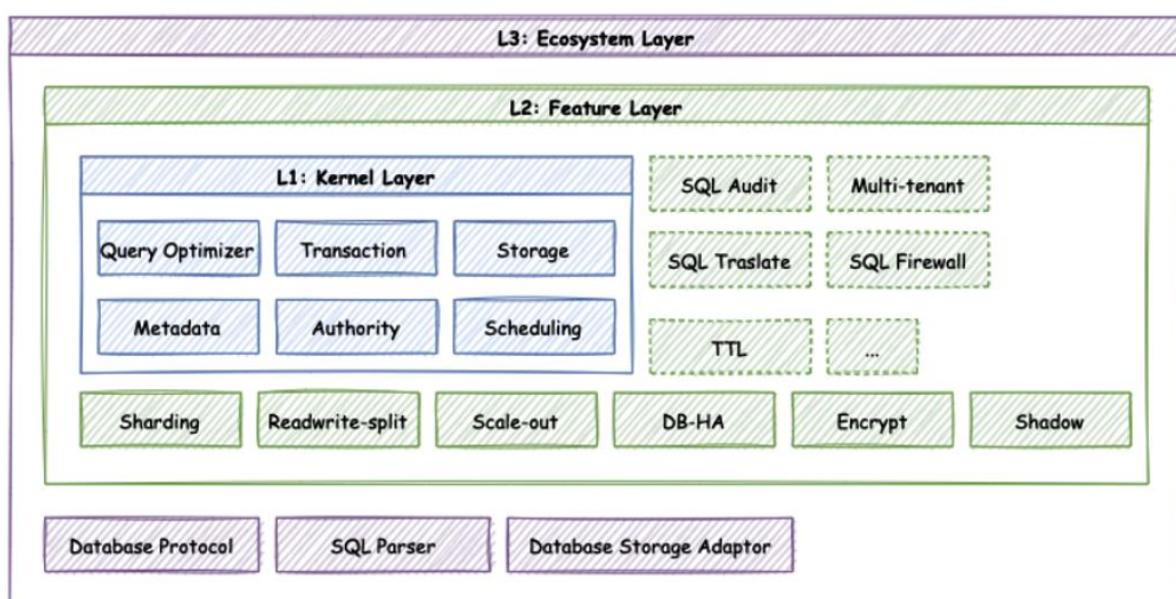
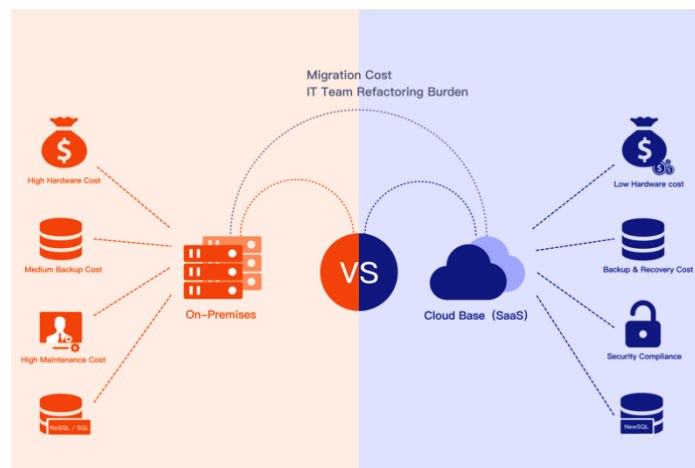
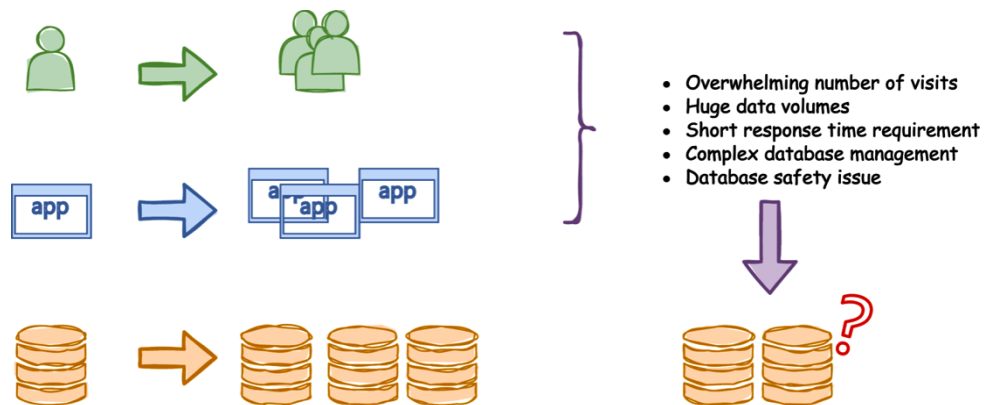
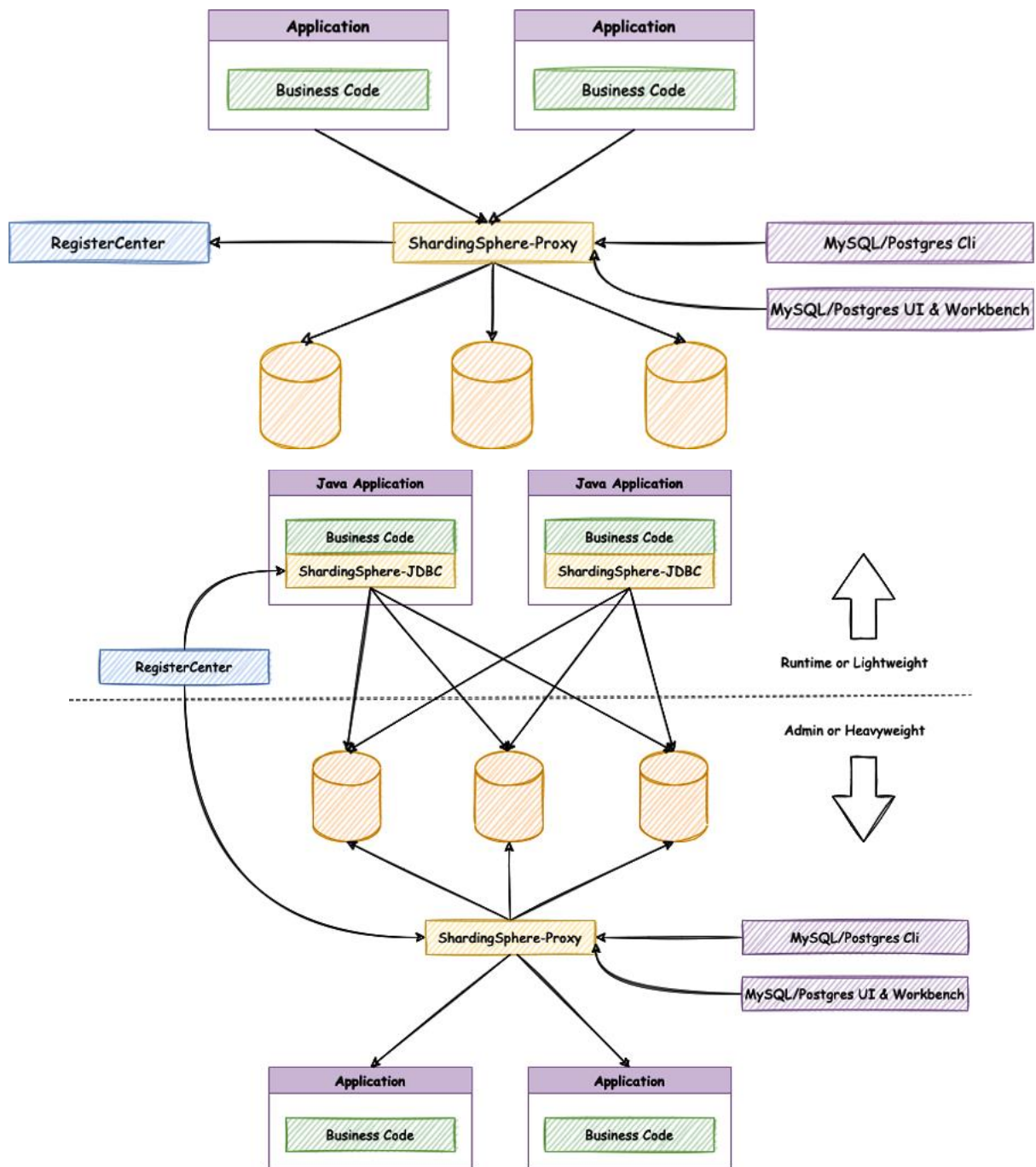
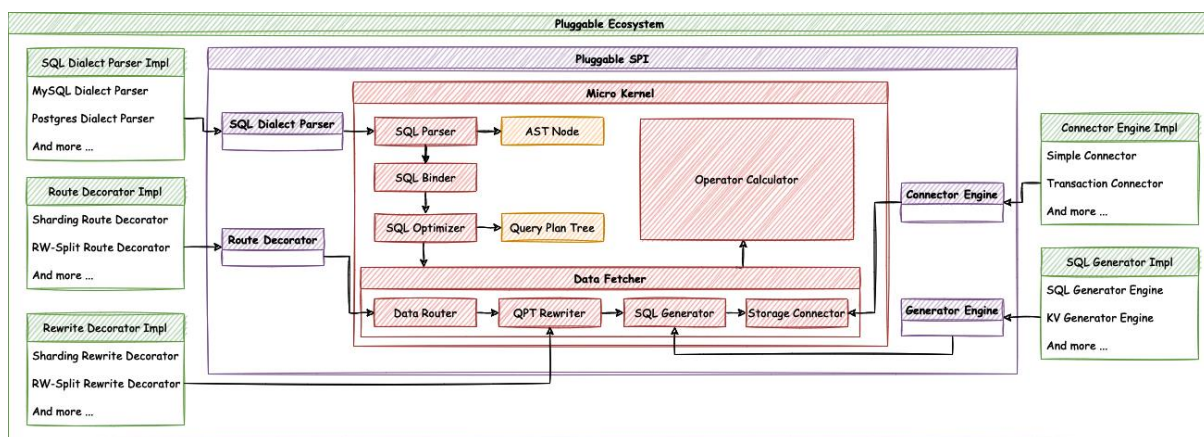
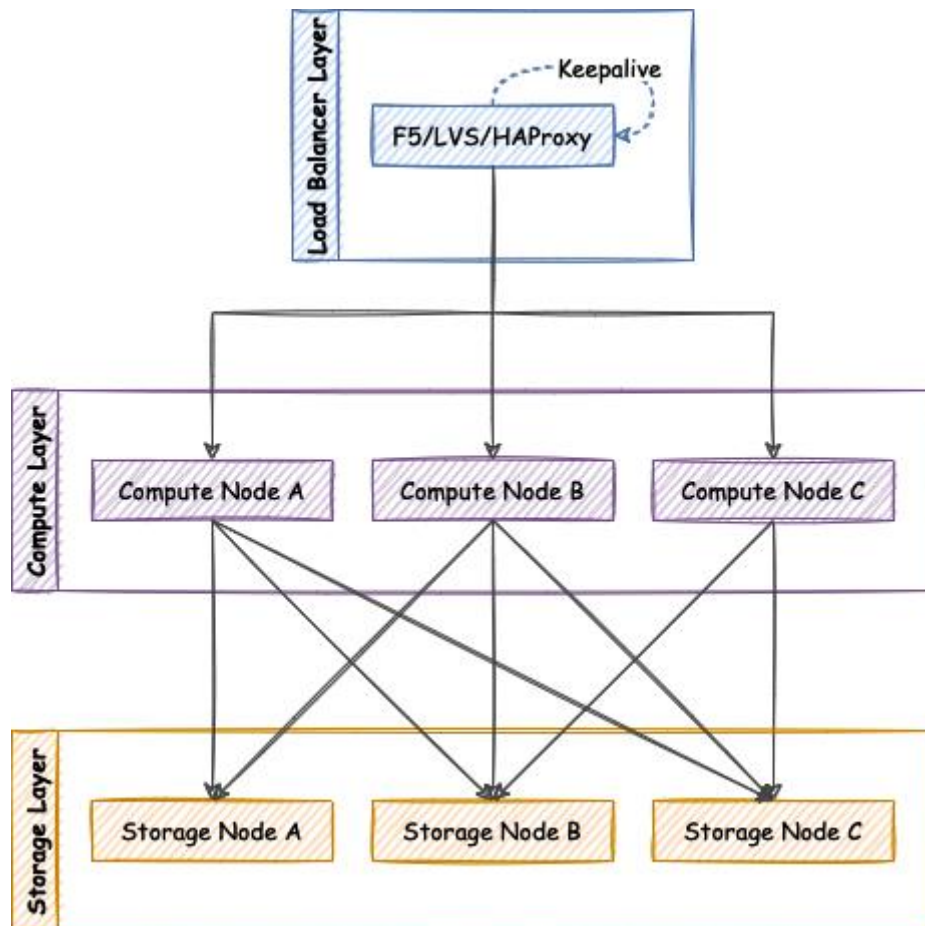


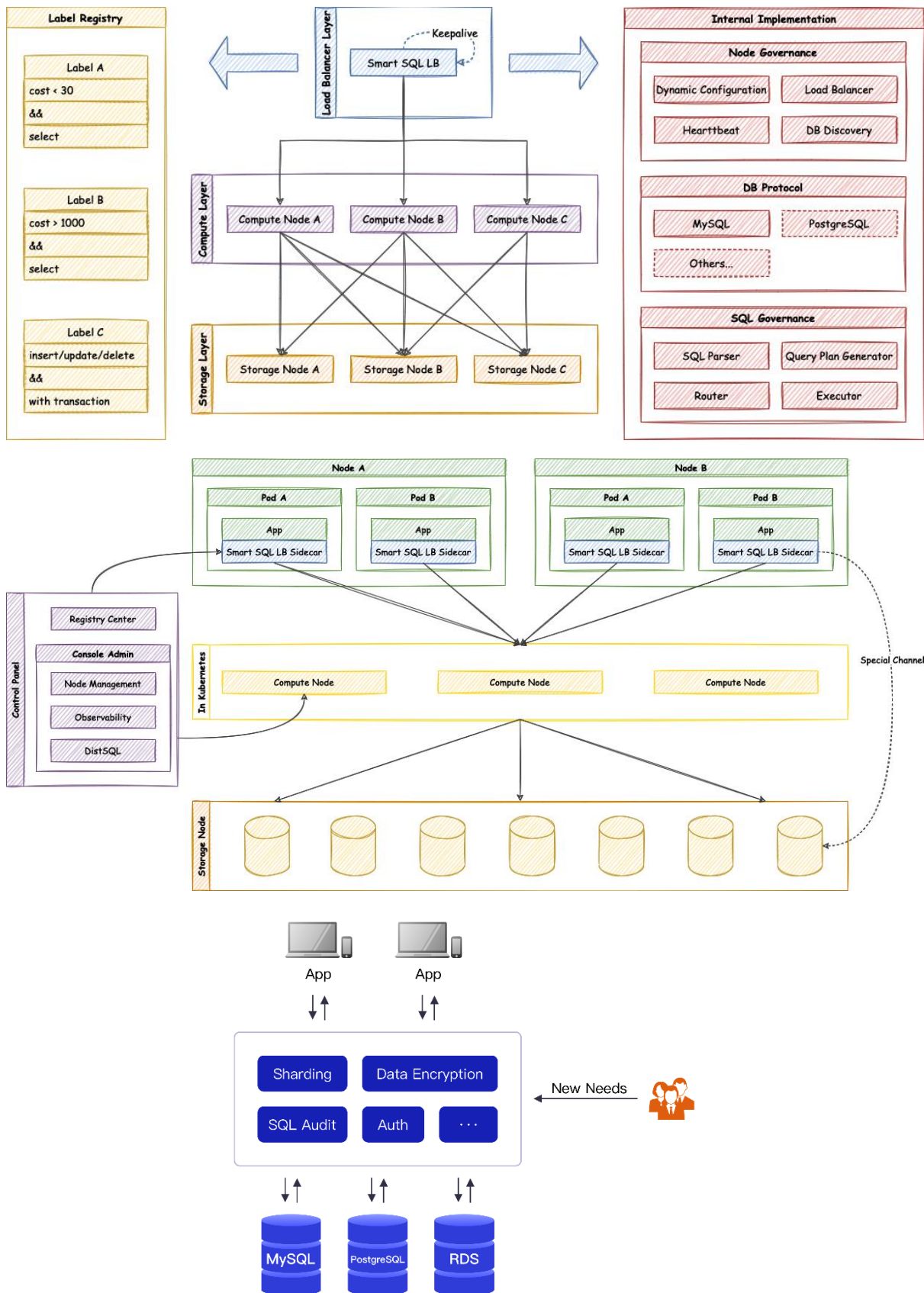
Chapter 1: The Evolution of DBMS, DBA, and the Role of Apache ShardingSphere

