



APACHECON
ASIA 2021

Middleware

The Powerful Distributed Scheduling Solution ElasticJob

Weijie Wu

Apache ShardingSphere Committer & Middleware Engineer at SphereEx

About Me



Weijie Wu 吴伟杰

- Apache ShardingSphere Committer
- Middleware Engineer at SphereEx
- Contributed to Apache ShardingSphere & Apache ShardingSphere ElasticJob
- Release Manager of ElasticJob 3.0.0



ShardingSphere



SphereEx

About the ElasticJob



Abilities in distributed job scheduling

- Elastic Schedule
- Resource Assign
- Job Governance
- Job Open Ecosystem
- Console & UI

- Stars: 7.1k
- Forks: 3k
- Contributors: 84
- Using by at least 83 companies



July, 2021
ElasticJob 3.0.0 GA

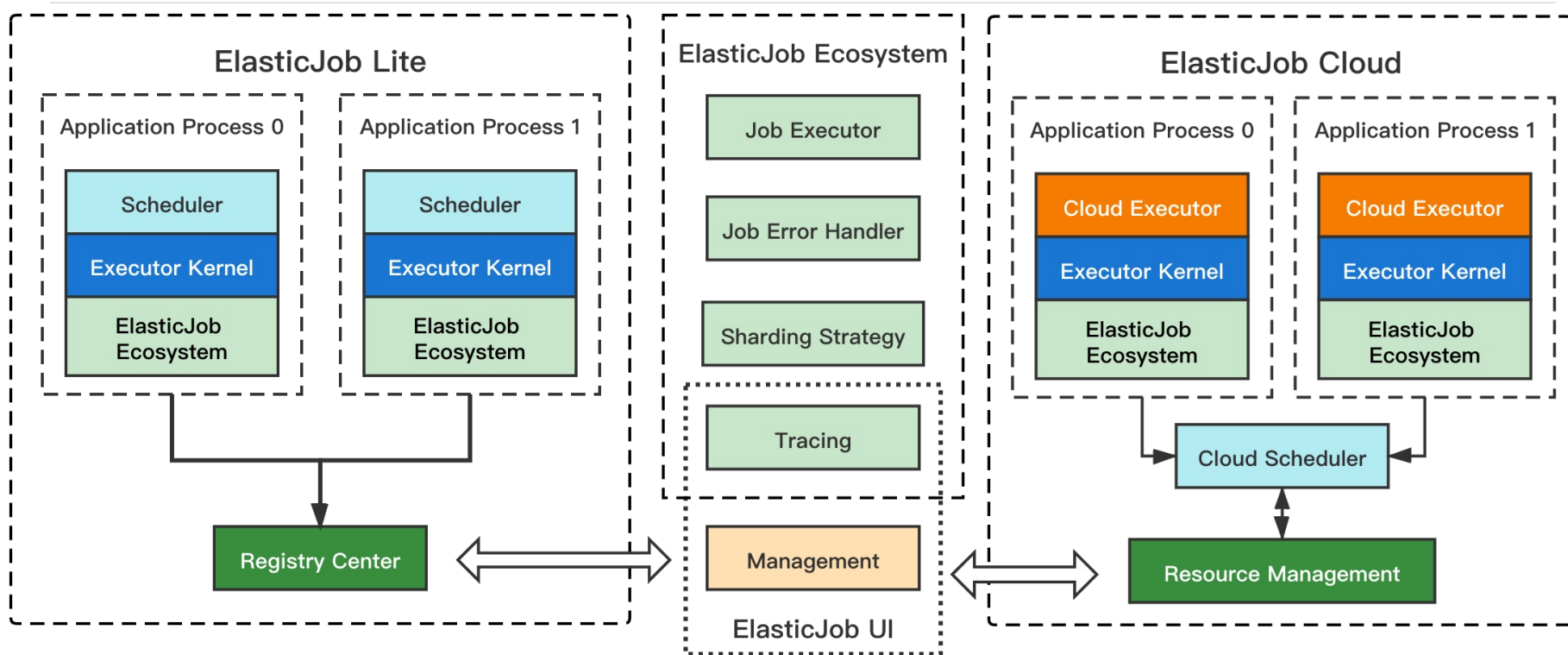
December, 2020
ElasticJob 3.0.0-RC1

June, 2020
Became sub project of
Apache ShardingSphere

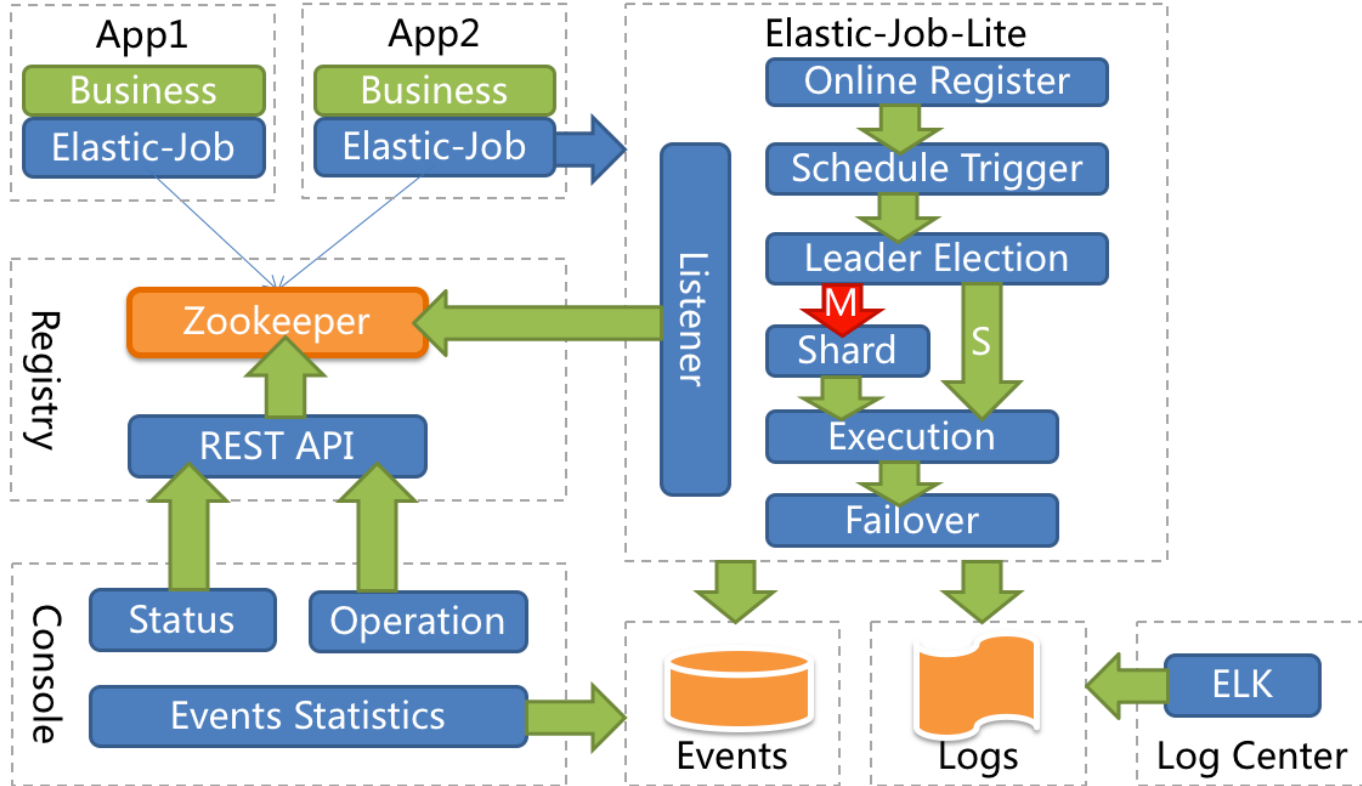
October, 2015
Open source by
dangdang.com

