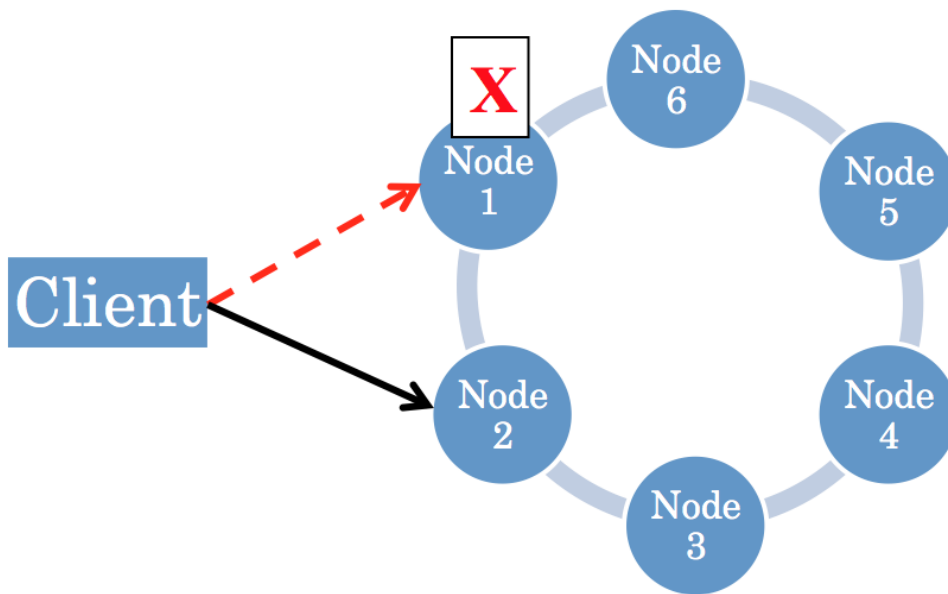



# Chapter 1: Getting Up and Running with Cassandra



Apache Software Foundation / Apache Cassandra / Download



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## Downloading Cassandra

### Latest version

Cassandra is moving to a monthly release process called Tick-Tock. **Even-numbered** releases (e.g. 3.2) contain new features; **odd-numbered** releases (e.g. 3.3) contain bug fixes only. If a critical bug is found, a patch will be released against the most recent bug fix release. Read more about [tick-tock here](#).

Download the latest Cassandra release: [3.9 \(pgp, md5 and sha1\)](#), released on 2016-09-29.

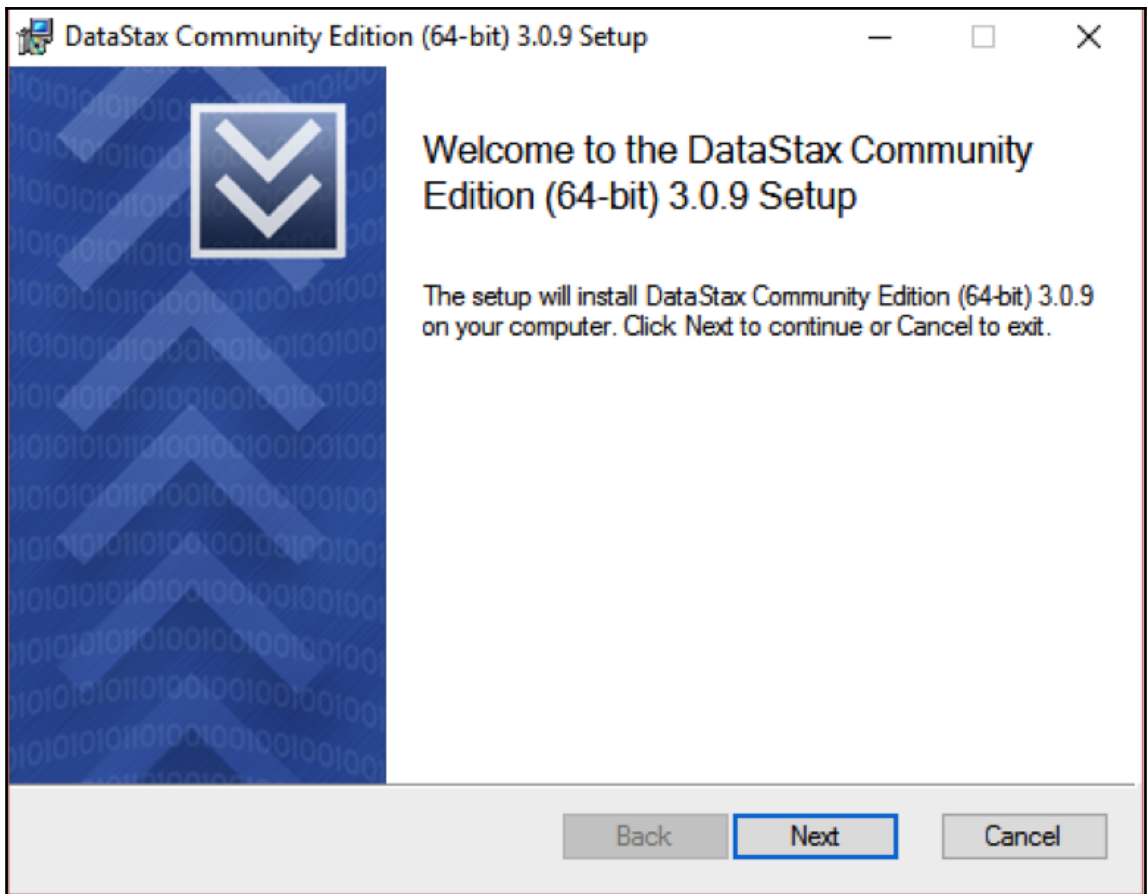
### Older supported releases

The following older Cassandra releases are still supported:

- Apache Cassandra 3.0 is supported until **May 2017**. The latest release is [3.0.9 \(pgp, md5 and sha1\)](#), released on 2016-09-20.
- Apache Cassandra 2.2 is supported until **November 2016**. The latest release is [2.2.8 \(pgp, md5 and sha1\)](#), released on 2016-09-28.
- Apache Cassandra 2.1 is supported until **November 2016** with **critical fixes only**. The latest release is [2.1.16 \(pgp, md5 and sha1\)](#), released on 2016-10-10.

Older (unsupported) versions of Cassandra are [archived here](#).

```
Datacenter: datacenter1
=====
Status=Up/Down
|/ State=Normal/Leaving/Joining/Moving
--  Address      Load          Tokens      Owns (effective)  Host ID                               Rack
UN  127.0.0.1     234.32 KB     256         100.0%           9e35777b-f2fa-460f-bb87-26fe0507fecd  rack1
```



```
C:\Program Files\DataStax Community\apache-cassandra>bin\nodetool status
Datacenter: datacenter1
=====
Status=Up/Down
|/ State=Normal/Leaving/Joining/Moving
-- Address      Load          Tokens      Owns (effective)  Host ID                               Rack
UN 127.0.0.1    155.59 KB    256         100.0%           86aa8bfc-8d69-4b28-8226-87f2d1b05c8e rack1

C:\Program Files\DataStax Community\apache-cassandra>
```

id	dob	name
1	02-25-1954	Alice

## Chapter 2: The First Table

username	email	encrypted_password
alice	alice@gmail.com	0x8914977ed729792e403da53024c6069a9158b8c4

username	encrypted_password
alice	0x8914977ed729792e403da53024c6069a9158b8c4

username	email	encrypted_password
alice	alice@gmail.com	0x8914977ed729792e403da53024c6069a9158b8c4
bob	null	0x10920941a69549d33aaee6116ed1f47e19b8e713

username	email	encrypted_password
bob	null	0x10920941a69549d33aaee6116ed1f47e19b8e713
alice	alice@gmail.com	0x8914977ed729792e403da53024c6069a9158b8c4

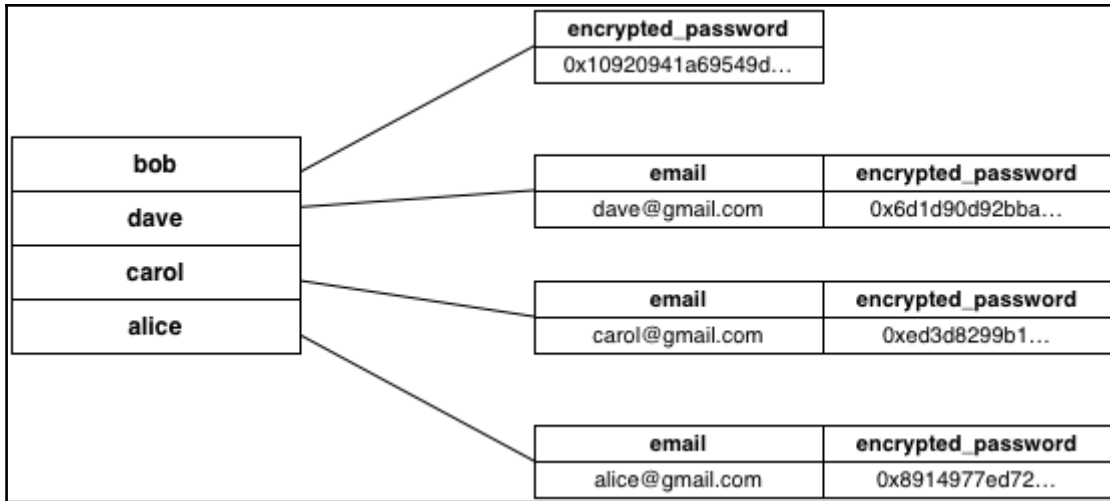
username	email	encrypted_password
bob	null	0x10920941a69549d33aaee6116ed1f47e19b8e713
dave	dave@gmail.com	0x6d1d90d92bbab0012270536f286d243729690a5b

[Invalid query] message="Only EQ and IN relation are supported on the partition key (unless you use the token() function)"

username	system.token(username)
bob	-5396685590450884643
dave	-4493667438046306776
carol	-3169904368870211108
alice	5699955792253506986



username	email	encrypted_password
carol	carol@gmail.com	0xed3d8299b191b59b7008759a104c10af3db6e63a
alice	alice@gmail.com	0x8914977ed729792e403da53024c6069a9158b8c4



username	email	encrypted_password
alice	alice@yahoo.com	0x8914977ed729792e403da53024c6069a9158b8c4

username	email	encrypted_password
alice	alice@gmail.com	0x8914977ed729792e403da53024c6069a9158b8c4

## Chapter 3: Organizing Related Data

username	id	body
bob	97719c50-e797-11e3-90ce-5f98e903bf02	Eating a tasty sandwich.
alice	76e7a4d0-e796-11e3-90ce-5f98e903bf02	Learning Cassandra!

username	id	body	DATEOF(id)
bob	97719c50-e797-11e3-90ce-5f98e903bf02	Eating a tasty sandwich.	2014-05-29 21:13:21-0400
alice	76e7a4d0-e796-11e3-90ce-5f98e903bf02	Learning Cassandra!	2014-05-29 21:05:17-0400

username	id	body	UNIXTIMESTAMPOF(id)
bob	97719c50-e797-11e3-90ce-5f98e903bf02	Eating a tasty sandwich.	1401412401813
alice	76e7a4d0-e796-11e3-90ce-5f98e903bf02	Learning Cassandra!	1401411917725

username	id	body
alice	76e7a4d0-e796-11e3-90ce-5f98e903bf02	Learning Cassandra!

username	id	body	UNIXTIMESTAMPOF(id)
bob	97719c50-e797-11e3-90ce-5f98e903bf02	Eating a tasty sandwich.	1401412401813
bob	3f9d81e0-e8f7-11e3-9211-5f98e903bf02	Bob Update 1	1401563437310
bob	3f9e9350-e8f7-11e3-9211-5f98e903bf02	Bob Update 2	1401563437317
bob	3f9f56a0-e8f7-11e3-9211-5f98e903bf02	Bob Update 3	1401563437322
alice	76e7a4d0-e796-11e3-90ce-5f98e903bf02	Learning Cassandra!	1401411917725
alice	3f9b5f00-e8f7-11e3-9211-5f98e903bf02	Alice Update 1	1401563437296
alice	3f9df710-e8f7-11e3-9211-5f98e903bf02	Alice Update 2	1401563437313
alice	3f9ee170-e8f7-11e3-9211-5f98e903bf02	Alice Update 3	1401563437319

```
InvalidRequest: code=2200 [Invalid query] message="Unable to coerce '2016-14-23' to a formatted date (long)"
```

```
InvalidRequest: code=2200 [Invalid query] message="(TimeType) Unable to coerce '14:65:45.123456' to a formatted time (long)"
```

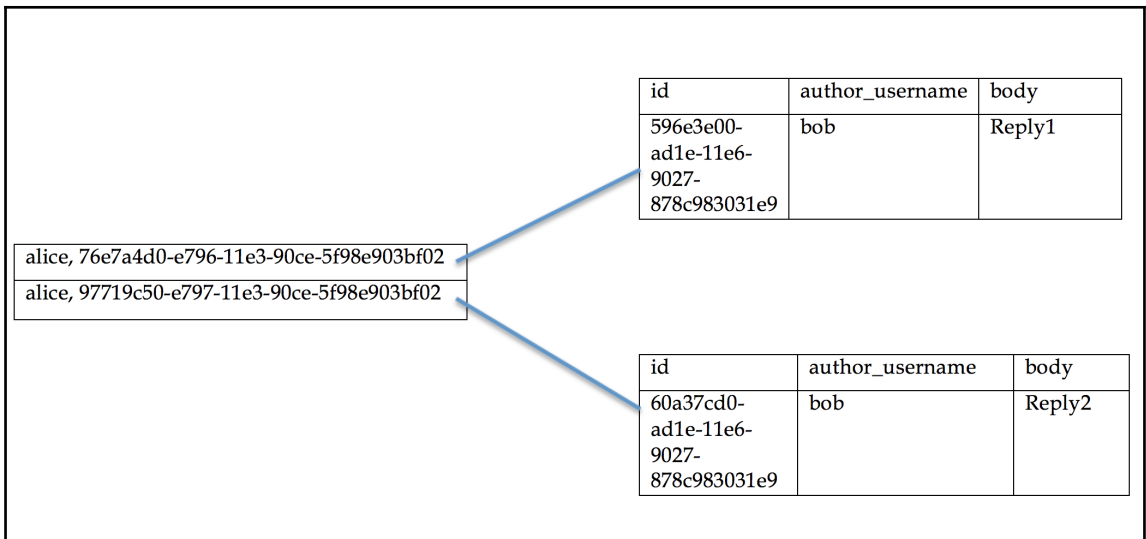
username	status_date	status_time	body
alice	2016-11-18	08:30:55.123000000	Alice Update 1
alice	2016-11-18	14:40:25.123456789	Alice Update 2
alice	2016-11-19	08:25:25.000000000	Alice Update 3
alice	2016-11-21	08:35:55.123456000	Alice Update 4
alice	2016-11-21	14:30:15.123000000	Alice Update 5
alice	2016-11-23	14:50:45.123456000	Alice Update 6

username	status_date	status_time	body
alice	2016-11-18	08:30:55.123000000	Alice Update 1
alice	2016-11-18	14:40:25.123456789	Alice Update 2
alice	2016-11-19	08:25:25.000000000	Alice Update 3

InvalidRequest: code=2200 [Invalid query] message="Clustering column "status time" cannot be restricted (preceding column "status date" is restricted by a non-EQ relation)"

username	status_date	status_time	body
alice	2016-11-21	14:30:15.123000000	Alice Update 5

InvalidRequest: code=2200 [Invalid query] message="Partition key parts: status\_update\_id must be restricted as other parts are"



username	id	email	body
alice	76e7a4d0-e796-11e3-90ce-5f98e903bf02	alice@gmail.com	Learning Cassandra!

