Shopee

Distributed Tracing in ClickHouse

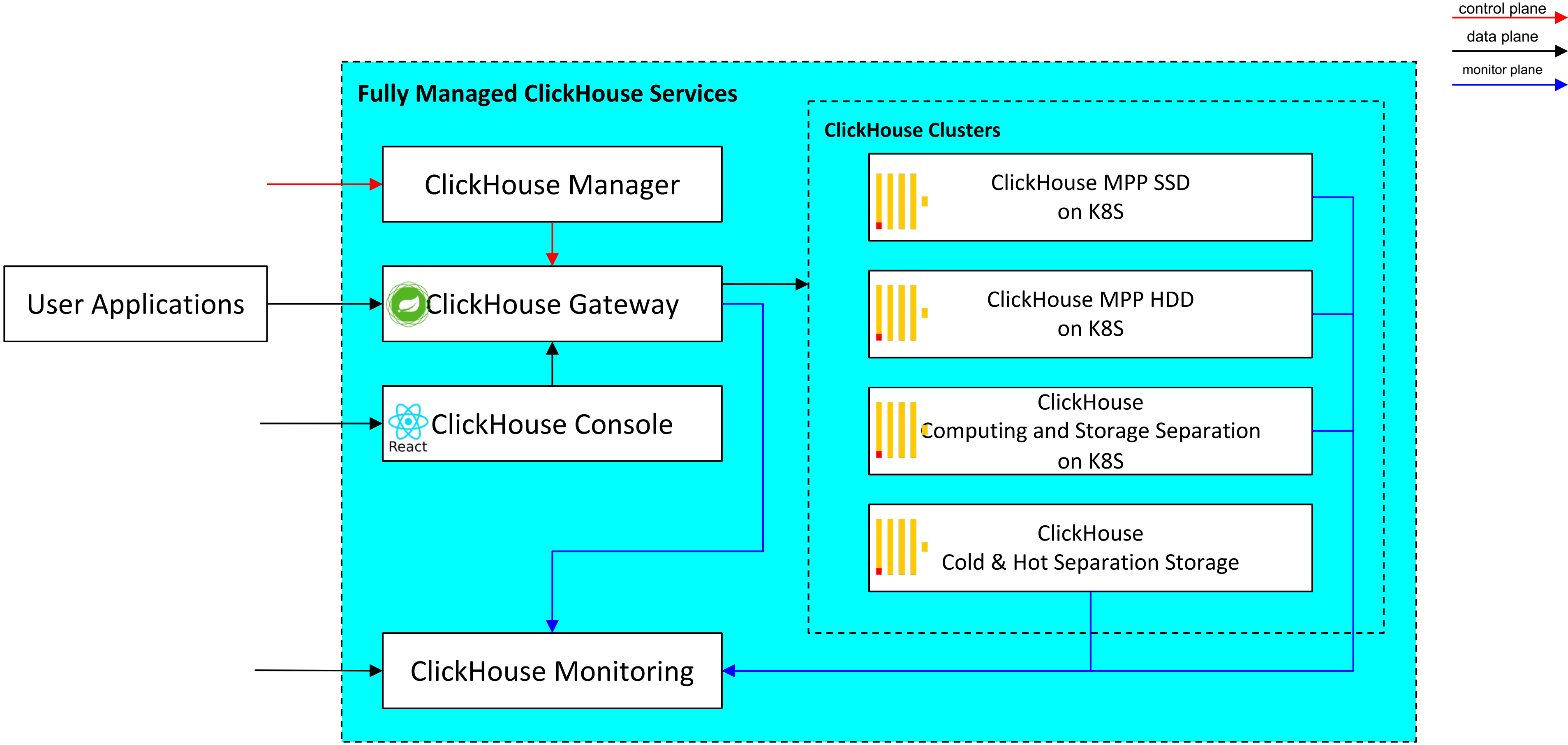
Frank Chen 16/03/2024

1. **Background**
2. Basic understanding of distributed tracing
3. Distributed tracing in/upon ClickHouse
4. Case Study

The ClickHouse in Shopee

- Anti Fraud Detecting
- User Behaviour Analytics
- Realtime Data warehouse
- Application Observability
- Video Quality Analytics
- AB Test
- Business Intelligence
- Application/Server Logs
- MySQL/ES Replacement

Holistic view of Shopee ClickHouse


control plane
data plane
monitor plane
Fully Managed ClickHouse Services
ClickHouse Manager
User Applications
ClickHouse Gateway
ClickHouse Console
React
ClickHouse Monitoring
ClickHouse Clusters
ClickHouse MPP SSD on K8S
ClickHouse MPP HDD on K8S
ClickHouse Computing and Storage Separation on K8S
ClickHouse Cold & Hot Separation Storage

Challenges

Why does my query return different responses?

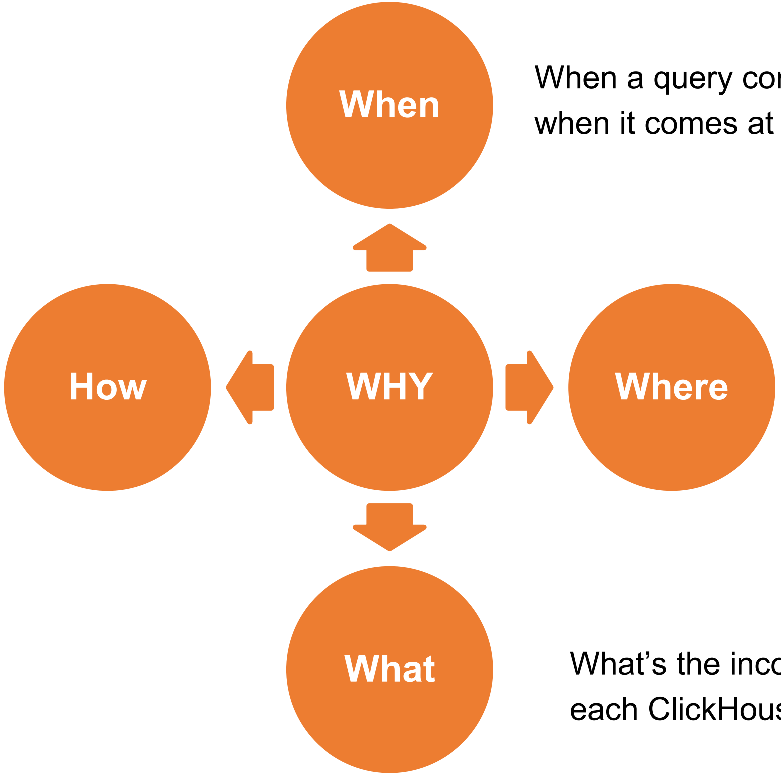
Why does my query fail occasionally?

Why does my INSERT query fail saying that table does not exist while the table does exist?

Why does ClickHouse take so long to process a query even the query is the very simple?

…

User questions break down



When a query comes at the gateway side and when it comes at the ClickHouse side

How a query is executed through the whole cluster, are there MVs executed for that query?

Where a query fails, gateway side or ClickHouse side

On Which node a query fails for a distributed query

For INSERT query, which shards does that query write data to

What's the incoming query and the sub-queries for each ClickHouse nodes

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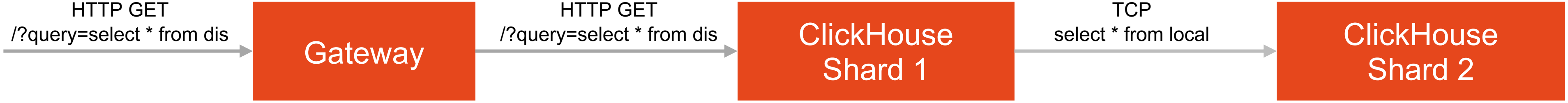
Rationale of distributed tracing(1)



HTTP GET
/?query=select * from dis

Gateway

HTTP GET
/?query=select * from dis

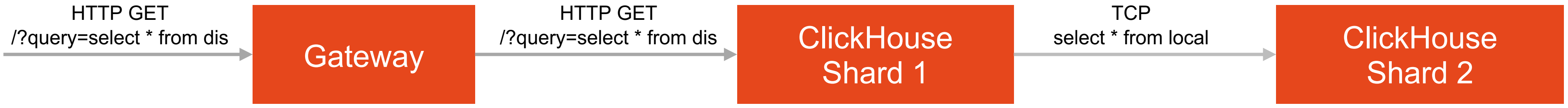
ClickHouse
Shard 1

TCP
select * from local

ClickHouse
Shard 2

GET /?query=select * from dis
startTime = 17:25:00.020
duration = 200ms

Rationale of distributed tracing(1)



HTTP GET
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Gateway

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/?query=select * from dis

ClickHouse
Shard 1

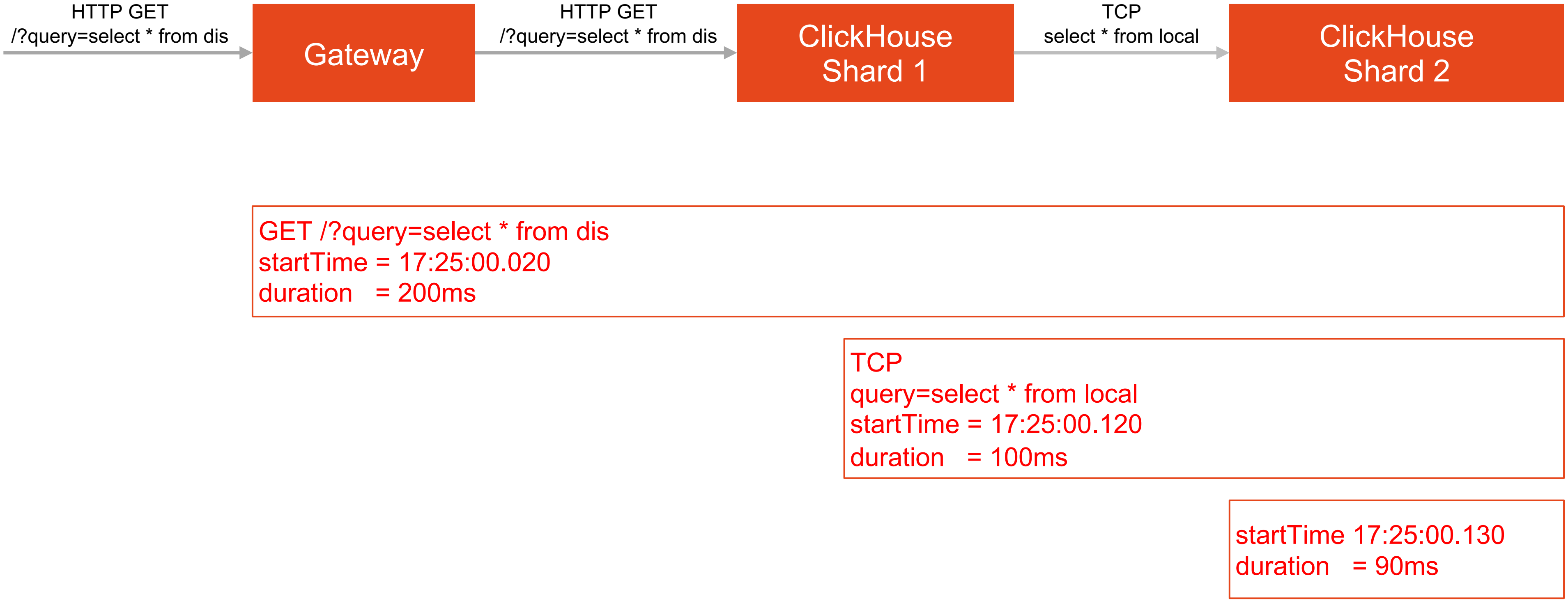
TCP
select * from local

ClickHouse
Shard 2

GET /?query=select * from dis
startTime = 17:25:00.020
duration = 200ms

TCP
query=select * from local
startTime = 17:25:00.120
duration = 100ms

Rationale of distributed tracing(1)