June, 2015
Project Started

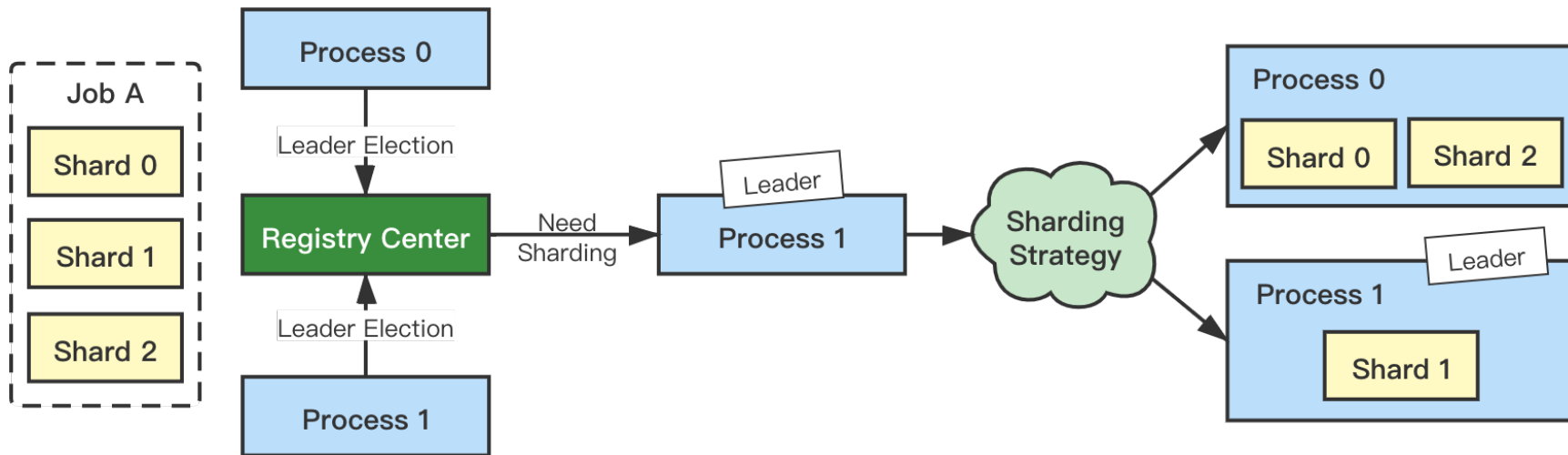
Architecture of ElasticJob



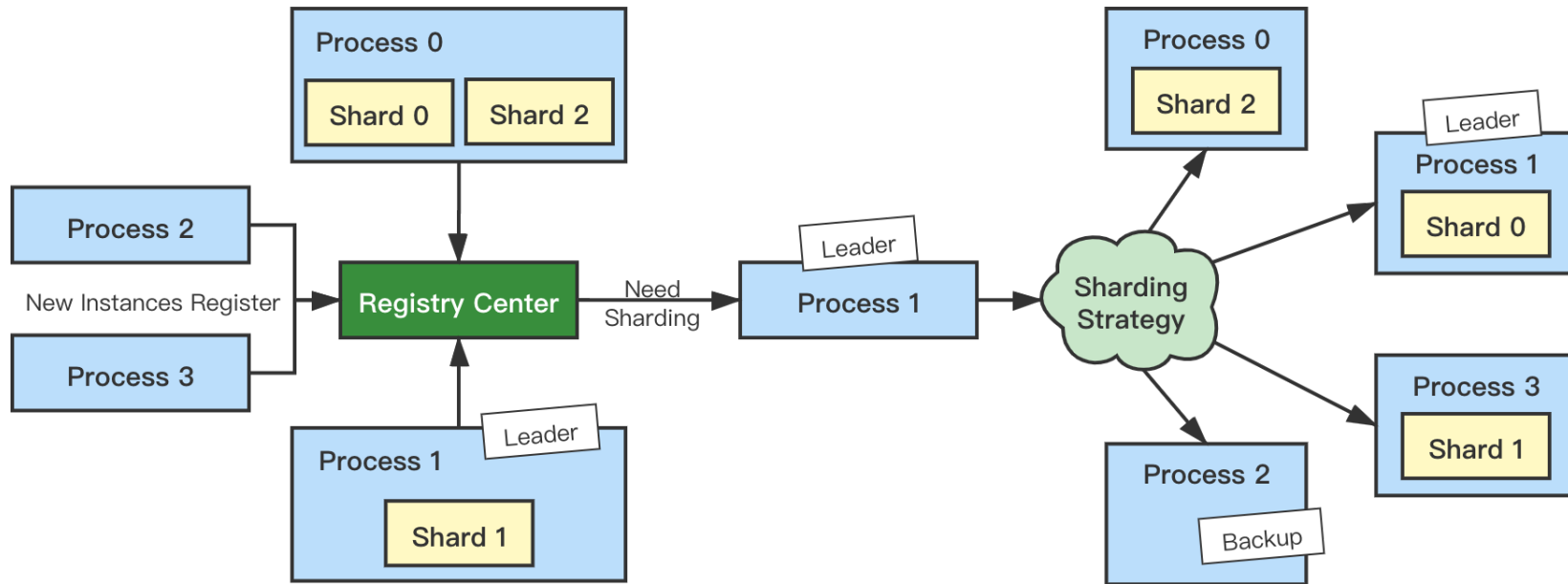
