

```
Connected to Test Cluster at 127.0.0.1:9042.
[cqlsh 5.0.1 | Cassandra 3.11.10 | CQL spec 3.4.4 | Native protocol v4]
Use HELP for help.
ation_factor':1});
cqlsh> describe keyspaces;

system_schema  system_auth  system  system_distributed  wmetro  system_traces

cqlsh> select * from system_schema.keyspaces;

keyspace_name | durable_writes | replication
-----+-----+-----
system_auth | True | {'class': 'org.apache.cassandra.locator.SimpleStrategy', 'replication_factor': '1'}
system_schema | True | {'class': 'org.apache.cassandra.locator.LocalStrategy'}
system_distributed | True | {'class': 'org.apache.cassandra.locator.SimpleStrategy', 'replication_factor': '3'}
system | True | {'class': 'org.apache.cassandra.locator.LocalStrategy'}
wmetro | True | {'class': 'org.apache.cassandra.locator.SimpleStrategy', 'replication_factor': '1'}
system_traces | True | {'class': 'org.apache.cassandra.locator.SimpleStrategy', 'replication_factor': '2'}

(6 rows)
cqlsh> use wmetro
... ;
ile bigint,current_position text,skill set<text>);

cqlsh:wmetro> select * from drivers;
InvalidRequest: Error from server: code=2200 [Invalid query] message="unconfigured table drivers"
cqlsh:wmetro> select * from driver;

driver_name | current_position | mobile | password | skill
-----+-----+-----+-----+-----
(0 rows)
cqlsh:wmetro> begin batch
ill) values('Swen','123abc',9000000001,'Wellington',{'Passenger'})
ill) values('Fred','234bcd',9000000002,'Upper Hutt',{'Passenger'})
ill) values('Jane','345cde',9000000003,'Lower Hutt',{'Goods'})
... apply batch;
cqlsh:wmetro> select * from driver;

driver_name | current_position | mobile | password | skill
-----+-----+-----+-----+-----
Fred | Upper Hutt | 9000000002 | 234bcd | {'Passenger'}
Swen | Wellington | 9000000001 | 123abc | {'Passenger'}
Jane | Lower Hutt | 9000000003 | 345cde | {'Goods'}

(3 rows)
text);
cqlsh:wmetro> begin batch
tenance','Gulliver');
Hutt','Gulliver');
r Hutt','Kiwi Rail');
ington','Kiwi Rail');
... apply batch;
cqlsh:wmetro> select * from vehicles;

vehicle_id | status | type
-----+-----+-----
WR1236 | Upper Hutt | Kiwi Rail
WR1234 | Maintenance | Gulliver
WR1235 | Lowe Hutt | Gulliver
WR1237 | Wellington | Kiwi Rail

(4 rows)
ine_name, station_name));
cqlsh:wmetro> begin batch
,longitude,time,distance) values('LINE1',2,'Wellington',-40.28,174.77,0605,0.0)

,longitude,time,distance) values('LINE2',2,'Upper Hutt',-41.12,175.07,1550,0.0)
... apply batch;
cqlsh:wmetro> select * from time_table;

line_name | station_name | distance | latitude | longitude | service_num | time
-----+-----+-----+-----+-----+-----+-----
LINE2 | Upper Hutt | 0 | -41.12 | 175.07 | 2 | 1550
LINE2 | Wellington | 34.3 | -40.28 | 174.77 | 2 | 1130
LINE1 | Upper Hutt | 34.3 | -41.12 | 175.07 | 2 | 1025
LINE1 | Wellington | 0 | -40.28 | 174.77 | 2 | 605

(4 rows)
nce counter);
ere vehicle_id=1234 ;
InvalidRequest: Error from server: code=2200 [Invalid query] message="Invalid INTEGER constant (1234) for "vehicle_id" of type text"
ere vehicle_id="WR1234" ;
SyntaxException: line 1:90 no viable alternative at input ',' (...total_distance + 3000 where vehicle_id=["WR123]4" );
ere vehicle_id='WR1234';
ere vehicle_id='WR1235';
ere vehicle_id='WR1236';
ere vehicle_id='WR1237';
```

```

qlsh:wmetro> select * from VEHICLE_USAGE;

vehicle_id | total_distance
-----+-----
WR1236 | 3500
WR1234 | 3000
WR1235 | 5000
WR1237 | 5300

(4 rows)
itude double,longitude double,speed double);
cqlsh:wmetro> begin batch
es(14,'2020-03-10',-42.30,171.50,76)
es(14,'2020-03-10 10:07:40+1300',-42.50,171.90,75)
es(14,'2020-03-10 10:30:25+1300',-44.50,160.60,75)
... apply batch ;