HTTP GET
/?query=select * from dis

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ClickHouse
Shard 1

TCP
select * from local

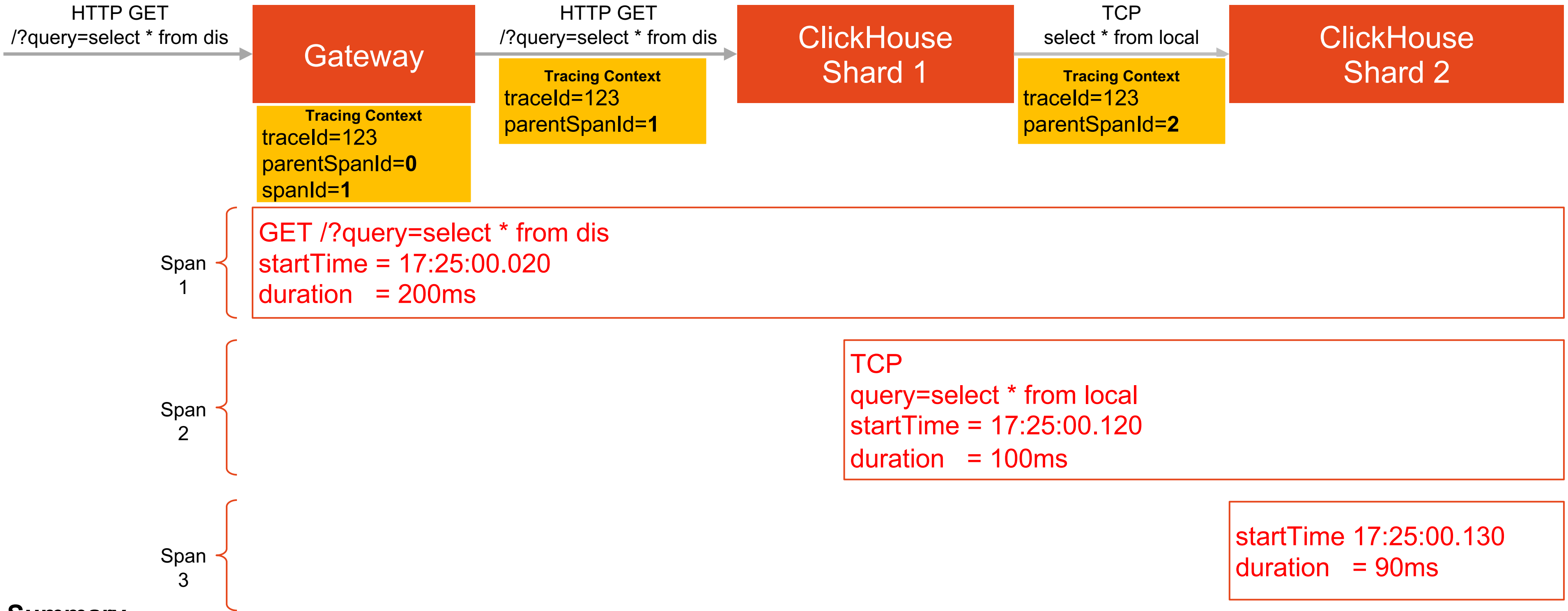
ClickHouse
Shard 2

GET /?query=select * from dis
startTime = 17:25:00.020
duration = 200ms

TCP
query=select * from local
startTime = 17:25:00.120
duration = 100ms

startTime 17:25:00.130
duration = 90ms

Rationale of distributed tracing(1)



HTTP GET
/?query=select * from dis

Gateway

Tracing Context
traceId=123
parentSpanId=**0**
spanId=**1**

HTTP GET
/?query=select * from dis

Tracing Context
traceId=123
parentSpanId=**1**

ClickHouse
Shard 1

TCP
select * from local

Tracing Context
traceId=123
parentSpanId=**2**

ClickHouse
Shard 2

Span
1

GET /?query=select * from dis
startTime = 17:25:00.020
duration = 200ms

Span
2

TCP
query=select * from local
startTime = 17:25:00.120
duration = 100ms

Span
3

startTime 17:25:00.130
duration = 90ms

Summary

At the start of HTTP request, application starts a unique context for current request

During the execution of such request inside one application, application can start a span to reflect execution of a method or a piece of code

When an application sends requests to external applications, they’re responsible to propagate the tracing context to other applications

Spans are related to each to simulate call stack

Rationale of distributed tracing(2)

Span Relationship

- Spans can be seen as a simulation of call stack, which is tree-like structure
- Spans use parent-child relationship to simulate the call stack structure

It would be much easier to understand the relationship of spans from the storage perspective

- Each span has a unique id inside one tracing context
- Each span has a parent span Id, indicating the caller of current span

application	instance	traceId	parentSpanId	spanId	name	url	startTime	duration
Gateway	10.1.1.1	12345678	0	1	http-server	/?query=xxx	17:25:00.020	200
Shard 1	192.168.0.1	12345678	1	2	http-server	/?query=xxx	17:25:00.030	190
Shard 2	192.168.0.1	12345678	2	3	query		17:25:00.120	100
Shard 2	192.168.0.2	12345678	3	4	tcp-server		17:25:00.130	90

By looking at the tracing logs, we know which component accounts for most of the time

Distributed tracing protocols

The key in the protocol is propagation of trace id and parent span id

Anyone can define its own protocol

For HTTP, HTTP headers are used to carry these information

zipkin

X-B3-TraceId: 0af7651916cd43dd8448eb211c80319c
X-B3-ParentSpanId: b7ad6b7169203331
X-B3-SpanId: 169206cd43dd8473

pinpoint

Pinpoint-TraceID: 0af7651916cd43dd8448eb211c80319c
Pinpoint-pSpanID: b7ad6b7169203331
Pinpoint-SpanID: 169206cd43dd8473

OpenTelementry

$$\texttt{traceparent: }\underbrace{\texttt{00}}_{\textbf{Version}}\texttt{-}\underbrace{\texttt{0af7651916cd43dd8448eb211c80319c}}_{\textbf{Trace Id}}\texttt{-}\underbrace{\texttt{b7ad6b7169203331}}_{\textbf{Span Id}}\texttt{-}\underbrace{\texttt{01}}_{\textbf{Flags}}$$

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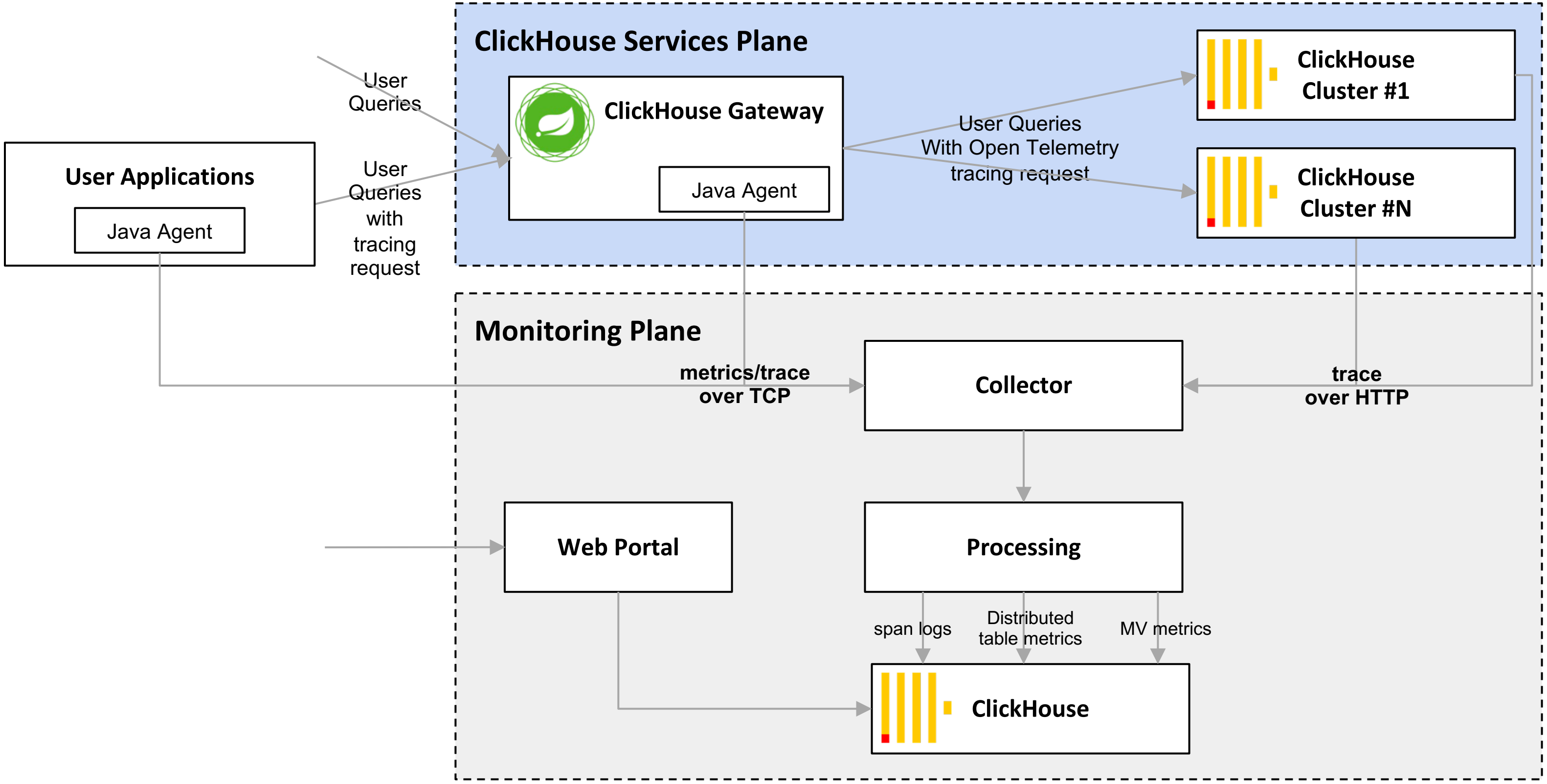
High level view of distributed tracing in ClickHouse



Challenges of implementing tracing in ClickHouse

Tracing Context Propagation across threads	A problem must to be solved to adapt multiple threads applications
ASYNC Insert on distributed table	ClickHouse specific problem Private tracing context propagation
ON CLUSTER DDL	ClickHouse specific problem Private tracing context propagation
Huge data processing and storage and query	HBase ? ES ?