Architecture of ElasticJob Lite



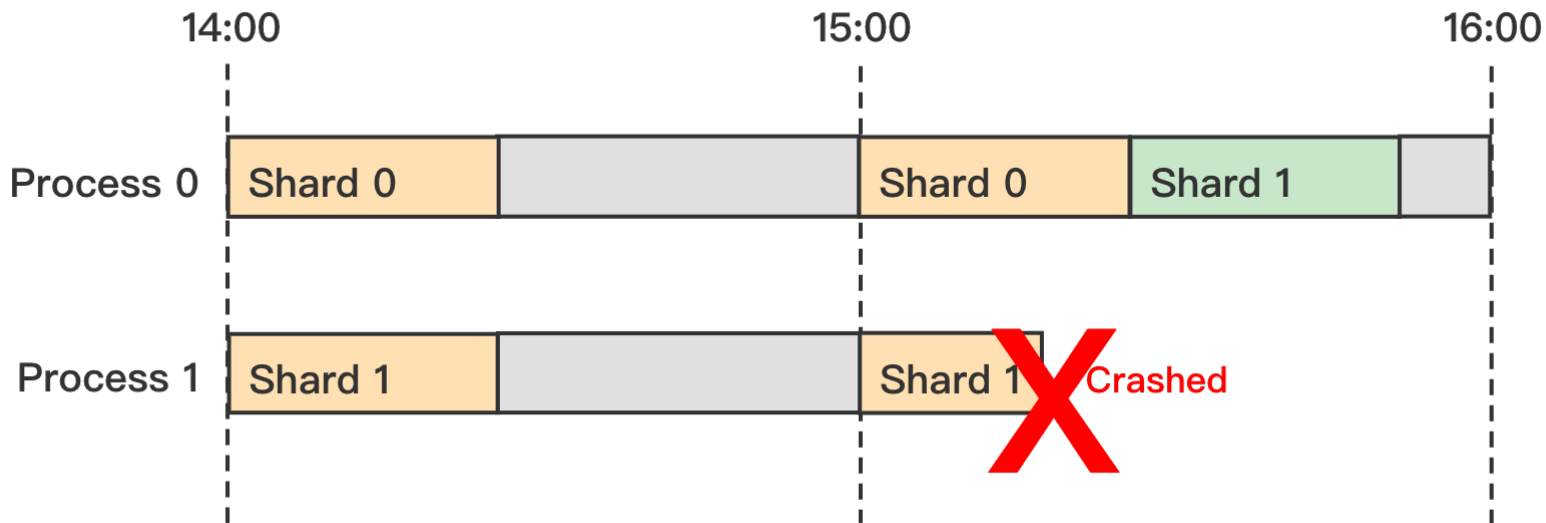
Job Sharding



Dynamic Sharding

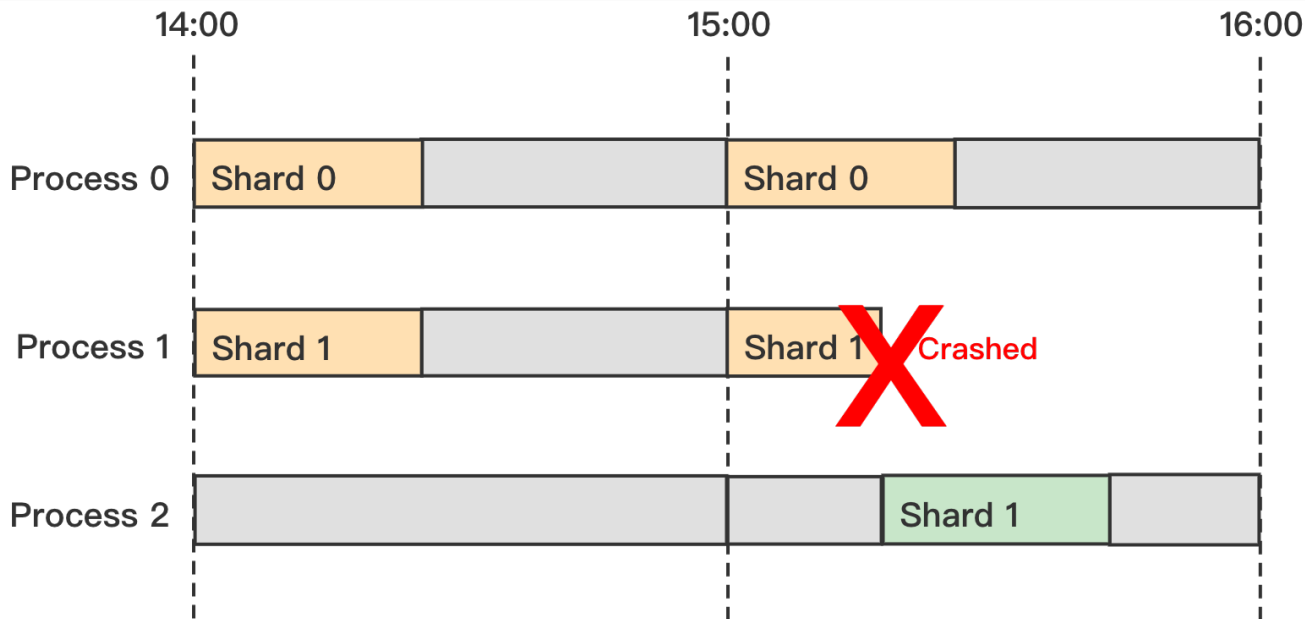


Failover