(1 rows)

username	id	email	body
alice	76e7a4d0-e796-11e3-90ce-5f98e903bf02	alice@gmail.com	Learning Cassandra!
alice	c5eeb290-7345-11e4-a0e6-5f98e903bf02	alice@gmail.com	Another status update

(2 rows)

username	email	encrypted_password
alice	alice@gmail.com	0x8914977ed729792e403da53024c6069a9158b8c4
alice	alice@gmail.com	0x8914977ed729792e403da53024c6069a9158b8c4

(2 rows)

username	email	encrypted_password
alice	alice@gmail.com	0x8914977ed729792e403da53024c6069a9158b8c4

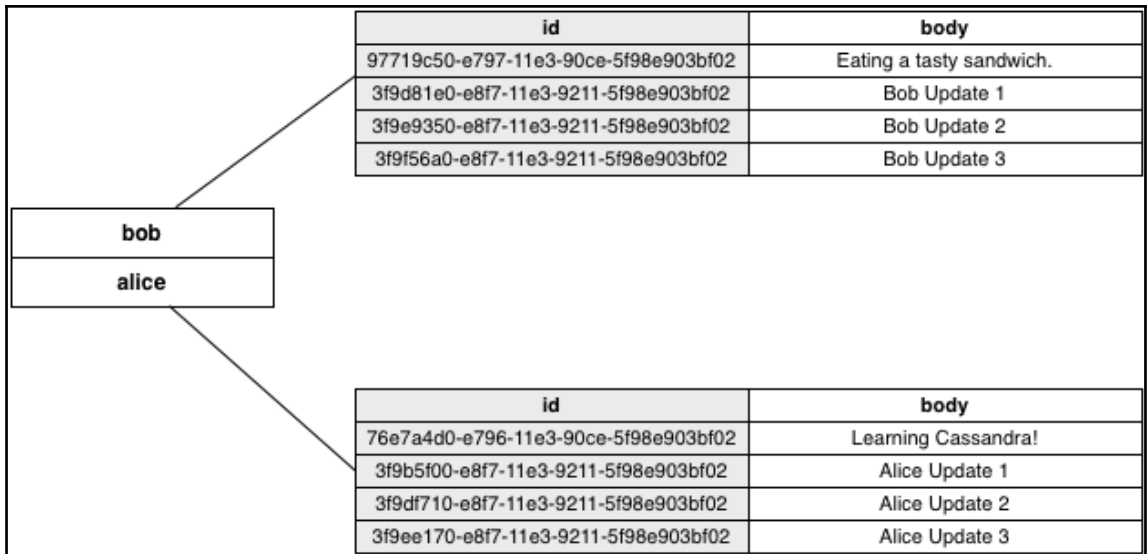
(1 rows)

username	id	email	body
bob		bob@gmail.com	null
alice	76e7a4d0-e796-11e3-90ce-5f98e903bf02	alice@gmail.com	Learning Cassandra!
alice	c5eeb290-7345-11e4-a0e6-5f98e903bf02	alice@gmail.com	Another status update

(3 rows)

username	id	email	body
bob	0b899e60-734a-11e4-a0e6-5f98e903bf02	bob@gmail.com	Bob status update
alice	76e7a4d0-e796-11e3-90ce-5f98e903bf02	alice@gmail.com	Learning Cassandra!
alice	c5eeb290-7345-11e4-a0e6-5f98e903bf02	alice@gmail.com	Another status update

(3 rows)



## Chapter 4: Beyond Key-Value Lookup

username	id	body
alice	76e7a4d0-e796-11e3-90ce-5f98e903bf02	Learning Cassandra!
alice	3f9b5f00-e8f7-11e3-9211-5f98e903bf02	Alice Update 1
alice	3f9df710-e8f7-11e3-9211-5f98e903bf02	Alice Update 2
alice	3f9ee170-e8f7-11e3-9211-5f98e903bf02	Alice Update 3

Bad Request: Cannot execute this query as it might involve data filtering and thus may have unpredictable performance. If you want to execute this query despite the performance unpredictability, use ALLOW FILTERING

Bad Request: Partition key part status\_update\_id must be restricted since preceding part is

id	DATEOF(id)	body
76e7a4d0-e796-11e3-90ce-5f98e903bf02	2014-05-29 21:05:17-0400	Learning Cassandra!

id	DATEOF(id)	body
76e7a4d0-e796-11e3-90ce-5f98e903bf02	2014-05-29 21:05:17-0400	Learning Cassandra!
3f9b5f00-e8f7-11e3-9211-5f98e903bf02	2014-05-31 15:10:37-0400	Alice Update 1
3f9df710-e8f7-11e3-9211-5f98e903bf02	2014-05-31 15:10:37-0400	Alice Update 2

id	DATEOF(id)	body
3f9ee170-e8f7-11e3-9211-5f98e903bf02	2014-05-31 15:10:37-0400	Alice Update 3

**count**  
-----  
**4**  
**(1 rows)**

id	DATEOF(id)	body
3f9ee170-e8f7-11e3-9211-5f98e903bf02	2014-05-31 15:10:37-0400	Alice Update 3
3f9df710-e8f7-11e3-9211-5f98e903bf02	2014-05-31 15:10:37-0400	Alice Update 2
3f9b5f00-e8f7-11e3-9211-5f98e903bf02	2014-05-31 15:10:37-0400	Alice Update 1
76e7a4d0-e796-11e3-90ce-5f98e903bf02	2014-05-29 21:05:17-0400	Learning Cassandra!

**Bad Request: Order by is currently only supported on the clustered columns of the PRIMARY KEY, got body**

username	id	body
alice	64e9cc20-f03a-11e3-995c-5f98e903bf02	Reversed status 3
alice	64e956f0-f03a-11e3-995c-5f98e903bf02	Reversed status 2
alice	64e670c0-f03a-11e3-995c-5f98e903bf02	Reversed status 1

username	status_date	status_time	body
alice	2016-11-18	08:30:55.123000000	Alice Update 1
alice	2016-11-18	14:40:25.123456789	Alice Update 2
alice	2016-11-19	08:25:25.000000000	Alice Update 3
alice	2016-11-21	08:35:55.123456000	Alice Update 4
alice	2016-11-21	14:30:15.123000000	Alice Update 5
alice	2016-11-23	14:50:45.123456000	Alice Update 6

username	status_date	status_time	body
alice	2016-11-23	14:50:45.123456000	Alice Update 6
alice	2016-11-21	14:30:15.123000000	Alice Update 5
alice	2016-11-21	08:35:55.123456000	Alice Update 4
alice	2016-11-19	08:25:25.000000000	Alice Update 3
alice	2016-11-18	14:40:25.123456789	Alice Update 2
alice	2016-11-18	08:30:55.123000000	Alice Update 1

InvalidRequest: code=2200 [Invalid query] message="Unsupported order by relation"

username	id	body
bob	97719c50-e797-11e3-90ce-5f98e903bf02	Eating a tasty sandwich.
bob	3f9d81e0-e8f7-11e3-9211-5f98e903bf02	Bob Update 1
bob	3f9e9350-e8f7-11e3-9211-5f98e903bf02	Bob Update 2

username	id	body
bob	3f9f56a0-e8f7-11e3-9211-5f98e903bf02	Bob Update 3

username	id	body
alice	76e7a4d0-e796-11e3-90ce-5f98e903bf02	Learning Cassandra!
alice	3f9b5f00-e8f7-11e3-9211-5f98e903bf02	Alice Update 1



username	id	body
alice	3f9df710-e8f7-11e3-9211-5f98e903bf02	Alice Update 2
alice	3f9ee170-e8f7-11e3-9211-5f98e903bf02	Alice Update 3

username	status_date	status_time	body
alice	2016-11-18	08:30:55.123000000	Alice Update 1
alice	2016-11-18	14:40:25.123456789	Alice Update 2
alice	2016-11-19	08:25:25.000000000	Alice Update 3
alice	2016-11-21	08:35:55.123456000	Alice Update 4
alice	2016-11-21	14:30:15.123000000	Alice Update 5
alice	2016-11-23	14:50:45.123456000	Alice Update 6
alice	2016-11-24	13:35:20.123456000	Alice Update 7

```
[json]
-----
{"username": "alice", "status_date": "2016-11-21", "status_time": "08:35:55.123456000", "body": "Alice Update 4"}
{"username": "alice", "status_date": "2016-11-21", "status_time": "14:30:15.123000000", "body": "Alice Update 5"}
{"username": "alice", "status_date": "2016-11-23", "status_time": "14:50:45.123456000", "body": "Alice Update 6"}
{"username": "alice", "status_date": "2016-11-24", "status_time": "13:35:20.123456000", "body": "Alice Update 7"}
```

tag

---

cake  
cassandra  
cassette  
casual

tag

---

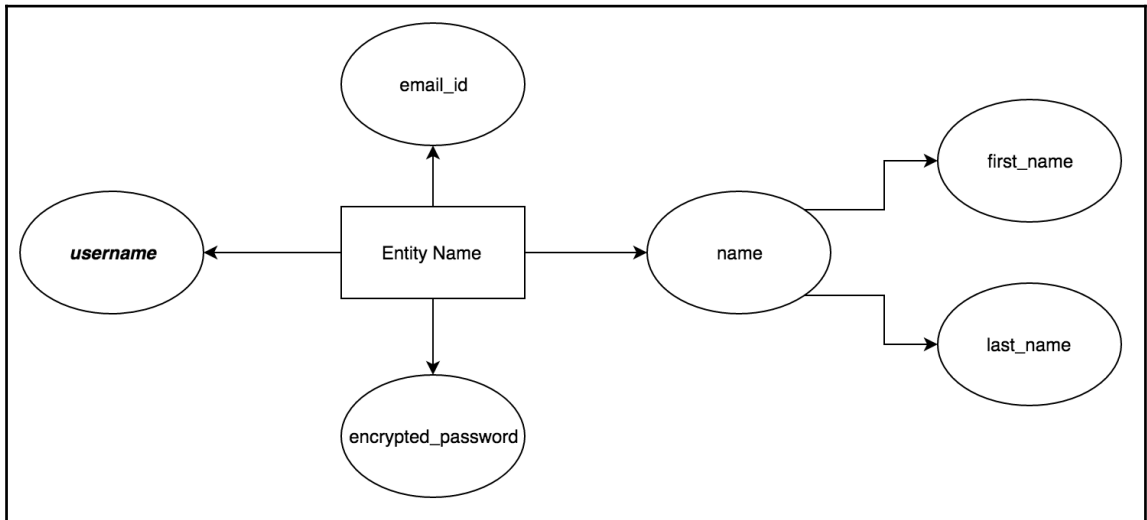
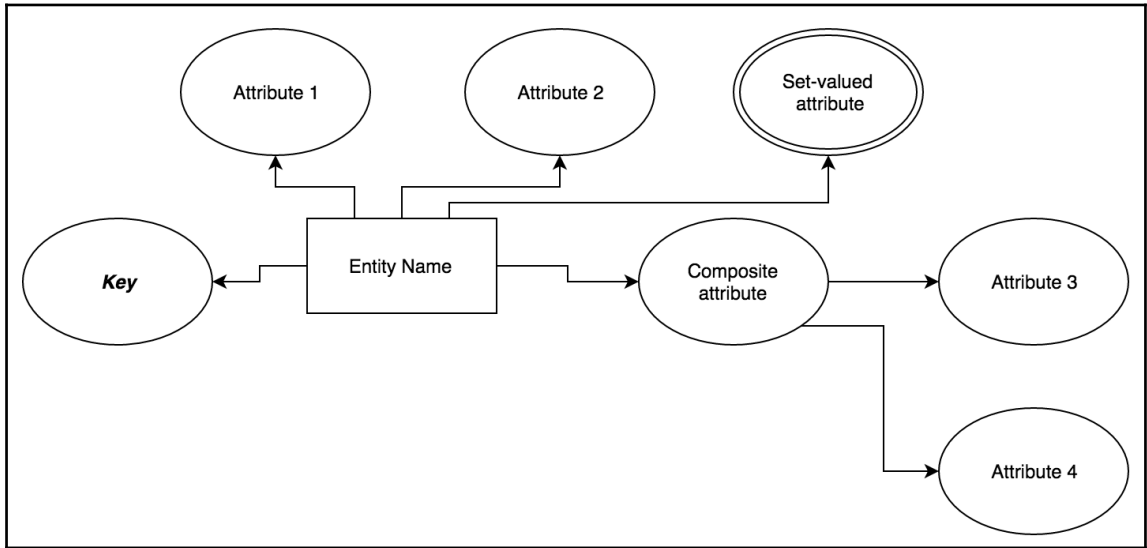
cassandra  
cassette  
casual