The distributed tracing feature in ClickHouse

We started the work 3 years ago, on ClickHouse 21.3

The distributed tracing feature in ClickHouse was then just a prototype, and full of bugs

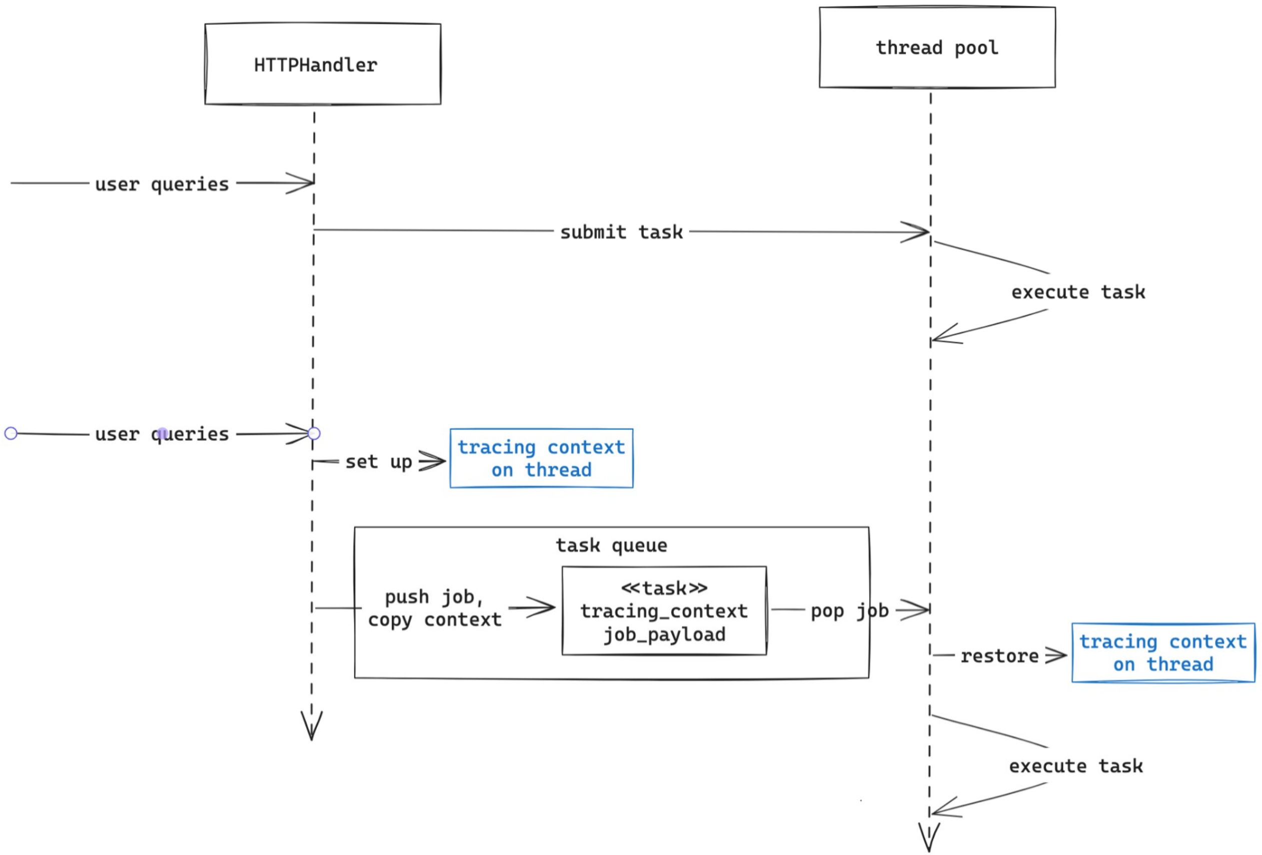
The core of distributed tracing feature was re-worked

95% of work has been contributed back to the community(23.3)

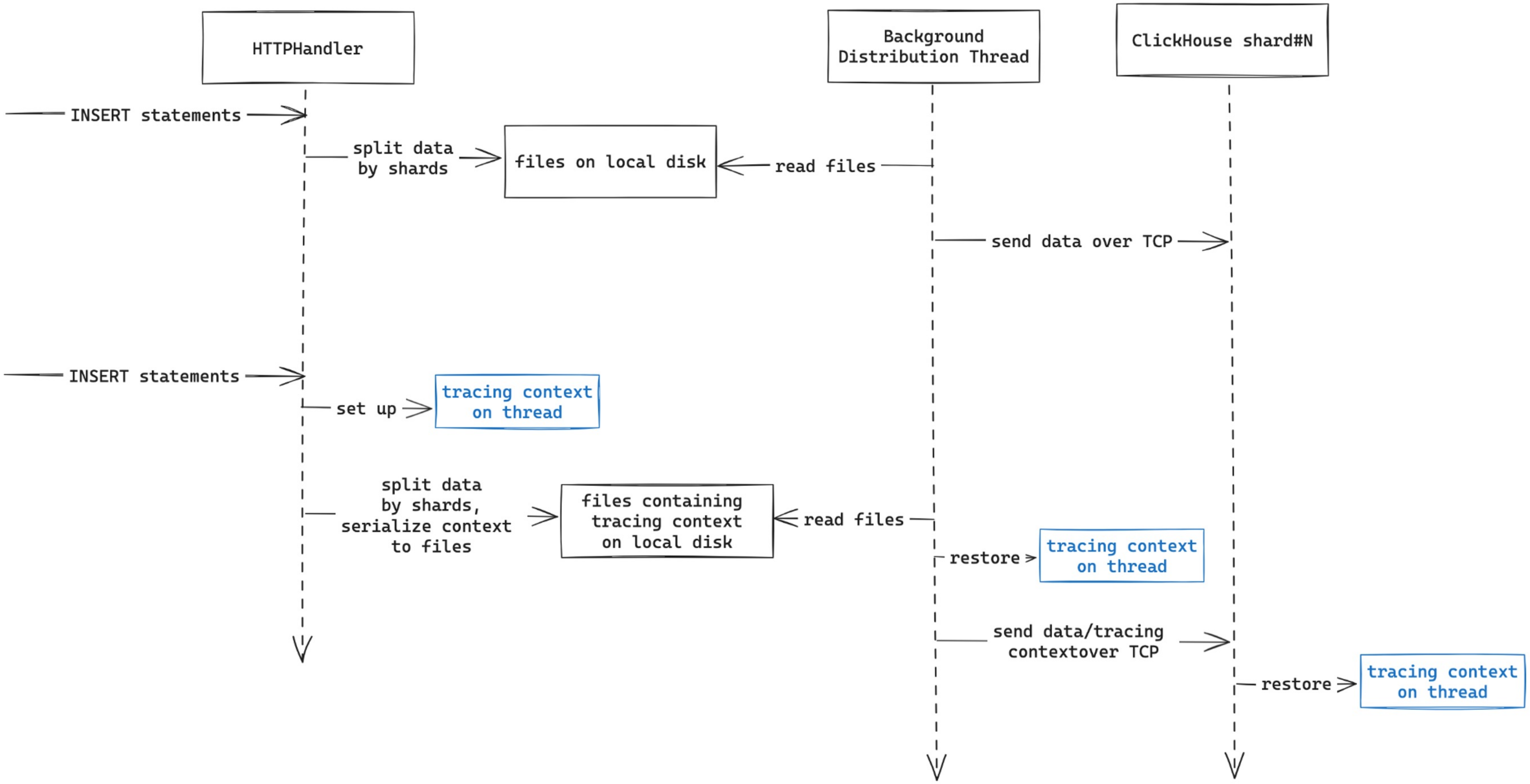
Category	Community Version Status @ 21.3
Queries	Buggy
Async INSERT on distributed table	Not Fully Supported
DDL	Buggy
ON CLUSTER DDL	Not Supported
Materialized View	Not Supported
Asynchronous tasks for query execution	Buggy
Log Export via URL Engine	Buggy

Addressing challenges of the async tasks

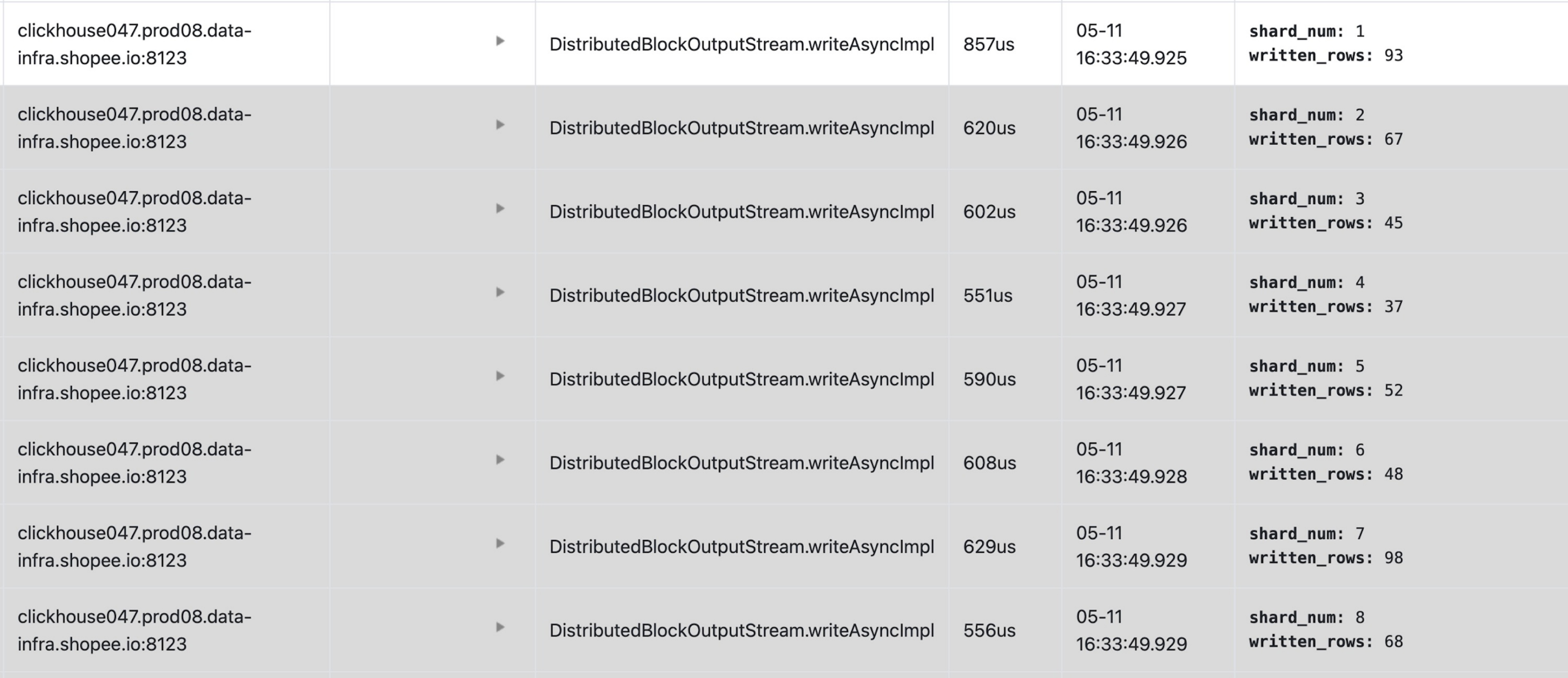
ClickHouse internally uses multiple threads to execute a query
How can we maintain the tracing context across threads?