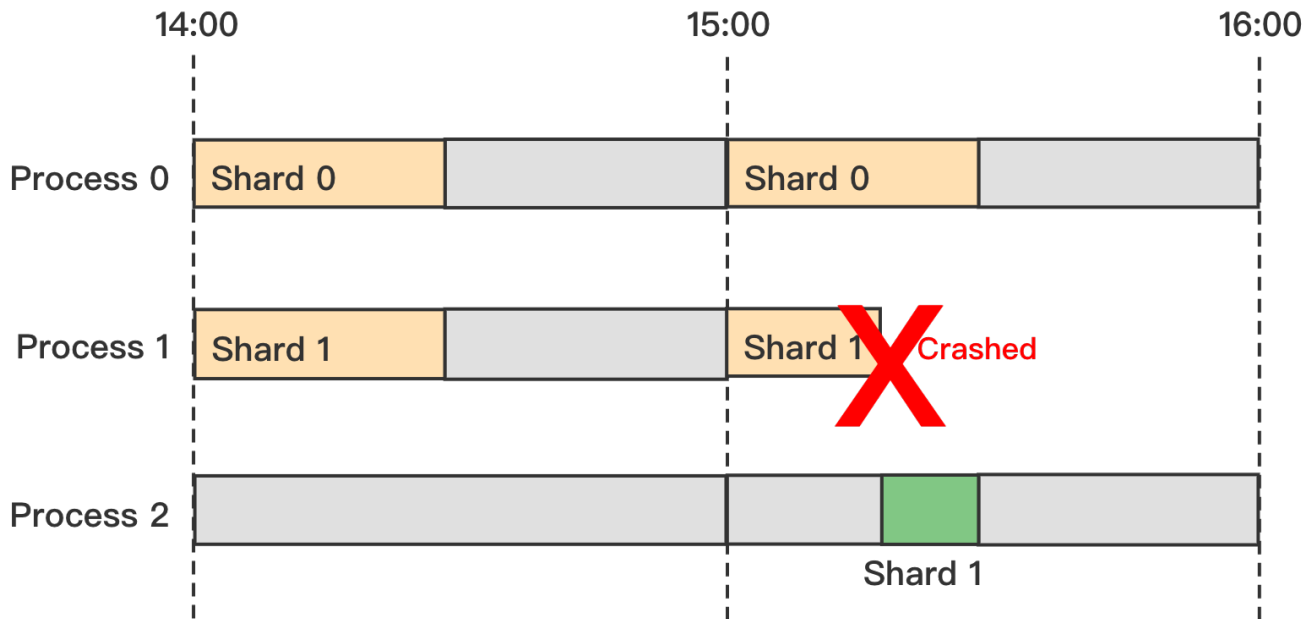
After finishing executing its job, the process will check if there is any shard that needs to be compensated.