cqlsh:wmetro> select * from data_point;

sequence | day | latitude | longitude | speed
-----+-----+-----+-----+-----
2020-03-09 21:30:25.000000+0000 | 14 | -44.5 | 160.6 | 75
2020-03-09 21:07:40.000000+0000 | 14 | -42.5 | 171.9 | 75
2020-03-10 00:00:00.000000+0000 | 14 | -42.3 | 171.5 | 76

(3 rows)
ill) values('William','678bcf',9000000004,'Wellington',{'Goods','Passenger'})
... ;
cqlsh:wmetro> select * from driver;

driver_name | current_position | mobile | password | skill
-----+-----+-----+-----+-----
Fred | Upper Hutt | 9000000002 | 234bcd | {'Passenger'}
Sven | Wellington | 9000000001 | 123abc | {'Passenger'}
William | Wellington | 9000000004 | 678bcf | {'Goods', 'Passenger'}
Jane | Lower Hutt | 9000000003 | 345cde | {'Goods'}

(4 rows)
cqlsh:wmetro> create index on driver(password);
cqlsh:wmetro> select * from driver;

driver_name | current_position | mobile | password | skill
-----+-----+-----+-----+-----
Fred | Upper Hutt | 9000000002 | 234bcd | {'Passenger'}
Sven | Wellington | 9000000001 | 123abc | {'Passenger'}
William | Wellington | 9000000004 | 678bcf | {'Goods', 'Passenger'}
Jane | Lower Hutt | 9000000003 | 345cde | {'Goods'}

(4 rows)
cqlsh:wmetro> update driver set password='789gfh' where driver_name='William';
cqlsh:wmetro> select * from driver;

driver_name | current_position | mobile | password | skill
-----+-----+-----+-----+-----
Fred | Upper Hutt | 9000000002 | 234bcd | {'Passenger'}
Sven | Wellington | 9000000001 | 123abc | {'Passenger'}
William | Wellington | 9000000004 | 789gfh | {'Goods', 'Passenger'}
Jane | Lower Hutt | 9000000003 | 345cde | {'Goods'}

(4 rows)
='William';
cqlsh:wmetro> select * from driver;

driver_name | current_position | mobile | password | skill
-----+-----+-----+-----+-----
Fred | Upper Hutt | 9000000002 | 234bcd | {'Passenger'}
Sven | Wellington | 9000000001 | 123abc | {'Passenger'}
William | Maintenance | 9000000004 | 789gfh | {'Goods', 'Passenger'}
Jane | Lower Hutt | 9000000003 | 345cde | {'Goods'}

(4 rows)
cqlsh:wmetro> update driver set skill={'Passenger'} where driver_name='Jane';
cqlsh:wmetro> select * from driver;

driver_name | current_position | mobile | password | skill
-----+-----+-----+-----+-----
Fred | Upper Hutt | 9000000002 | 234bcd | {'Passenger'}
Sven | Wellington | 9000000001 | 123abc | {'Passenger'}
William | Maintenance | 9000000004 | 789gfh | {'Goods', 'Passenger'}
Jane | Lower Hutt | 9000000003 | 345cde | {'Passenger'}

(4 rows)
Jane';
cqlsh:wmetro> select * from driver;

driver_name | current_position | mobile | password | skill
-----+-----+-----+-----+-----
Fred | Upper Hutt | 9000000002 | 234bcd | {'Passenger'}
Sven | Wellington | 9000000001 | 123abc | {'Passenger'}
William | Maintenance | 9000000004 | 789gfh | {'Goods', 'Passenger'}
Jane | Lower Hutt | 9000000003 | 345cde | {'Goods', 'Passenger'}

```

```
(4 rows)
password='789gfh';

[applied]
-----
      True

cqsh:wmetro> select * from driver;

driver_name | current_position | mobile      | password | skill
-----+-----+-----+-----+-----
      Fred |      Upper Hutt | 9000000002 | 234bcd | {'Passenger'}
      Swen |      Wellington | 9000000001 | 123abc | {'Passenger'}
    William |      Maintenance | 9000000004 | 678bcf | {'Goods', 'Passenger'}
      Jane |      Lower Hutt | 9000000003 | 345cde | {'Goods', 'Passenger'}

(4 rows)
cqsh:wmetro> alter table driver add workdays int ;
cqsh:wmetro> update driver set workdays=22 where driver_name='William'
... update driver set workdays=22 where driver_name='Fred';
SyntaxException: line 2:0 mismatched input 'update' expecting EOF (...workdays=22 where driver_name='William'[update]...)