Addressing the challenges of ASYNC INSERT on distributed tables

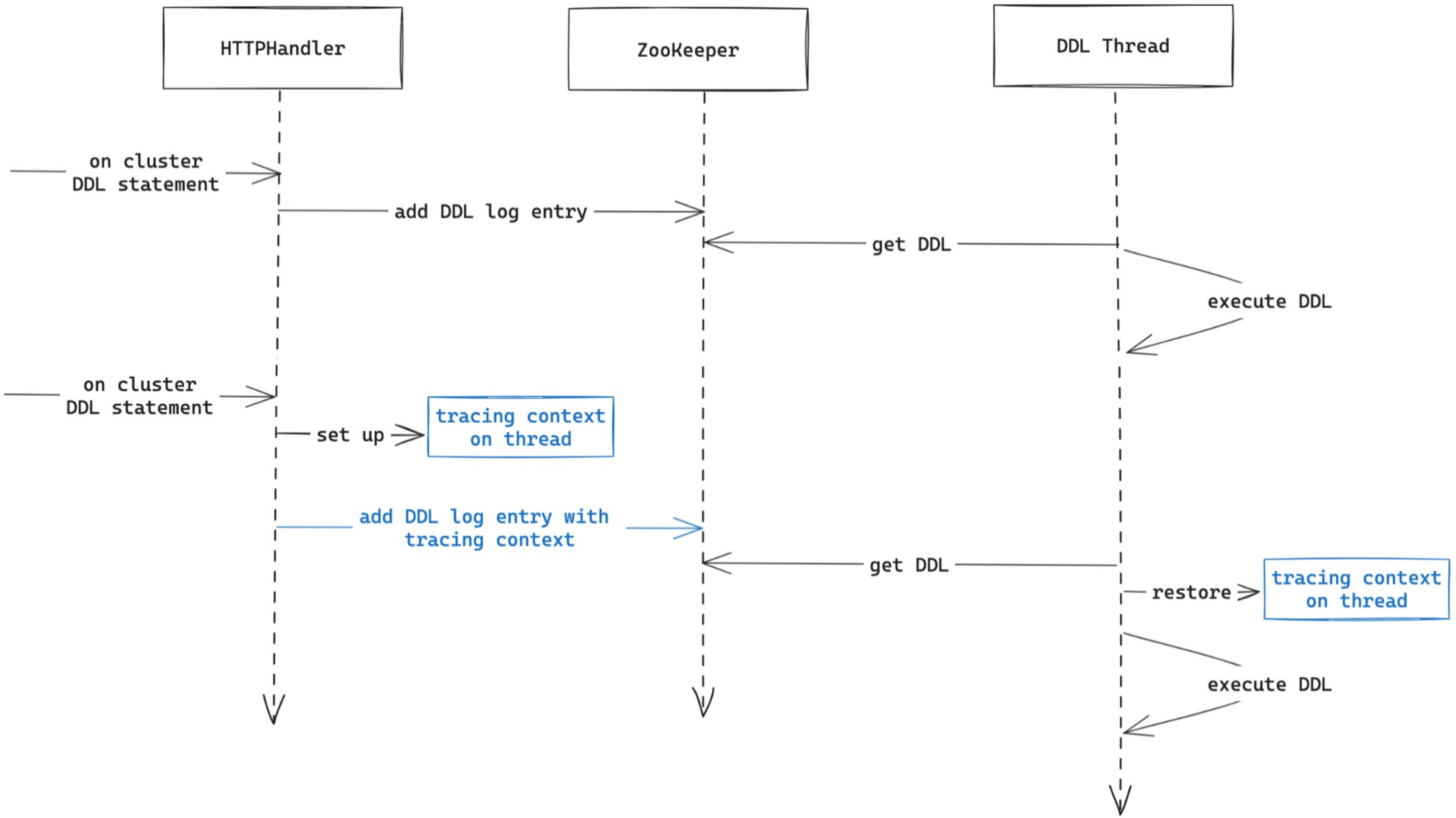

HTTPHandler
Background Distribution Thread
ClickHouse shard#N
INSERT statements
split data by shards
files on local disk
read files
send data over TCP
INSERT statements
set up
tracing context on thread
split data by shards, serialize context to files
files containing tracing context on local disk
read files
restore
tracing context on thread
send data/tracing contextover TCP
restore
tracing context on thread

Example

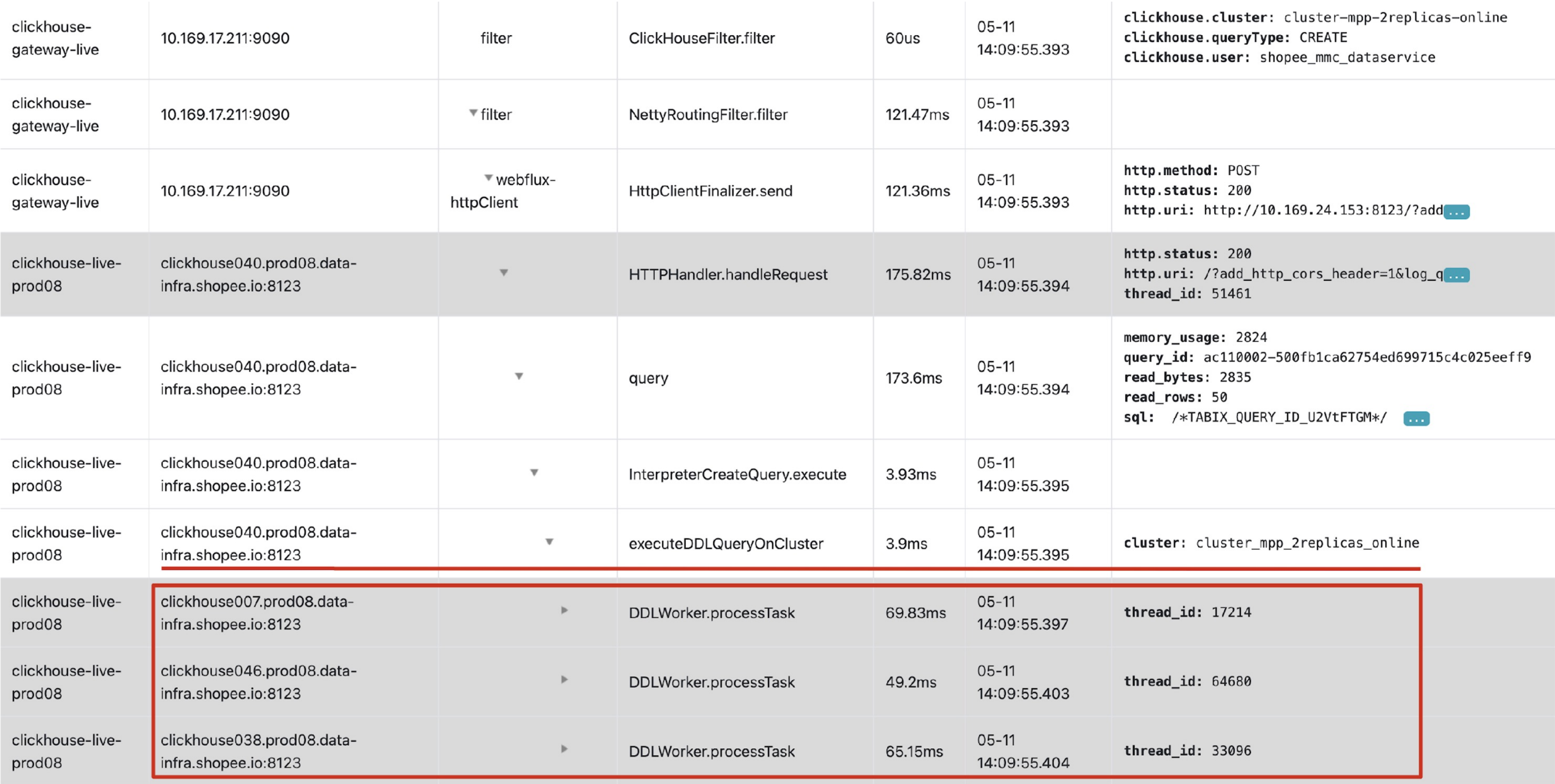


clickhouse047.prod08.data-infra.shopee.io:8123	▶	DistributedBlockOutputStream.writeAsyncImpl	857us	05-11 16:33:49.925	**shard_num:** 1 **written_rows:** 93
clickhouse047.prod08.data-infra.shopee.io:8123	▶	DistributedBlockOutputStream.writeAsyncImpl	620us	05-11 16:33:49.926	**shard_num:** 2 **written_rows:** 67
clickhouse047.prod08.data-infra.shopee.io:8123	▶	DistributedBlockOutputStream.writeAsyncImpl	602us	05-11 16:33:49.926	**shard_num:** 3 **written_rows:** 45
clickhouse047.prod08.data-infra.shopee.io:8123	▶	DistributedBlockOutputStream.writeAsyncImpl	551us	05-11 16:33:49.927	**shard_num:** 4 **written_rows:** 37
clickhouse047.prod08.data-infra.shopee.io:8123	▶	DistributedBlockOutputStream.writeAsyncImpl	590us	05-11 16:33:49.927	**shard_num:** 5 **written_rows:** 52
clickhouse047.prod08.data-infra.shopee.io:8123	▶	DistributedBlockOutputStream.writeAsyncImpl	608us	05-11 16:33:49.928	**shard_num:** 6 **written_rows:** 48
clickhouse047.prod08.data-infra.shopee.io:8123	▶	DistributedBlockOutputStream.writeAsyncImpl	629us	05-11 16:33:49.929	**shard_num:** 7 **written_rows:** 98
clickhouse047.prod08.data-infra.shopee.io:8123	▶	DistributedBlockOutputStream.writeAsyncImpl	556us	05-11 16:33:49.929	**shard_num:** 8 **written_rows:** 68