Failover



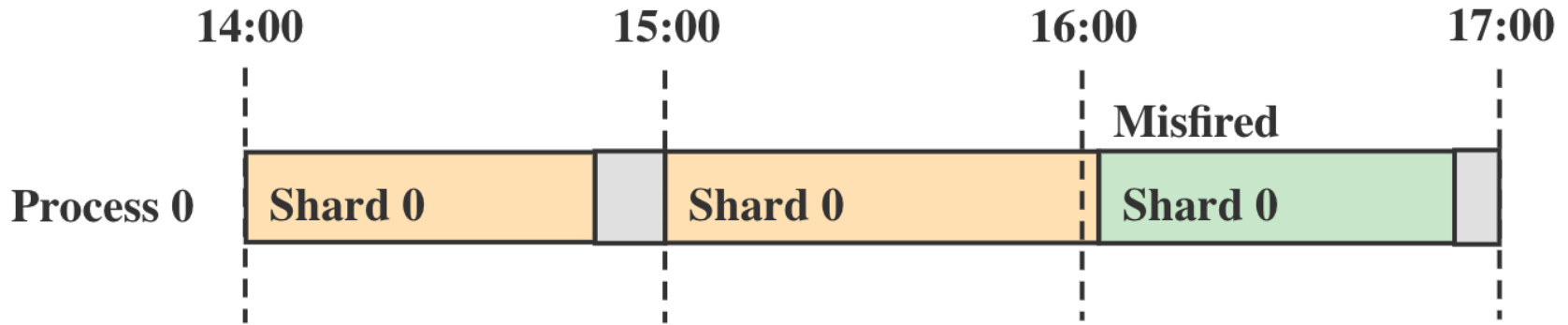
The process which scheduled the job but wasn't assigned any shards will compensate failover shards immediately once detected any instance crashed.

Failover



Ideally, the crashed shards still can be finished in time if the job's business logic supports breakpoint continuation.

Misfire



A job runs per hour : 0 0 * * * ?

ElasticJob UI



- Job Management
 - ✓ Job status
 - ✓ Configurations management
 - ✓ Trigger, enable/disable, shutdown...
- Server Management
 - ✓ Server status
 - ✓ Enable/disable, shutdown...
- Job History Tracking
 - ✓ Job execution log
 - ✓ Job status trace log

The screenshot shows the ShardingSphere ElasticJob UI. On the left is a dark sidebar with a menu containing: Global settings, Registry center, Event trace data source, Job operation, Job dimension, Server dimension, Job history (highlighted), Job trace, History status (highlighted in orange), and Help. The main content area is titled 'Home / Job history / History status'. It features a search bar with 'Job name', 'Creation time from', 'Creation time to', and 'Select state' dropdowns. Below is a table with columns: Job name, Sharding item, Status, Creation time, and Comments. The table contains 12 rows of job history data. At the bottom right of the table is a pagination control showing page 2 of 522.

Job name	Sharding item	Status	Creation time	Comments
backup-delivery	[1]	TASK_STAGING	2021-7-11 23:44:14	Job 'backup-delivery' execute begin.
backup-delivery	[0, 2]	TASK_STAGING	2021-7-11 23:44:14	Job 'backup-delivery' execute begin.
backup-delivery	[0, 2]	TASK_FINISHED	2021-7-11 23:44:13	
backup-delivery	[1]	TASK_FINISHED	2021-7-11 23:44:13	
backup-delivery	[0, 2]	TASK_RUNNING	2021-7-11 23:44:13	
backup-delivery	[1]	TASK_RUNNING	2021-7-11 23:44:13	
backup-delivery	[1]	TASK_STAGING	2021-7-11 23:44:13	Job 'backup-delivery' execute begin.
backup-delivery	[0, 2]	TASK_STAGING	2021-7-11 23:44:13	Job 'backup-delivery' execute begin.
backup-delivery	[0, 2]	TASK_FINISHED	2021-7-11 23:44:12	
backup-delivery	[1]	TASK_FINISHED	2021-7-11 23:44:12	

ElasticJob UI Job Management



ShardingSphere

- Global settings
- Job operation
- Job dimension**
- Server dimension
- Job history
- Help



No connected registry center

root

English

Home / Job operation / Job dimension

Search

Q

Job name	Sharding total count	Crontab	Description	Status	Operation
backup-delivery	3	0/10 ****?		Crashed	Update Remove
final-settlement	10	0 0 1 * ?		OK	Update Detail Trigger Disable Shutdown
job-instances-cleanup	1	0 0 0/1 * * ?		OK	Update Detail Trigger Disable Shutdown
one-off-backup-delivery	3			Crashed	Update Remove
order-status-checking	9	0 0/15 ****?		OK	Update Detail Trigger Disable Shutdown
server-ip-cleanup	1	0 ****?		OK	Update Detail Trigger Disable Shutdown
shadow-benchmark	64	0 0 3 * * ?		OK	Update Detail Trigger Disable Shutdown

ElasticJob UI Server Management



ShardingSphere

- Global settings
- Job operation
- Job dimension
- Server dimension**
- Job history
- Help



No connected registry center

root

English

Home / Job operation / Server dimension

Search



Server IP	Instance count	Job num	Disabled jobs num	Operation
172.17.0.2	1	5	0	Detail Disable Shutdown
172.17.0.3	1	5	0	Detail Disable Shutdown
172.17.0.4	1	5	0	Detail Disable Shutdown
172.17.0.5	1	5	0	Detail Disable Shutdown
172.17.0.6	1	5	0	Detail Disable Shutdown
192.168.0.103	2	7	0	Detail Disable Shutdown