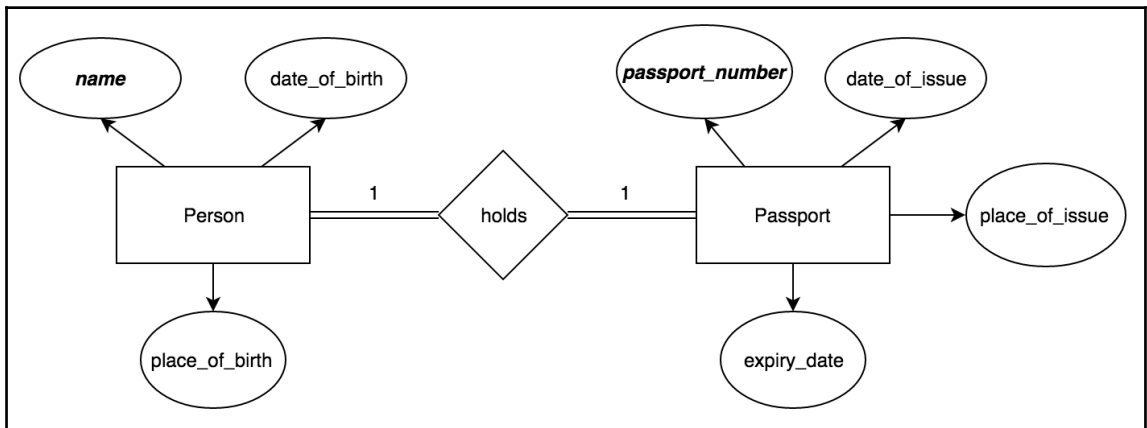
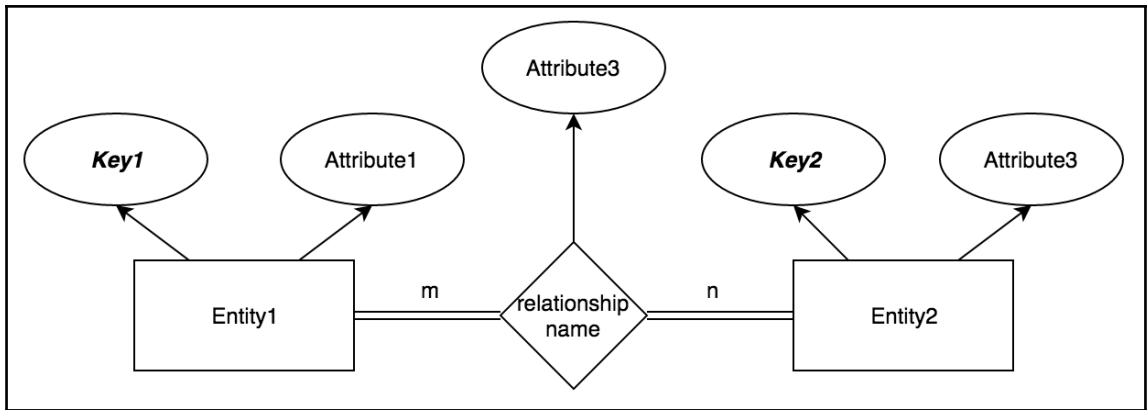
tag

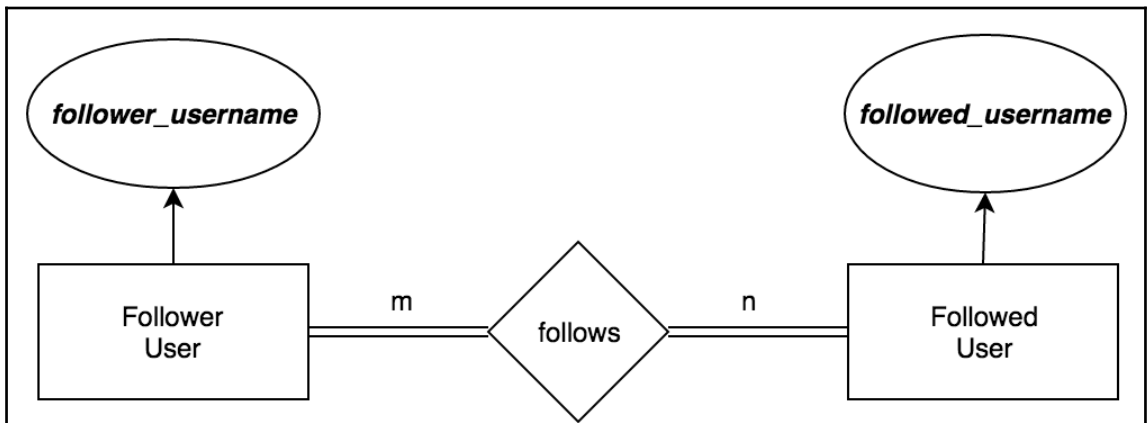
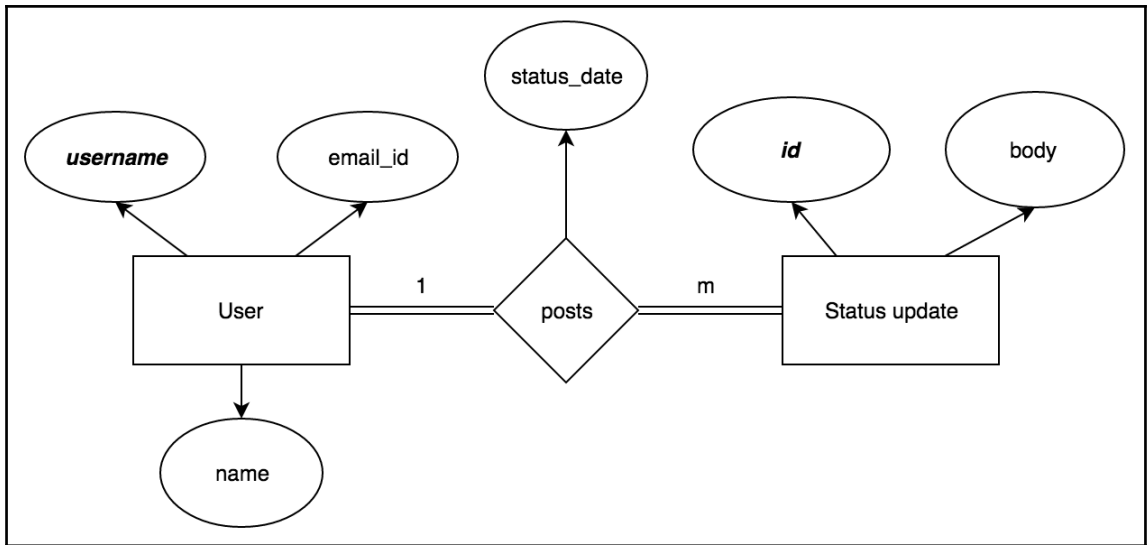
-----

cassandra

## Chapter 5: Establishing Relationships







<code>followed_username</code>
<code>bob</code>
<code>carol</code>

(2 rows)

Bad Request: Cannot execute this query as it might involve data filtering and thus may have unpredictable performance. If you want to execute this query despite the performance unpredictability, use ALLOW FILTERING

**follower\_username**

-----

**alice**

(1 rows)

**followed\_username**

-----

**carol**

(1 rows)



code=2200 [Invalid query] message="Cannot execute this query as it might involve data filtering and thus may have unpredictable performance. If you want to execute this query despite the performance unpredictability, use ALLOW FILTERING"

followed_username		follower_username
dave		bob
carol		bob
alice		bob

(3 rows)

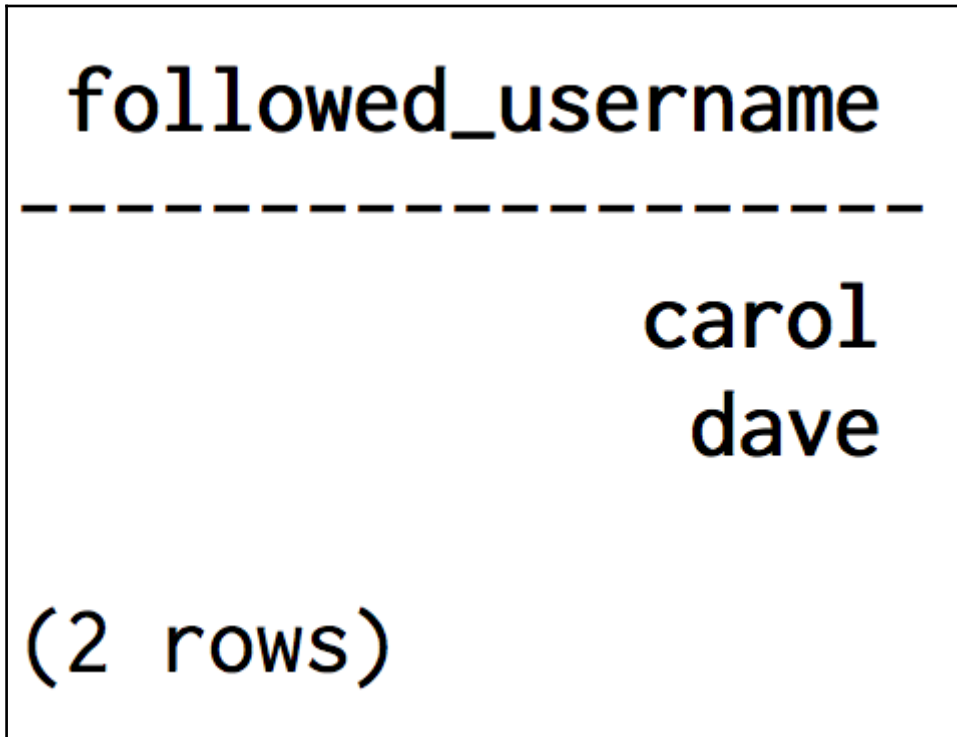
followed_username		follower_username
alice		bob
alice		carol

InvalidRequest: code=2200 [Invalid query] message="Cannot execute this query as it might involve data filtering and thus may have unpredictable performance. If you want to execute this query despite the performance unpredictability, use ALLOW FILTERING"

follower_username		followed_username
	+	
bob		alice
bob		carol
bob		dave

follower_username		followed_username
	+	
bob		alice
bob		carol

## Chapter 6: Denormalizing Data for Maximum Performance



id	UNIXTIMESTAMPOF(id)	body
3a597500-28cf-11e4-8069-5f98e903bf02	1408583123024	carol update one
3a5a3850-28cf-11e4-8069-5f98e903bf02	1408583123029	carol update two
3a58d8c0-28cf-11e4-8069-5f98e903bf02	1408583123020	dave update one
3a59c320-28cf-11e4-8069-5f98e903bf02	1408583123026	dave update two

username	id	UNIXTIMESTAMPOF(id)	body
carol	3a5a3850-28cf-11e4-8069-5f98e903bf02	1408583123029	carol update two
dave	3a59c320-28cf-11e4-8069-5f98e903bf02	1408583123026	dave update two

username	id	UNIXTIMESTAMPOF(id)	body
carol	3a597500-28cf-11e4-8069-5f98e903bf02	1408583123024	carol update one
dave	3a58d8c0-28cf-11e4-8069-5f98e903bf02	1408583123020	dave update one

```
follower_username
-----
alice
(1 rows)
```

```
NOW()
-----
aeebe5d0-2ada-11e4-8069-5f98e903bf02
```

status_update_username	status_update_id
dave	a05b90b0-2ada-11e4-8069-5f98e903bf02
carol	65cd8320-2ad7-11e4-8069-5f98e903bf02

(2 rows)

username	id	body
dave	a05b90b0-2ada-11e4-8069-5f98e903bf02	dave update 3
carol	65cd8320-2ad7-11e4-8069-5f98e903bf02	carol update 3

(2 rows)

status_update_username	status_update_id	body
dave	16e2f240-2afa-11e4-8069-5f98e903bf02	dave update 4
carol	cacc7de0-2af9-11e4-8069-5f98e903bf02	carol update 4

(2 rows)

## Chapter 7: Expanding Your Data Model

```
system_schema system_auth system system_distributed system_traces my_status
```

```
CREATE KEYSPACE my_status WITH replication = {'class': 'SimpleStrategy', 'replication_factor': '1'} AND durable_writes = true;
CREATE TABLE my_status.user_status_updates (
  username text,
  id timeuuid,
  body text,
  PRIMARY KEY (username, id)
) WITH CLUSTERING ORDER BY (id ASC)
```

```
CREATE TABLE users (
  username text,
  email text,
  encrypted_password blob,
  PRIMARY KEY (username)
) WITH
  bloom_filter_fp_chance=0.010000 AND
  caching='KEYS_ONLY' AND
  comment='' AND
  dclocal_read_repair_chance=0.000000 AND
  gc_grace_seconds=864000 AND
  index_interval=128 AND
  read_repair_chance=0.100000 AND
  replicate_on_write='true' AND
  populate_io_cache_on_flush='false' AND
  default_time_to_live=0 AND
  speculative_retry='99.0PERCENTILE' AND
  memtable_flush_period_in_ms=0 AND
  compaction={'class': 'SizeTieredCompactionStrategy'} AND
  compression={'sstable_compression': 'LZ4Compressor'};
```

```
CREATE TABLE users (  
    username text,  
    city_state text,  
    email text,  
    encrypted_password blob,  
    PRIMARY KEY (username)  
) WITH
```

```
CREATE TABLE users (
  username text,
  email text,
  encrypted_password blob,
  location text,
  PRIMARY KEY (username)
) WITH
```

username	email	encrypted_password	location
bob	null	0x10920941a69549d33aeee6116ed1f47e19b8e713	null
dave	dave@gmail.com	0x6d1d90d92bbab0012270536f286d243729690a5b	null
carol	carol@gmail.com	0xed3d8299b191b59b7008759a104c10af3db6e63a	null
alice	alice@gmail.com	0x8914977ed729792e403da53024c6069a9158b8c4	null