Addressing the challenges of ON CLUSTER DDLs

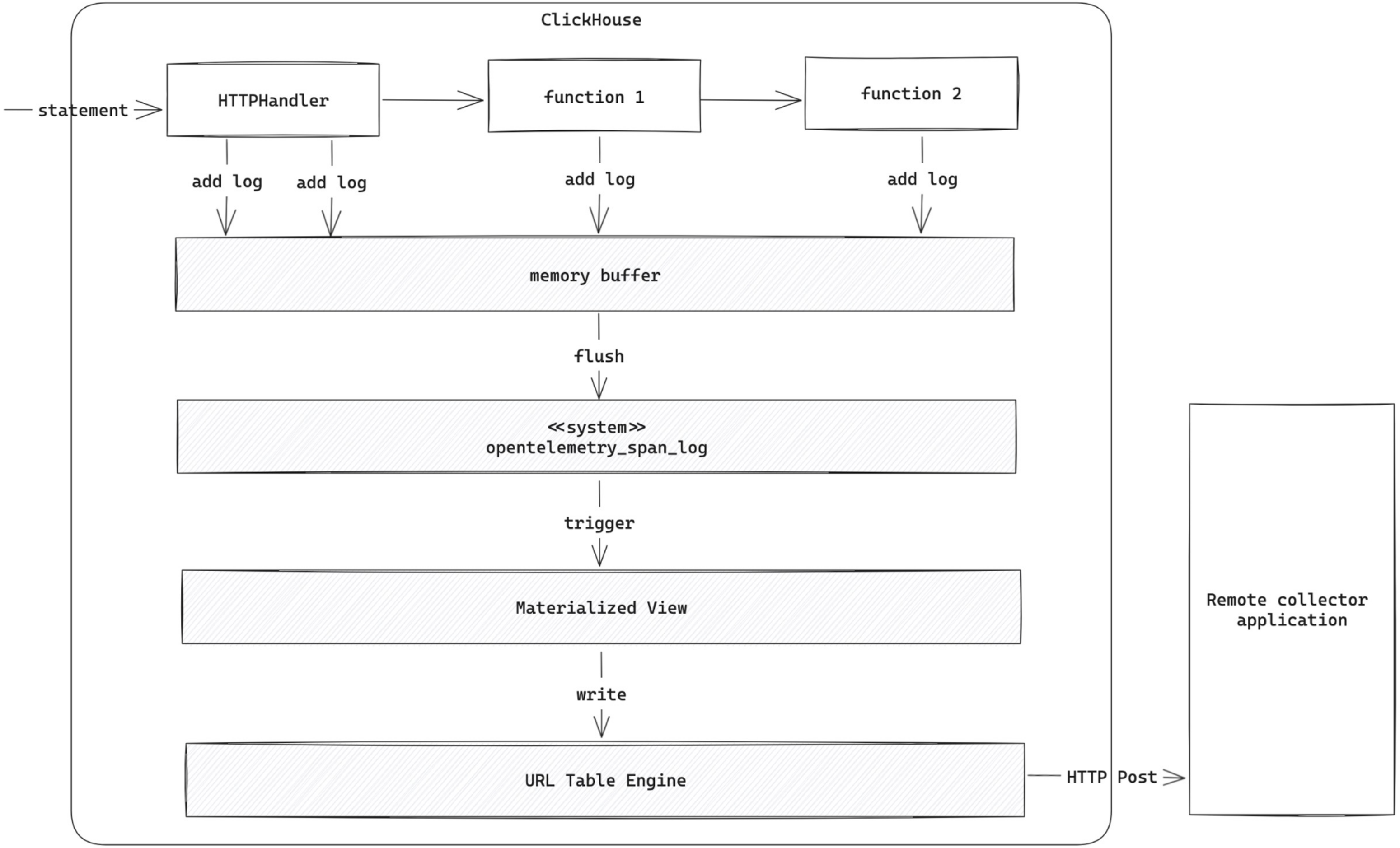


Example

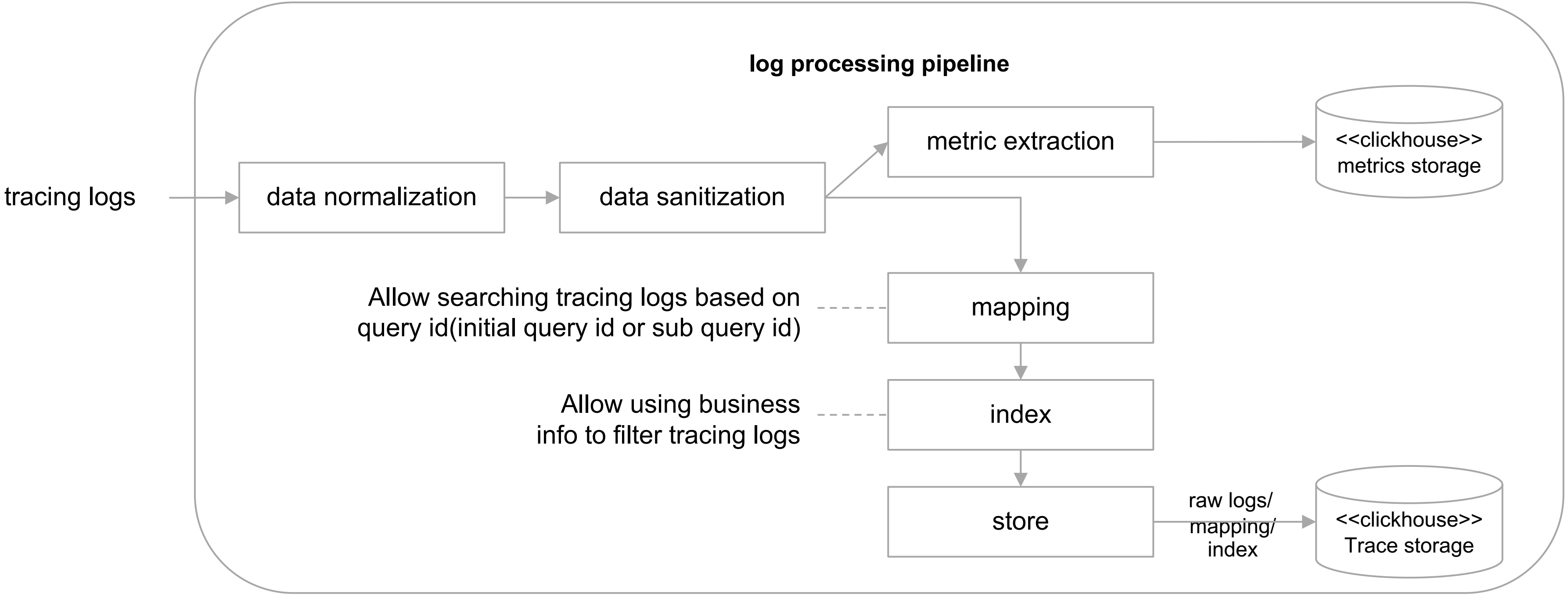


clickhouse-gateway-live	10.169.17.211:9090	filter	ClickHouseFilter.filter	60us	05-11 14:09:55.393	**clickhouse.cluster:** cluster-mpp-2replicas-online **clickhouse.queryType:** CREATE **clickhouse.user:** shopee_mmc_dataservice
clickhouse-gateway-live	10.169.17.211:9090	▼ filter	NettyRoutingFilter.filter	121.47ms	05-11 14:09:55.393	
clickhouse-gateway-live	10.169.17.211:9090	▼ webflux-httpClient	HttpClientFinalizer.send	121.36ms	05-11 14:09:55.393	**http.method:** POST **http.status:** 200 **http.uri:** http://10.169.24.153:8123/?add ...
clickhouse-live-prod08	clickhouse040.prod08.data-infra.shopee.io:8123	▼	HTTPHandler.handleRequest	175.82ms	05-11 14:09:55.394	**http.status:** 200 **http.uri:** /?add_http_cors_header=1&log_q ... **thread_id:** 51461
clickhouse-live-prod08	clickhouse040.prod08.data-infra.shopee.io:8123	▼	query	173.6ms	05-11 14:09:55.394	**memory_usage:** 2824 **query_id:** ac110002-500fb1ca62754ed699715c4c025eeff9 **read_bytes:** 2835 **read_rows:** 50 **sql:** /*TABIX_QUERY_ID_U2VtFTGM*/ ...
clickhouse-live-prod08	clickhouse040.prod08.data-infra.shopee.io:8123	▼	InterpreterCreateQuery.execute	3.93ms	05-11 14:09:55.395	
clickhouse-live-prod08	clickhouse040.prod08.data-infra.shopee.io:8123	▼	executeDDLQueryOnCluster	3.9ms	05-11 14:09:55.395	**cluster:** cluster_mpp_2replicas_online
clickhouse-live-prod08	clickhouse007.prod08.data-infra.shopee.io:8123	▸	DDLWorker.processTask	69.83ms	05-11 14:09:55.397	**thread_id:** 17214
clickhouse-live-prod08	clickhouse046.prod08.data-infra.shopee.io:8123	▸	DDLWorker.processTask	49.2ms	05-11 14:09:55.403	**thread_id:** 64680
clickhouse-live-prod08	clickhouse038.prod08.data-infra.shopee.io:8123	▸	DDLWorker.processTask	65.15ms	05-11 14:09:55.404	**thread_id:** 33096

Distributed tracing log collection



Log processing out of ClickHouse



Store distributed tracing logs in ClickHouse

ClickHouse in return is used to store distributed tracing logs

Higher compression ratio

- Default LZ compress archives 20% compression ratio while zstd can achieve about 13% compression ratio
- 1:8 compression ratio in general

Higher throughput for INSERT

- Data can be inserted in very large batch, typically 300K rows per INSERT, greatly improved the performance of data processing middleware
- 3 million rows inserted per second

Hybrid disks support

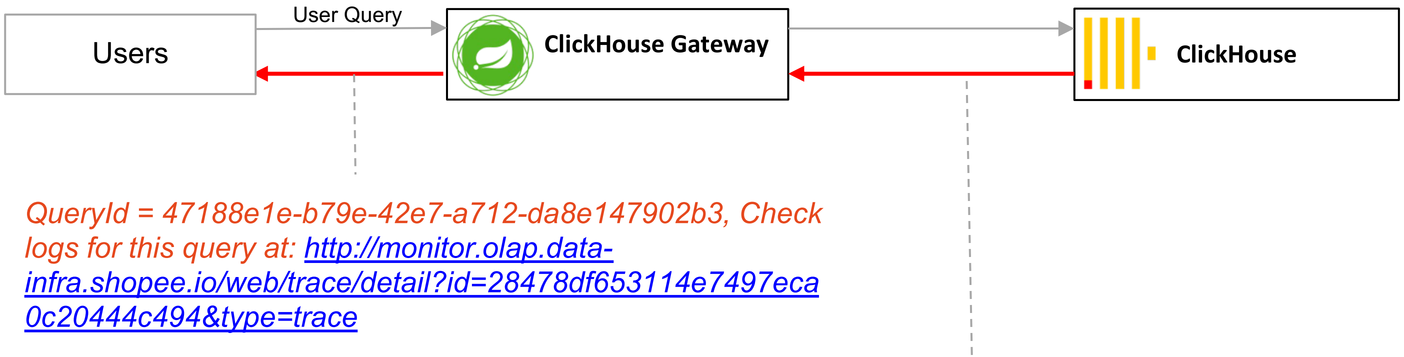
- SSD for short term storage
- HDD for longer term storage

Better analytics support

Open the black box for users(1)

To find tracing logs for specific query, a query id or trace id is needed, but

- trace id is automatically generated at server side, is not visible for clients
- query id is also sometimes automatically generated by libraries(like JDBC), it’s invisible for clients

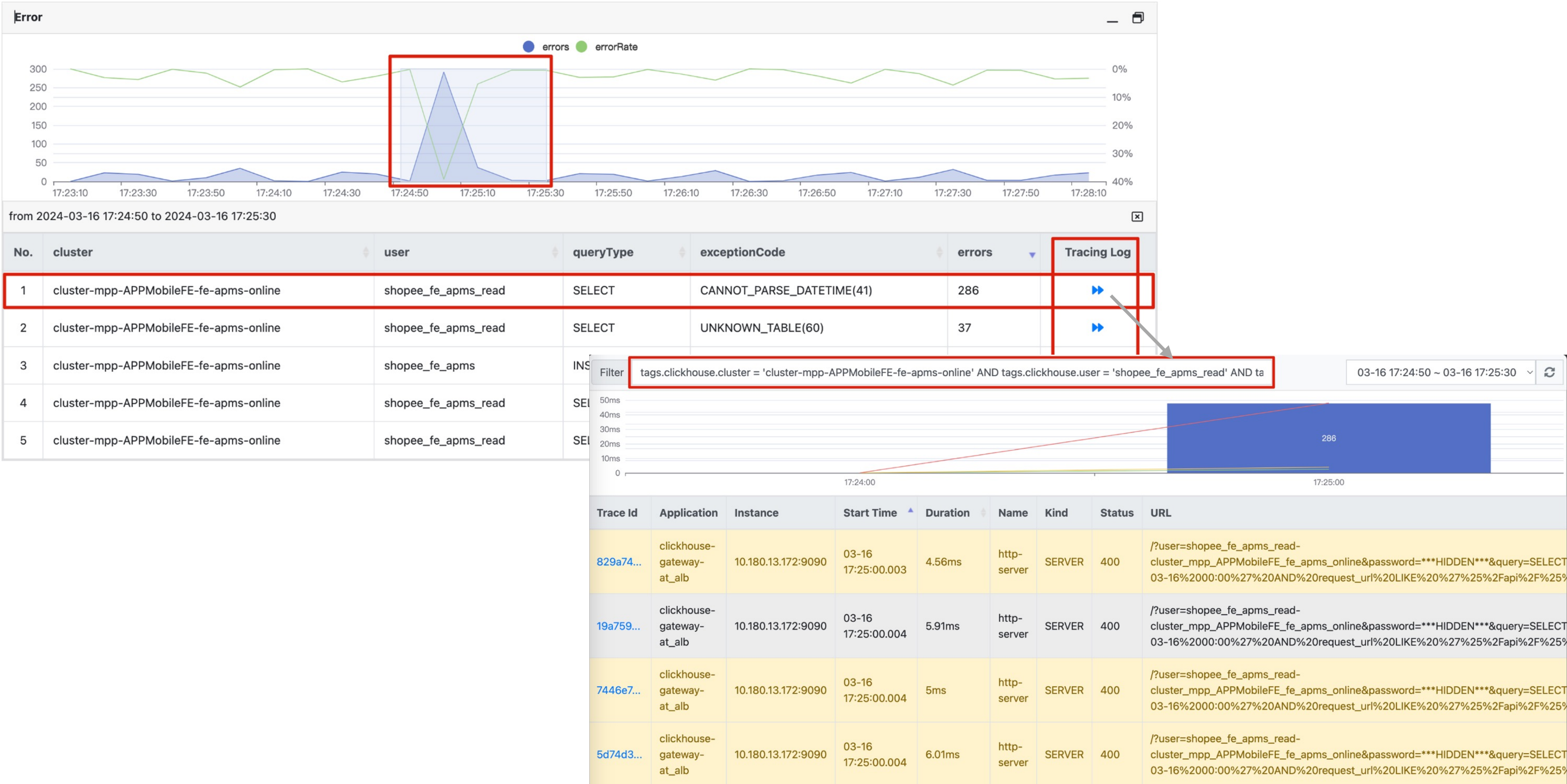


QueryId = 47188e1e-b79e-42e7-a712-da8e147902b3, Check logs for this query at: http://monitor.olap.data-infra.shopee.io/web/trace/detail?id=28478df653114e7497eca0c20444c494&type=trace