ElasticJob UI

Job History Tracing



ShardingSphere

Home / Job history / History status

No connected registry center root English

Job name Creation time from - Creation time to Select state Q

Job name	Sharding item	Status	Creation time	Comments
backup-delivery	[1]	TASK_STAGING	2021-7-11 23:44:14	Job 'backup-delivery' execute begin.
backup-delivery	[0, 2]	TASK_STAGING	2021-7-11 23:44:14	Job 'backup-delivery' execute begin.
backup-delivery	[0, 2]	TASK_FINISHED	2021-7-11 23:44:13	
backup-delivery	[1]	TASK_FINISHED	2021-7-11 23:44:13	
backup-delivery	[0, 2]	TASK_RUNNING	2021-7-11 23:44:13	
backup-delivery	[1]	TASK_RUNNING	2021-7-11 23:44:13	
backup-delivery	[1]	TASK_STAGING	2021-7-11 23:44:13	Job 'backup-delivery' execute begin.
backup-delivery	[0, 2]	TASK_STAGING	2021-7-11 23:44:13	Job 'backup-delivery' execute begin.
backup-delivery	[0, 2]	TASK_FINISHED	2021-7-11 23:44:12	
backup-delivery	[1]	TASK_FINISHED	2021-7-11 23:44:12	

< 1 2 3 4 5 6 ... 522 >

Copyright © The Apache Software Foundation, Licensed under the Apache License 2

Application Scenarios



Job Sharding: Divides the work and makes it horizontal-scalable

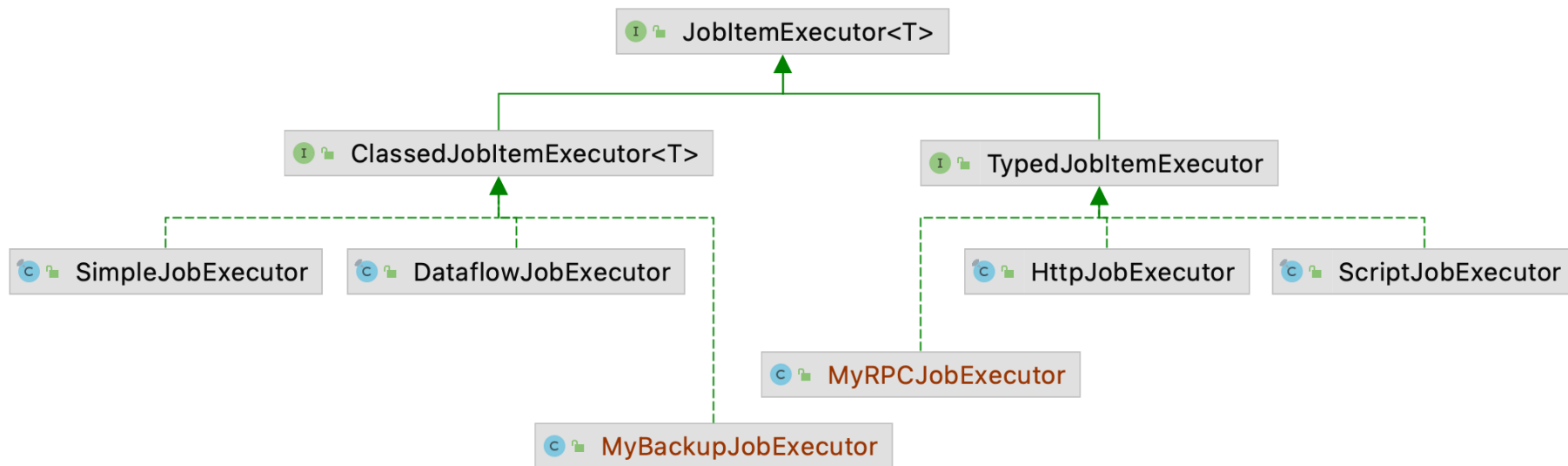
```
public class FinalSettlementJob implements DataflowJob<Order> {

    @Override
    public List<Order> fetchData(ShardingContext shardingContext) {
        return getOrder("select * from order where id % ? = ?",
            shardingContext.getShardingTotalCount(),
            shardingContext.getShardingItem());
    }

    @Override
    public void processData(ShardingContext context, List<Order> data) {
        // Processing Data
    }
}
```


What's new in 3.0.0

New Extensible Job API

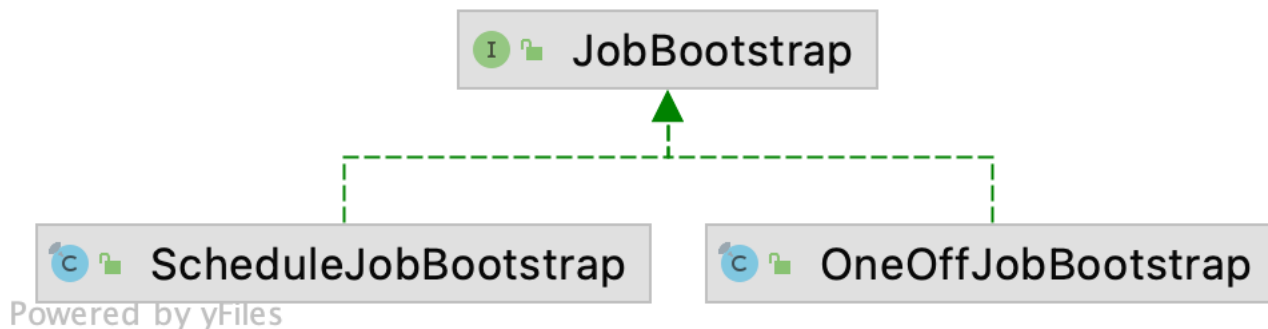


Powered by yFiles

Create and use your own JobItemExecutor by SPI

What's new in 3.0.0

A New Way to Trigger



1. `OneOffJobBootstrap job = /* Job Configuration*/`
2. `job.execute();`

Schedule jobs by Cron, or execute as you need

What's new in 3.0.0

ElasticJob Ecosystem



Job Executor

- Simple
- Dataflow
- Script
- **HTTP**

Tracing

- MySQL
- **PostgreSQL**
- **Oracle**
- **SQL Server**
- **DB2**
- **SQL92**

Job Error Handler

- **Email notification**
- **DingTalk notification**
- **WeCom notification**
- Ignore
- Log
- Throw