(4 rows)

username	email	encrypted_password	location
bob	null	0x10920941a69549d33aeee6116ed1f47e19b8e713	null
dave	dave@gmail.com	0x6d1d90d92bbab0012270536f286d243729690a5b	null
carol	carol@gmail.com	0xed3d8299b191b59b7008759a104c10af3db6e63a	null
alice	alice@gmail.com	0x8914977ed729792e403da53024c6069a9158b8c4	New York, NY

(4 rows)



username	email	encrypted_password	location
bob	null	0x10920941a69549d33aaee6116ed1f47e19b8e713	null
dave	dave@me.com	0x6d1d90d92bbab0012270536f286d243729690a5b	San Francisco, CA
carol	carol@gmail.com	0xed3d8299b191b59b7008759a104c10af3db6e63a	null
alice	alice@gmail.com	0x8914977ed729792e403da53024c6069a9158b8c4	New York, NY

username	email	encrypted_password	location
bob	null	0x10920941a69549d33aaee6116ed1f47e19b8e713	St. Louis, MO
dave	dave@me.com	0x6d1d90d92bbab0012270536f286d243729690a5b	San Francisco, CA
carol	carol@gmail.com	0xed3d8299b191b59b7008759a104c10af3db6e63a	St. Louis, MO
alice	alice@gmail.com	0x8914977ed729792e403da53024c6069a9158b8c4	New York, NY

### Cassandra

username	email	encrypted_password
dave	dave@gmail.com	0x6d1d90d

### Relational Database

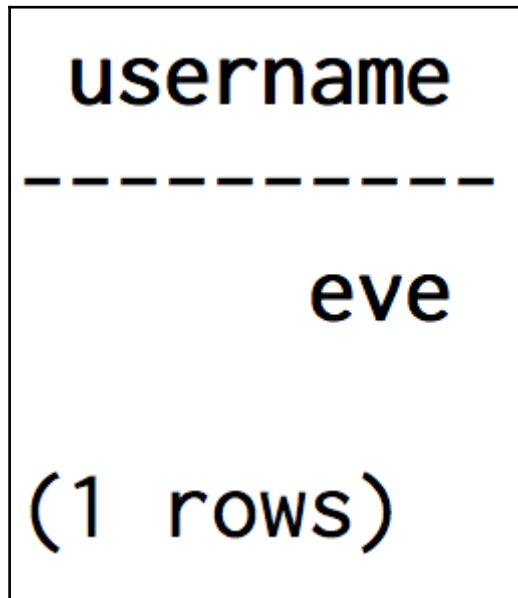
username	email	encrypted_password	location
dave	dave@gmail.com	0x6d1d90d	NULL

username	email	encrypted_password	location
bob	null	0x10920941a69549d33aaee6116ed1f47e19b8e713	null
dave	dave@me.com	0x6d1d90d92bbab0012270536f286d243729690a5b	San Francisco, CA
carol	carol@gmail.com	0xed3d8299b191b59b7008759a104c10af3db6e63a	St. Louis, MO
alice	alice@gmail.com	0x8914977ed729792e403da53024c6069a9158b8c4	New York, NY

username	email	encrypted_password	location
bob	null	0x10920941a69549d33aaee6116ed1f47e19b8e713	null
dave	dave@me.com	0x6d1d90d92bbab0012270536f286d243729690a5b	San Francisco, CA
carol	carol@hotmail.com	0xed3d8299b191b59b7008759a104c10af3db6e63a	null
alice	alice@gmail.com	0x8914977ed729792e403da53024c6069a9158b8c4	null

username	email	encrypted_password	location
bob	null	0x10920941a69549d33aaee6116ed1f47e19b8e713	null
dave	dave@me.com	0x6d1d90d92bbab0012270536f286d243729690a5b	San Francisco, CA
eve	eve@gmail.com	0x85e36ed9f726295921a4a6f40d95c202c895180c	Washington, D.C.
carol	carol@hotmail.com	0xed3d8299b191b59b7008759a104c10af3db6e63a	null
alice	alice@gmail.com	0x8914977ed729792e403da53024c6069a9158b8c4	null

username	email	encrypted_password	location
bob	null	0x10920941a69549d33aaee6116ed1f47e19b8e713	null
dave	dave@me.com	0x6d1d90d92bbab0012270536f286d243729690a5b	San Francisco, CA
eve	eve123@hotmail.com	0x411ebd49a24f8be2250c527160509264622d7883	Washington, D.C.
carol	carol@hotmail.com	0xed3d8299b191b59b7008759a104c10af3db6e63a	null
alice	alice@gmail.com	0x8914977ed729792e403da53024c6069a9158b8c4	null



[applied]  
-----  
True

[applied]	username	email	encrypted_password	location
False	frank	frank@gmail.com	0xa71451665e16d8c6e6edfd444c60156efc861432	Los Angeles, CA

username	email	encrypted_password	location
bob	null	0x10920941a69549d33aaee6116ed1f47e19b8e713	null
dave	dave@me.com	0x6d1d90d92bbab0012270536f286d243729690a5b	San Francisco, CA
gina	null	null	Houston, TX
eve	eve123@hotmail.com	0x411ebd49a24f8be2250c527160509264622d7883	Washington, D.C.
carol	carol@hotmail.com	0xed3d8299b191b59b7008759a104c10af3db6e63a	null
frank	frank@gmail.com	0xa71451665e16d8c6e6edfd444c60156efc861432	Los Angeles, CA
alice	alice@gmail.com	0x8914977ed729792e403da53024c6069a9158b8c4	null

[applied]  
-----  
True

username	location	version
happycorp	New York, NY	8a810110-3220-11e4-8eeb-5f98e903bf02

[applied]	version
False	8a810110-3220-11e4-8eeb-5f98e903bf02

[applied]
False



```
starred_by_users
-----
null

(1 rows)
```

username	id	starred_by_users
alice	76e7a4d0-e796-11e3-90ce-5f98e903bf02	{'bob'}

(1 rows)

username	id	starred_by_users
alice	76e7a4d0-e796-11e3-90ce-5f98e903bf02	{'bob', 'carol'}

(1 rows)

username	id	starred_by_users
alice	76e7a4d0-e796-11e3-90ce-5f98e903bf02	{'bob', 'carol', 'dave'}

(1 rows)

username	id	starred_by_users
alice	76e7a4d0-e796-11e3-90ce-5f98e903bf02	{ 'bob', 'carol' }

(1 rows)

username	id	starred_by_users
bob	97719c50-e797-11e3-90ce-5f98e903bf02	{ 'alice' }

(1 rows)

username	id	shared_by
alice	76e7a4d0-e796-11e3-90ce-5f98e903bf02	[ 'dave', 'bob', 'carol' ]

(1 rows)

**Bad Request: List index 3 out of bound, list has size 3**

username	id	shared_by
alice	76e7a4d0-e796-11e3-90ce-5f98e903bf02	[ 'robert' ]

(1 rows)

username	social_identities
alice	{ 'instagram': 9839025, 'twitter': 2725634, 'yo': 25 }

(1 rows)

```

username | social_identities
-----+-----
alice | {'twitter': 2725634, 'yo': 25}

(1 rows)

```

username	id	body	shared_by	starred_by_users
bob	97719c50-e797-11e3-90ce-5f98e903bf02	Eating a tasty sandwich.	null	['alice']

(1 rows)

```

username | social_identities
-----+-----
ivan | {'instagram': 109550, 'twitter': 875958}
alice | {'twitter': 2725634, 'yo': 25}

(2 rows)

```

InvalidRequest: code=2200 [Invalid query] message="Cannot restrict clustering columns by IN relations when a collection is selected by the query"

username	id	body	shared_by	starred_by_users
alice	76e7a4d0-e796-11e3-90ce-5f98e903bf02	Learning Cassandra!	['robert']	['bob', 'carol']
alice	3f9b5f00-e8f7-11e3-9211-5f98e903bf02	Alice Update 1	null	null

(2 rows)

InvalidRequest: code=2200 [Invalid query] message="Cannot add a collection with the name social\_identities because a collection with the same name and a different type (map<text, bigint>) has already been used in the past"



username	education
alice	('Big Data University', 2003)

(1 rows)

username	education
alice	('BDU', None)
bob	('Cassandra College', None)

(2 rows)

username	education
alice	('Big Data University', 2003)

(1 rows)

InvalidRequest: code=2200 [Invalid query] message="Cannot drop column ColumnDefinition{name=education, type=org.apache.cassandra.db.marshall.TupleType(org.apache.cassandra.db.marshall.UTF8Type,org.apache.cassandra.db.marshall.Int32Type), kind=REGULAR, position=-1 } because it has dependent secondary indexes (users\_education\_idx)"

```
username | education
-----+-----
  alice | {school_name: 'Big Data University', graduation_year: 2003}
(1 rows)
```

```
username | education
-----+-----
  alice | {school_name: 'Big Data University', graduation_year: 2003}
(1 rows)
```

```
username | education.school_name
-----+-----
  alice |      Big Data University
(1 rows)
```

```
InvalidRequest: code=2200 [Invalid query] message="Non-frozen collections are not allowed inside collections: map<text, set<text>>"
```

```
username | telephone_numbers
-----+-----
  alice | {'home': {'123456789', '123789456'}, 'office': {'123654789', '123987456'}}
(1 rows)
```

```
username | education_history
-----+-----
  alice | {{school_name: 'Big Data University', graduation_year: 2003}, {school_name: 'Cassandra College', graduation_year: 2005}}
(1 rows)
```

## Chapter 9: Aggregating Time-Series Data

year	date	api_views	mobile_views	total_views	web_views
2014	2014-10-05 00:00:00+0000	null	null	1	1

(1 rows)

Bad Request: INSERT statement are not allowed on counter tables, use UPDATE instead

year	date	api_views	mobile_views	total_views	web_views
2014	2014-02-01 00:00:00+0000	null	null	500	null
2014	2014-10-05 00:00:00+0000	null	null	1	1

(2 rows)

year	date	api_views	mobile_views	total_views	web_views
2014	2014-10-05 00:00:00+0000	null	null	1	1

(1 rows)

year	date	api_views	mobile_views	total_views	web_views
2014	2014-02-01 00:00:00+0000	null	null	600	null
2014	2014-10-05 00:00:00+0000	null	null	1	1

(2 rows)

Bad Request: Cannot add a non counter column (last\_view\_time) in a counter column family

```

README.txt
cassandra-env.ps1
cassandra-env.sh
cassandra.yaml
commitlog_archiving.properties
cqlshrc.sample
hotspot_compiler
jvm.options
logback-tools.xml
logback.xml
metrics-reporter-config-sample.yaml
triggers