Code: 47. DB::Exception: Missing columns: 'ext' …

Code: 47. DB::Exception: Missing columns: 'ext' …

Open the black box for users(2) - Search tracing logs through metrics dashboard



from 2024-03-16 17:24:50 to 2024-03-16 17:25:30

No.	cluster	user	queryType	exceptionCode	errors	Tracing Log
1	cluster-mpp-APPMobileFE-fe-apms-online	shopee_fe_apms_read	SELECT	CANNOT_PARSE_DATETIME(41)	286	⏩
2	cluster-mpp-APPMobileFE-fe-apms-online	shopee_fe_apms_read	SELECT	UNKNOWN_TABLE(60)	37	⏩
3	cluster-mpp-APPMobileFE-fe-apms-online	shopee_fe_apms	INS			
4	cluster-mpp-APPMobileFE-fe-apms-online	shopee_fe_apms_read	SEI			
5	cluster-mpp-APPMobileFE-fe-apms-online	shopee_fe_apms_read	SEI			

Filter: tags.clickhouse.cluster = 'cluster-mpp-APPMobileFE-fe-apms-online' AND tags.clickhouse.user = 'shopee_fe_apms_read' AND ta

03-16 17:24:50 ~ 03-16 17:25:30

Trace Id	Application	Instance	Start Time	Duration	Name	Kind	Status	URL
829a74...	clickhouse-gateway-at_alb	10.180.13.172:9090	03-16 17:25:00.003	4.56ms	http-server	SERVER	400	/?user=shopee_fe_apms_read-cluster_mpp_APPMobileFE_fe_apms_online&password=***HIDDEN***&query=SELECT 03-16%2000:00%27%20AND%20request_url%20LIKE%20%27%25%2Fapi%2F%25
19a759...	clickhouse-gateway-at_alb	10.180.13.172:9090	03-16 17:25:00.004	5.91ms	http-server	SERVER	400	/?user=shopee_fe_apms_read-cluster_mpp_APPMobileFE_fe_apms_online&password=***HIDDEN***&query=SELECT 03-16%2000:00%27%20AND%20request_url%20LIKE%20%27%25%2Fapi%2F%25
7446e7...	clickhouse-gateway-at_alb	10.180.13.172:9090	03-16 17:25:00.004	5ms	http-server	SERVER	400	/?user=shopee_fe_apms_read-cluster_mpp_APPMobileFE_fe_apms_online&password=***HIDDEN***&query=SELECT 03-16%2000:00%27%20AND%20request_url%20LIKE%20%27%25%2Fapi%2F%25
5d74d3...	clickhouse-gateway-at_alb	10.180.13.172:9090	03-16 17:25:00.004	6.01ms	http-server	SERVER	400	/?user=shopee_fe_apms_read-cluster_mpp_APPMobileFE_fe_apms_online&password=***HIDDEN***&query=SELECT 03-16%2000:00%27%20AND%20request_url%20LIKE%20%27%25%2Fapi%2F%25

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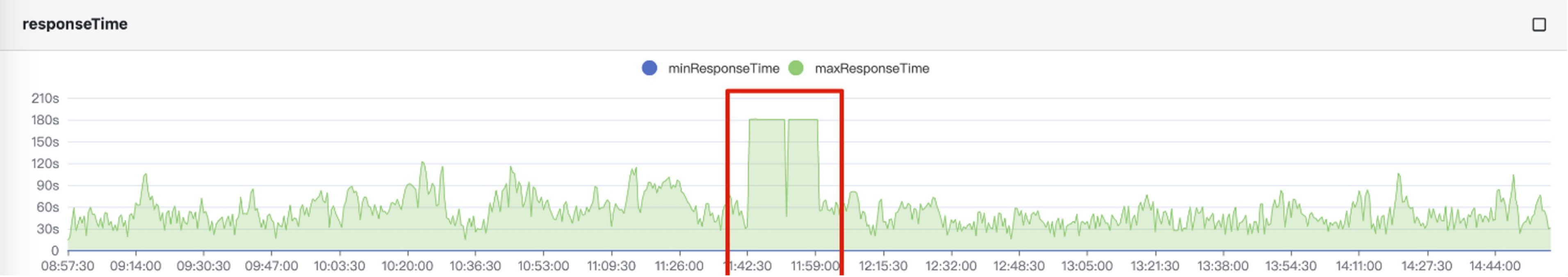
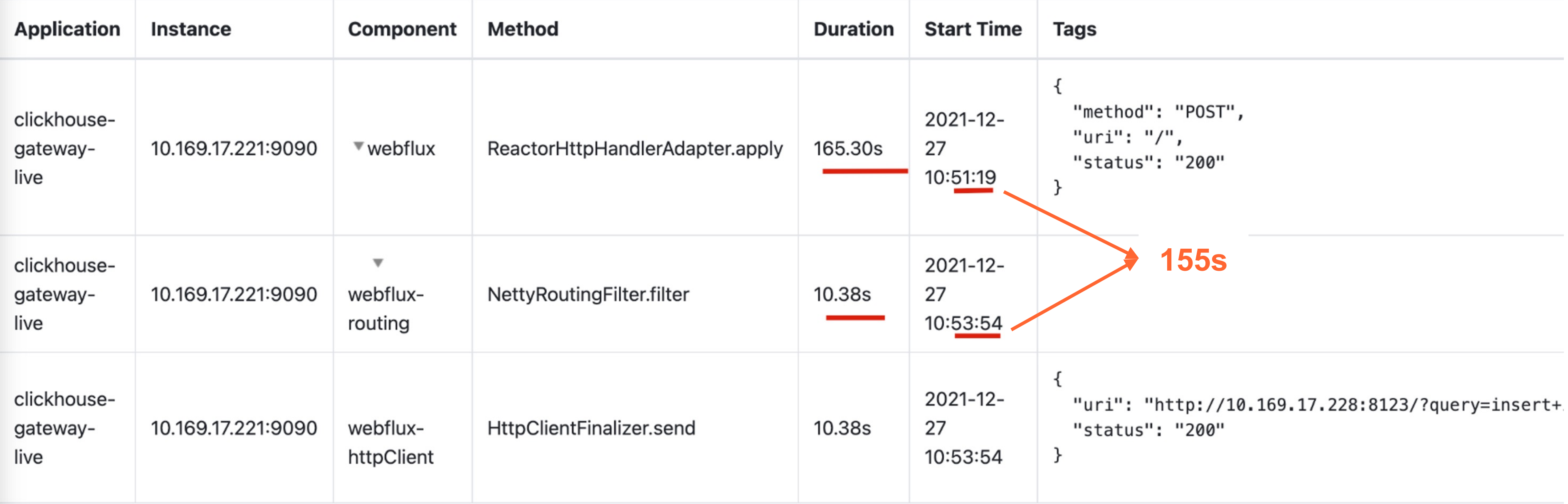
Case 1 - Identify the bottleneck





Application	Instance	Component	Method	Duration	Start Time	Tags

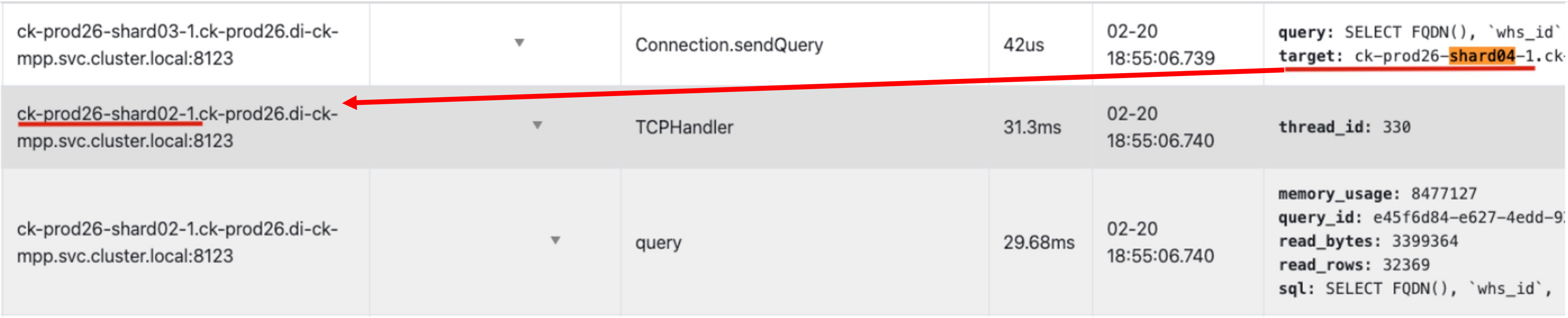
clickhouse-gateway-live	10.169.17.221:9090	▼ webflux	ReactorHttpHandlerAdapter.apply	165.30s	2021-12-27 10:51:19	{
						"method": "POST",
						"uri": "/",
						"status": "200"
						}

clickhouse-gateway-live	10.169.17.221:9090	▼ webflux-routing	NettyRoutingFilter.filter	10.38s	2021-12-27 10:53:54	

clickhouse-gateway-live	10.169.17.221:9090	webflux-httpClient	HttpClientFinalizer.send	10.38s	2021-12-27 10:53:54	{
						"uri": "http://10.169.17.228:8123/?query=insert+
						"status": "200"
						}

155s

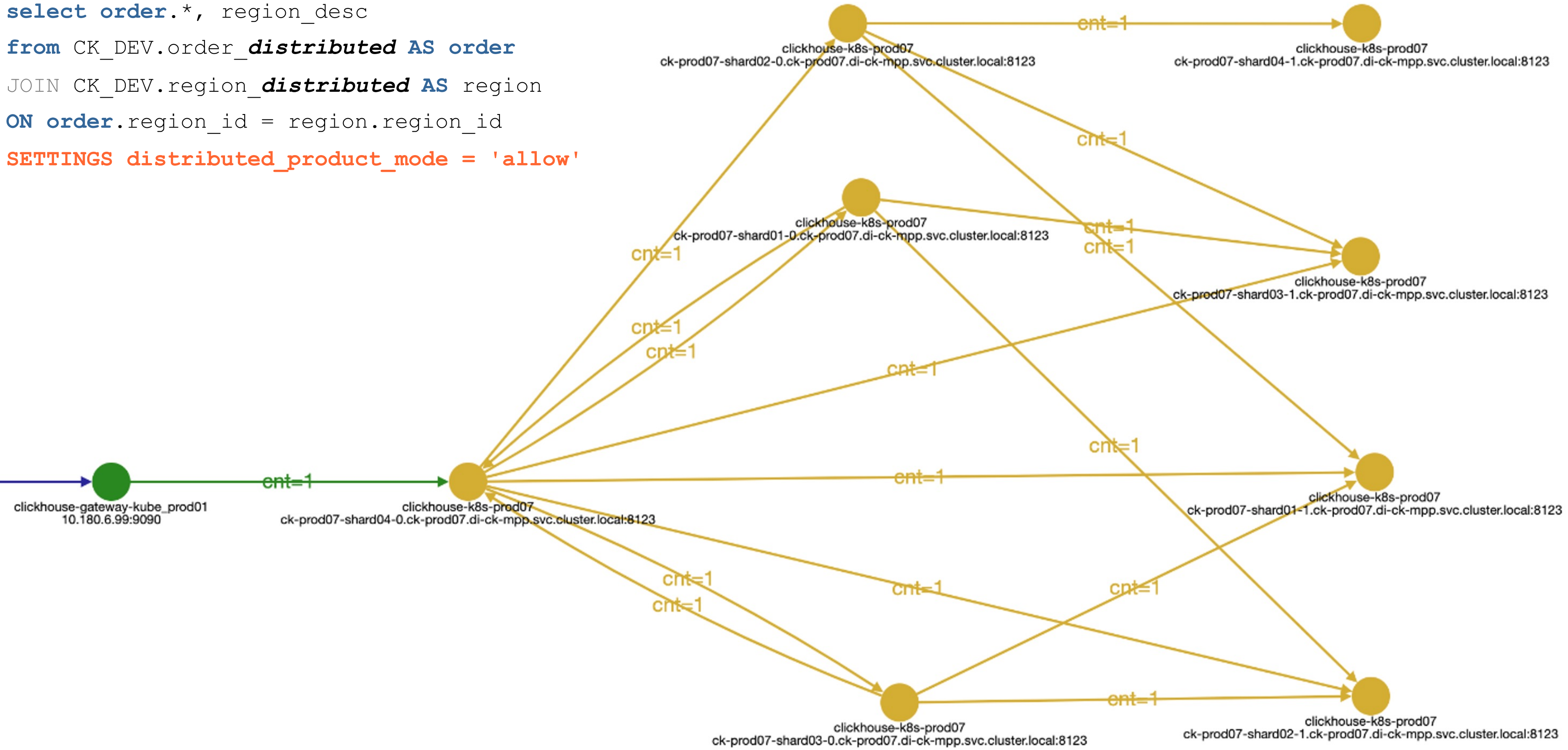
Case 2 - Identify network problems



ck-prod26-shard03-1.ck-prod26.di-ck-mpp.svc.cluster.local:8123	▼	Connection.sendQuery	42us	02-20 18:55:06.739	**query:** SELECT FQDN(), `whs_id` **target:** ck-prod26-shard04-1.ck
ck-prod26-shard02-1.ck-prod26.di-ck-mpp.svc.cluster.local:8123	▼	TCPHandler	31.3ms	02-20 18:55:06.740	**thread_id:** 330
ck-prod26-shard02-1.ck-prod26.di-ck-mpp.svc.cluster.local:8123	▼	query	29.68ms	02-20 18:55:06.740	**memory_usage:** 8477127 **query_id:** e45f6d84-e627-4edd-9 **read_bytes:** 3399364 **read_rows:** 32369 **sql:** SELECT FQDN(), `whs_id`,