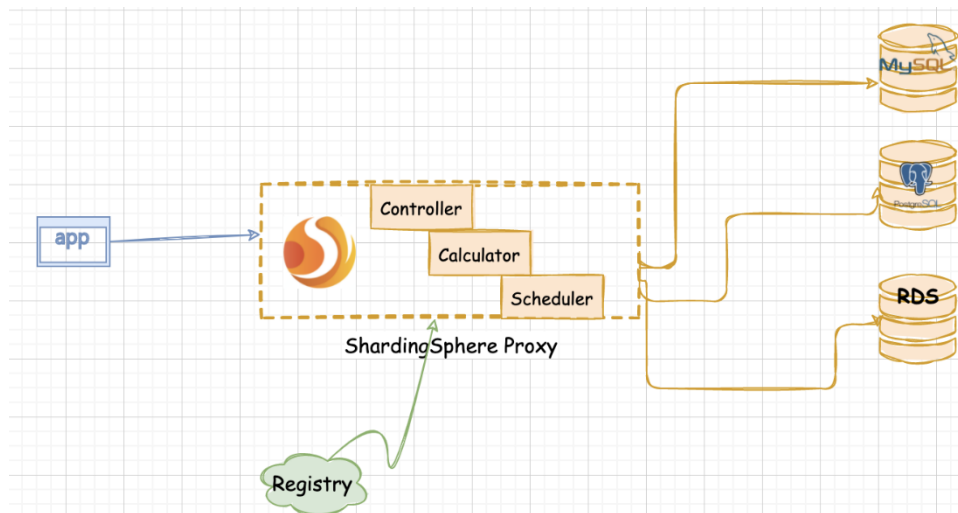
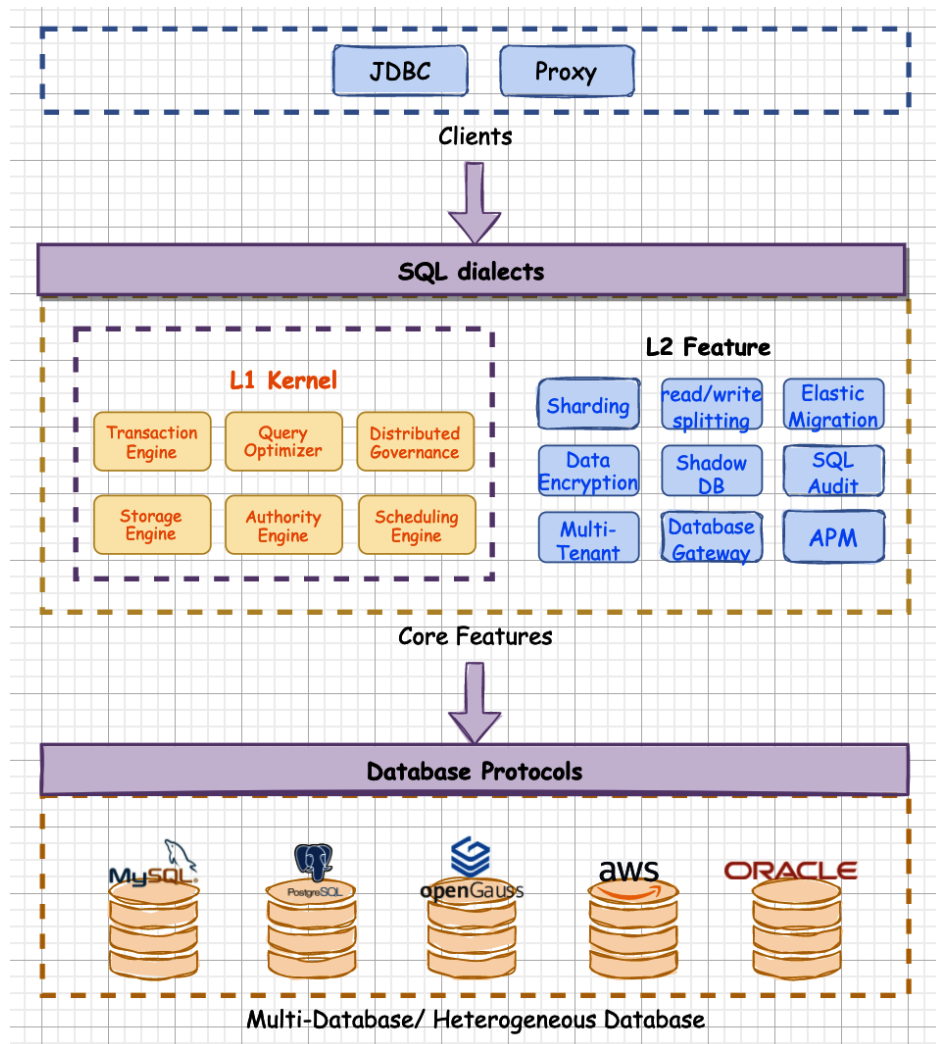


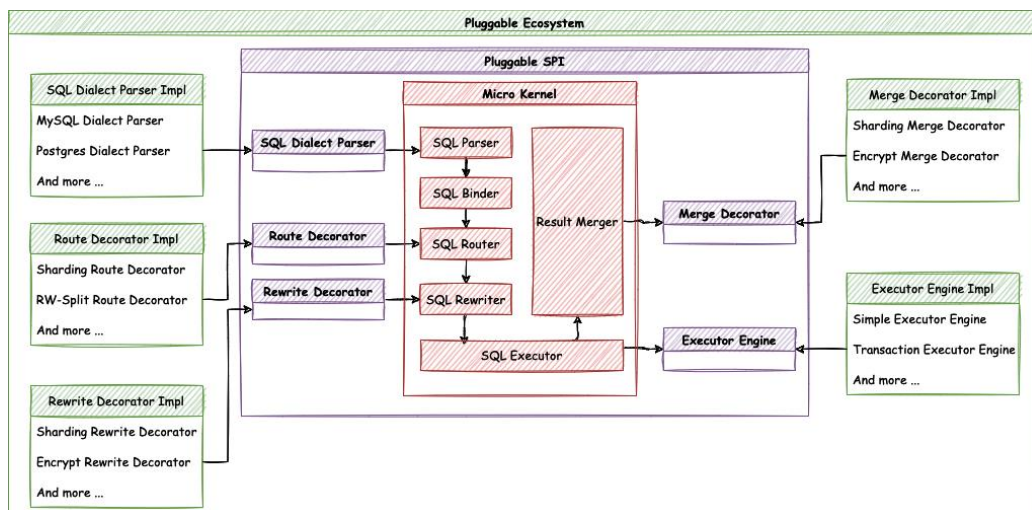
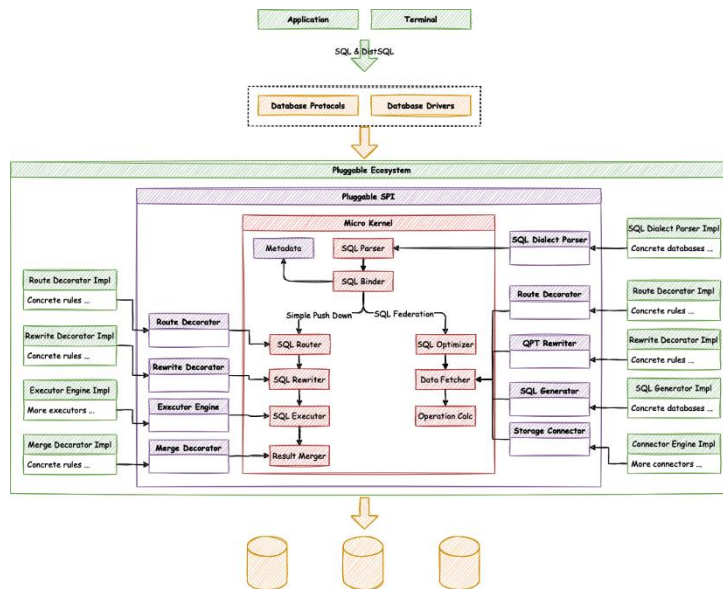
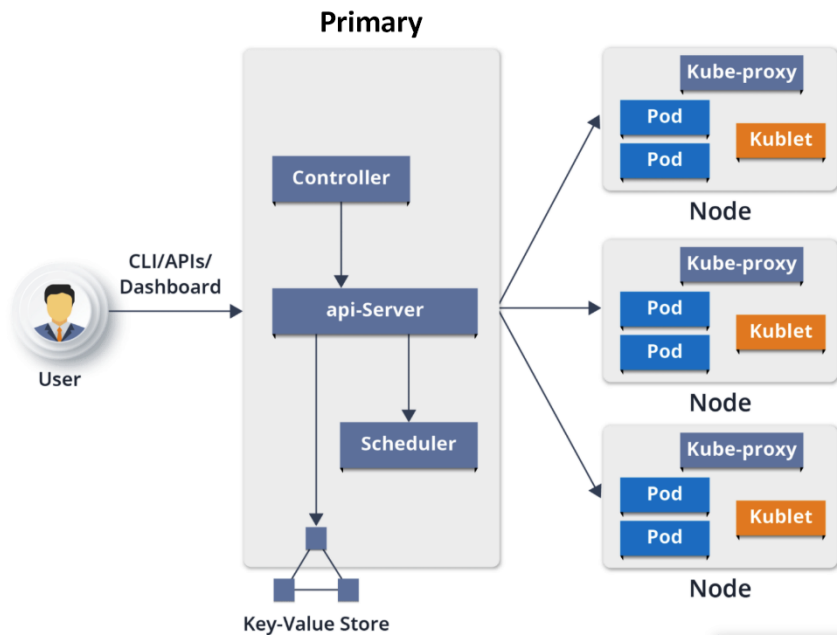