```

```

0 21747 21118 0 6:47PM ttys001 0:00.02 sudo ./bin/cassandra -f
0 21748 21747 0 6:47PM ttys001 0:12.00 /usr/bin/java -Xloggc:./bin/./logs/gc.log -XX:+UseParNewGC -XX:+UseConcMarkSweep
GC -XX:+CMSParallelRemarkEnabled -XX:SurvivorRatio=8 -XX:MaxTenuringThreshold=1 -XX:CMSInitiatingOccupancyFraction=75 -XX:+UseCMSI
nitiatingOccupancyOnly -XX:CMSWaitDuration=10000 -XX:+CMSParallelInitialMarkEnabled -XX:+CMSEdenChunksRecordAlways -XX:+CMSClassUn
loadingEnabled -XX:+PrintGCDetails -XX:+PrintGCDateStamps -XX:+PrintHeapAtGC -XX:+PrintTenuringDistribution -XX:+PrintGCApplicatio
nStoppedTime -XX:+PrintPromotionFailure -XX:+UseGCLogFileRotation -XX:NumberOfGCLogFiles=10 -XX:GCLogFileSize=10M -Xms4096M -Xmx40
96M -Xmn800M -XX:+UseCondCardMark -ea -Xss256k -XX:+AlwaysPreTouch -XX:-UseBiasedLocking -XX:StringTableSize=1000003 -XX:+UseTLAB
-XX:+ResizeTLAB -XX:+PerfDisableSharedMem -XX:CompileCommandFile=./bin/./conf/hotspot_compiler -javaagent:./bin/./lib/jamm-0.3.0
.jar -XX:+UseThreadPriorities -XX:ThreadPriorityPolicy=42 -XX:+HeapDumpOnOutOfMemoryError -Djava.net.preferIPv4Stack=true -Dcassa
nra.jmx.local.port=7199 -XX:+DisableExplicitGC -Djava.library.path=./bin/./lib/sigar-bin -Dlogback.configurationFile=logback.xml
-Dcassandra.logdir=./bin/./logs -Dcassandra.storagedir=./bin/./data -Dcassandra-foreground=yes -cp ./bin/./conf:./bin/./build/
classes/main:./bin/./build/classes/thrift:./bin/./lib/ST4-4.0.8.jar:./bin/./lib/airline-0.6.jar:./bin/./lib/antlr-runtime-3.5.
2.jar:./bin/./lib/apache-cassandra-3.0.7.jar:./bin/./lib/apache-cassandra-clientutil-3.0.7.jar:./bin/./lib/apache-cassandra-thr
ift-3.0.7.jar:./bin/./lib/asm-5.0.4.jar:./bin/./lib/cassandra-driver-core-3.0.1-shaded.jar:./bin/./lib/commons-cli-1.1.jar:./bi
n/./lib/commons-codec-1.2.jar:./bin/./lib/commons-lang3-3.1.jar:./bin/./lib/commons-math3-3.2.jar:./bin/./lib/compress-lzf-0.8
.4.jar:./bin/./lib/concurrentlinkedhashmap-lru-1.4.jar:./bin/./lib/disruptor-3.0.1.jar:./bin/./lib/ecj-4.4.2.jar:./bin/./lib/g
uava-18.0.jar:./bin/./lib/high-scale-lib-1.0.6.jar:./bin/./lib/jackson-core-asl-1.9.2.jar:./bin/./lib/jackson-mapper-asl-1.9.2.
jar:./bin/./lib/jamm-0.3.0.jar:./bin/./lib/javax.inject.jar:./bin/./lib/jbcrypt-0.3m.jar:./bin/./lib/jcl-over-slf4j-1.7.7.jar:
./bin/./lib/jna-4.0.0.jar:./bin/./lib/joda-time-2.4.jar:./bin/./lib/json-simple-1.1.jar:./bin/./lib/libthrift-0.9.2.jar:./bin/
./lib/log4j-over-slf4j-1.7.7.jar:./bin/./lib/logback-classic-1.1.3.jar:./bin/./lib/logback-core-1.1.3.jar:./bin/./lib/lz4-1.3.
0.jar:./bin/./lib/metrics-core-3.1.0.jar:./bin/./lib/metrics-logback-3.1.0.jar:./bin/./lib/metrics-statsd-common-4.1.2.jar:./bi
n/./lib/metrics3-statsd-4.1.2.jar:./bin/./lib/netty-all-4.0.23.Final.jar:./bin/./lib/ohc-core-0.4.3.jar:./bin/./lib/ohc-core-j
8-0.4.3.jar:./bin/./lib/reporter-config-base-3.0.2-595b3c23.jar:./bin/./lib/reporter-config3-3.0.2-595b3c23.jar:./bin/./lib/see
dprovider-1.0.5.jar:./bin/./lib/sigar-1.6.4.jar:./bin/./lib/slf4j-api-1.7.7.jar:./bin/./lib/snakeyaml-1.11.jar:./bin/./lib/sna
ppy-java-1.1.1.7.jar:./bin/./lib/stream-2.5.2.jar:./bin/./lib/thrift-server-0.3.7.jar:./bin/./lib/jsr223/*/*.jar org.apache.cas
sandra.service.CassandraDaemon

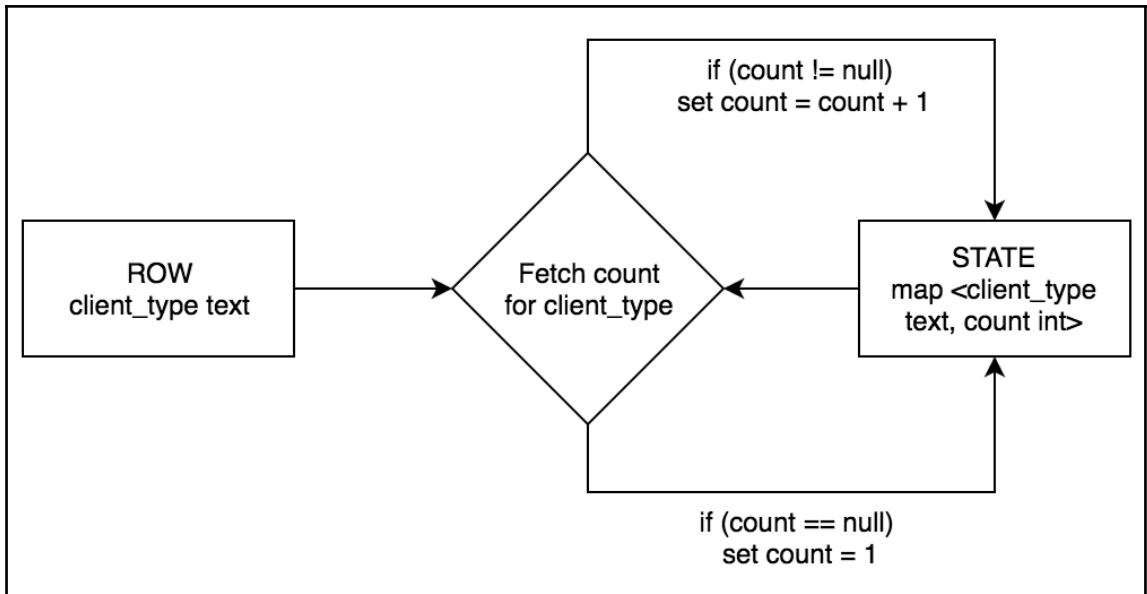
```

username	location
bob	happycorp null
happycorp	New York, NY
dave	San Francisco, CA
gina	Houston, TX
eve	Washington, D.C.
carol	null
frank	Los Angeles, CA
ivan	null
alice	null

username	my_status.selectcity(location)
bob	null
happycorp	New York
dave	San Francisco
gina	Houston
eve	Washington
carol	null
frank	Los Angeles
ivan	null
alice	null

(9 rows)

status_update_username	status_update_id	system.timestamp(observed_at)	client_type
alice	76e7a4d0-e796-11e3-90ce-5f98e903bf02	2014-10-05 19:12:17+0000	web
alice	76e7a4d0-e796-11e3-90ce-5f98e903bf02	2016-12-21 07:42:00+0000	web
alice	76e7a4d0-e796-11e3-90ce-5f98e903bf02	2016-12-21 07:42:00+0000	web
alice	76e7a4d0-e796-11e3-90ce-5f98e903bf02	2016-12-21 07:42:00+0000	mobile
alice	76e7a4d0-e796-11e3-90ce-5f98e903bf02	2016-12-21 07:42:00+0000	mobile
alice	76e7a4d0-e796-11e3-90ce-5f98e903bf02	2016-12-21 07:42:00+0000	api



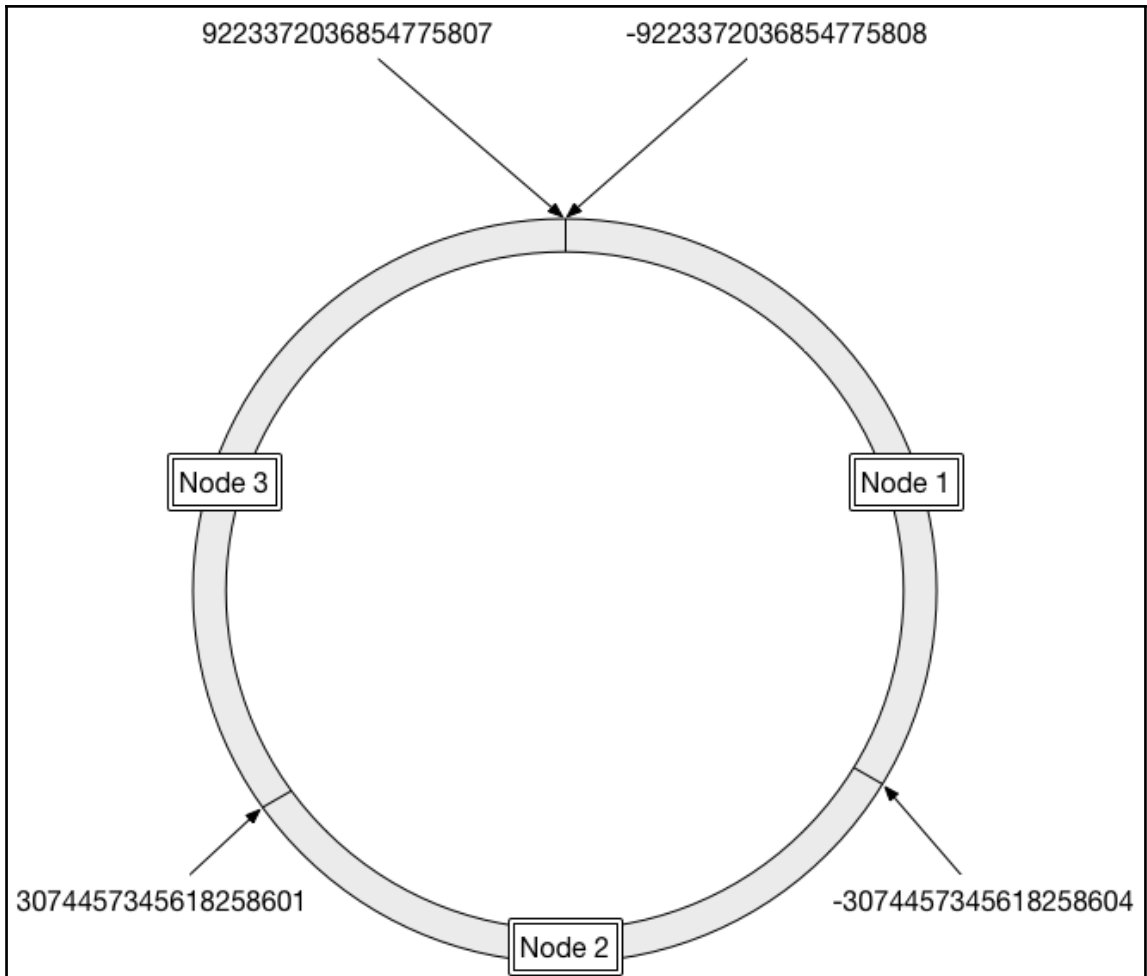
status_update_username	status_update_id	my_status.group_and_count(client_type)
alice	76e7a4d0-e796-11e3-90ce-5f98e903bf02	{'api': 1, 'mobile': 2, 'web': 3}

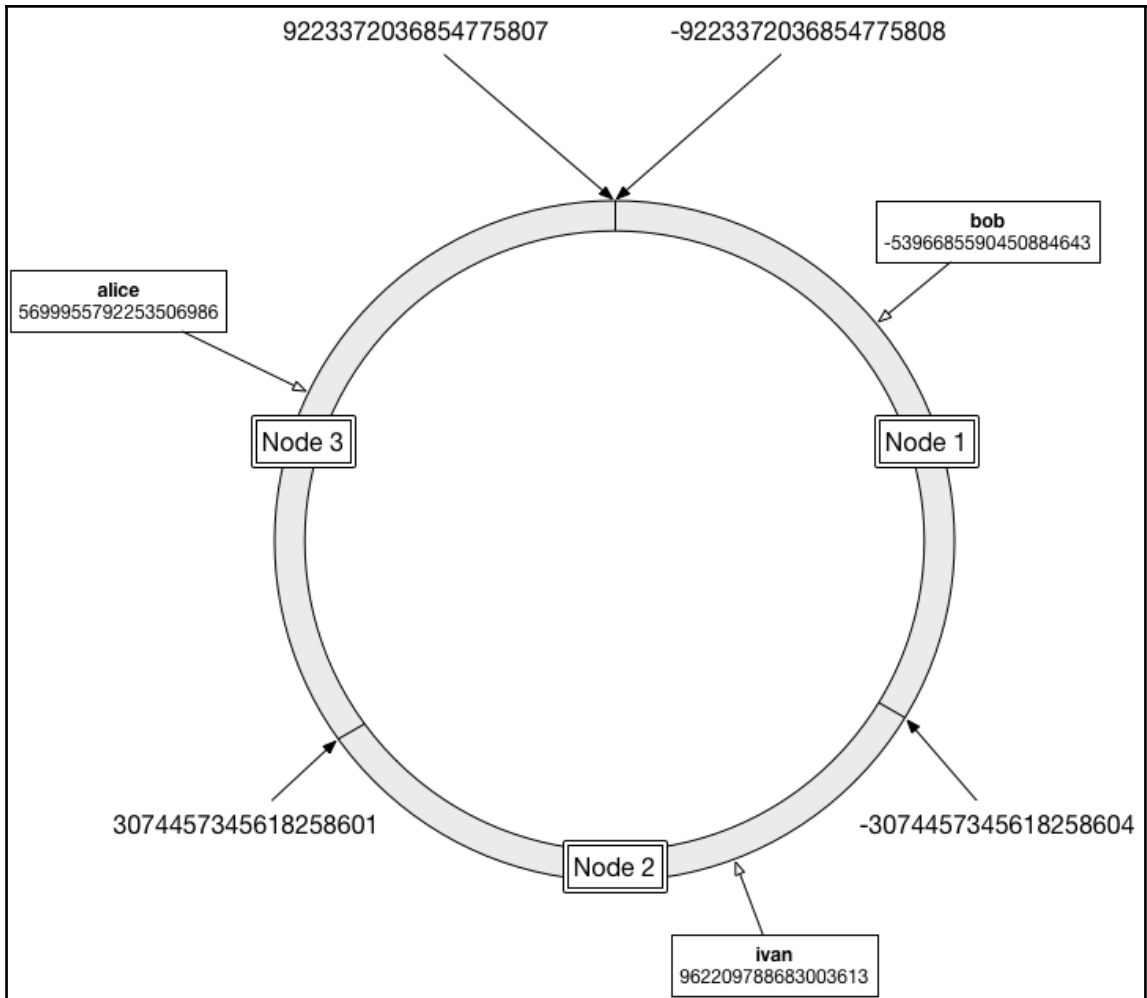
status_update_username	status_update_id	my_status.group_and_count(client_type)
alice	76e7a4d0-e796-11e3-90ce-5f98e903bf02	{'api': 1, 'mobile': 2, 'web': 2}

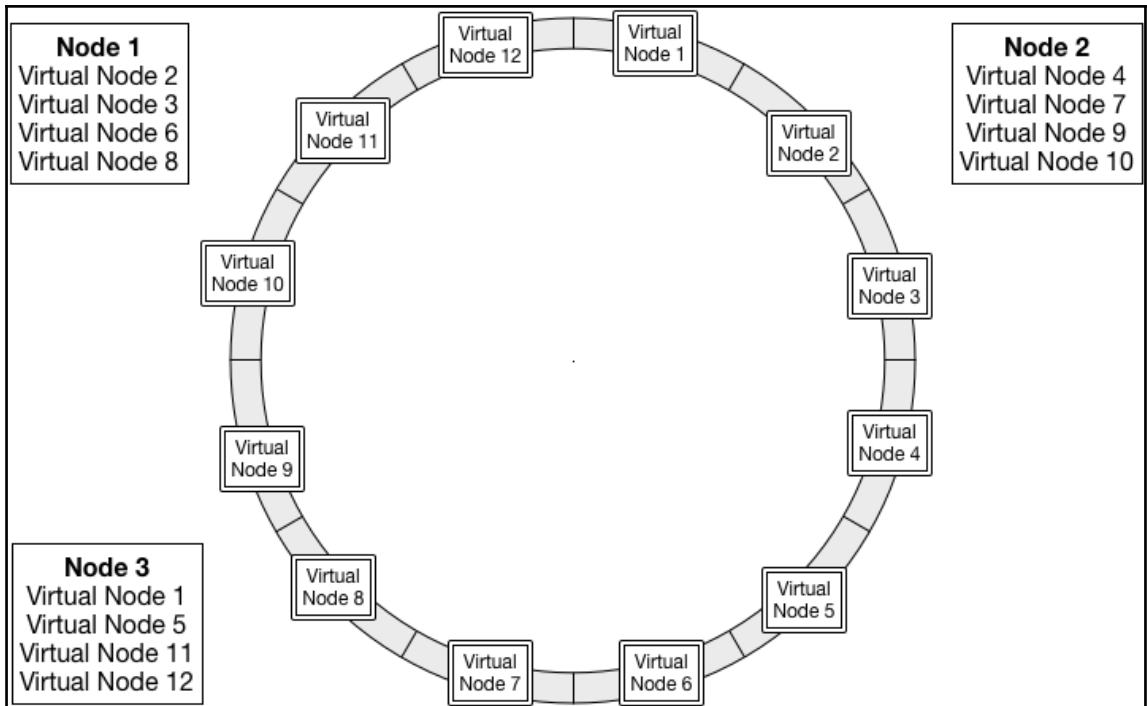
## Chapter 10: How Cassandra Distributes Data