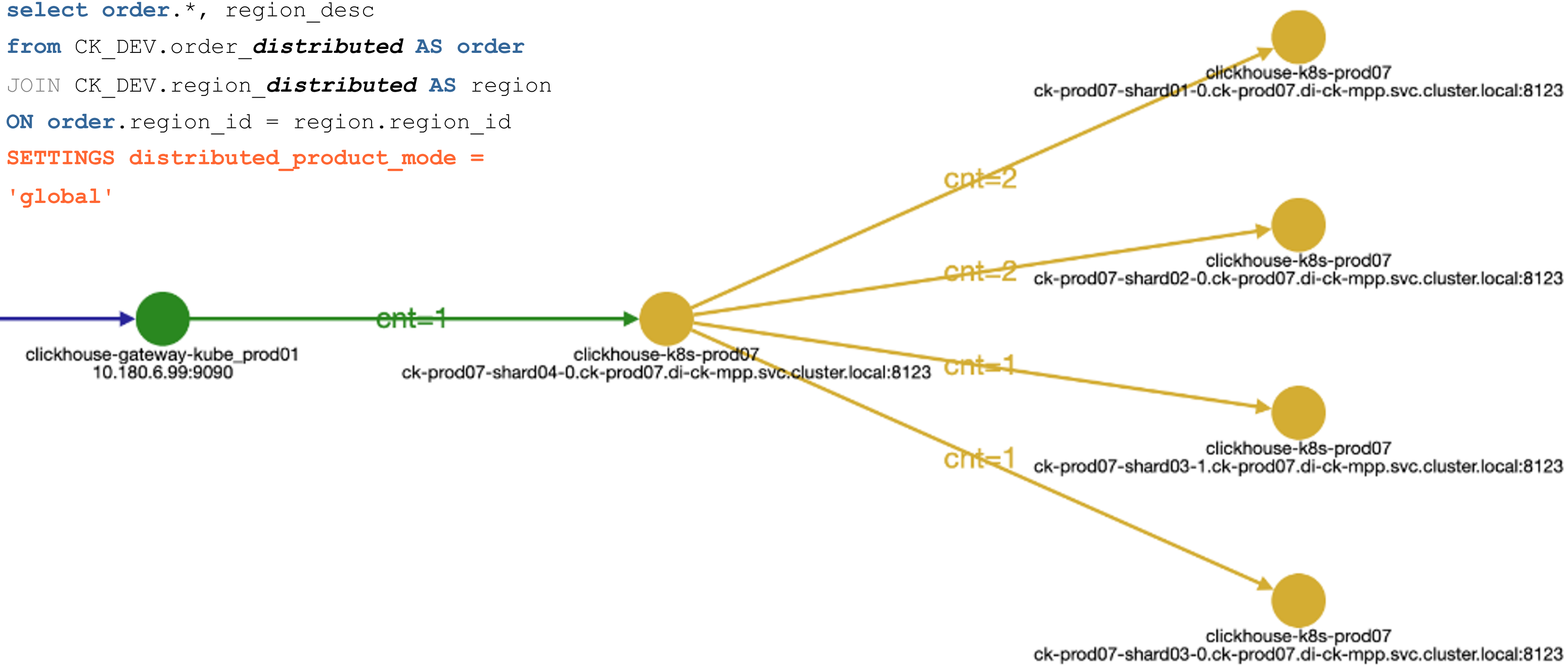
Case 3 - Understanding the distributed JOIN in ClickHouse

```
select order.*, region_desc
from CK_DEV.order_distributed AS order
JOIN CK_DEV.region_distributed AS region
ON order.region_id = region.region_id
SETTINGS distributed_product_mode = 'allow'
```

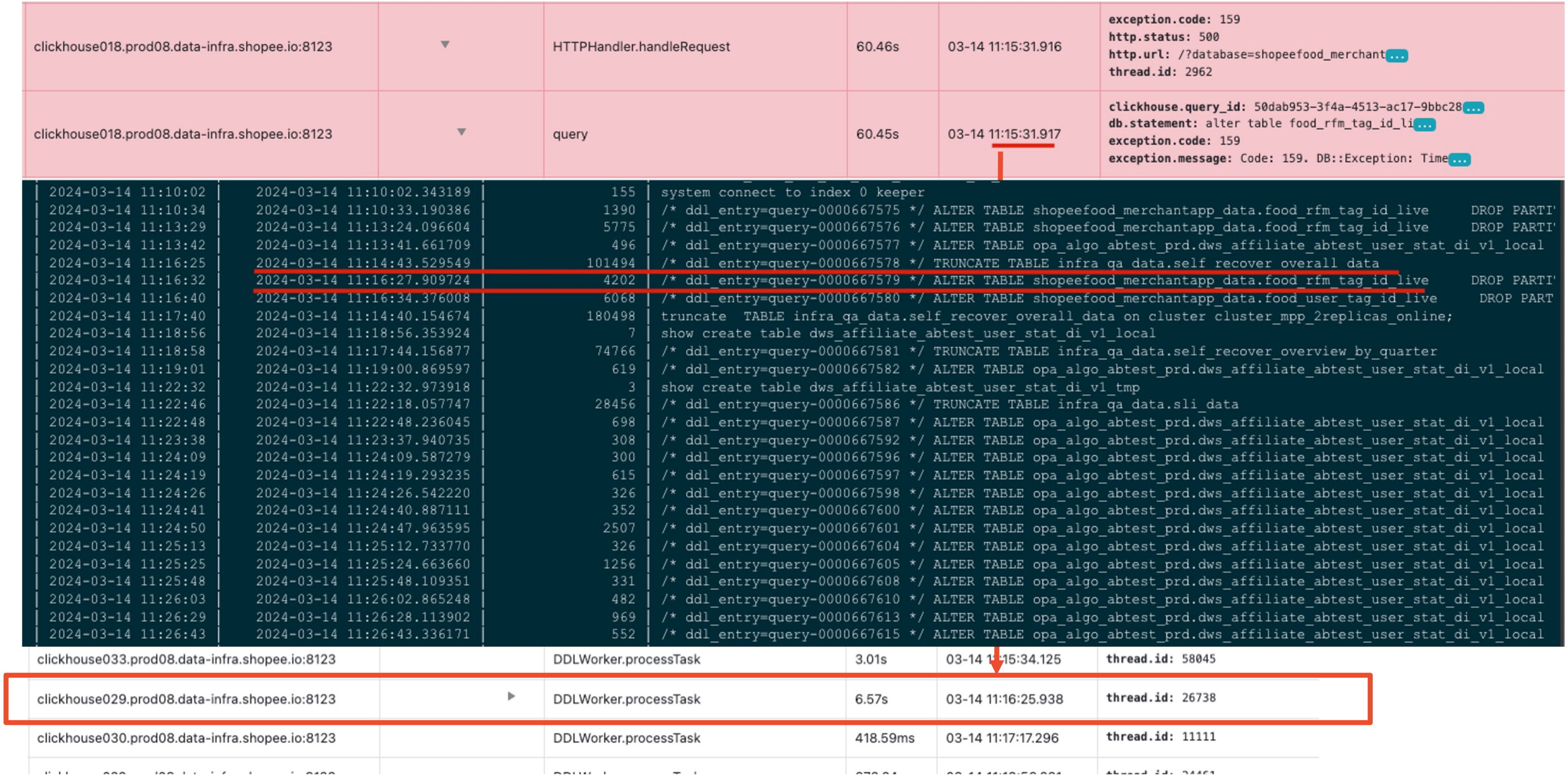

clickhouse-k8s-prod07
ck-prod07-shard02-0.ck-prod07.di-ck-mpp.svc.cluster.local:8123
cnt=1
clickhouse-k8s-prod07
ck-prod07-shard04-1.ck-prod07.di-ck-mpp.svc.cluster.local:8123
cnt=1
clickhouse-k8s-prod07
ck-prod07-shard01-0.ck-prod07.di-ck-mpp.svc.cluster.local:8123
cnt=1
cnt=1
cnt=1
clickhouse-k8s-prod07
ck-prod07-shard03-1.ck-prod07.di-ck-mpp.svc.cluster.local:8123
cnt=1
cnt=1
cnt=1
cnt=1
clickhouse-gateway-kube_prod01
10.180.6.99:9090
cnt=1
clickhouse-k8s-prod07
ck-prod07-shard04-0.ck-prod07.di-ck-mpp.svc.cluster.local:8123
cnt=1
clickhouse-k8s-prod07
ck-prod07-shard01-1.ck-prod07.di-ck-mpp.svc.cluster.local:8123
cnt=1
cnt=1
cnt=1
cnt=1
clickhouse-k8s-prod07
ck-prod07-shard03-0.ck-prod07.di-ck-mpp.svc.cluster.local:8123
cnt=1
clickhouse-k8s-prod07
ck-prod07-shard02-1.ck-prod07.di-ck-mpp.svc.cluster.local:8123

Case 3 - Understanding the distributed JOIN in ClickHouse

```
select order.*, region_desc
from CK_DEV.order_distributed AS order
JOIN CK_DEV.region_distributed AS region
ON order.region_id = region.region_id
SETTINGS distributed_product_mode =
'global'
```


clickhouse-gateway-kube_prod01
10.180.6.99:9090
cnt=1
clickhouse-k8s-prod07
ck-prod07-shard04-0.ck-prod07.di-ck-mpp.svc.cluster.local:8123
cnt=2
clickhouse-k8s-prod07
ck-prod07-shard01-0.ck-prod07.di-ck-mpp.svc.cluster.local:8123
cnt=2
clickhouse-k8s-prod07
ck-prod07-shard02-0.ck-prod07.di-ck-mpp.svc.cluster.local:8123
cnt=1
clickhouse-k8s-prod07
ck-prod07-shard03-1.ck-prod07.di-ck-mpp.svc.cluster.local:8123
cnt=1
clickhouse-k8s-prod07
ck-prod07-shard03-0.ck-prod07.di-ck-mpp.svc.cluster.local:8123