Chapter 2: Architectural Overview of Apache ShardingSphere

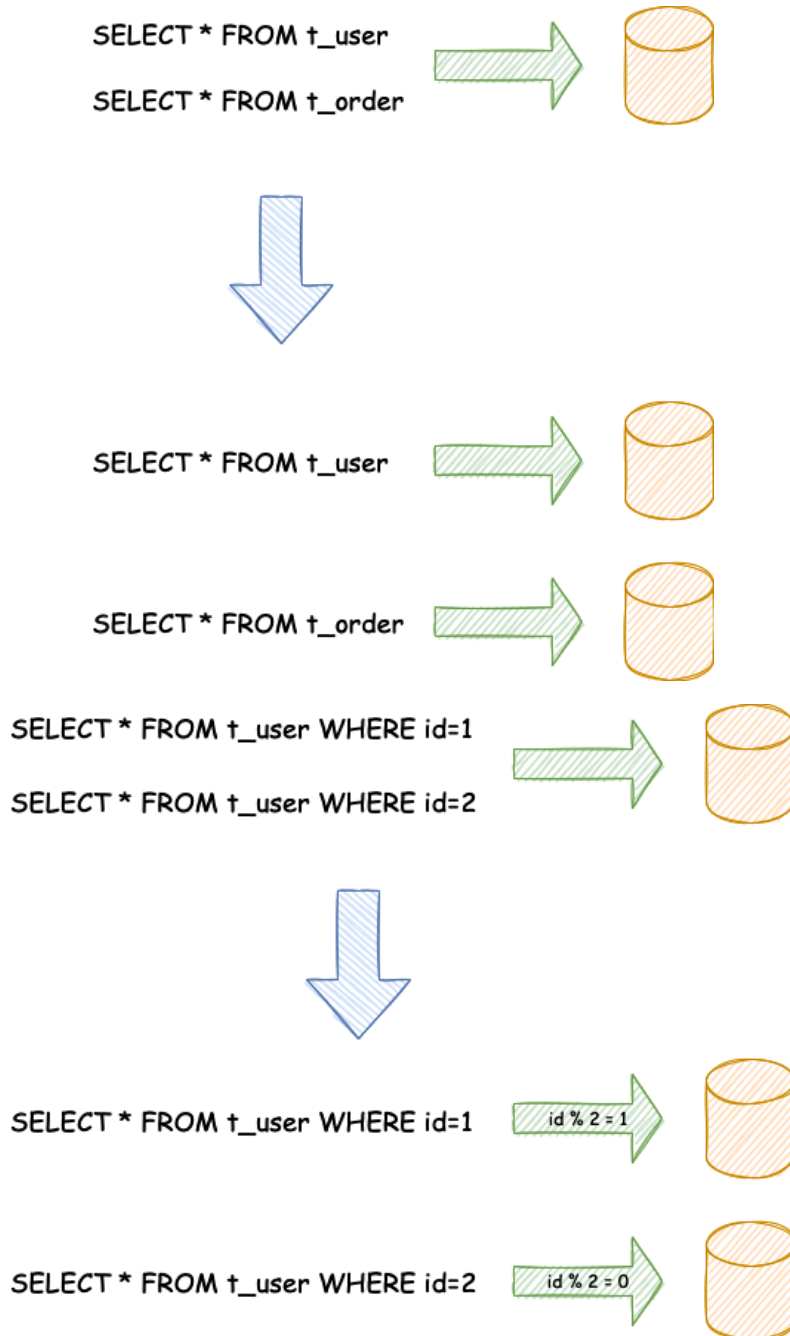


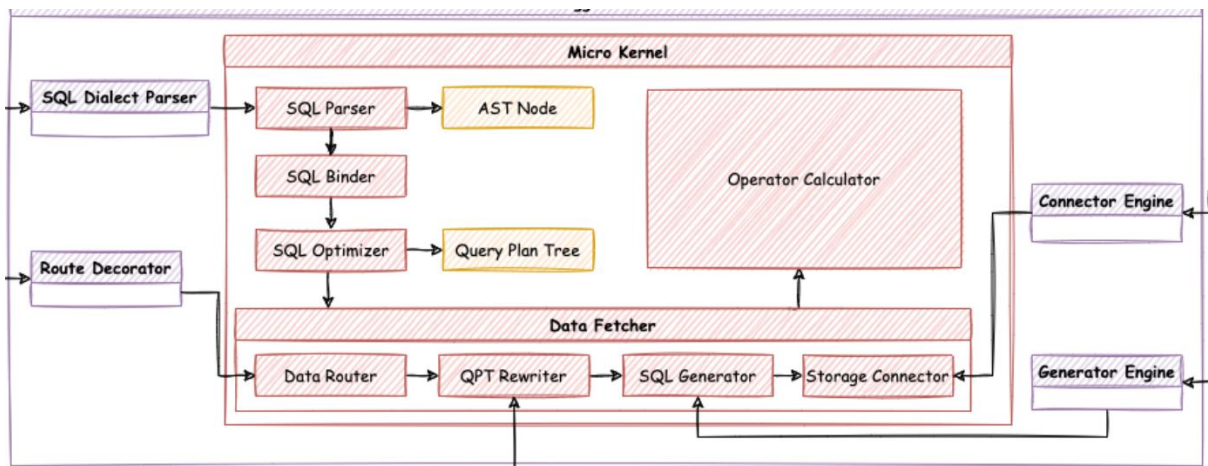
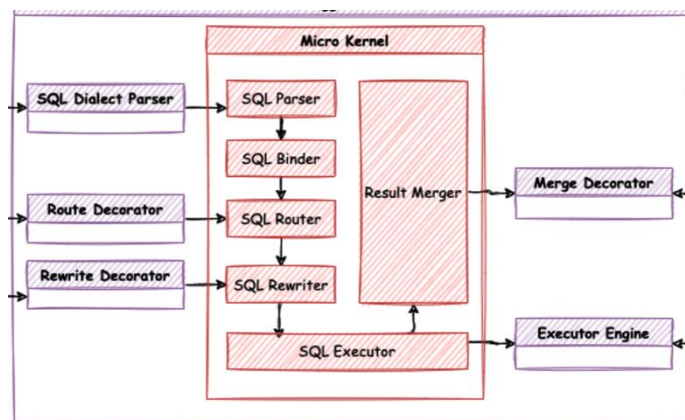
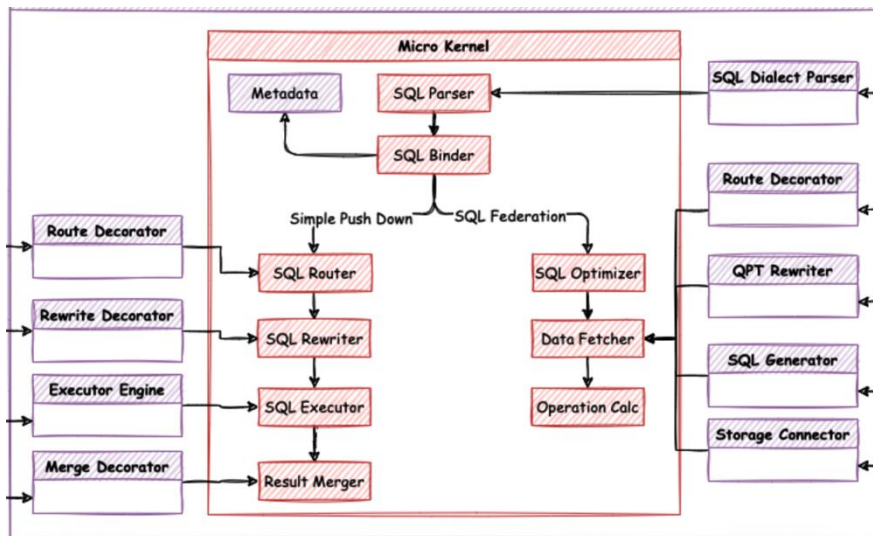


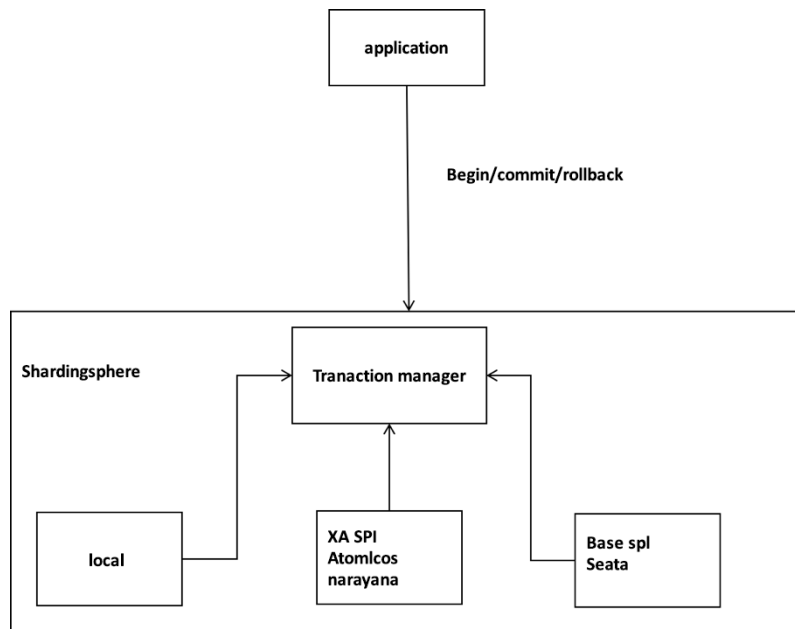
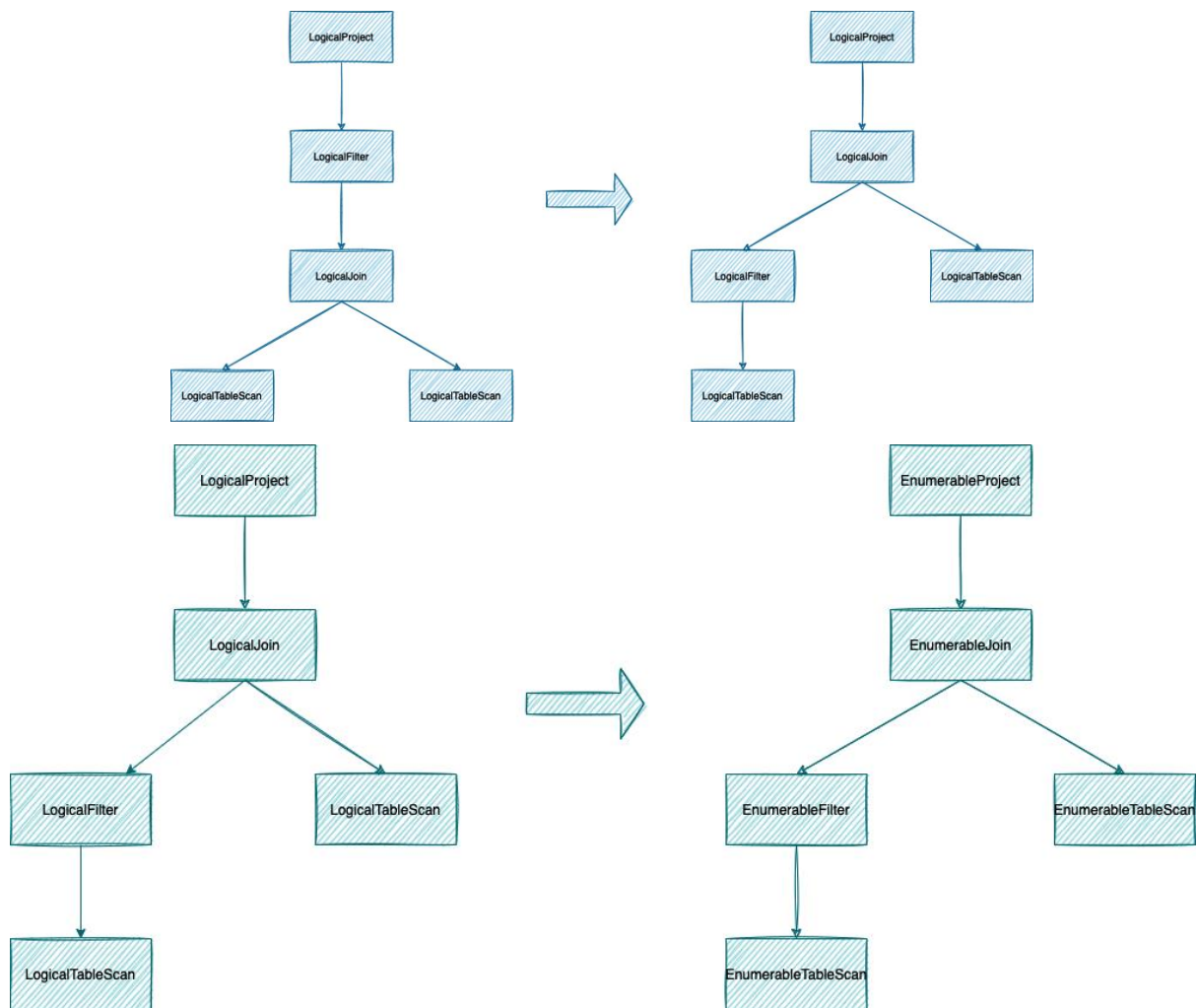


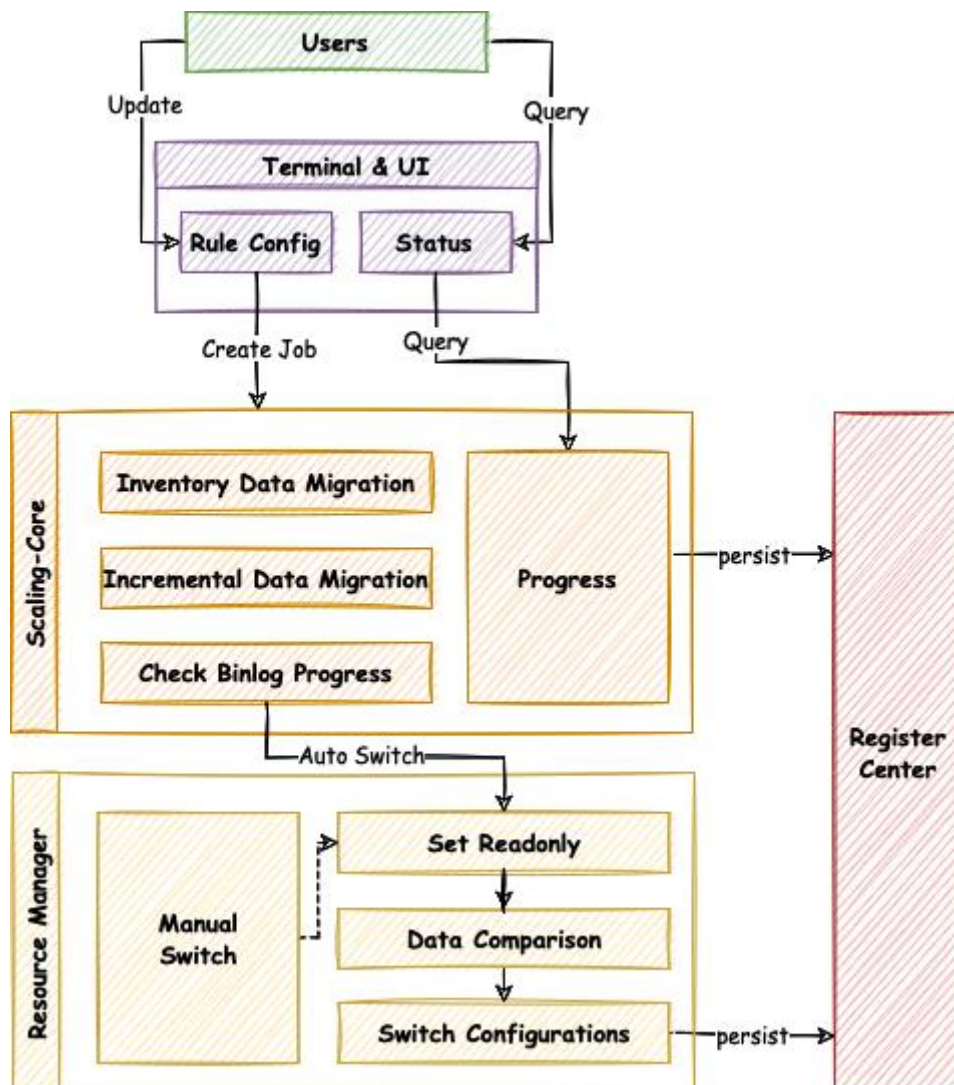
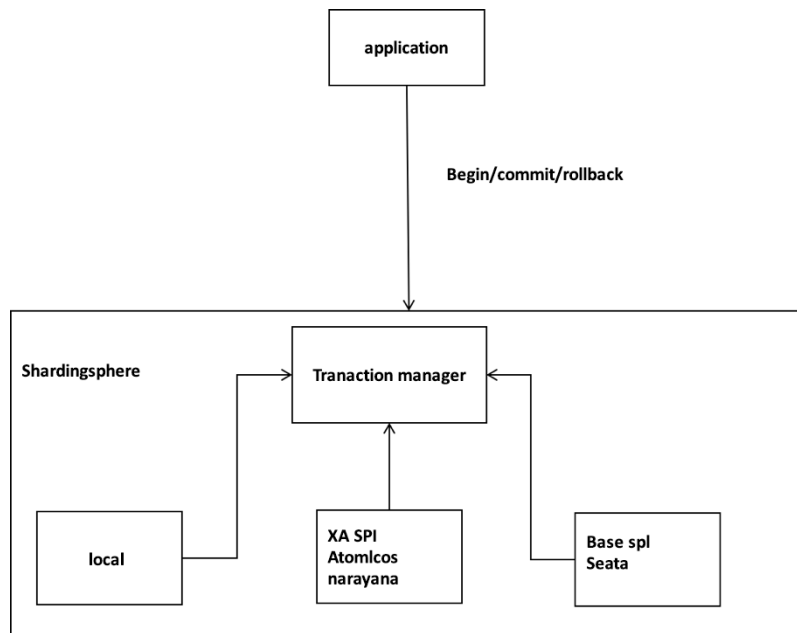