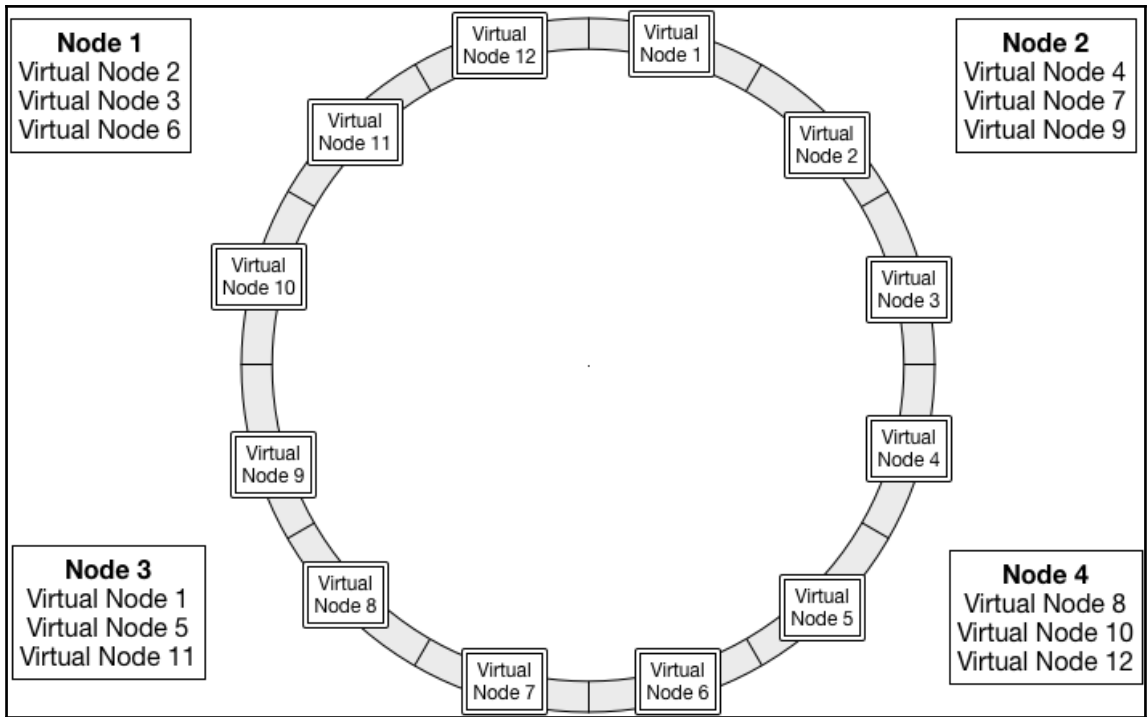
<code>username</code>	<code> </code>	<code>token(username)</code>
<code>alice</code>	<code> </code>	<code>5699955792253506986</code>
<code>bob</code>	<code> </code>	<code>-5396685590450884643</code>
<code>ivan</code>	<code> </code>	<code>962209788683003613</code>

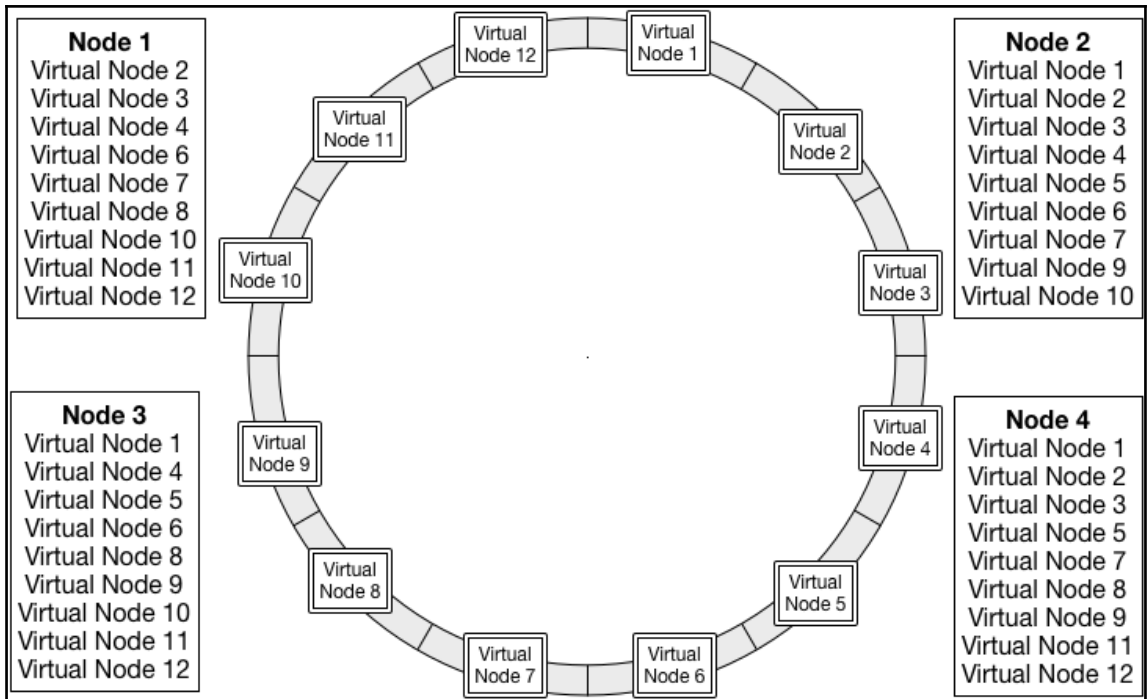


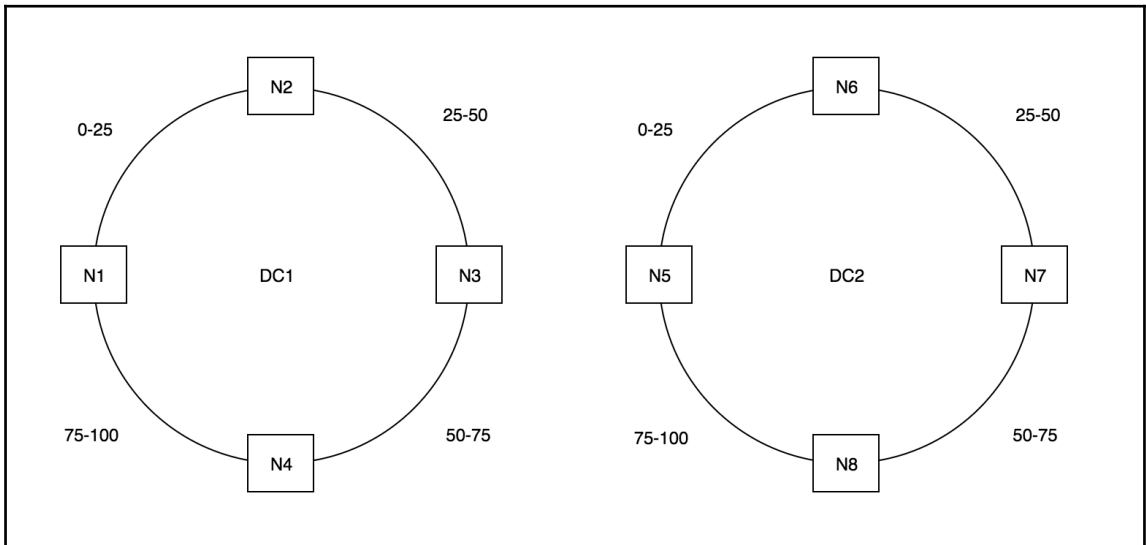
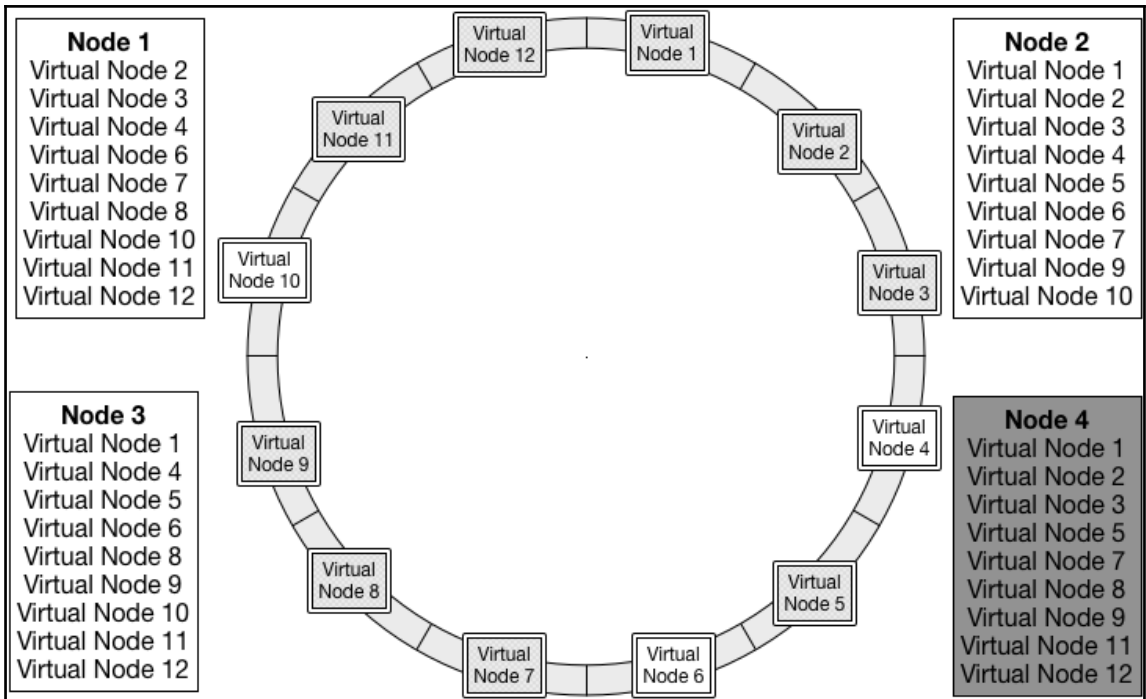












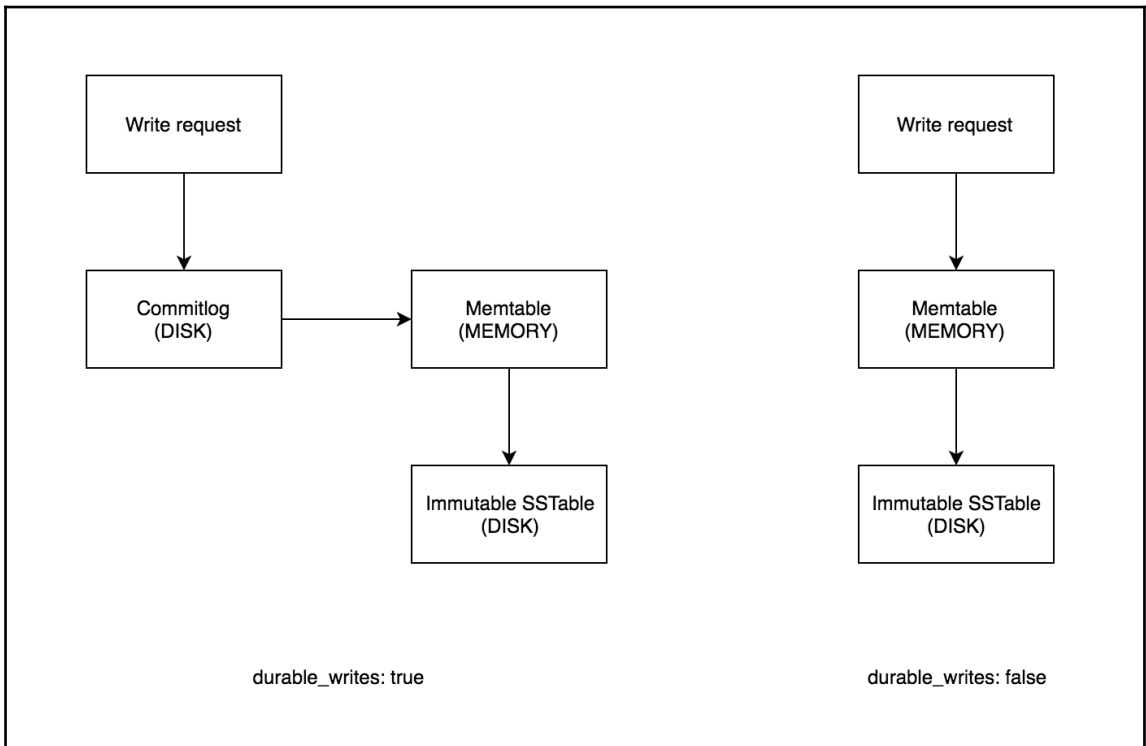
```
# Datacenter One
127.0.0.1=DC1:RAC1
127.0.0.2=DC1:RAC1

127.0.0.3=DC1:RAC2

# Datacenter Two
127.0.0.4=DC2:RAC1

127.0.0.5=DC2:RAC2
127.0.0.6=DC2:RAC2

# Default (Nodes with IP address not present in this file will be assigned this DC and RACK)
default=DC1:RAC1
```



email	writetime(email)	location	writetime(location)
media@happycorp.com	1481711196093000	New York, NY	1481711604804000

username	location
bob	Austin, TX

(1 rows)

username	location
bob	Austin, TX

(1 rows)



username	location	ttl(location)
bob	Vancouver	17

(1 rows)

```
CREATE TABLE my_status.users (
  username text PRIMARY KEY,
  education frozen<education_information>,
  education_history set<frozen<education_information>>,
  email text,
  encrypted_password blob,
  location text,
  telephone_numbers map<text, frozen<set<text>>>,
  version timeuuid
) WITH bloom_filter_fp_chance = 0.01
AND caching = {'keys': 'ALL', 'rows_per_partition': 'NONE'}
AND comment = ''
AND compaction = {'class': 'org.apache.cassandra.db.compaction.SizeTieredCompactionStrategy', 'max_threshold': '32', 'min_threshold': '4'}
AND compression = {'chunk_length_in_kb': '64', 'class': 'org.apache.cassandra.io.compress.LZ4Compressor'}
AND crc_check_chance = 1.0
AND dclocal_read_repair_chance = 0.1
AND default_time_to_live = 0
AND gc_grace_seconds = 864000
AND max_index_interval = 2048
AND memtable_flush_period_in_ms = 0
AND min_index_interval = 128
AND read_repair_chance = 0.0
AND speculative_retry = '99PERCENTILE';
CREATE INDEX users_education_idx ON my_status.users (education);
```

