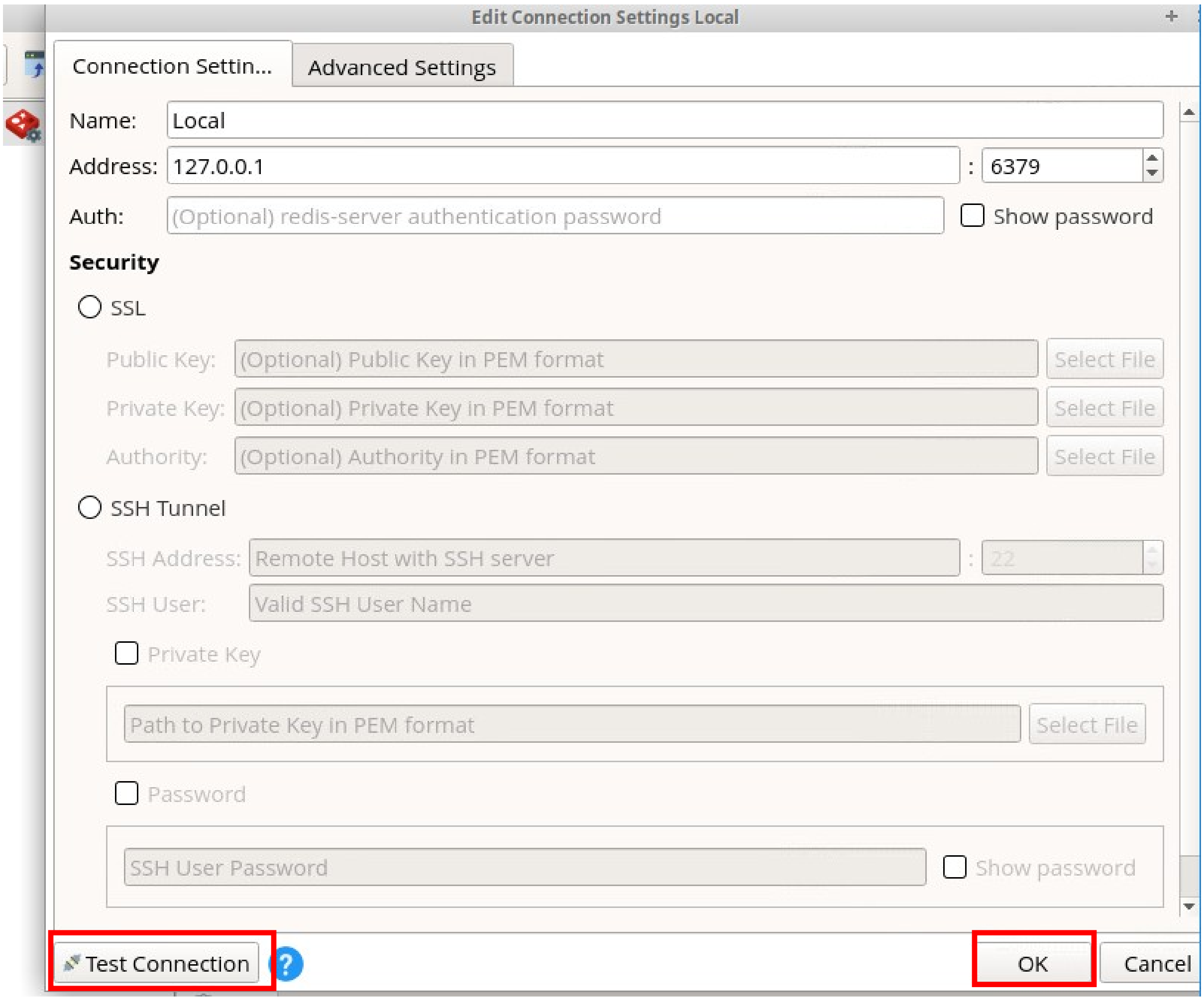
Lab 5.7 Working Redis Desktop Manager.



Press **Connect to Redis Server** button


Applications
Redis Desktop Manager 201...
Redis Desktop Manager 2019.5-c57dd5f
Connect to Redis Server
Local
Redis Desktop Manager

On the Connection page don’t change anything, just press Test Connection and then OK:



Edit Connection Settings Local

Connection Settin... | Advanced Settings

Name: Local

Address: 127.0.0.1 : 6379

Auth: (Optional) redis-server authentication password □ Show password

Security

○ SSL

Public Key: (Optional) Public Key in PEM format

Private Key: (Optional) Private Key in PEM format

Authority: (Optional) Authority in PEM format

○ SSH Tunnel

SSH Address: Remote Host with SSH server : 22

SSH User: Valid SSH User Name

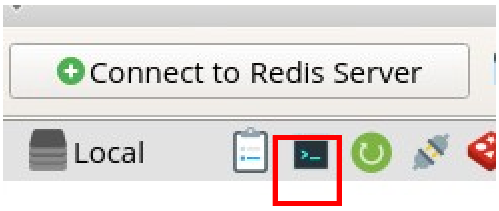
□ Private Key

Path to Private Key in PEM format

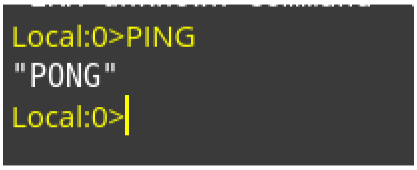
□ Password

SSH User Password □ Show password

You can Open Console:

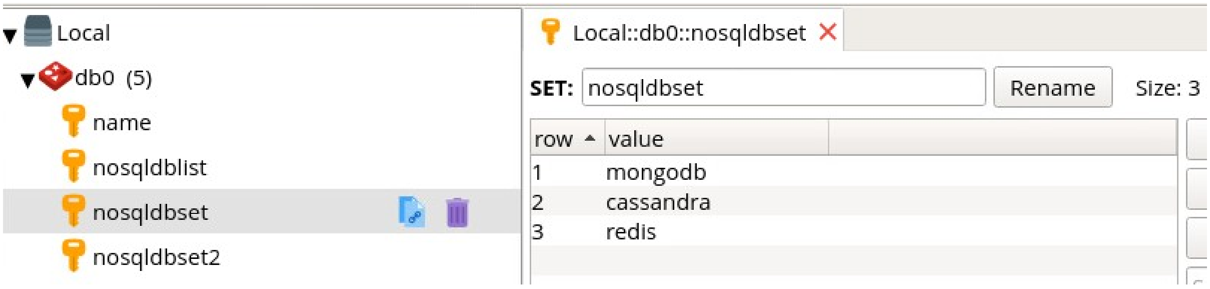


And work in the command line environment:



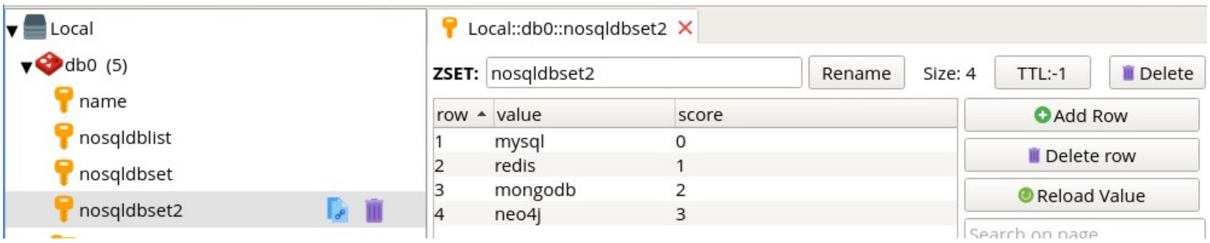
```
Local:0>PING
"PONG"
Local:0>
```

Or you can use a User Interface:



SET: nosqldbset Size: 3

row	value
1	mongodb
2	cassandra
3	redis



ZSET: nosqldbset2

Size: 4

TTL:-1

row	value	score
1	mysql	0
2	redis	1
3	mongodb	2
4	neo4j	3

Lab 3.7 Setting up Expiry

A common use case for a key-value system like Redis is as a fast-access cache for data that’s more expensive to retrieve or compute. Expiration helps keep the total key set from growing unbounded, by tasking Redis to delete a key value after a certain time has passed. Marking a key for expiration requires the EXPIRE command, an existing key, and a time to live in seconds.

1. Set a key and set it to expire in ten seconds. We can check whether the key EXISTS within ten seconds and it returns a 1 (true). If we wait to execute, it will eventually return a 0 (false).

```
127.0.0.1:6379> SET ice "I'm melting…"
OK
127.0.0.1:6379> EXPIRE ice 10
(integer) 1
127.0.0.1:6379> EXISTS ice
(integer) 1
127.0.0.1:6379> EXISTS ice
(integer) 0
```

2. Setting and expiring keys is so common that Redis provides a shortcut command called SETEX.

```
127.0.0.1:6379> SETEX ice 10 "I'm melting…"
```

3. You can query the time a key has to live with TTL. Setting ice to expire as shown earlier and checking its TTL will return the number of seconds left.

```
127.0.0.1:6379> TTL ice
(integer) 4
```

At any moment before the key expires, you can remove the timeout by running `command PERSIST key_name`.

```
127.0.0.1:6379> PERSIST ice
```

Lab 3.8 Working with Database Namespaces

So far, we’ve interacted only with a single namespace, but sometimes we need to separate keys by namespace. For example, if you wrote an internationalized key-value store, you could store different translated responses in different namespaces. The key greeting could be set to “guten tag” in a German namespace and “bonjour” in French. When a user selects their language, the application just pulls all values from the namespace assigned. In Redis nomenclature, a namespace is called a database and is keyed by number. So far, we’ve always interacted with the default namespace 0 (also known as database 0). Here we set greeting to the English hello.

```
127.0.0.1:6379> SET greeting hello
OK
127.0.0.1:6379> GET greeting "hello"
```

But if we switch to another database via the SELECT command, that key is unavailable.

```
127.0.0.1:6379> SELECT 1
OK
127.0.0.1:6379[1]> GET greeting
(nil)
```

And setting a value to this database’s namespace will not affect the value of the original.

```
127.0.0.1:6379[1]> SET greeting "guten tag"
OK
127.0.0.1:6379[1]> SELECT 0
OK
127.0.0.1:6379> GET greeting
"hello"
```

Since all databases are running in the same server instance, Redis lets us shuffle keys around with the MOVE command.

Here we move greeting to database 2:

```
127.0.0.1:6379> MOVE greeting 2
(integer) 2
127.0.0.1:6379> SELECT 2
OK
127.0.0.1:6379[2]> GET greeting
"hello"
```

This can be useful for running different applications against a single Redis server but still allow these multiple applications to trade data between each other.