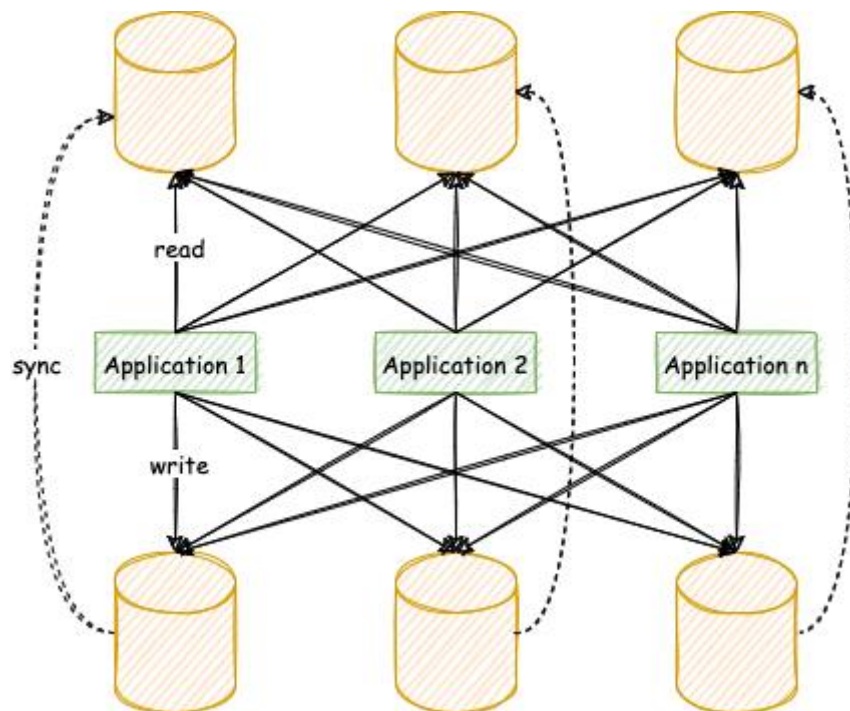
Chapter 3: Key Features and Use Cases – Your Distributed Database Essentials











UPDATE t_user SET status='OK' WHERE id=1

SELECT * FROM t_user WHERE id=1



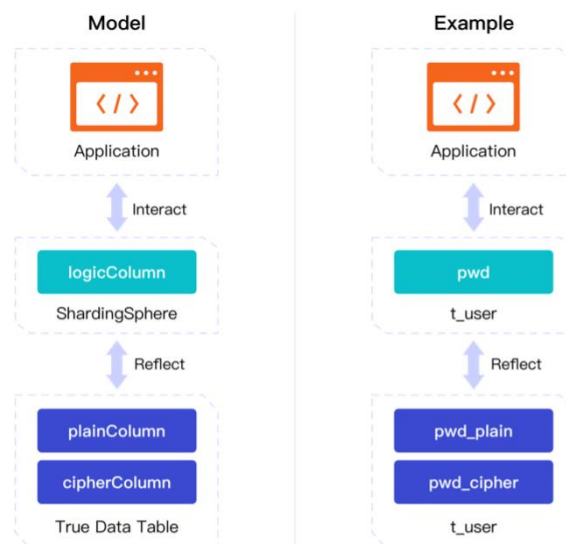
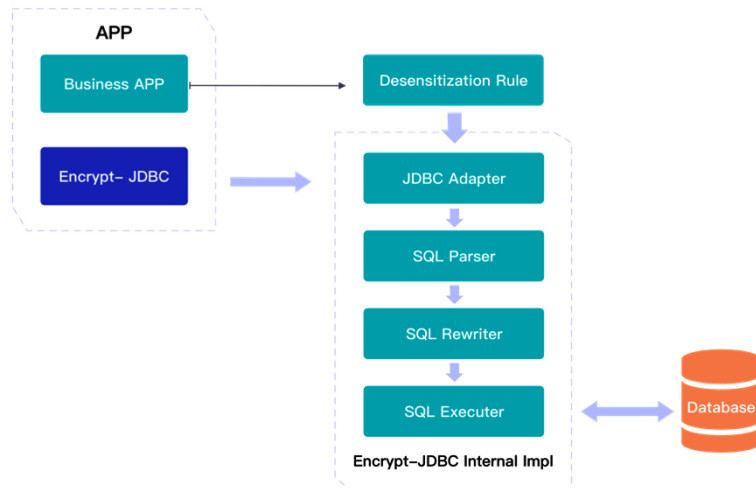
UPDATE t_user SET status='OK' WHERE id=1



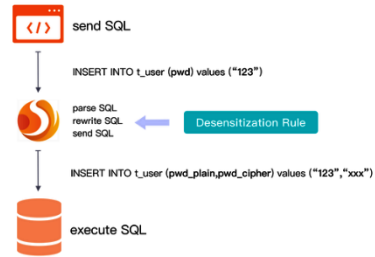
SELECT * FROM t_user WHERE id=1



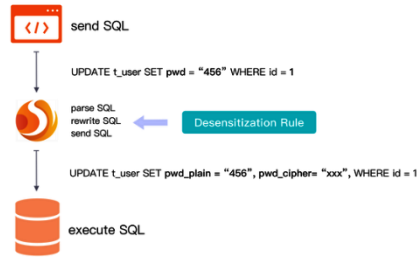
Chapter 4: Key Features and Use Cases – Focusing on Performance and Security



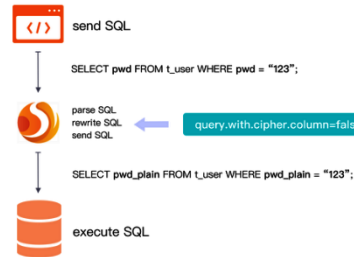
insert-use logicColumn



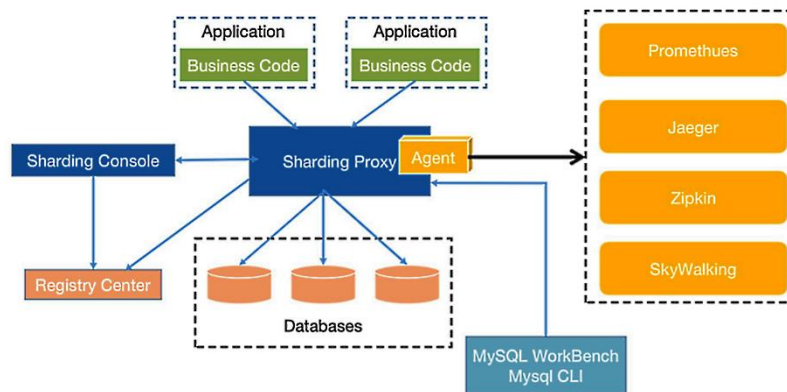
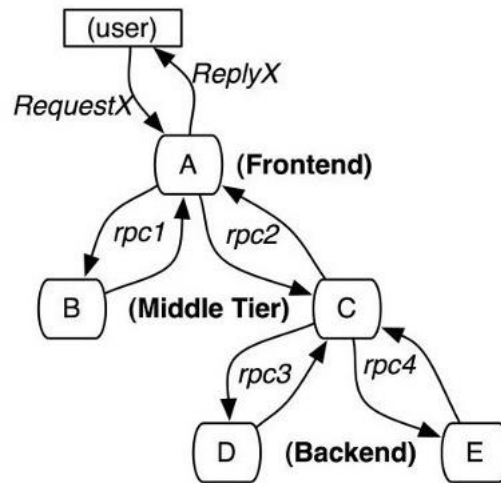
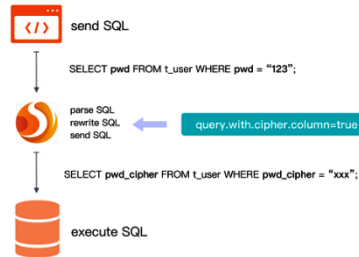
update-use logicColumn

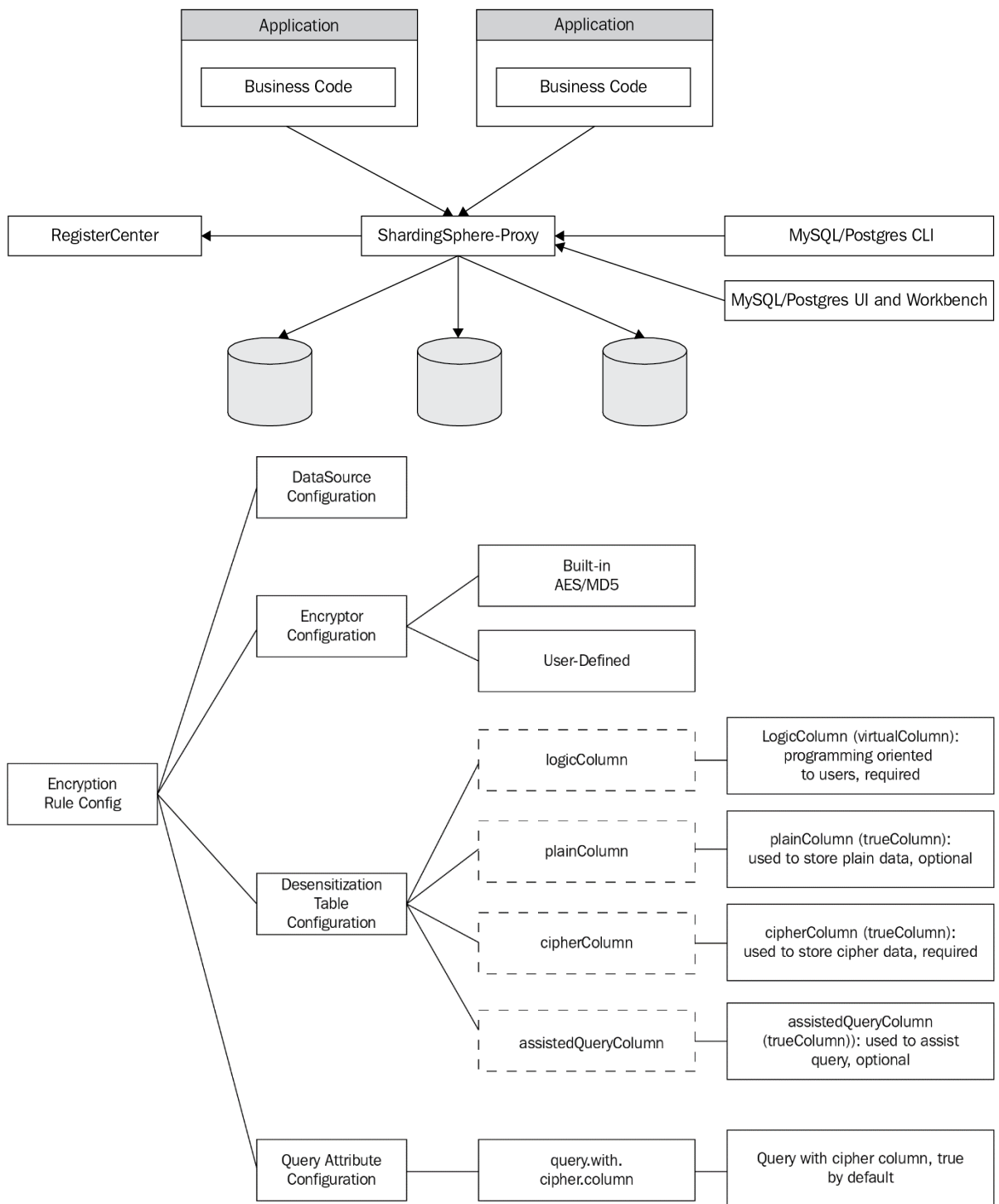


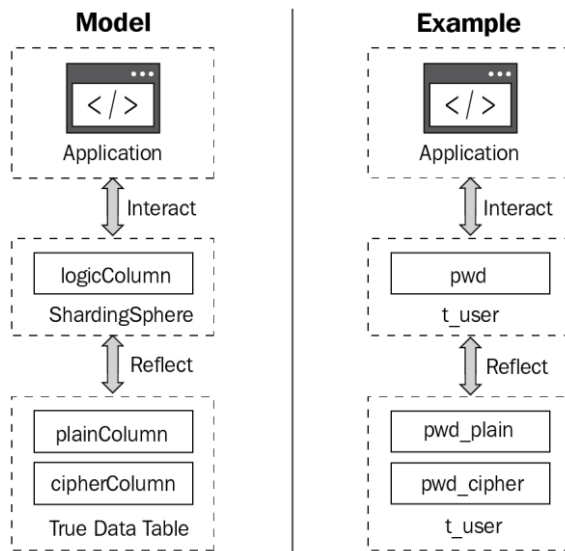
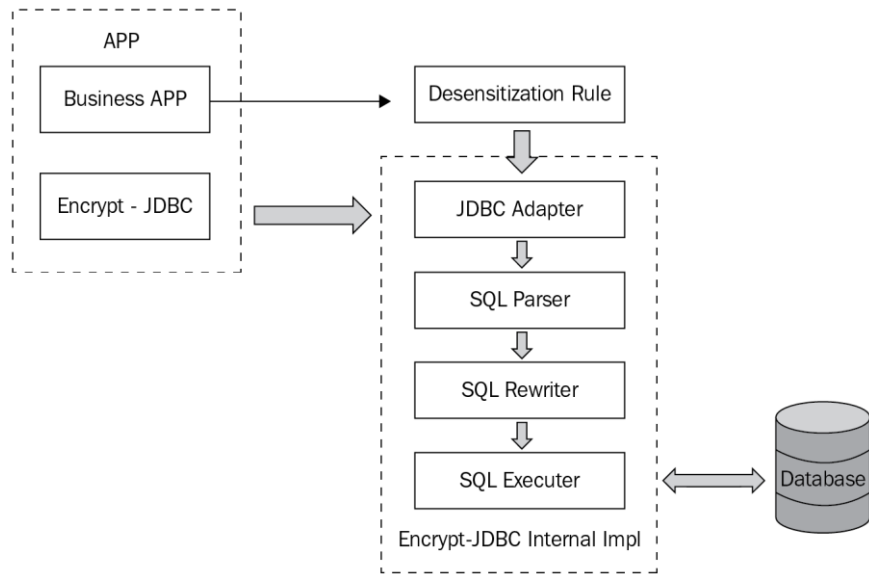
query-use plainColumn



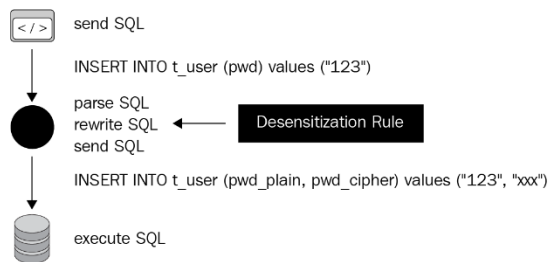
query-use cipherColumn



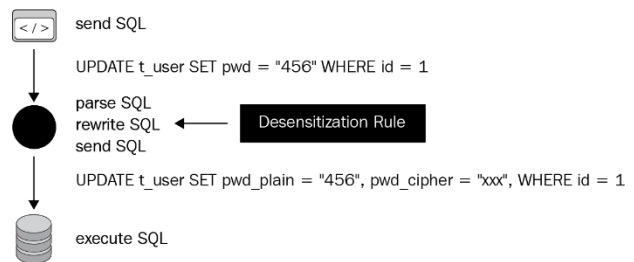




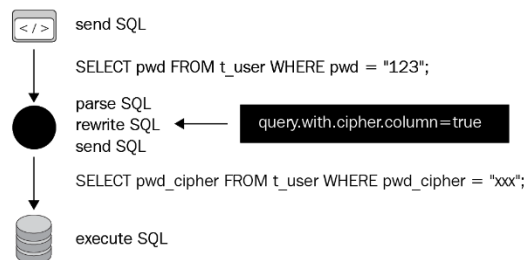
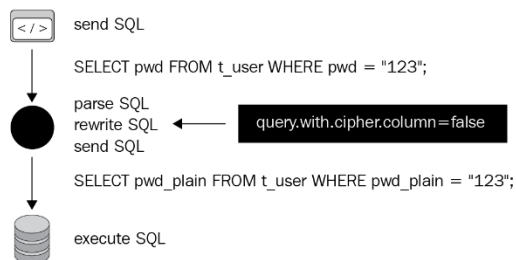
insert-use logicColumn