cqsh:wmetro> update driver set workdays=22 where driver_name='Fred';
cqsh:wmetro> update driver set workdays=22 where driver_name='William';
cqsh:wmetro> update driver set workdays=21 where driver_name='Jane';
cqsh:wmetro> update driver set workdays=22 where driver_name='Swen';
cqsh:wmetro> select * from driver;
```

```
driver_name | current_position | mobile      | password | skill | workdays
-----+-----+-----+-----+-----+-----
      Fred |      Upper Hutt | 9000000002 | 234bcd | {'Passenger'} | 22
      Swen |      Wellington | 9000000001 | 123abc | {'Passenger'} | 22
    William |      Maintenance | 9000000004 | 678bcf | {'Goods', 'Passenger'} | 22
      Jane |      Lower Hutt | 9000000003 | 345cde | {'Goods', 'Passenger'} | 21

(4 rows)
```

```
ington','Diesel');
cqsh:wmetro> select * from vehicles;
```

```
vehicle_id | status      | type
-----+-----+-----
    WR1236 |      Upper Hutt | Kiwi Rail
    WR1234 | Maintenance | Gulliver
    WR1238 |      Wellington | Diesel
    WR1235 |      Lowe Hutt | Gulliver
    WR1237 |      Wellington | Kiwi Rail
```

```
(5 rows)
;
cqsh:wmetro> select * from vehicles;
```

```
vehicle_id | status      | type
-----+-----+-----
    WR1236 |      Upper Hutt | Kiwi Rail
    WR1234 |      Upper Hutt | Gulliver
    WR1238 |      Wellington | Diesel
    WR1235 |      Lowe Hutt | Gulliver
    WR1237 |      Wellington | Kiwi Rail
```

```
(5 rows)
cqsh:wmetro> alter table vehicle add daily_distance ;
SyntaxException: line 1:39 no viable alternative at input ';' (alter table vehicle add daily_distance [;])
cqsh:wmetro> alter table vehicles add daily_distance;
SyntaxException: line 1:39 no viable alternative at input ';' (alter table vehicles add daily_distance[;])
cqsh:wmetro> alter table vehicles add daily_distance int;
cqsh:wmetro> update vehicles set daily_distance=180 where vehicle_id="WR1236";
SyntaxException: line 1:64 no viable alternative at input ';' (...set daily_distance=180 where vehicle_id=["WR123]6");
cqsh:wmetro> select* from veicles;
InvalidRequest: Error from server: code=2200 [Invalid query] message="unconfigured table veicles"
cqsh:wmetro> select * from vehicles;
```

```
vehicle_id | daily_distance | status      | type
-----+-----+-----+-----
    WR1236 |          null |      Upper Hutt | Kiwi Rail
    WR1234 |          null |      Upper Hutt | Gulliver
    WR1238 |          null |      Wellington | Diesel
    WR1235 |          null |      Lowe Hutt | Gulliver
    WR1237 |          null |      Wellington | Kiwi Rail
```

```
(5 rows)
;
;
;
;
;
cqsh:wmetro> select * from vehicles;
```

```
vehicle_id | daily_distance | status      | type
-----+-----+-----+-----
    WR1236 |          180 |      Upper Hutt | Kiwi Rail
```

WR1234		200		Upper Hutt		Gulliver
WR1238		300		Wellington		Diesel
WR1235		50		Lowe Hutt		Gulliver
WR1237		300		Wellington		Kiwi Rail

```
(5 rows)
HICLE_ID='WR1235';
cqsh:wmetro> SELECT * FROM VEHICLE_USAGE;
```

vehicle_id	total_distance
WR1236	3500
WR1234	3000
WR1235	5050
WR1237	5300

```
(4 rows)
```

```
cqsh:wmetro> begin batch
,longitude,time,distance) values('LINE3',2,'Melling',-43.20,171.60,1540,330)
,longitude,time,distance) values('LINE3',2,'Waterloo',-53.50,165.70,0940,40,0)
,longitude,time,distance) values('LINE4',2,'Melling',-43.20,171.60,1540,0)
)
... apply batch ;
InvalidRequest: Error from server: code=2200 [Invalid query] message="Unmatched column names/values"
,longitude,time,distance) values('LINE3',2,'Melling',-43.20,171.60,1540,330.0)
... ;
cqsh:wmetro> begin batch
)
,longitude,time,distance) values('LINE4',2,'Melling',-43.20,171.60,1540,0.0)
... apply batch ;
InvalidRequest: Error from server: code=2200 [Invalid query] message="Unmatched column names/values"
;
InvalidRequest: Error from server: code=2200 [Invalid query] message="Unmatched column names/values"