Bold: New in 3.0.0 and contributed by the community

What's new in 3.0.0

Spring Boot Starter

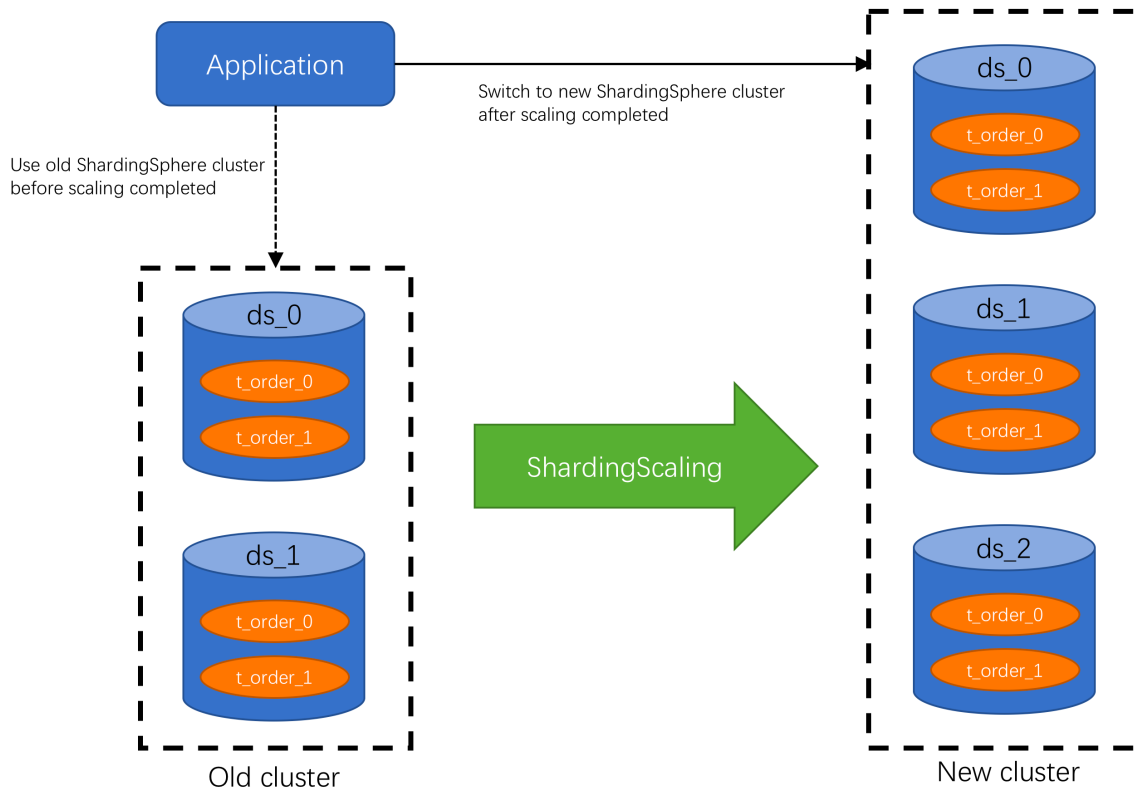


@Component

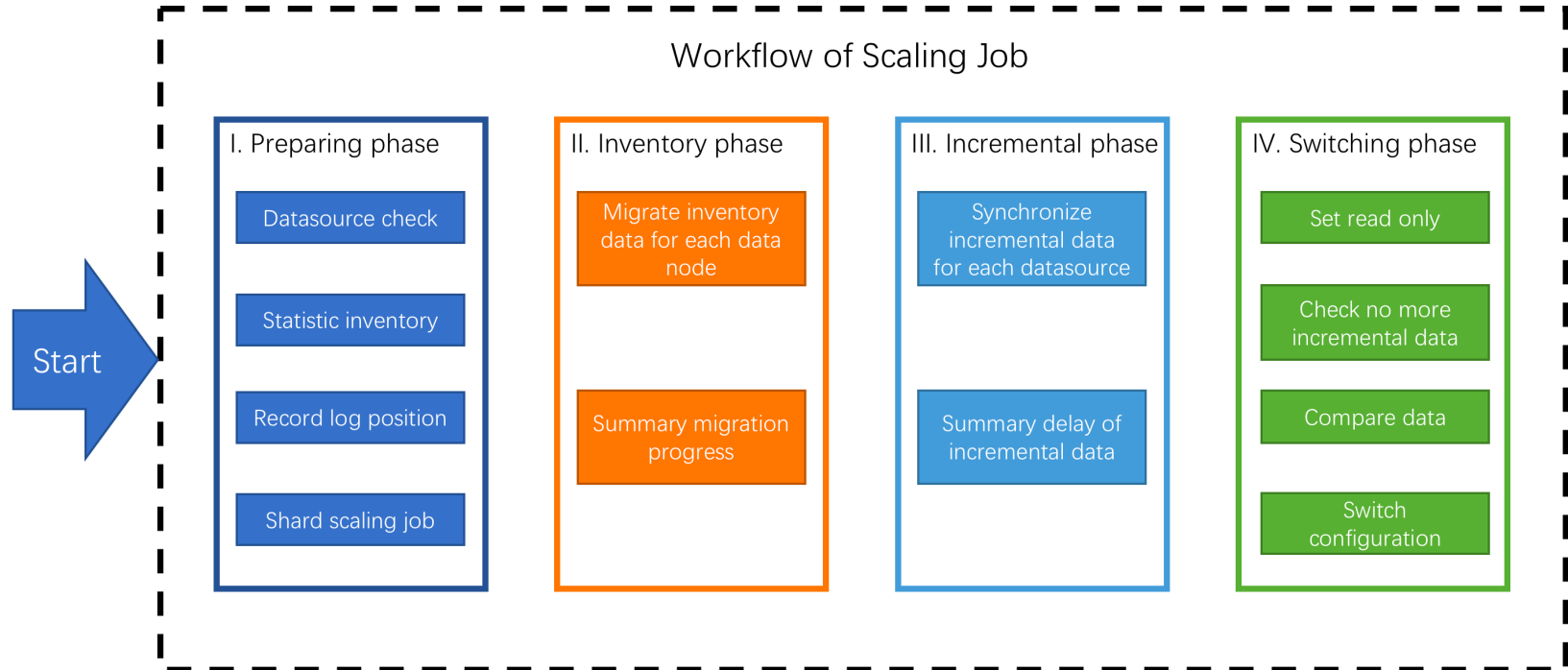
```
public class DataRefreshJob implements SimpleJob {
    @Override
    public void execute(final ShardingContext shardingContext) {
        // Do something here
    }
}
```

```
elasticjob:
  regCenter:
    serverLists: zookeeper0:2181,zookeeper1:2181,zookeeper2:2181
    namespace: schedule-jobs
  jobs:
    dataRefreshJob:
      elasticJobClass: org.path.to.DataRefreshJob
      cron: 0 0 0/6 * * ?
      shardingTotalCount: 3
      shardingItemParameters: 0=Beijing,1=Shanghai,2=Guangzhou
```