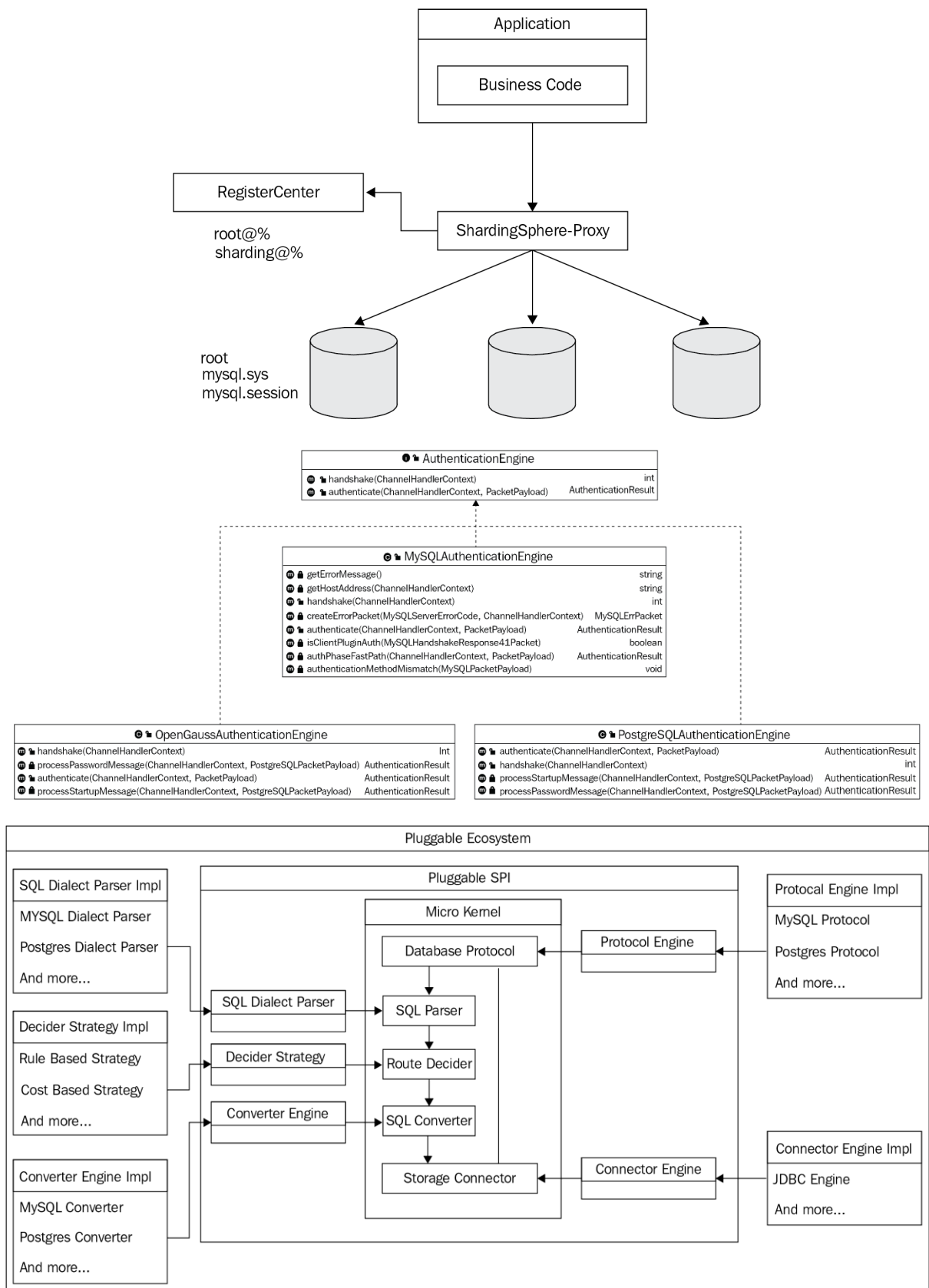


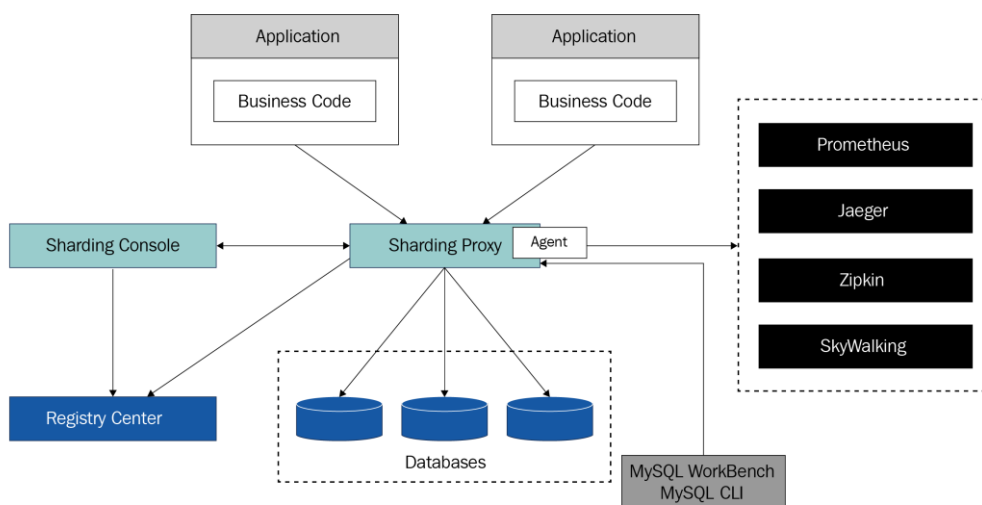
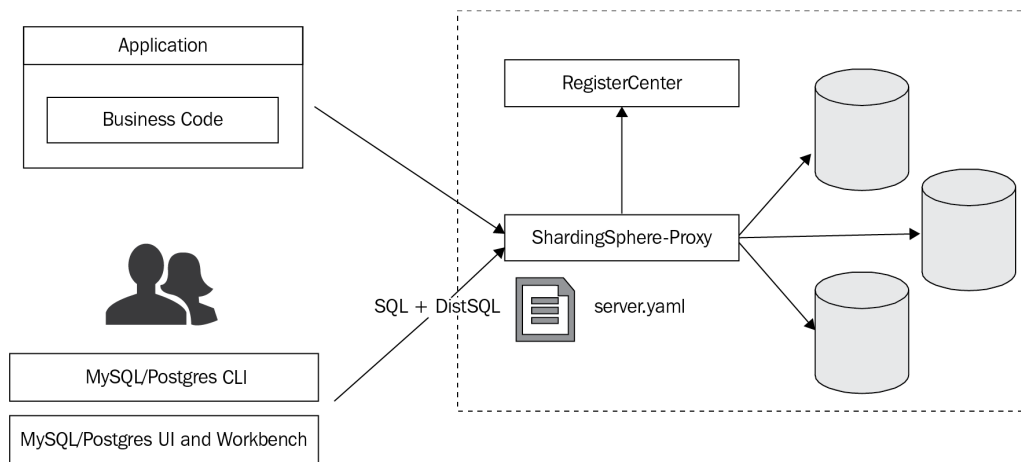
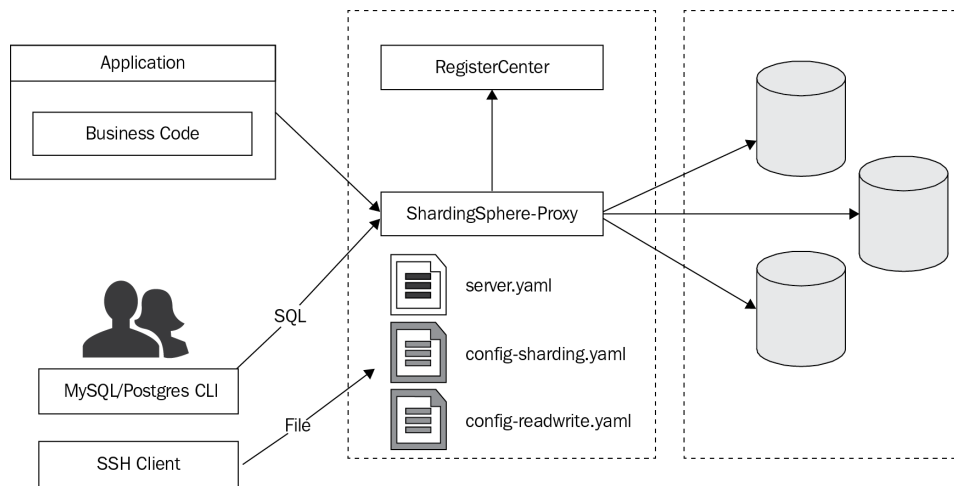
update-use logicColumn



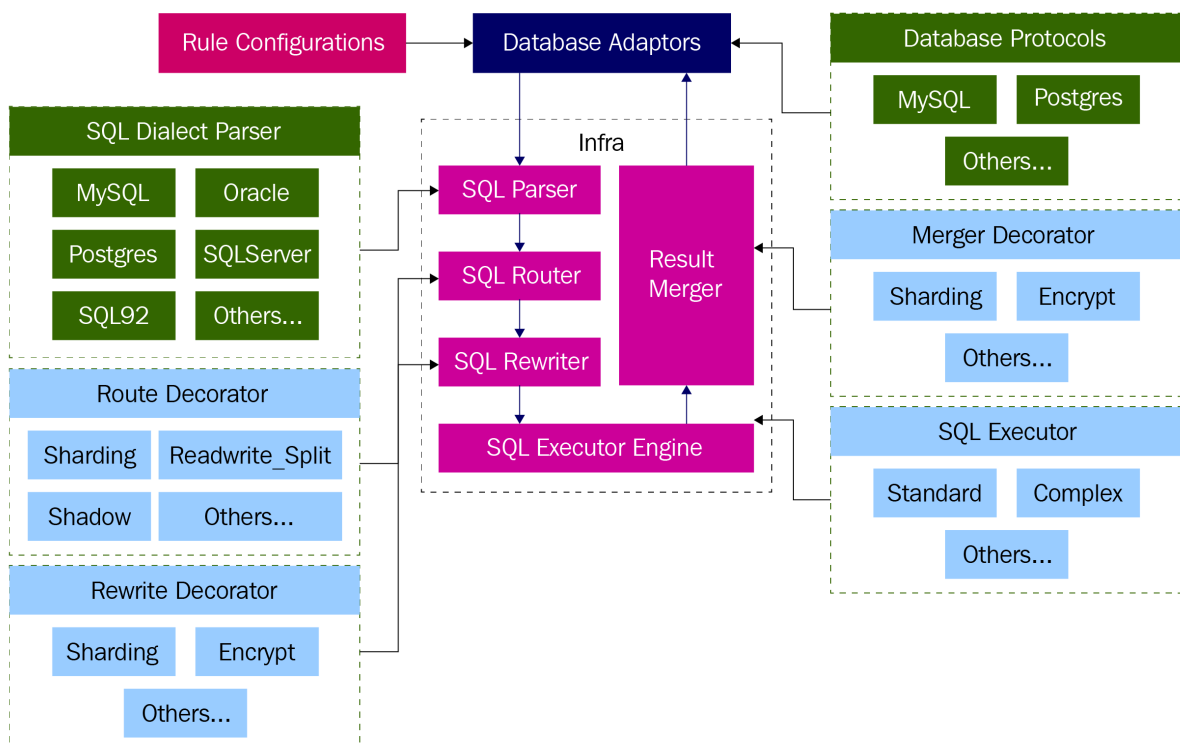
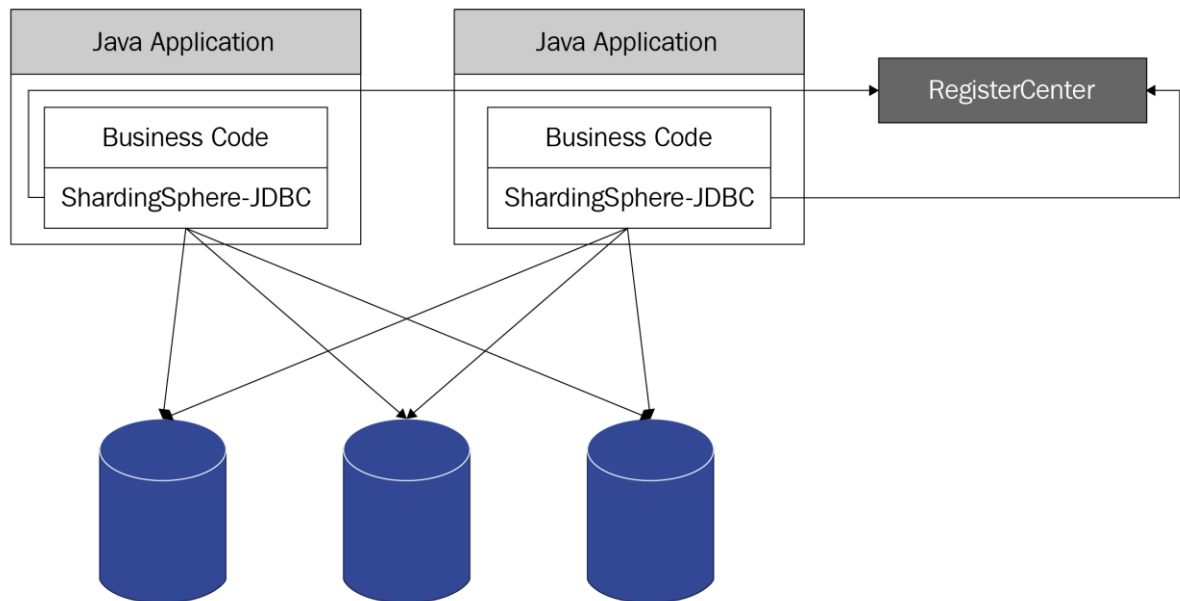
query-use cipherColumn