,longitude,time,distance) values('LINE3',2,'Waterloo',-53.50,165.70,0940,0.0);
,longitude,time,distance) values('LINE4',2,'Melling',-43.20,171.60,1540,0.0)
... ;
0);
InvalidRequest: Error from server: code=2200 [Invalid query] message="Unmatched column names/values"
,longitude,time,distance) values('LINE4',2,'Waterloo',-53.50,165.70,0940,330.0)
... ;
cqsh:wmetro> SELECT * FROM TIME_TABLE;
```

line_name	station_name	distance	latitude	longitude	service_num	time
LINE2	Upper Hutt	0	-41.12	175.07	2	1550
LINE2	Wellington	34.3	-40.28	174.77	2	1130
LINE3	Melling	330	-43.2	171.6	2	1540
LINE3	Waterloo	0	-53.5	165.7	2	940
LINE4	Melling	0	-43.2	171.6	2	1540
LINE4	Waterloo	330	-53.5	165.7	2	940
LINE1	Upper Hutt	34.3	-41.12	175.07	2	1025
LINE1	Wellington	0	-40.28	174.77	2	605

```
(8 rows)
' and station_name='Waterloo';
SyntaxException: line 1:7 no viable alternative at input 'table' (update [table]...)
station_name='Waterloo';
station_name='Melling';
cqsh:wmetro> begin batch
station_name='Waterloo'
station_name='Melling'
... apply batch ;
es(15,'2020-03-04',-52.10,168.90,67);
cqsh:wmetro> select * from time_table;
```

line_name	station_name	distance	latitude	longitude	service_num	time
LINE2	Upper Hutt	0	-41.12	175.07	2	1550
LINE2	Wellington	34.3	-40.28	174.77	2	1130
LINE3	Melling	330	-43.2	171.6	1	1540
LINE3	Waterloo	0	-53.5	165.7	1	940
LINE4	Melling	0	-43.2	171.6	1	1540
LINE4	Waterloo	330	-53.5	165.7	1	940
LINE1	Upper Hutt	34.3	-41.12	175.07	2	1025
LINE1	Wellington	0	-40.28	174.77	2	605

```
(8 rows)
cqsh:wmetro> SELECT * FROM DATA_POINT;
```

sequence	day	latitude	longitude	speed
2020-03-04 00:00:00.000000+0000	15	-52.1	168.9	67
2020-03-09 21:30:25.000000+0000	14	-44.5	160.6	75
2020-03-09 21:07:40.000000+0000	14	-42.5	171.9	75
2020-03-10 00:00:00.000000+0000	14	-42.3	171.5	76

```
(4 rows)
cqsh:wmetro> exit
```

COMMANDS EXECUTED

```
create keyspace wmetro with replication={'class':'SimpleStrategy','replication_factor':1};
describe system_schema.keyspaces;
use wmetro;
```

```
create table driver(driver_name text primary key,password text,mobile bigint,current_position text,skill set<text>);
begin batch
insert into driver(driver_name,password,mobile,current_position,skill) values('Sven','123abc',9000000001,'Wellington',{'Passenger'})
insert into driver(driver_name,password,mobile,current_position,skill) values('Fred','234bcd',9000000002,'Upper Hutt',{'Passenger'})
insert into driver(driver_name,password,mobile,current_position,skill) values('Jane','345cde',9000000003,'Lower Hutt',{'Goods'})
apply batch;
select * from driver;
```

```
create table vehicles(vehicle_id text primary key,status text,type text);
begin batch
insert into vehicles(vehicle_id,status,type) values('WR1234','Maintenance','Gulliver');
insert into vehicles(vehicle_id,status,type) values('WR1235','Lowe Hutt','Gulliver');
insert into vehicles(vehicle_id,status,type) values('WR1236','Upper Hutt','Kiwi Rail');
insert into vehicles(vehicle_id,status,type) values('WR1237','Wellington','Kiwi Rail');
apply batch;
select * from vehicles;
```

```
create table time_table(line_name text, service_num int,station_name text,latitude double,longitude double,time int,distance double, primary key(line_name, station_name));
begin batch
insert into
time_table(line_name,service_num,station_name,latitude,longitude,time,distance) values('LINE1',2,'Wellington',-40.28,174.77,0605,0.0)
insert into time_table(line_name,service_num,station_name,latitude,longitude,time,distance) values('LINE1',2,'Upper Hutt',-41.12,175.07,1025,34.3)
insert into time_table(line_name,service_num,station_name,latitude,longitude,time,distance) values('LINE2',2,'Wellington',-40.28,174.77,1130,34.3)
insert into time_table(line_name,service_num,station_name,latitude,longitude,time,distance) values('LINE2',2,'Upper Hutt',-41.12,175.07,1550,0.0)