## Chapter 11: Cassandra Multi-Node Cluster

```
inet 127.0.0.1 netmask 0xff000000
inet 127.0.0.2 netmask 0xff000000
inet 127.0.0.3 netmask 0xff000000
```

```
Datcenter: datacenter1
=====
Status=Up/Down
|/ State=Normal/Leaving/Joining/Moving
-- Address      Load          Tokens      Owns (effective)  Host ID                                     Rack
UN 127.0.0.1    102.79 KB    256          100.0%            40d6e0b5-489a-4df1-a823-e218b6dd7baf    rack1
```

```
Datcenter: datacenter1
=====
Status=Up/Down
|/ State=Normal/Leaving/Joining/Moving
-- Address      Load          Tokens      Owns (effective)  Host ID                                     Rack
UN 127.0.0.1    104.21 KB    256          60.4%            40d6e0b5-489a-4df1-a823-e218b6dd7baf    rack1
UN 127.0.0.2    86.54 KB     256          68.8%            aed8cd4d-ca52-4cab-b0cc-97348ff36d17    rack1
UN 127.0.0.3    106.59 KB    256          70.8%            1375c591-6007-404f-b801-1b3b2b256bde    rack1
```

```
cqlsh> CONSISTENCY
Current consistency level is ONE.
```

Tracing session: 4056720-e62e-11e6-bb67-b126be40f4ae

activity	timestamp	source	source_elapsed
Execute CQL3 query	2017-01-29 06:21:40.370000	127.0.0.1	0
Parsing INSERT INTO "keyspace3"."users" ("username", "email", "encrypted_password") VALUES ('alice', 'alice@yahoo.com', '0x8914977ed729792e403da53024c6069a9158b8c4 '); [SharedPool-Worker-1]	2017-01-29 06:21:40.374000	127.0.0.1	3532
Preparing statement [SharedPool-Worker-1]	2017-01-29 06:21:40.376000	127.0.0.1	6301
om /127.0.0.1 [MessagingService-Incoming-/127.0.0.1]	2017-01-29 06:21:40.377000	127.0.0.2	18
om /127.0.0.1 [MessagingService-Incoming-/127.0.0.1]	2017-01-29 06:21:40.377000	127.0.0.3	24
etermining replicas for mutation [SharedPool-Worker-1]	2017-01-29 06:21:40.377000	127.0.0.1	6777
Appending to commitlog [SharedPool-Worker-1]	2017-01-29 06:21:40.377000	127.0.0.2	206
to /127.0.0.2 [MessagingService-Outgoing-/127.0.0.2]	2017-01-29 06:21:40.377000	127.0.0.1	7036
to /127.0.0.3 [MessagingService-Outgoing-/127.0.0.3]	2017-01-29 06:21:40.377000	127.0.0.1	7039
Appending to commitlog [SharedPool-Worker-2]	2017-01-29 06:21:40.377000	127.0.0.1	7063
Adding to users memtable [SharedPool-Worker-2]	2017-01-29 06:21:40.377000	127.0.0.1	7203
Adding to users memtable [SharedPool-Worker-1]	2017-01-29 06:21:40.378000	127.0.0.2	386

Datacenter: datacenter1

=====  
 Status=Up/Down  
 |/ State=Normal/Leaving/Joining/Moving

Address	Load	Tokens	Owns	Host ID	Rack
UN 127.0.0.1	201.05 KB	256	?	40d6e0b5-489a-4df1-a823-e218b6dd7baf	rack1
UN 127.0.0.2	248.78 KB	256	?	aed8cd4d-ca52-4cab-b0cc-97348ff36d17	rack1
DN 127.0.0.3	244.59 KB	256	?	1375c591-6007-404f-b801-1b3b2b256bde	rack1

Traceback (most recent call last):  
 File "/Users/yarabsa/cassandra1/bin/cqlsh.py", line 1314, in perform\_simple\_statement  
 result = future.result()  
 File "/Users/yarabsa/cassandra1/bin/./lib/cassandra-driver-internal-only-3.0.0-6af642d.zip/cassandra-driver-3.0.0-6af642d/cassandra/cluster.py", line 3122, in result  
 raise self.\_final\_exception  
 Unavailable: code=1000 [Unavailable exception] message="Cannot achieve consistency level QUORUM" info={'required\_replicas': 2, 'alive\_replicas': 1, 'consistency': 'QUORUM'}

username	email	encrypted_password
bob	bob@gmail.com	0x10920941a69549d33aaee6116ed1f47e19b8e713
alice	alice@gmail.com	0x8914977ed729792e403da53024c6069a9158b8c4

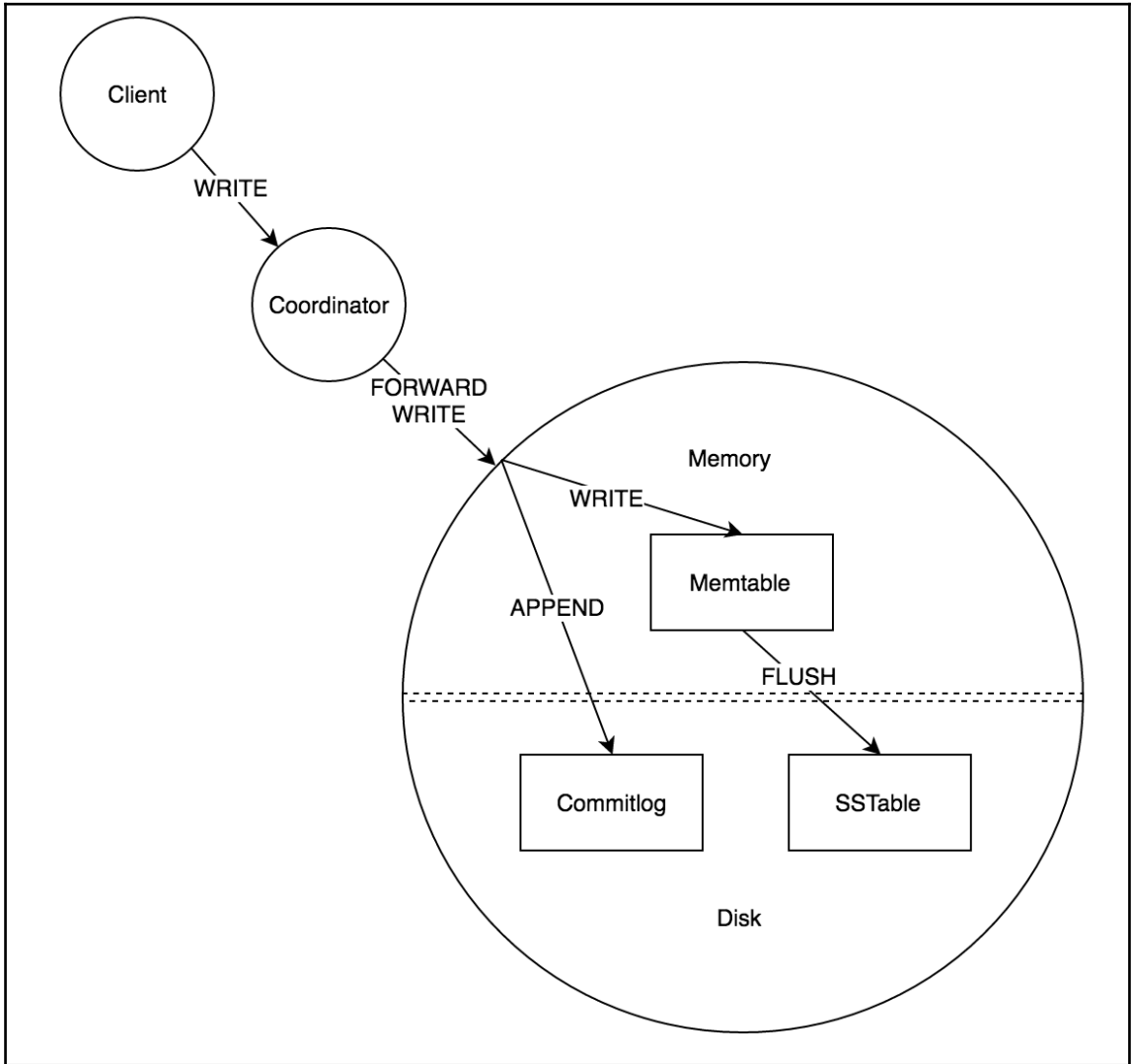
Datacenter: datacenter1

=====  
 Status=Up/Down  
 |/ State=Normal/Leaving/Joining/Moving

Address	Load	Tokens	Owns	Host ID	Rack
DN 127.0.0.1	234.38 KB	256	?	40d6e0b5-489a-4df1-a823-e218b6dd7baf	rack1
UN 127.0.0.2	248.51 KB	256	?	aed8cd4d-ca52-4cab-b0cc-97348ff36d17	rack1
DN 127.0.0.3	244.59 KB	256	?	1375c591-6007-404f-b801-1b3b2b256bde	rack1

InvalidRequest: code=2200 [Invalid query] message="ANY ConsistencyLevel is only supported for writes"

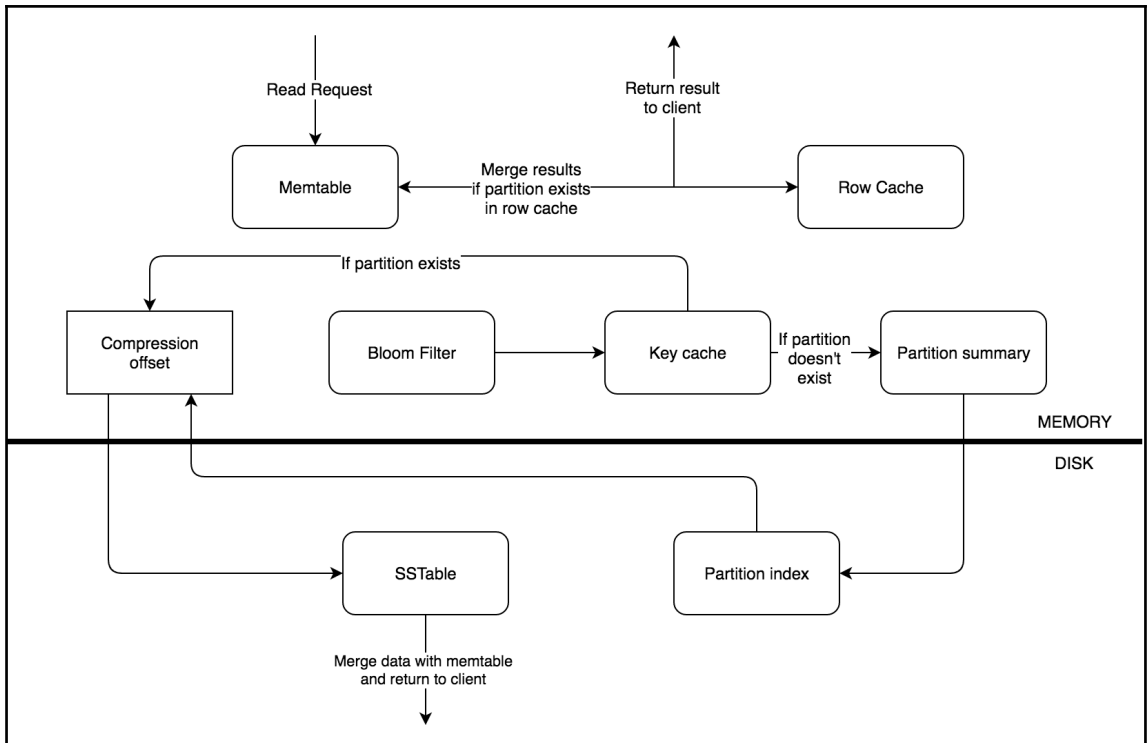
username	email	encrypted_password
bob	bob@yahoo.com	0x10920941a69549d33aeee6116ed1f47e19b8e713
alice	alice@gmail.com	0x8914977ed729792e403da53024c6069a9158b8c4



```
{
  "partition" : {
    "key" : [ "alice" ],
    "position" : 0
  },
  "rows" : [
    {
      "type" : "row",
      "position" : 19,
      "liveness_info" : { "tstamp" : "2017-01-29T14:35:36.726114Z" },
      "cells" : [
        { "name" : "email", "value" : "alice@gmail.com" },
        { "name" : "encrypted_password", "value" : "8914977ed729792e403da53024c6069a9158b8c4" }
      ]
    }
  ]
}
```

```
{
  "partition" : {
    "key" : [ "alice" ],
    "position" : 0
  },
  "rows" : [
    {
      "type" : "row",
      "position" : 19,
      "liveness_info" : { "tstamp" : "2017-02-08T03:47:45.731382Z" },
      "cells" : [
        { "name" : "email", "value" : "alice@yahoo.com" }
      ]
    }
  ]
}
```

```
ID : 40d6e0b5-489a-4df1-a823-e218b6dd7baf
Gossip active : true
Thrift active : false
Native Transport active: true
Load : 167.76 KB
Generation No : 1486528624
Uptime (seconds) : 1650
Heap Memory (MB) : 124.92 / 4016.00
Off Heap Memory (MB) : 0.00
Data Center : datacenter1
Rack : rack1
Exceptions : 0
Key Cache : entries 24, size 1.92 KB, capacity 100 MB, 66 hits, 90 requests, 0.733 recent hit rate, 14400 save period in seconds
Row Cache : entries 0, size 0 bytes, capacity 0 bytes, 0 hits, 0 requests, NaN recent hit rate, 0 save period in seconds
Counter Cache : entries 0, size 0 bytes, capacity 50 MB, 0 hits, 0 requests, NaN recent hit rate, 7200 save period in seconds
Token : (invoke with -T/--tokens to see all 256 tokens)
```



