



Carta gRPC Error Handling

Umar Yousafzai - Service Infrastructure

April 21, 2022

Problem



Developer Toil

“Getting a noise error from gRPC in fund-admin ... is there a way to configure log level based on response codes?” **fund-admin**

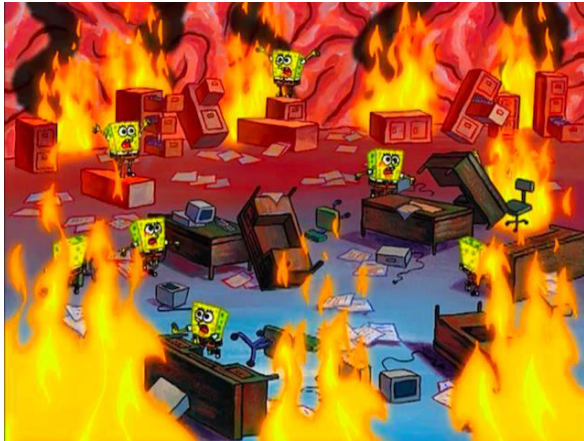
“We also have the error issue for login/auth. We get a lot of noise because every UNAUTHENTICATED or FAILED_PRECONDITION is logged as an error in APM.” **CDS**

“We have the same thing on CDS where sometimes we have an object not found or a permission denied, or some other status that means that the request failed, but it’s not necessarily an error or exception.” **IAM**

“We are returning various gRPC status codes (non-ok) when users have invalid logins. This is causing a lot of noise in our DD logs since they are all showing as errors. It’s hard to parse through logs for meaningful errors we need to address because of the amount of error logs being generated from bad logins.” **IAM**



Inconsistent Error Reporting



Unexpected Error: `StatusCode.INTERNAL`



Expected Error: `StatusCode.NOT_FOUND`



Effects



Error Observability

Mar 22, 12:00 am - Apr 12, 11:59 pm 22d

[View in Analytics](#) ✕

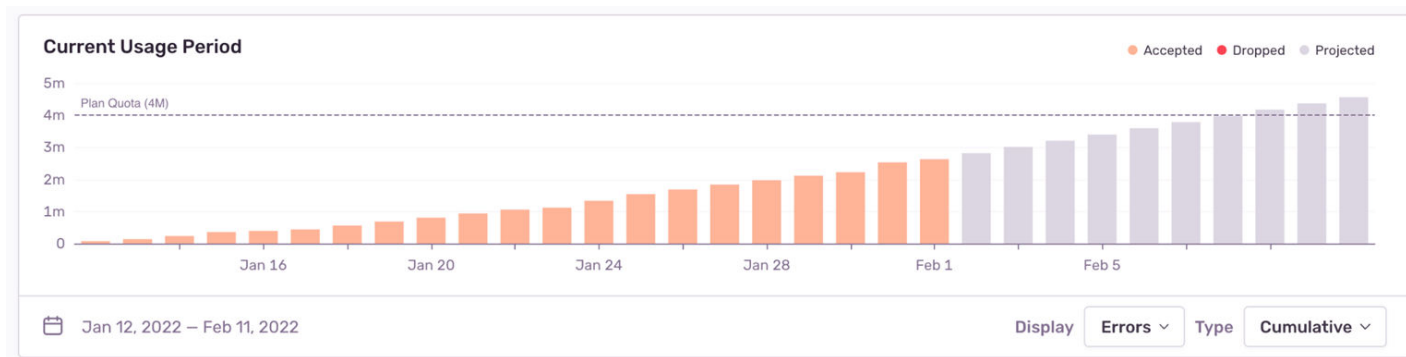
Errors were higher than expected for `grpc.context.state.code:NOT_FOUND`



flipper-server-main: APM Traces for March 22 - April 12



Error Observability



Sentry Quota Expected Usage: Feb. 2022



Developer Toil

“We did set up a filter in our app to not send any of those [NOT_FOUNDs] to Sentry, but it also prevents *other* error logs from going to Sentry that we might care about” - **IS Engineer**

```
if event.get("logger", None) == "carta.grpc.server_logging_interceptor":  
    # Ignore log events from this module for now  
    # https://sentry.io/organizations/carta/issues/2771084001/?environment=production&project=1228322&  
    return None
```



Solution - Customized Expected Status Codes

```
def get_expected_status_codes(self) -> Set[grpc.StatusCode]:  
    return {grpc.StatusCode.UNAUTHENTICATED, grpc.StatusCode.NOT_FOUND, grpc.StatusCode.FAILED_PRECONDITION}
```

Server Side: app.py

```
managed_channel = ManagedGRPCChannel.with_default_interceptors(  
    app_config=GRPCApplicationConfig(),  
    channel_config=GRPCChannelConfig(host="10.255.131.238", port="50051", insecure=True),  
    expected_status_codes = {grpc.StatusCode.UNAUTHENTICATED, grpc.StatusCode.NOT_FOUND, grpc.StatusCode.FAILED_PRECONDITION}  
)
```