apply batch;
select * from time_table;
```

```
create table vehicle_usage(vehicle_id text primary key,total_distance counter);
update vehicle_usage set total_distance = total_distance + 3000 where vehicle_id='WR1234';
update vehicle_usage set total_distance = total_distance + 5000 where vehicle_id='WR1235';
update vehicle_usage set total_distance = total_distance + 3500 where vehicle_id='WR1236';
update vehicle_usage set total_distance = total_distance + 5300 where vehicle_id='WR1237';
select * from VEHICLE_USAGE;
```

```
CREATE table data_point(day int,sequence timestamp primary key,latitude double,longitude double,speed double);
begin batch
insert into data_point(day,sequence,latitude,longitude,speed) values(14,'2020-03-10',-42.30,171.50,76)
insert into data_point(day,sequence,latitude,longitude,speed) values(14,'2020-03-10 10:07:40+1300',-42.50,171.90,75)
insert into data_point(day,sequence,latitude,longitude,speed) values(14,'2020-03-10 10:30:25+1300',-44.50,160.60,75)
apply batch;
select * from data_point;
```

```
insert into driver(driver_name,password,mobile,current_position,skill) values('William','678bcf',9000000004,'Wellington',{'Goods','Passenger'})
select * from driver;
```

```
update driver set password='678bcf' where driver_name='William' if password='789gfh';
select * from driver;
```

```
update driver set current_position='Maintenance' where driver_name='William';
select * from driver;
```

```
update driver set skill={'Passenger','Goods'} where driver_name='Jane';
select * from driver;
```

```
alter table driver add workdays int ;
update driver set workdays=22 where driver_name='William';
update driver set workdays=22 where driver_name='Fred';
update driver set workdays=21 where driver_name='Jane';
update driver set workdays=22 where driver_name='Sven';
```

```
insert into vehicles(vehicle_id,status,type) values('WR1238','Wellington','Diesel');
select * from vehicles;
```

```
update vehicles set status='Upper Hutt' where vehicle_id='WR1234';
select * from vehicles;
```

```
alter table vehicles add daily_distance int;
update vehicles set daily_distance = 200 where vehicle_id='WR1234';
```

```
update vehicles set daily_distance = 180 where vehicle_id='WR1236';
update vehicles set daily_distance = 300 where vehicle_id='WR1237';
update vehicles set daily_distance = 50 where vehicle_id='WR1235';
update vehicles set daily_distance = 300 where vehicle_id='WR1238';
select * from vehicles;
```

```
UPDATE VEHICLE_USAGE SET TOTAL_DISTANCE=TOTAL_DISTANCE+50 WHERE VEHICLE_ID='WR1235';
SELECT * FROM VEHICLE_USAGE;
```

```
begin batch
insert into time_table(line_name,service_num,station_name,latitude,longitude,time,distance) values('LINE3',2,'Melling',-43.20,171.60,1540,330.0)
insert into time_table(line_name,service_num,station_name,latitude,longitude,time,distance) values('LINE3',2,'Waterloo',-53.50,165.70,0940,0.0)
insert into time_table(line_name,service_num,station_name,latitude,longitude,time,distance) values('LINE4',2,'Melling',-43.20,171.60,1540,0.0)
insert into time_table(line_name,service_num,station_name,latitude,longitude,time,distance) values('LINE4',2,'Waterloo',-53.50,165.70,0940,330.0)
apply batch ;
SELECT * FROM TIME_TABLE;
```

```
update time_table set service_num = 1 where line_name='LINE4' and station_name='Waterloo';
update time_table set service_num = 1 where line_name='LINE4' and station_name='Melling';
update time_table set service_num = 1 where line_name='LINE3' and station_name='Waterloo';
update time_table set service_num = 1 where line_name='LINE3' and station_name='Melling';
select * from time_table;
```

```
insert into data_point(day,sequence,latitude,longitude,speed) values(15,'2020-03-04',-52.10,168.90,67);
SELECT * FROM DATA_POINT;
```

```
EXIT
```