Case 4 - Identify problematic node

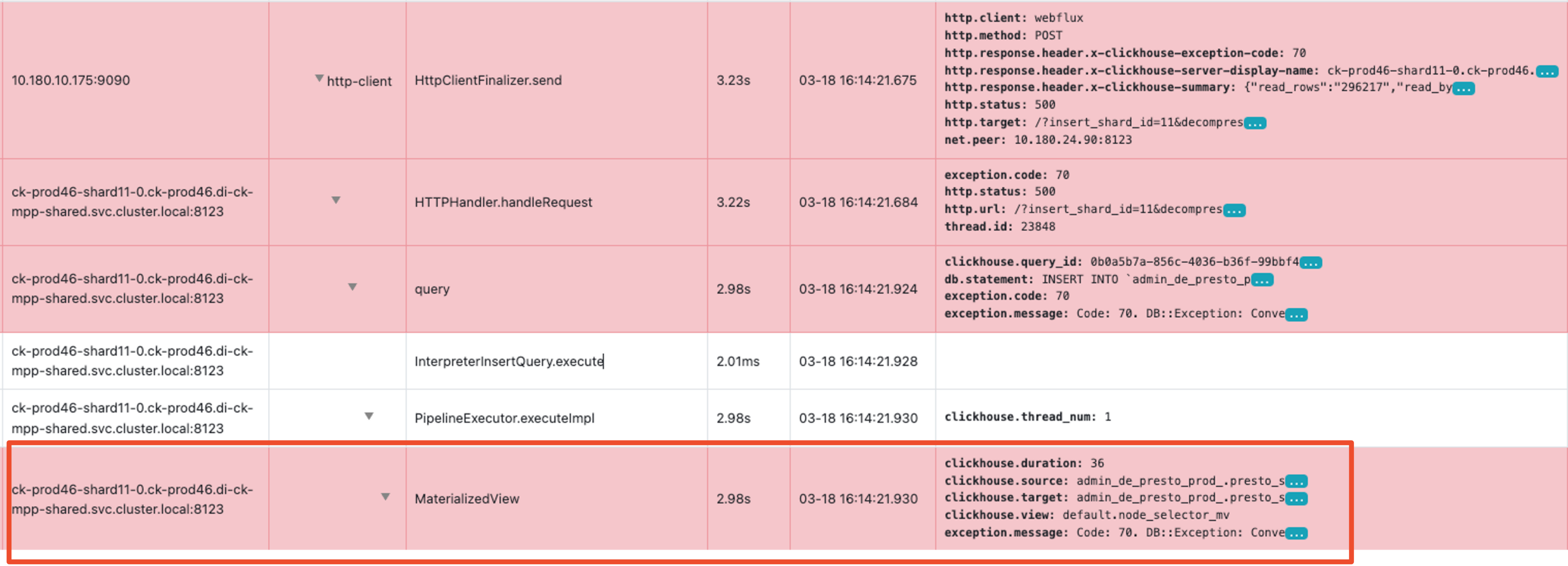


clickhouse018.prod08.data-infra.shopee.io:8123	▼	HTTPHandler.handleRequest	60.46s	03-14 11:15:31.916	**exception.code:** 159 **http.status:** 500 **http.url:** /?database=shopeefood_merchant... **thread.id:** 2962
clickhouse018.prod08.data-infra.shopee.io:8123	▼	query	60.45s	03-14 11:15:31.917	**clickhouse.query_id:** 50dab953-3f4a-4513-ac17-9bbc28... **db.statement:** alter table food_rfm_tag_id_li... **exception.code:** 159 **exception.message:** Code: 159. DB::Exception: Time...

```
| 2024-03-14 11:10:02 |    2024-03-14 11:10:02.343189 |        155 | system connect to index 0 keeper
| 2024-03-14 11:10:34 |    2024-03-14 11:10:33.190386 |       1390 | /* ddl_entry=query-0000667575 */ ALTER TABLE shopeefood_merchantapp_data.food_rfm_tag_id_live     DROP PARTI'
| 2024-03-14 11:13:29 |    2024-03-14 11:13:24.096604 |       5775 | /* ddl_entry=query-0000667576 */ ALTER TABLE shopeefood_merchantapp_data.food_rfm_tag_id_live     DROP PARTI'
| 2024-03-14 11:13:42 |    2024-03-14 11:13:41.661709 |        496 | /* ddl_entry=query-0000667577 */ ALTER TABLE opa_algo_abtest_prd.dws_affiliate_abtest_user_stat_di_v1_local
| 2024-03-14 11:16:25 |    2024-03-14 11:14:43.529549 |     101494 | /* ddl_entry=query-0000667578 */ TRUNCATE TABLE infra_qa_data.self_recover_overall_data
| 2024-03-14 11:16:32 |    2024-03-14 11:16:27.909724 |       4202 | /* ddl_entry=query-0000667579 */ ALTER TABLE shopeefood_merchantapp_data.food_rfm_tag_id_live     DROP PARTI'
| 2024-03-14 11:16:40 |    2024-03-14 11:16:34.376008 |       6068 | /* ddl_entry=query-0000667580 */ ALTER TABLE shopeefood_merchantapp_data.food_user_tag_id_live     DROP PART
| 2024-03-14 11:17:40 |    2024-03-14 11:14:40.154674 |     180498 | truncate  TABLE infra_qa_data.self_recover_overall_data on cluster cluster_mpp_2replicas_online;
| 2024-03-14 11:18:56 |    2024-03-14 11:18:56.353924 |          7 | show create table dws_affiliate_abtest_user_stat_di_v1_local
| 2024-03-14 11:18:58 |    2024-03-14 11:17:44.156877 |      74766 | /* ddl_entry=query-0000667581 */ TRUNCATE TABLE infra_qa_data.self_recover_overview_by_quarter
| 2024-03-14 11:19:01 |    2024-03-14 11:19:00.869597 |        619 | /* ddl_entry=query-0000667582 */ ALTER TABLE opa_algo_abtest_prd.dws_affiliate_abtest_user_stat_di_v1_local
| 2024-03-14 11:22:32 |    2024-03-14 11:22:32.973918 |          3 | show create table dws_affiliate_abtest_user_stat_di_v1_tmp
| 2024-03-14 11:22:46 |    2024-03-14 11:22:18.057747 |      28456 | /* ddl_entry=query-0000667586 */ TRUNCATE TABLE infra_qa_data.sli_data
| 2024-03-14 11:22:48 |    2024-03-14 11:22:48.236045 |        698 | /* ddl_entry=query-0000667587 */ ALTER TABLE opa_algo_abtest_prd.dws_affiliate_abtest_user_stat_di_v1_local
| 2024-03-14 11:23:38 |    2024-03-14 11:23:37.940735 |        308 | /* ddl_entry=query-0000667592 */ ALTER TABLE opa_algo_abtest_prd.dws_affiliate_abtest_user_stat_di_v1_local
| 2024-03-14 11:24:09 |    2024-03-14 11:24:09.587279 |        300 | /* ddl_entry=query-0000667596 */ ALTER TABLE opa_algo_abtest_prd.dws_affiliate_abtest_user_stat_di_v1_local
| 2024-03-14 11:24:19 |    2024-03-14 11:24:19.293235 |        615 | /* ddl_entry=query-0000667597 */ ALTER TABLE opa_algo_abtest_prd.dws_affiliate_abtest_user_stat_di_v1_local
| 2024-03-14 11:24:26 |    2024-03-14 11:24:26.542220 |        326 | /* ddl_entry=query-0000667598 */ ALTER TABLE opa_algo_abtest_prd.dws_affiliate_abtest_user_stat_di_v1_local
| 2024-03-14 11:24:41 |    2024-03-14 11:24:40.887111 |        352 | /* ddl_entry=query-0000667600 */ ALTER TABLE opa_algo_abtest_prd.dws_affiliate_abtest_user_stat_di_v1_local
| 2024-03-14 11:24:50 |    2024-03-14 11:24:47.963595 |       2507 | /* ddl_entry=query-0000667601 */ ALTER TABLE opa_algo_abtest_prd.dws_affiliate_abtest_user_stat_di_v1_local
| 2024-03-14 11:25:13 |    2024-03-14 11:25:12.733770 |        326 | /* ddl_entry=query-0000667604 */ ALTER TABLE opa_algo_abtest_prd.dws_affiliate_abtest_user_stat_di_v1_local
| 2024-03-14 11:25:25 |    2024-03-14 11:25:24.663660 |       1256 | /* ddl_entry=query-0000667605 */ ALTER TABLE opa_algo_abtest_prd.dws_affiliate_abtest_user_stat_di_v1_local
| 2024-03-14 11:25:48 |    2024-03-14 11:25:48.109351 |        331 | /* ddl_entry=query-0000667608 */ ALTER TABLE opa_algo_abtest_prd.dws_affiliate_abtest_user_stat_di_v1_local
| 2024-03-14 11:26:03 |    2024-03-14 11:26:02.865248 |        482 | /* ddl_entry=query-0000667610 */ ALTER TABLE opa_algo_abtest_prd.dws_affiliate_abtest_user_stat_di_v1_local
| 2024-03-14 11:26:29 |    2024-03-14 11:26:28.113902 |        969 | /* ddl_entry=query-0000667613 */ ALTER TABLE opa_algo_abtest_prd.dws_affiliate_abtest_user_stat_di_v1_local
| 2024-03-14 11:26:43 |    2024-03-14 11:26:43.336171 |        552 | /* ddl_entry=query-0000667615 */ ALTER TABLE opa_algo_abtest_prd.dws_affiliate_abtest_user_stat_di_v1_local
```

clickhouse033.prod08.data-infra.shopee.io:8123		DDLWorker.processTask	3.01s	03-14 11:15:34.125	**thread.id:** 58045
clickhouse029.prod08.data-infra.shopee.io:8123	▶	DDLWorker.processTask	6.57s	03-14 11:16:25.938	**thread.id:** 26738
clickhouse030.prod08.data-infra.shopee.io:8123		DDLWorker.processTask	418.59ms	03-14 11:17:17.296	**thread.id:** 11111

Case 5 - Identify errors from materialized view



10.180.10.175:9090	▼ http-client	HttpClientFinalizer.send	3.23s	03-18 16:14:21.675	**http.client:** webflux **http.method:** POST **http.response.header.x-clickhouse-exception-code:** 70 **http.response.header.x-clickhouse-server-display-name:** ck-prod46-shard11-0.ck-prod46.... **http.response.header.x-clickhouse-summary:** {"read_rows":"296217","read_by... **http.status:** 500 **http.target:** /?insert_shard_id=11&decompres... **net.peer:** 10.180.24.90:8123
ck-prod46-shard11-0.ck-prod46.di-ck-mpp-shared.svc.cluster.local:8123	▼	HTTPHandler.handleRequest	3.22s	03-18 16:14:21.684	**exception.code:** 70 **http.status:** 500 **http.url:** /?insert_shard_id=11&decompres... **thread.id:** 23848
ck-prod46-shard11-0.ck-prod46.di-ck-mpp-shared.svc.cluster.local:8123	▼	query	2.98s	03-18 16:14:21.924	**clickhouse.query_id:** 0b0a5b7a-856c-4036-b36f-99bbf4... **db.statement:** INSERT INTO `admin_de_presto_p... **exception.code:** 70 **exception.message:** Code: 70. DB::Exception: Conve...
ck-prod46-shard11-0.ck-prod46.di-ck-mpp-shared.svc.cluster.local:8123		InterpreterInsertQuery.execute	2.01ms	03-18 16:14:21.928	
ck-prod46-shard11-0.ck-prod46.di-ck-mpp-shared.svc.cluster.local:8123	▼	PipelineExecutor.executeImpl	2.98s	03-18 16:14:21.930	**clickhouse.thread_num:** 1
ck-prod46-shard11-0.ck-prod46.di-ck-mpp-shared.svc.cluster.local:8123	▼	MaterializedView	2.98s	03-18 16:14:21.930	**clickhouse.duration:** 36 **clickhouse.source:** admin_de_presto_prod_.presto_s... **clickhouse.target:** admin_de_presto_prod_.presto_s... **clickhouse.view:** default.node_selector_mv **exception.message:** Code: 70. DB::Exception: Conve...

Thanks