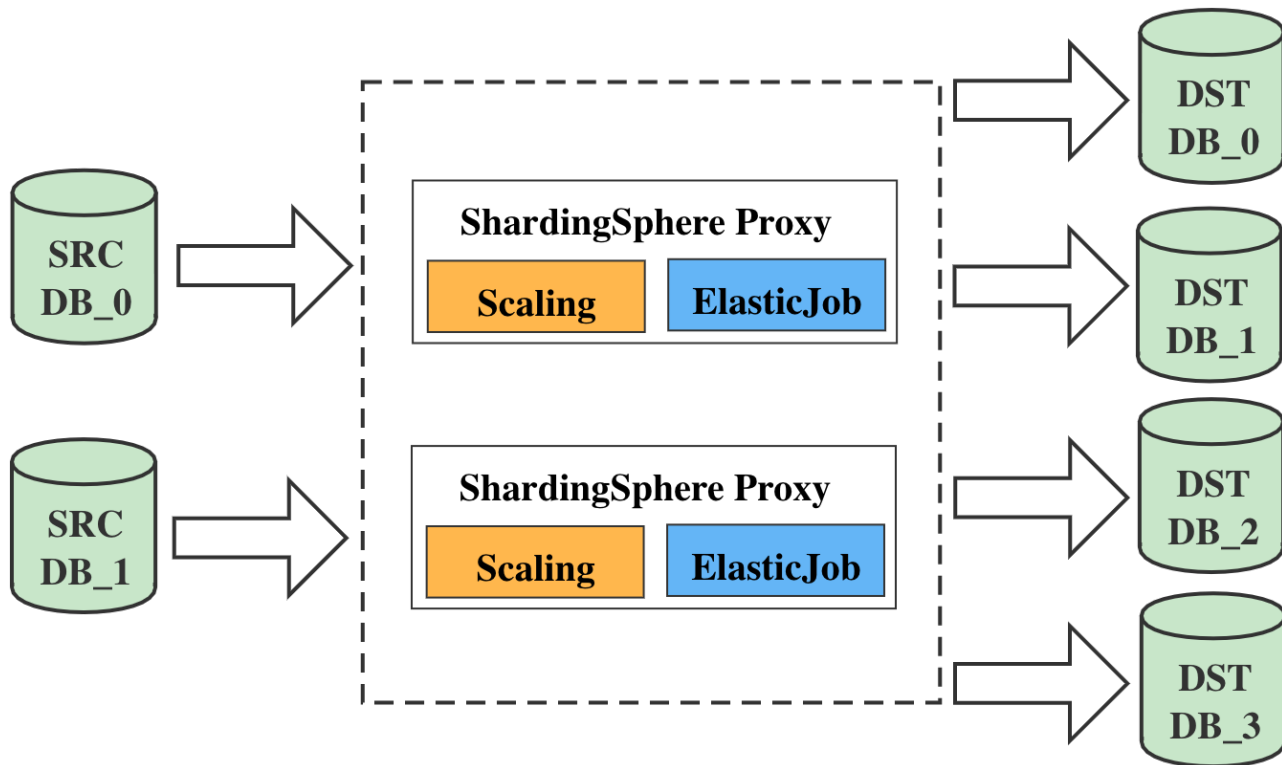
ShardingSphere Scaling



ShardingSphere Scaling



ElasticJob in ShardingSphere Scaling



Repository



APACHECON
ASIA 2021

ElasticJob

<https://github.com/apache/shardingsphere-elasticjob.git>

ElasticJob-UI

<https://github.com/apache/shardingsphere-elasticjob-ui.git>

THANK YOU

QUESTIONS?

Join us in Slack