## Chapter 12: Application Development Using the Java Driver

```
Cluster name: Test Cluster
Host: /127.0.0.1
```

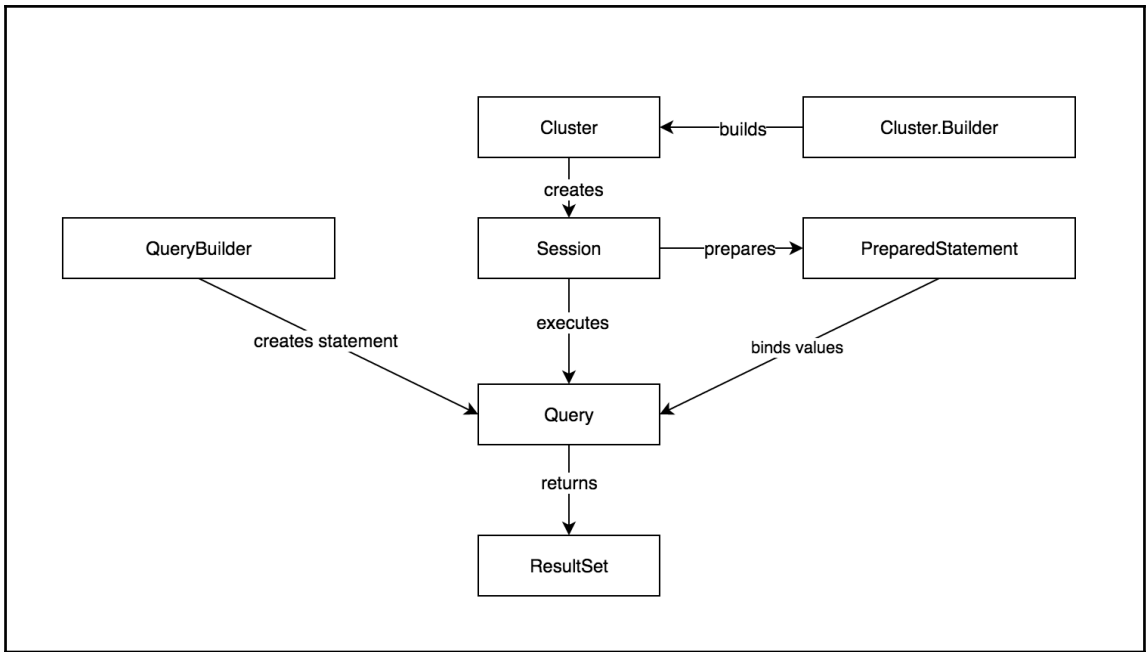
```
Username: greg, Email: greg@gmail.com, Location: null
Username: bob, Email: null, Location: Austin, TX
Username: happycorp, Email: media@happycorp.com, Location: New York, NY
Username: dave, Email: dave@me.com, Location: San Francisco, CA
Username: gina, Email: null, Location: Houston, TX
Username: eve, Email: eve123@hotmail.com, Location: Washington, D.C.
Username: carol, Email: carol@hotmail.com, Location: null
Username: frank, Email: frank@gmail.com, Location: Los Angeles, CA
Username: ivan, Email: ivan@gmail.com, Location: null
Username: alice, Email: alice@gmail.com, Location: null
```

```
Username: alice, Email: alice@yahoo.com, Location: null
```

```
username | email          | location
-----+-----+-----
alice | alice@aol.com | Los Angeles, CA
```

```
username | email          | location
-----+-----+-----
alice | alice@hotmail.com | San Francisco, CA
```

```
Username: alice, Email: alice@hotmail.com, Location: San Francisco, CA
```





# Appendix A: Peeking under the Hood

```

$ cassandra-cli
Connected to: "Test Cluster" on 127.0.0.1/9160
Welcome to Cassandra CLI version 2.0.7

The CLI is deprecated and will be removed in Cassandra 3.0. Consider migrating to cqlsh.
CQL is fully backwards compatible with Thrift data; see http://www.datastax.com/dev/blog/thrift-to-cql3

Type 'help;' or '?' for help.
Type 'quit;' or 'exit;' to quit.

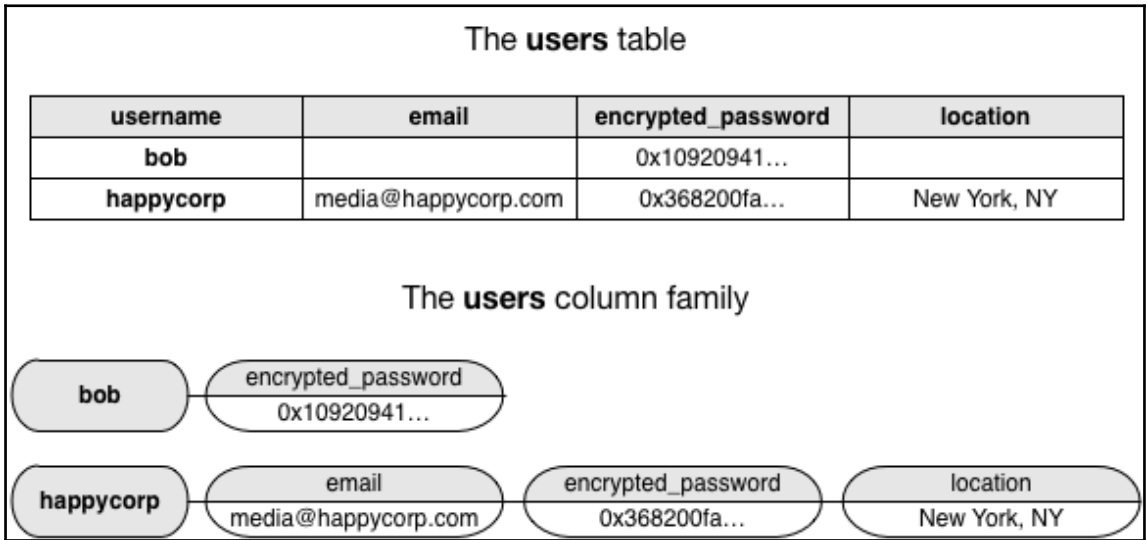
[default@unknown] █
    
```

```

RowKey: bob
=> (name=, value=, timestamp=1401412616531000)
=> (name=encrypted_password, value=10920941a69549d33aaee6116ed1f47e19b8e713, timestamp=1401412616531000)
=> (name=version, value=ec0c1fb1321f11e48eeb5f98e903bf02, timestamp=1409607341355000)
-----
RowKey: happycorp
=> (name=, value=, timestamp=1409607324125000)
=> (name=email, value=6d65646961406861707079636f72702e636f6d, timestamp=1409607324125000)
=> (name=encrypted_password, value=368200fa910c16cc644f3512e63b541c85fa2a3c, timestamp=1409607324125000)
=> (name=location, value=4e657720596f726b2c204e59, timestamp=1409607607205000)
=> (name=version, value=8a810110322011e48eeb5f98e903bf02, timestamp=1409607607205000)
    
```

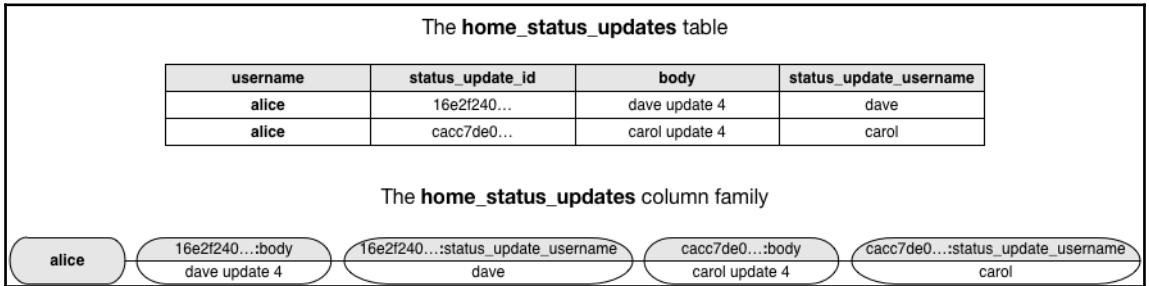
```

=> (name=email, value=media@happycorp.com, timestamp=1409607324125000)
Elapsed time: 3.34 msec(s).
    
```



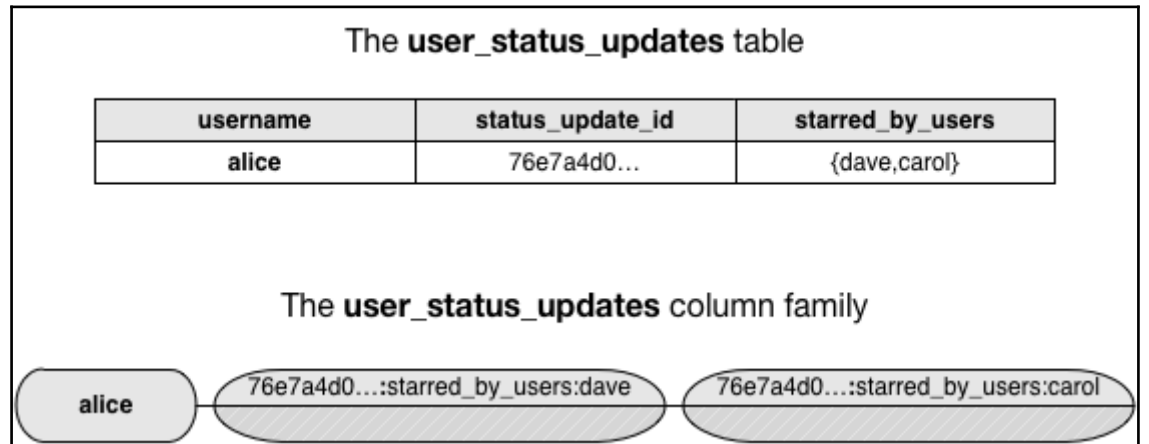
```

RowKey: alice
=> (name=16e2f240-2afa-11e4-8069-5f98e903bf02:, value=, timestamp=1408823428694000)
=> (name=16e2f240-2afa-11e4-8069-5f98e903bf02:body, value=dave update 4, timestamp=1408823428694000)
=> (name=16e2f240-2afa-11e4-8069-5f98e903bf02:status_update_username, value=dave, timestamp=1408823428694000)
=> (name=cacc7de0-2af9-11e4-8069-5f98e903bf02:, value=, timestamp=1408821757668000)
=> (name=cacc7de0-2af9-11e4-8069-5f98e903bf02:body, value=carol update 4, timestamp=1408821757668000)
=> (name=cacc7de0-2af9-11e4-8069-5f98e903bf02:status_update_username, value=carol, timestamp=1408821757668000)
    
```



```

=> (name=76e7a4d0-e796-11e3-90ce-5f98e903bf02:starred_by_users:626f62, value=, timestamp=1411314062536000)
=> (name=76e7a4d0-e796-11e3-90ce-5f98e903bf02:starred_by_users:6361726f6c, value=, timestamp=1411314212388000)
    
```



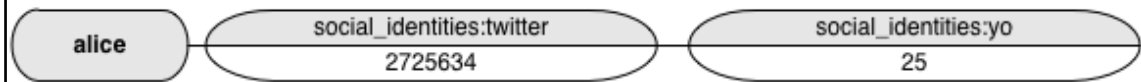
```

=> (name=encrypted_password, value=8914977ed729792e403da53024c6069a9158b8c4, timestamp=1409605884231000)
=> (name=social_identities:74776974746572, value=2725634, timestamp=1411314494120000)
    
```

The **users** table

username	social_identities
alice	{'twitter': 2725634, 'yo': 25}

The **users** column family



```
=> (name=76e7a4d0-e796-11e3-90ce-5f98e903bf02:shared_by:4116d73041a611e4b4ad5f98e903bf02, value=726f62657274, timestamp=1411314365135000)
=> (name=76e7a4d0-e796-11e3-90ce-5f98e903bf02:shared_by:e358efe0678711e4ac53f51fa8d64e2e, value=626f62, timestamp=1415479406045000)
```

## Appendix B: Authentication and Authorization

name	super
cassandra	True
data_analytics	False

(2 rows)

username	resource	permissions
data_analytics	data/my_status	{'SELECT'}
data_analytics	data/my_status/status_update_views	{'MODIFY'}

(2 rows)

username	resource	permissions
data_analytics	data/my_status	{'SELECT'}

(1 rows)

username	id	body
bob	97719c50-e797-11e3-90ce-5f98e903bf02	Eating a tasty sandwich.
bob	e93a7410-7344-11e4-a0e6-5f98e903bf02	Bob Update 1
bob	e93bac90-7344-11e4-a0e6-5f98e903bf02	Bob Update 2
bob	e9454980-7344-11e4-a0e6-5f98e903bf02	Bob Update 3
alice	76e7a4d0-e796-11e3-90ce-5f98e903bf02	Learning Cassandra!
alice	e9367c70-7344-11e4-a0e6-5f98e903bf02	Alice Update 1
alice	e93b3760-7344-11e4-a0e6-5f98e903bf02	Alice Update 2
alice	e9443810-7344-11e4-a0e6-5f98e903bf02	Alice Update 3

(8 rows)

```
code=2100 [Unauthorized] message="User data_analytics has no MODIFY permission on <table my_status.users> or any of its parents"
```