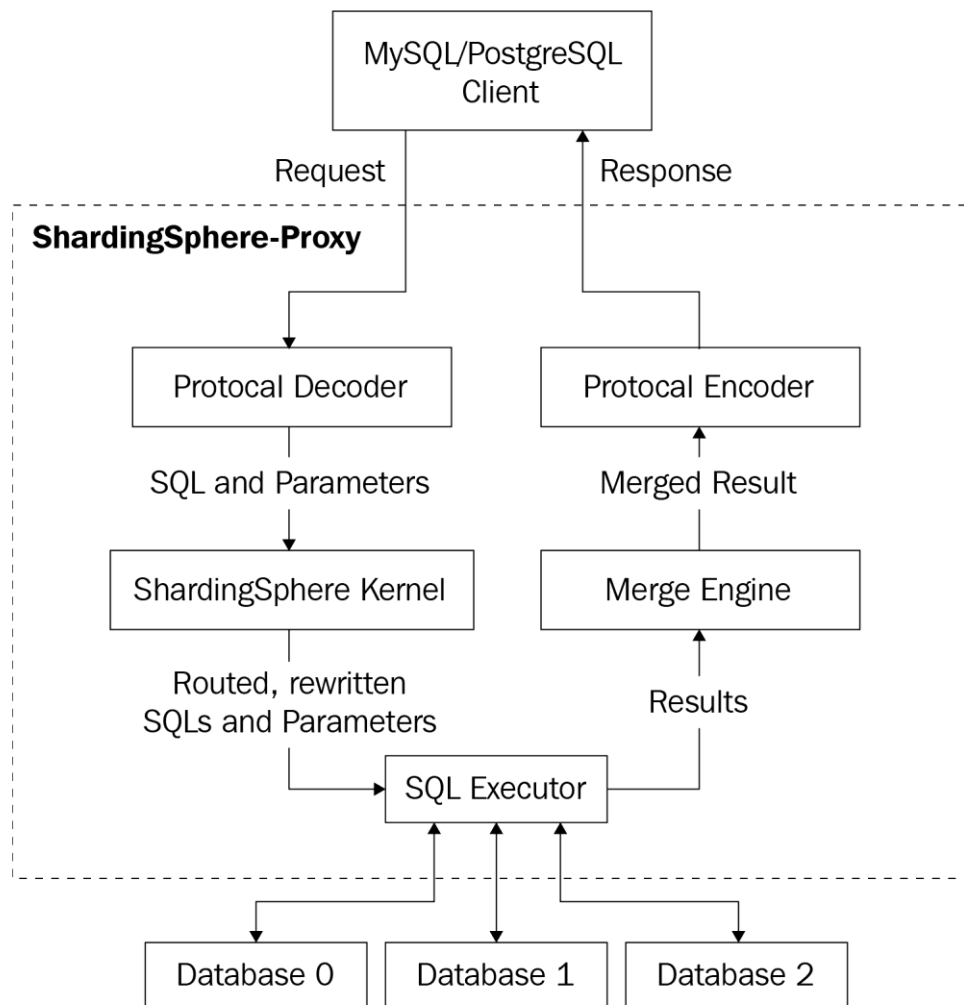
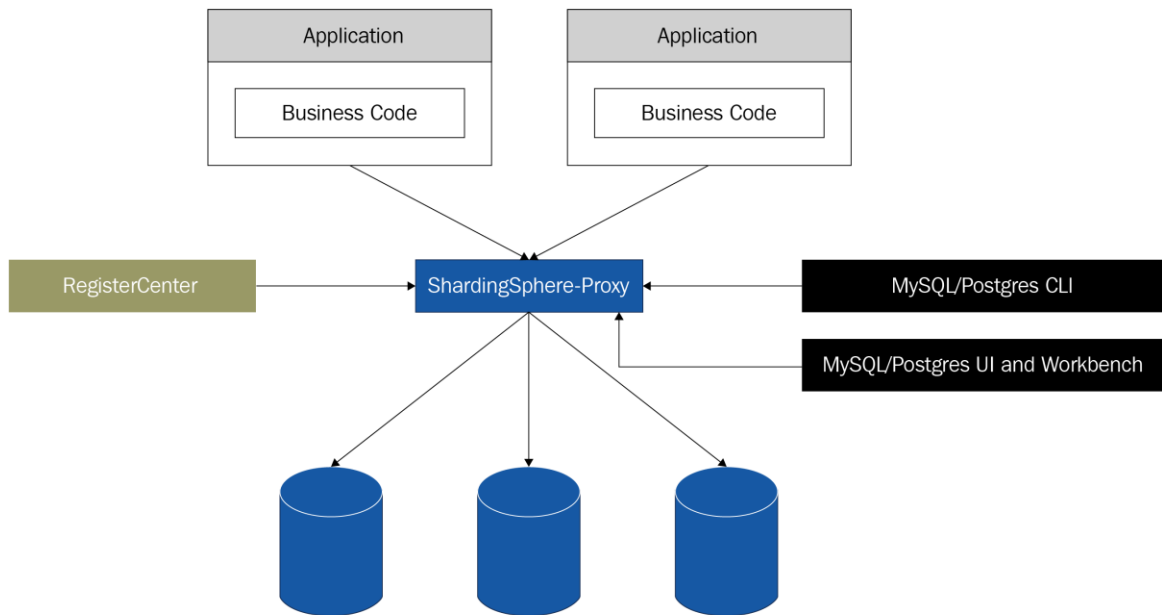


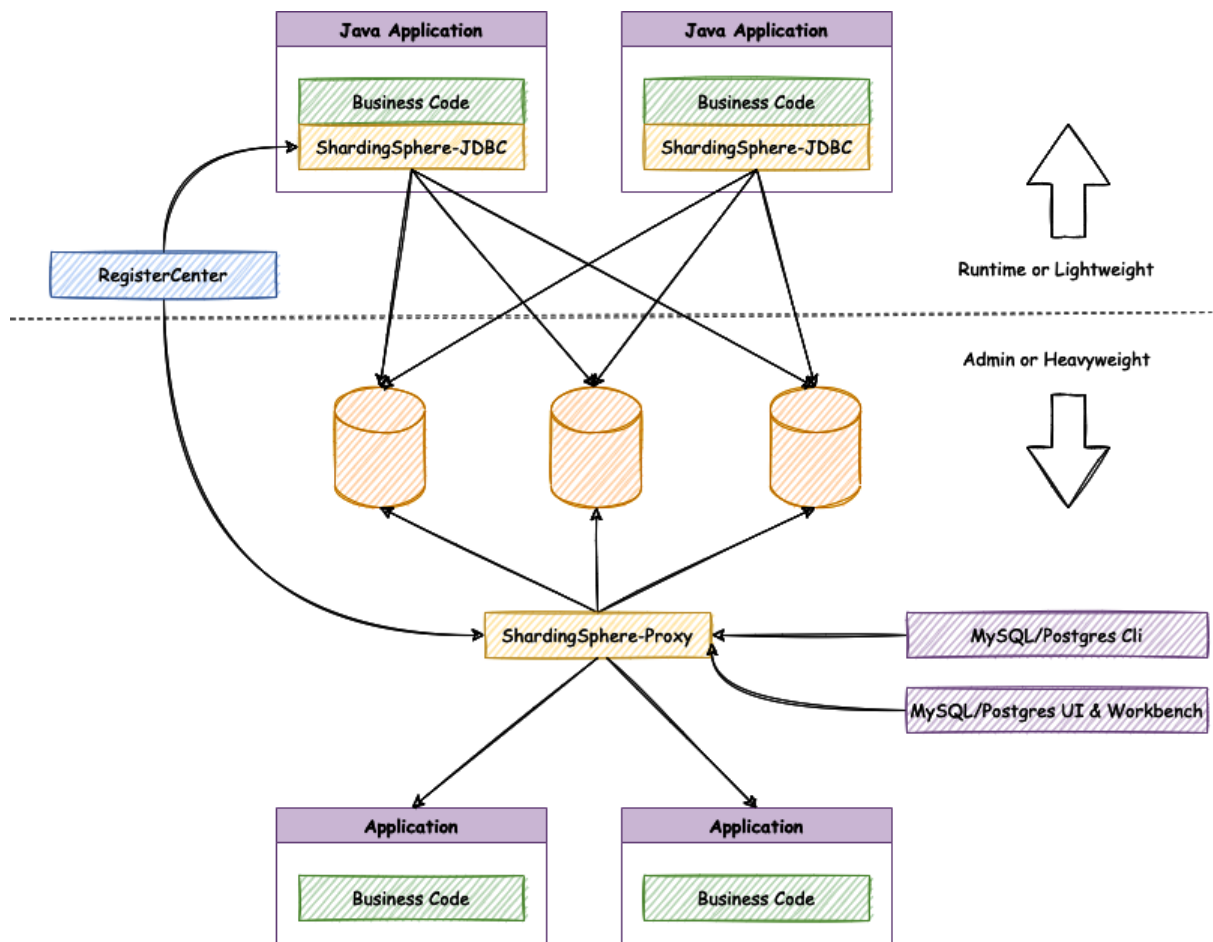




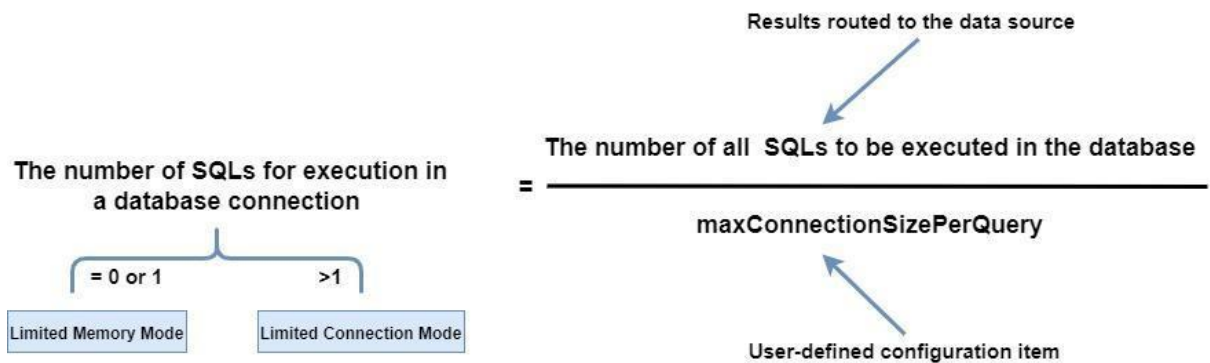
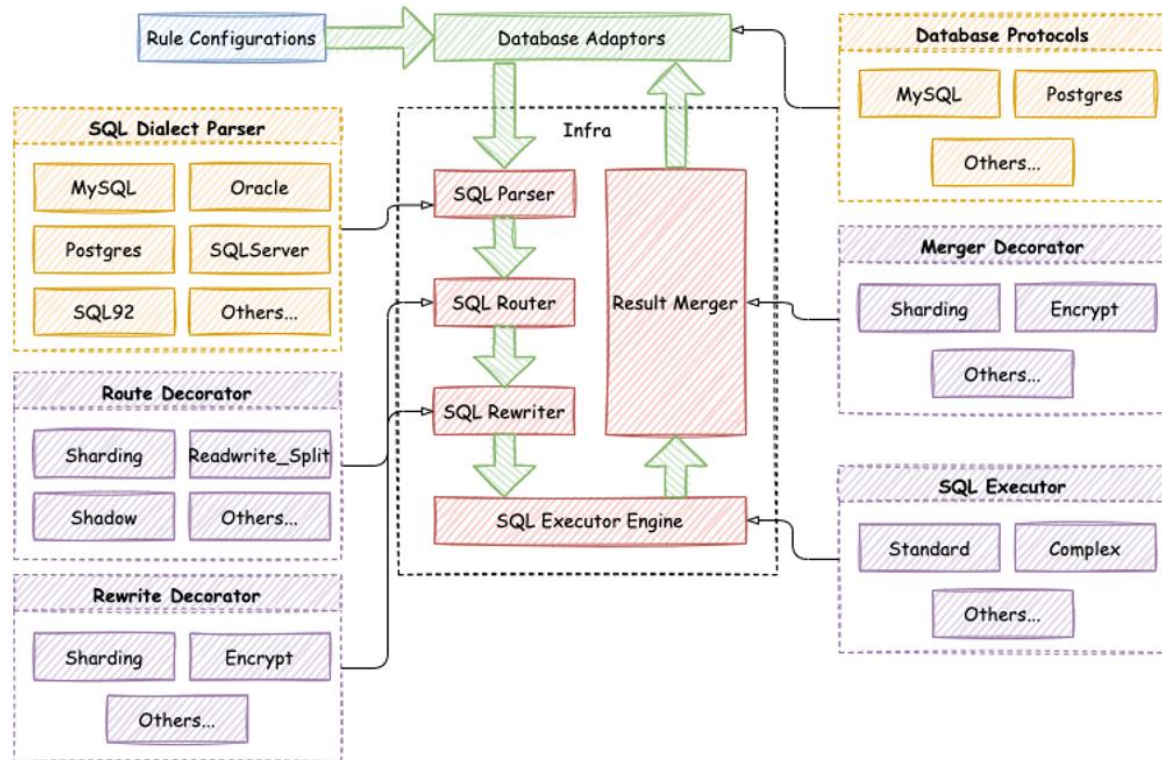
Chapter 5: Exploring ShardingSphere Adaptors







Chapter 8: Apache ShardingSphere Advanced Usage – Database Plus and Plugin Platform



Chapter 10: Testing Frequently Encountered Application Scenarios

```
mysql> CREATE SHARDING TABLE RULE t_user (
  ->   RESOURCES(ds_0, ds_1),
  ->   SHARDING_COLUMN=id,TYPE(NAME=MOD,PROPERTIES("sharding-count=4))
  -> );
Query OK, 0 rows affected (0.86 sec)

mysql> CREATE TABLE `t_user` (
  ->   `id` INT(8) NOT NULL,
  ->   `mobile` CHAR(20) NOT NULL,
  ->   `idcard` VARCHAR(18) NOT NULL,
  ->   PRIMARY KEY (`id`)
  -> );
Query OK, 0 rows affected (0.19 sec)
```

```
mysql> SELECT * FROM t_user ORDER BY id;
+----+-----+-----+
| id | mobile      | idcard      |
+----+-----+-----+
| 1  | 18236483857 | 220605194709308170 |
| 2  | 15686689114 | 360222198806088804 |
| 3  | 14523360225 | 411601198601098107 |
| 4  | 18143924353 | 540228199804231247 |
| 5  | 15523349333 | 360924195311103360 |
| 6  | 13261527931 | 513229195302236086 |
| 7  | 13921892133 | 500108194806107214 |
| 8  | 15993370854 | 451322194405305441 |
| 9  | 18044280924 | 411329199808285772 |
| 10 | 13983621809 | 430204195612042092 |
| 11 | 18044270924 | 411329199708285772 |
| 12 | 13983631809 | 430204195611042092 |
+----+-----+-----+
12 rows in set (0.04 sec)
```

```
mysql> SELECT * FROM t_user_0;
```

id	mobile	idcard
4	18143924353	540228199804231247
8	15993370854	451322194405305441
12	13983631809	430204195611042092

```
3 rows in set (0.00 sec)
```

```
mysql> SELECT * FROM t_user_2;
```

id	mobile	idcard
2	15686689114	360222198806088804
6	13261527931	513229195302236086
10	13983621809	430204195612042092

```
3 rows in set (0.00 sec)
```

```
mysql> SELECT * FROM t_user_1;
```

id	mobile	idcard
1	18236483857	220605194709308170
5	15523349333	360924195311103360
9	18044280924	411329199808285772

```
3 rows in set (0.00 sec)
```

```
mysql> SELECT * FROM t_user_3;
```

id	mobile	idcard
3	14523360225	411601198601098107
7	13921892133	500108194806107214
11	18044270924	411329199708285772