Client Side: Creating gRPC Channel



Before - Datadog APM

Actual errors as ERROR in APM

↓ DATE	SERVICE	RESOURCE	DURATION	METHOD	STATUS CODE	LATENCY BREAKDOWN	GRPC.CONTEXT.STAT...	GRPC.CONTEXT.STATE.DETAILS
Apr 20 16:36:02.233	flipper-server-umar	/carta.proto.infra.flipper.v1.FeatureFl...	920 µs				UNKNOWN	
Apr 20 16:36:02.127	flipper-server-umar	/carta.proto.infra.flipper.v1.FeatureFl...	1.03 ms				UNKNOWN	
Apr 20 16:36:01.980	flipper-server-umar	/carta.proto.infra.flipper.v1.FeatureFl...	819 µs				RESOURCE_EXHAUSTED	resource exhausted with abort
Apr 20 16:36:01.851	flipper-server-umar	/carta.proto.infra.flipper.v1.FeatureFl...	782 µs				RESOURCE_EXHAUSTED	resource exhausted with set_code
Apr 20 16:36:01.719	flipper-server-umar	/carta.proto.infra.flipper.v1.FeatureFl...	963 µs				ABORTED	abort code with abort
Apr 20 16:36:01.637	flipper-server-umar	/carta.proto.infra.flipper.v1.FeatureFl...	1.02 ms				ABORTED	abort with set_code
Apr 20 16:36:01.528	flipper-server-umar	/carta.proto.infra.flipper.v1.FeatureFl...	970 µs				FAILED_PRECONDITION	failed precondition with abort
Apr 20 16:36:01.433	flipper-server-umar	/carta.proto.infra.flipper.v1.FeatureFl...	807 µs				NOT_FOUND	not found with abort
Apr 20 16:36:01.320	flipper-server-umar	/carta.proto.infra.flipper.v1.FeatureFl...	1.09 ms				FAILED_PRECONDITION	failed pre-condition with set_code
Apr 20 16:36:01.202	flipper-server-umar	/carta.proto.infra.flipper.v1.FeatureFl...	911 µs				NOT_FOUND	not found with set_code
Apr 20 16:36:01.082	flipper-server-umar	/carta.proto.infra.flipper.v1.FeatureFl...	731 µs				UNAUTHENTICATED	unauthenticated with set_code

Expected errors as ERROR in APM



After - Datadog APM

Actual errors as ERROR in APM

↓ DATE	SERVICE	RESOURCE	DURATION	METHOD	STATUS CODE	GRPC.STATUS.CODE	@GRPC.STATUS.DETAILS
Apr 20 19:48:32.639	sample-python-service-grpc	/carta.proto.infra.flipper.v1.FeatureFl...	9.73 ms			UNKNOWN	Exception calling application: manually throw ...
Apr 20 19:48:32.559	sample-python-service-grpc	/carta.proto.infra.flipper.v1.FeatureFl...	11.9 ms			UNKNOWN	Exception calling application: set() missing 1...
Apr 20 19:48:32.466	sample-python-service-grpc	/carta.proto.infra.flipper.v1.FeatureFl...	12.6 ms			RESOURCE_EXHAUSTED	resource exhausted with abort
Apr 20 19:48:32.353	sample-python-service-grpc	/carta.proto.infra.flipper.v1.FeatureFl...	8.62 ms			RESOURCE_EXHAUSTED	resource exhausted with set_code
Apr 20 19:48:32.233	sample-python-service-grpc	/carta.proto.infra.flipper.v1.FeatureFl...	12.2 ms			ABORTED	abort code with abort
Apr 20 19:48:32.139	sample-python-service-grpc	/carta.proto.infra.flipper.v1.FeatureFl...	7.58 ms			ABORTED	abort with set_code
Apr 20 19:48:32.050	sample-python-service-grpc	/carta.proto.infra.flipper.v1.FeatureFl...	6.68 ms			FAILED_PRECONDITION	failed precondition with abort
Apr 20 19:48:31.983	sample-python-service-grpc	/carta.proto.infra.flipper.v1.FeatureFl...	6.42 ms			NOT_FOUND	not found with abort
Apr 20 19:48:31.917	sample-python-service-grpc	/carta.proto.infra.flipper.v1.FeatureFl...	6.59 ms			FAILED_PRECONDITION	failed pre-condition with set_code
Apr 20 19:48:31.837	sample-python-service-grpc	/carta.proto.infra.flipper.v1.FeatureFl...	5.93 ms			NOT_FOUND	not found with set_code
Apr 20 19:48:31.755	sample-python-service-grpc	/carta.proto.infra.flipper.v1.FeatureFl...	44.1 ms			UNAUTHENTICATED	unauthenticated with set_code

Expected errors as OK in APM



Before - Datadog Logging

ERROR

Apr 20, 2022 at 16:43:49.236 (about 16 hours ago)

View in Context

Export

HOST

i-0eb029aef1f86f455

SERVICE

flipper-server

SOURCE

flipper-server

CONTAINER NAME

k8s_flipper-server-umar_flipper-server-uma...