3 rows in set (0.00 sec)

```
mysql> SELECT * FROM t_user;
```

id	mobile	idcard
1	18236483857	220605194709308170
2	15686689114	360222198806088804
3	14523360225	411601198601098107
4	18143924353	540228199804231247
5	15523349333	360924195311103360
6	13261527931	513229195302236086
7	13921892133	500108194806107214
8	15993370854	451322194405305441
9	18044280924	411329199808285772
10	13983621809	430204195612042092

10 rows in set (0.06 sec)

```
mysql> SELECT * FROM t_user;
```

id	mobile_cipher	idcard_cipher
1	p31PkI9nIunYdH+AngyNUA==	pQv0JEkM94QzktJdM8UMg/uLrU71G6n6DALdPp9w6L0=
2	CV8+uYRaw0zcTQnQX3RcwA==	dCF7k4haK0aIV/d7dtwgzIb4lIFlJ913hrPim1+J278=
3	jnfu7o44KgN/PV1zhiu7jw==	8iulp3+XTSv2XHGUUHKV0UsLuFx7yEpQVT+47EFfg94=
4	ZJDrTv/XIjdqdG1yp0t95w==	iqU6myMGfgI/XnxCtjhbMrwIauriWu8crxPS6BH2pMk=
5	FnQMYGnFJaiWmTHENYzbFA==	KAPrCXoo1svMt5NWe0UaKYZIl1rSEVddHbBJ01jPIqw=
6	lv2ECfTCgQQksvdPp6k3Ug==	BBBPAuwU+iJluI9d9TA+H81BPnVXBaly1BE3Ep\N4e8=
7	z46vpnHCFTkIF2EtntxpHQ==	Bc39nPtyz1ji9Rc8k4f7G9CKfPew23mKFwp8guK7ybg=
8	p/IJdGcCikhpCu5gVZj4jg==	nnv/ks1i7uHXKncU0uLzE80WM0nGlcGkLokT2dltSaQ=
9	NvPcQv4w3EqD77+VAX0KCA==	+yeo5LWKNWcekFqYawCKjsctAZqe104DrI7AeZdR/Uk=
10	x0yg9E0X9lhy9mUx0QyL0A==	U7P1CMcxn6VPYHPGTAtjHEbb6N6vhG0pdJtVjAdHlA=

10 rows in set (0.00 sec)

mobile	status	type
13261527931	2	product_ds
14523360225	2	product_ds
15523349313	2	product_ds
15523349323	2	product_ds
15523349333	2	product_ds
15686689114	2	product_ds
18143924153	2	product_ds
18143924253	2	product_ds
18143924353	2	product_ds
18236483857	2	product_ds

10 rows in set (0.00 sec)

mobile	status	type
15639784513	1	shadow_ds
15639784703	1	shadow_ds
15639784713	1	shadow_ds
15716172114	1	shadow_ds
15716173114	1	shadow_ds
18099515602	1	shadow_ds
18099515611	1	shadow_ds
18099515622	1	shadow_ds
18766746515	1	shadow_ds
18766747515	1	shadow_ds

10 rows in set (0.00 sec)

```
mysql> SELECT * FROM t_order;
```

order_id	user_id	status
1	20001	read
2	20002	read
3	20003	read
4	20004	read
5	20005	read
6	20006	read
7	20007	read
8	20008	read
9	20009	read
10	20010	read

10 rows in set (0.16 sec)

```
mysql> SELECT * FROM t_order;
+-----+-----+-----+
| order_id | user_id | status |
+-----+-----+-----+
|         1 |    10001 | write  |
|         2 |    10002 | write  |
|         3 |    10003 | write  |
|         4 |    10004 | write  |
|         5 |    10005 | write  |
|         6 |    10006 | write  |
|         7 |    10007 | write  |
|         8 |    10008 | write  |
|         9 |    10009 | write  |
|        10 |    10010 | write  |
+-----+-----+-----+
10 rows in set (0.01 sec)
```

```
mysql> insert into t_order values(1,1,1);
Query OK, 1 row affected (0.04 sec)
```

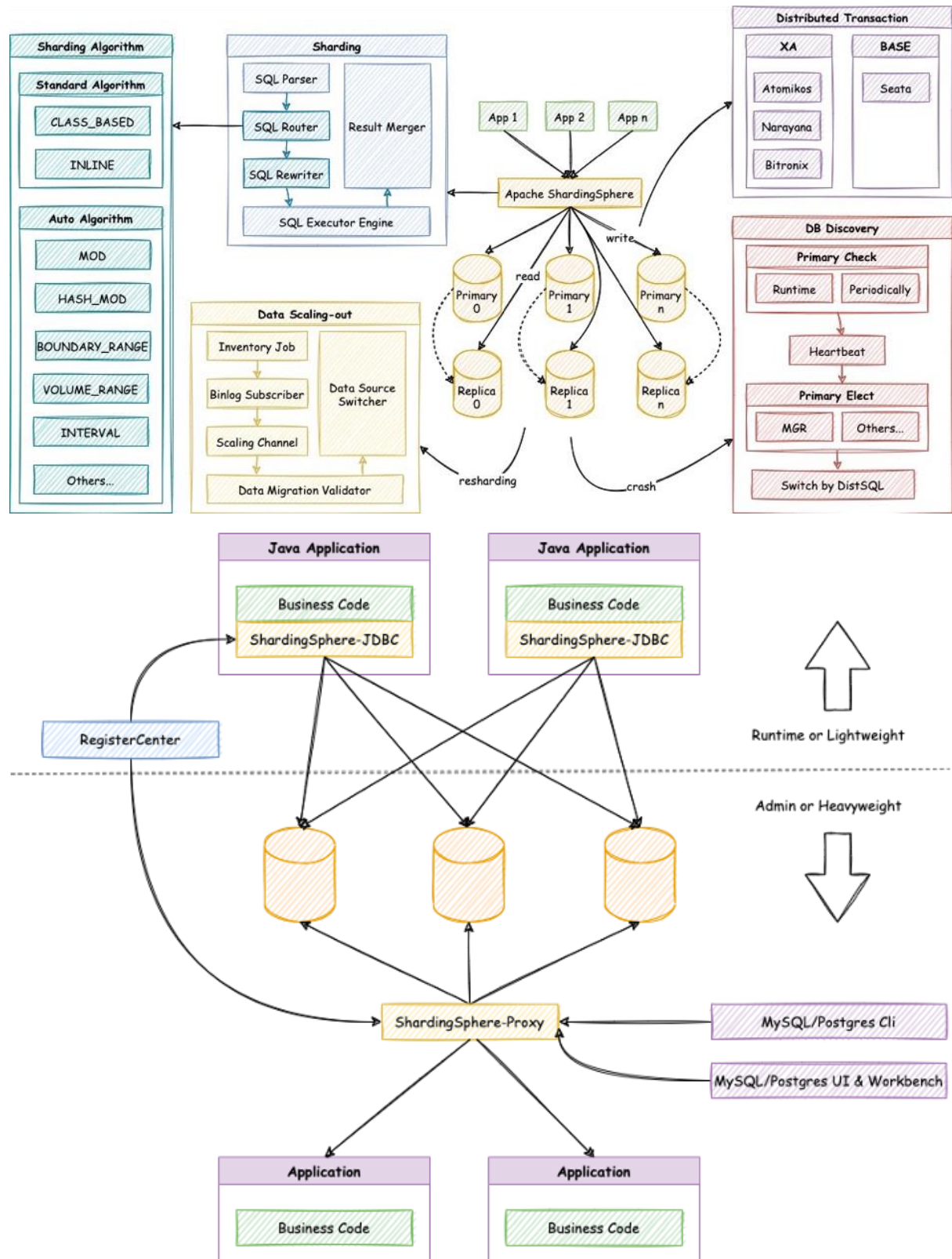
```
mysql> insert into t_user values(1,1,1);
Query OK, 1 row affected (0.01 sec)
```

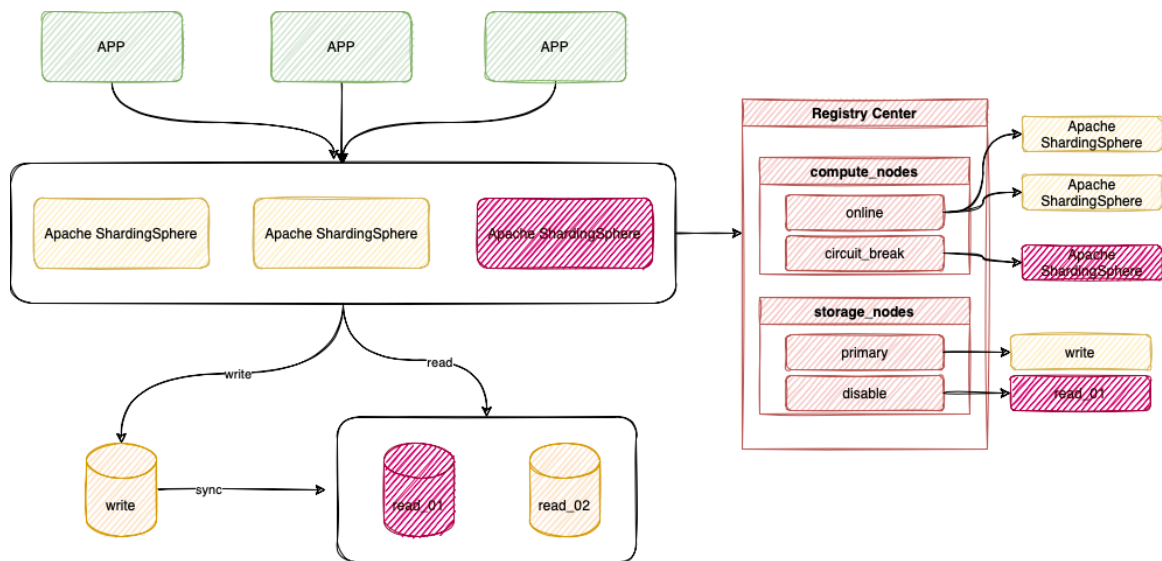
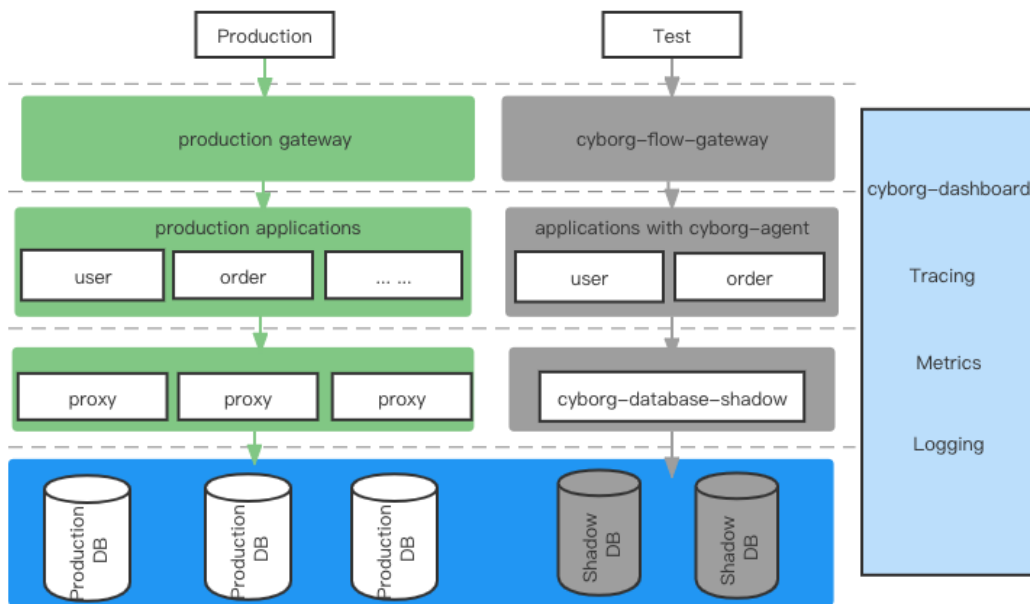
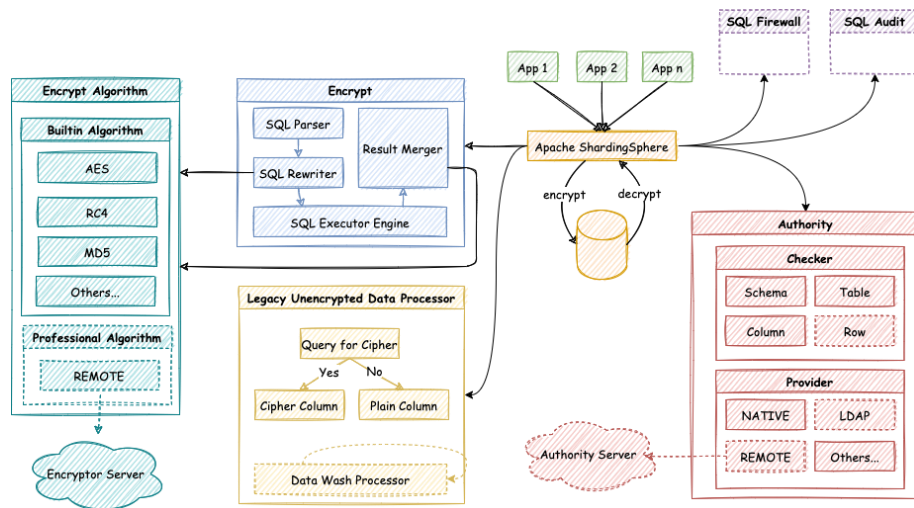
```
mysql> select * from t_order;
+-----+-----+-----+
| order_id | user_id | status |
+-----+-----+-----+
|         1 | 1       | 1       |
+-----+-----+-----+
1 row in set (0.02 sec)
```

```
mysql> select * from t_user;
+----+-----+-----+
| id | mobile | idcard |
+----+-----+-----+
|  1 | 1       | 1       |
+----+-----+-----+
1 row in set (0.00 sec)
```

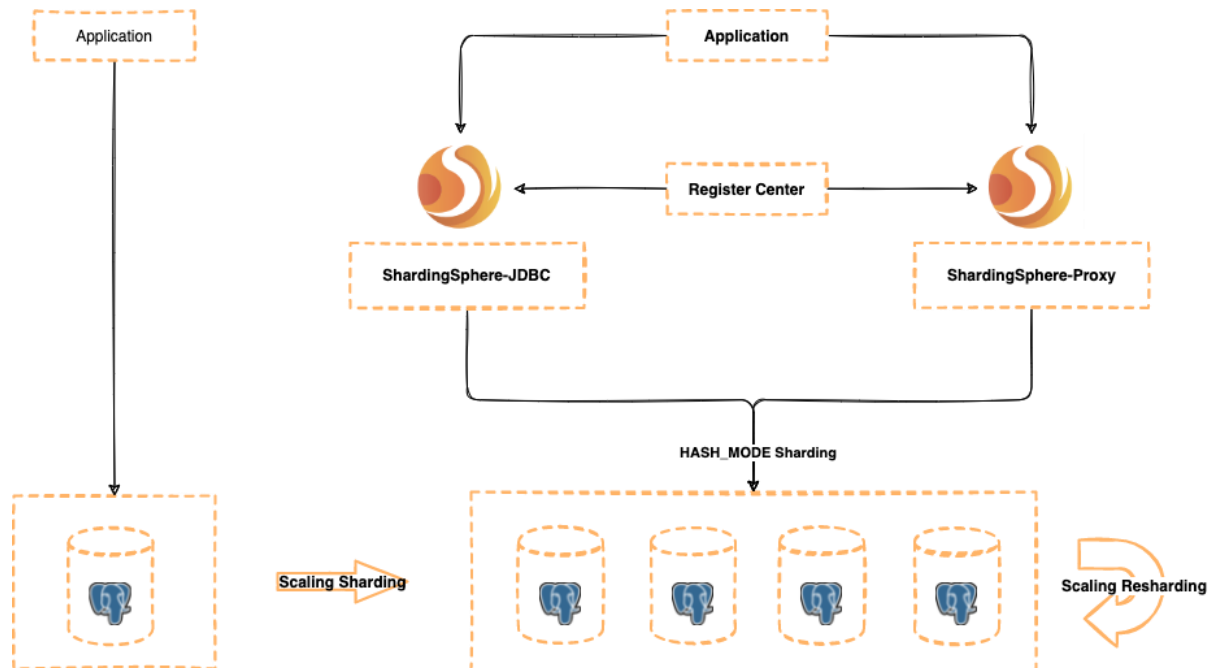
```
mysql> █
```

Chapter 11: Exploring the Best Use Cases for ShardingSphere





Chapter 12: Applying Theory to Practical Real-World Examples



id	mobile	idcard
4	18143924353	540228199804231247
8	15993370854	451322194405305441
12	13983631809	430204195611042092

3 rows in set (0.00 sec)

Example results query example output

id	mobile	idcard
2	15686689114	360222198806088804
6	13261527931	513229195302236086
10	13983621809	430204195612042092

3 rows in set (0.00 sec)

Additional example results query example output

```

+-----+-----+-----+
| id | mobile      | idcard      |
+-----+-----+-----+
| 1 | 18236483857 | 220605194709308170 |
| 5 | 15523349333 | 360924195311103360 |
| 9 | 18044280924 | 411329199808285772 |
+-----+-----+-----+
3 rows in set (0.00 sec)

```

Example output for step 2

```

+-----+-----+-----+
| id | mobile      | idcard      |
+-----+-----+-----+
| 3 | 14523360225 | 411601198601098107 |
| 7 | 13921892133 | 500108194806107214 |
| 11 | 18044270924 | 411329199708285772 |
+-----+-----+-----+
3 rows in set (0.00 sec)

```

Additional example output
for step 2

```

***** 1. row *****
      table: t_user
      actual_data_nodes:
      actual_data_sources: ds_0,ds_1
      database_strategy_type:
      database_sharding_column:
      database_sharding_algorithm_type:
      database_sharding_algorithm_props:
      table_strategy_type: MOD
      table_sharding_column: id
      table_sharding_algorithm_type: MOD
      table_sharding_algorithm_props: sharding-count=4
      key_generate_column:
      key_generator_type:
      key_generator_props:

```

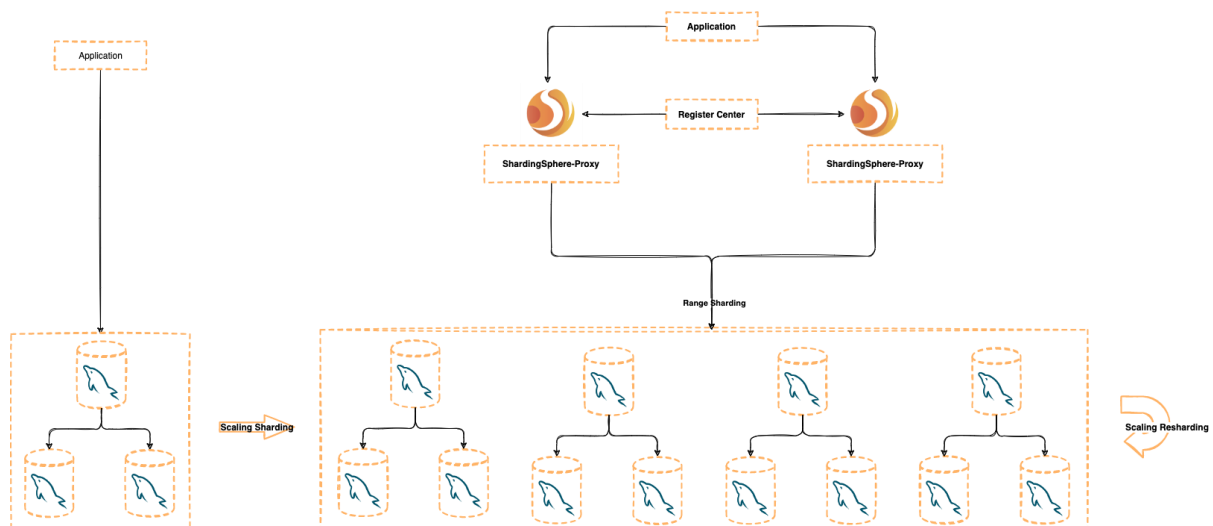
Sharding
table rules

```

***** 1. row *****
      name: t_user
      nodes: ds_0.t_user_0, ds_1.t_user_1, ds_0.t_user_2, ds_1.t_user_3

```

Sharding
table nodes



```
id is : 1, mobile is : 18236483857, id card is : 220605194709308170
id is : 2, mobile is : 15686689114, id card is : 360222198806088804
id is : 3, mobile is : 14523360225, id card is : 411601198601098107
id is : 4, mobile is : 18143924353, id card is : 540228199804231247
id is : 5, mobile is : 15523349333, id card is : 360924195311103360
id is : 6, mobile is : 13261527931, id card is : 513229195302236086
id is : 7, mobile is : 13921892133, id card is : 500108194806107214
id is : 8, mobile is : 15993370854, id card is : 451322194405305441
id is : 9, mobile is : 18044280924, id card is : 411329199808285772
id is : 10, mobile is : 13983621809, id card is : 430204195612042092
```

```
mysql> SHOW DB_DISCOVERY RULES\G
***** 1. row *****
      group_name: primary_replica_ds
      data_source_names: ds_0,ds_1,ds_2
      primary_data_source_name: ds_0
      discovery_type: {group_name=mgr, type=mgr, props={group-name=b13df29e-90b6-11e8-8d1b-525400fc3996}}
      discovery_heartbeat: {group_name=mgr-heartbeat, props={keep-alive-cron=0/5 * * * * ?}}
1 row in set (0.07 sec)

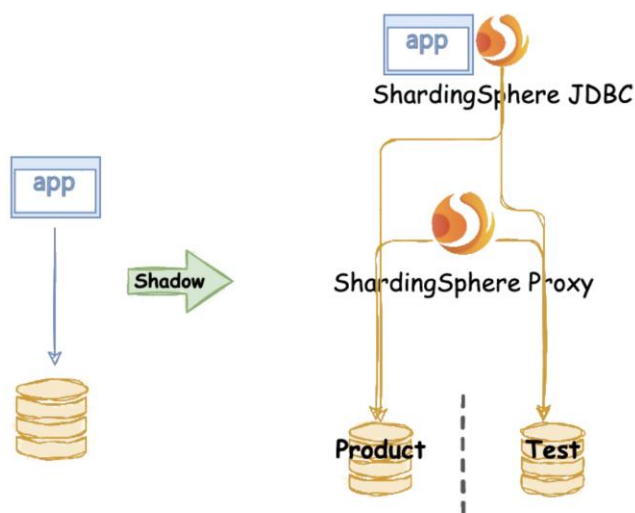
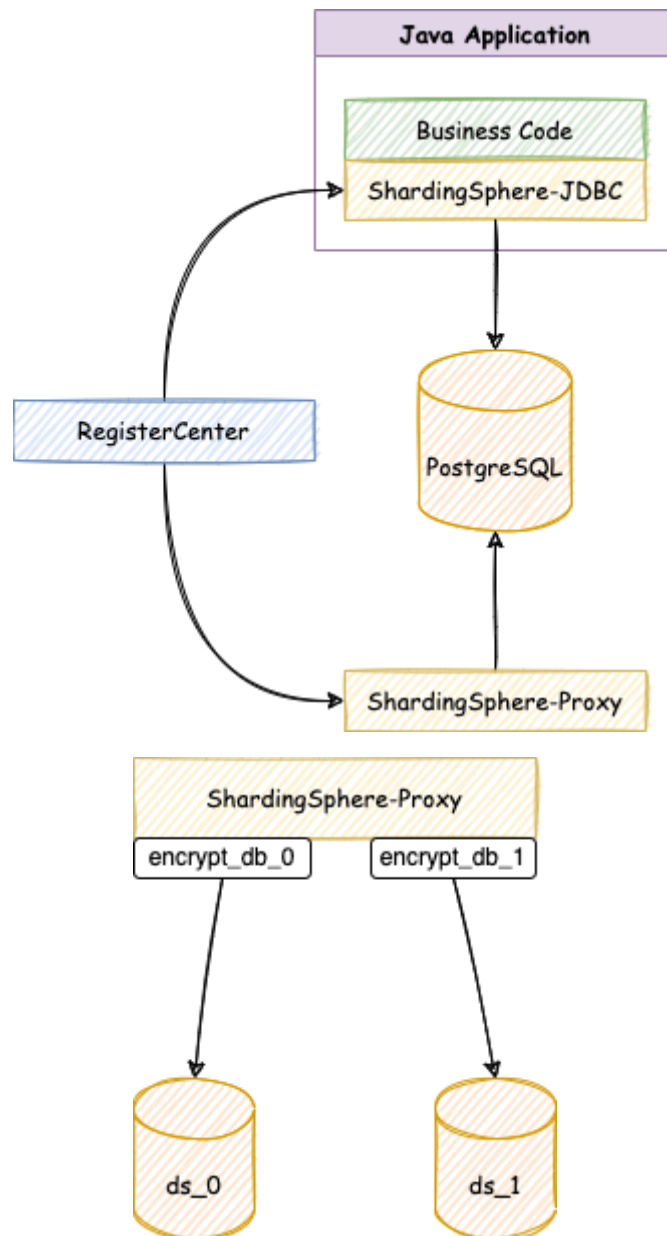
mysql> SHOW READWRITE_SPLITTING READ RESOURCES\G
***** 1. row *****
resource: ds_1
      status: enable
***** 2. row *****
resource: ds_2
      status: enable
2 rows in set (0.02 sec)
```

```
mysql> SHOW DB_DISCOVERY RULES\G
***** 1. row *****
      group_name: primary_replica_ds
      data_source_names: ds_0,ds_1,ds_2
      primary_data_source_name: ds_0
      discovery_type: {group_name=mgr, type=mgr, props={group-name=b13df29e-90b6-11e8-8d1b-525400fc3996}}
      discovery_heartbeat: {group_name=mgr-heartbeat, props={keep-alive-cron=0/5 * * * * ?}}
1 row in set (0.00 sec)

mysql>
mysql>
mysql> SHOW READWRITE_SPLITTING READ RESOURCES\G
***** 1. row *****
resource: ds_2
      status: enable
***** 2. row *****
resource: ds_1
      status: disable
2 rows in set (0.01 sec)
```

```
App-Demo (ssh)
id is : 2, mobile is : 15686689114, id card is : 360222198806088804
id is : 3, mobile is : 14523360225, id card is : 411601198601098107
id is : 4, mobile is : 18143924353, id card is : 540228199804231247
id is : 5, mobile is : 15523349333, id card is : 360924195311103360
id is : 6, mobile is : 13261527931, id card is : 513229195302236086
id is : 7, mobile is : 13921892133, id card is : 500108194806107214
id is : 8, mobile is : 15993370854, id card is : 451322194405305441
id is : 9, mobile is : 18044280924, id card is : 411329199808285772
id is : 10, mobile is : 13983621809, id card is : 430204195612042092
```

```
App-Demo (ssh)
id is : 5, mobile is : 15523349333, id card is : 360924195311103360
id is : 6, mobile is : 13261527931, id card is : 513229195302236086
id is : 7, mobile is : 13921892133, id card is : 500108194806107214
id is : 8, mobile is : 15993370854, id card is : 451322194405305441
id is : 9, mobile is : 18044280924, id card is : 411329199808285772
id is : 10, mobile is : 13983621809, id card is : 430204195612042092
id is : 11, mobile is : 13921892134, id card is : 500108194806107211
id is : 12, mobile is : 15993370855, id card is : 451322194405305442
id is : 13, mobile is : 18044280926, id card is : 411329199808285773
id is : 14, mobile is : 13983621807, id card is : 430204195612042094
id is : 15, mobile is : 18044270928, id card is : 411329199708285775
id is : 16, mobile is : 13983631800, id card is : 130204195611042096
id is : 17, mobile is : 13983631800, id card is : 230204195611042093
id is : 18, mobile is : 13983631800, id card is : 330204195611042091
id is : 19, mobile is : 13983631800, id card is : 230204195611042092
```



Load test online with DB

Two alternative clients
MySQL/PostgreSQL to choose
Default/User-defined test strategy
Metric/Tracing visualization
Database gateway

http://192.168.87.4:8082/order/create

POST http://192.168.87.4:8082/order/create

Params Authorization Headers (8) Body Pre-request Script Tests Settings

none form-data x-www-form-urlencoded raw binary GraphQL JSON

```
1 {
2   "userId": 1,
3   "sku": "sku-1-pro"
4 }
```

Body Cookies Headers (5) Test Results

Pretty Raw Preview Visualize Text

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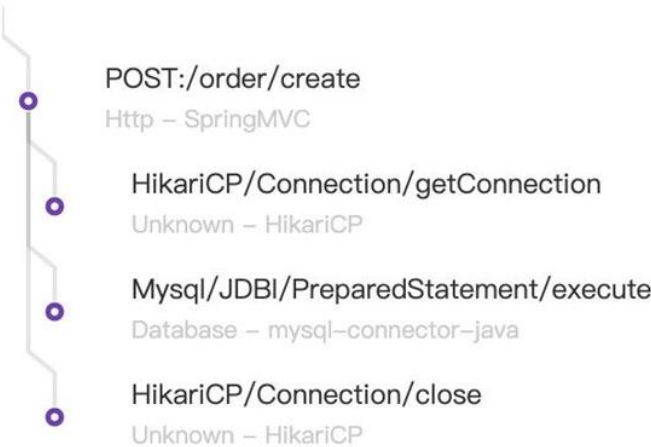
POST:/order/create

738da78c2a394cae bdf4674385f5a763.41.16418039149760003



Starting point 2022-01-10 16:38:34 Duration 54 ms Span 4

poc-shadow



http://192.168.87.4:9080/order/create

POST

⌵

http://192.168.87.4:9080/order/create

Params

Authorization

Headers (8)

Body ●

Pre-request Script

Tests

Settings

☐ none

☐ form-data

☐ x-www-form-urlencoded

☒ raw

☐ binary

☐ GraphQL

JSON ⌵

```
1 {
2   ... "userId": 1,
3   ... "sku": "sku-1-shadow"
4 }
```

Body

Cookies

Headers (5)

Test Results

Pretty

Raw

Preview

Visualize

Text ⌵

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