DOCKER IMAGE

esharesinc/flipper-server

POD NAME

flipper-server-umar-7dd99877cb-4n4w4

ALL TAGS

env:test autoscaling_group:nodes.test.carta.dev availability-zone:us-east-1a

container_id:080d2277850fcd1613f0af0f6e4e12a39fd420e215113cf458bdd48d8a2972dd

container_name:k8s_flipper-server-umar_flipper-server-umar-7dd99877cb-4n4w4_infrastructure_3e2b5e0b-ad2b-496c-abdc-dc64d43b42b3_0 datadog.in... +42

NOT_FOUND: not found with set_code

Event Attributes

Trace (1)

Metrics

Processes

LOGGER NAME

carta.grpc.server_logging_interceptor

ERROR KIND

NOT_FOUND

Error Message

not found with set_code



After - Datadog Logging

INFO Status

INFO Apr 20, 2022 at 19:48:31.837 (about 13 hours ago) View in Context Export ×

HOST i-0c886e502320a7d77	SERVICE sample-python-service-grpc	SOURCE sample-python-service-grpc
CONTAINER NAME k8s_sample-python-service-grpc_sample-pyt...	DOCKER IMAGE esharesinc/sample-python-service-grpc	POD NAME sample-python-service-grpc-sample-python-ser...

ALL TAGS

env:test autoscaling_group:nodes.test.carta.dev availability-zone:us-east-1b
container_id:80b921ec88285520206ea9f0d6a8c82af847d7faa581a79069b34b1f95c7f667
container_name:k8s_sample-python-service-grpc_sample-python-service-grpc-sample-python-service-grpc-d8b9grbcd_infrastructure_53a14c37-6727-4edd... +38

NOT_FOUND: not found with set_code in sample service

Event Attributes Trace (1) Metrics Processes

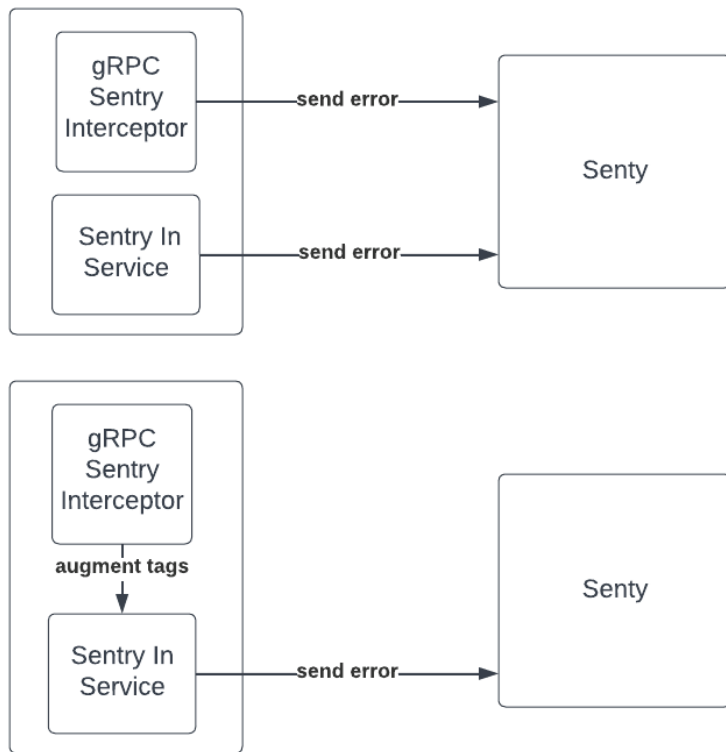
LOGGER NAME carta.grpc.server_logging_interceptor	ERROR KIND NOT_FOUND
---	--------------------------------

Error Message

not found with set_code in sample service



Sentry Configuration



Stakeholder Feedback

“Huge shoutout to your team for working on this gRPC error stuff. This is exactly the kind of support I (and everyone in IS eng.) is looking for from platform teams!” - **IS Engineer** to **Chris**



Future Considerations

- Current release will be backwards compatible to test new error handling strategy and obtain feedback
- In the future, a major release will be done with breaking changes
 - Deprecate current Sentry interceptor
 - Push Sentry configuration on service owners
 - Rely mainly on logging for error reporting



Acknowledgements!



Chris Fairles



Ryan Kelly



Thank you for listening!