facebook

The Importance of Wise Protocol Semantics in the Design of Microservices

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computer 😩

distributed system 😱

microservices === distributed systems

Make Distributed Systems That Don't Suck.

Three Principles of Stress-Free Service Communication.

1. Your Transport Layer Matters More than You Think it Does.

HTTP is Not Your Friend.

"Every HTTP API eventually grows until it ~~can consume email~~ contains a buggy implementation of about half of TCP."

TCP is your Frenemy.

Pretend You're In Third Grade and Pass Messages Around.

(Yes, it's OK to build an RPC framework on top of this.)

2. Use a Structured Data Format with a Schema.

Data Formats

Or, how I Learned to Stop Worrying and Love Thrift

```
{"task_id": 12345, "title": "Test Task", "description": "This is to show off JSON
formatting for a task.", "status": true, "comments": [...]}
```

JSON is garbage.

Duplicated effort on all sides.

Data Formats

Or, how I Learned to Stop Worrying and Love Thrift

```
struct Task {
  1: i64 task_id
  2: string title
  3: string description
  4: i64 uid
  5: bool completed
}
```

Data Formats

Or, how I Learned to Stop Worrying and Love Thrift

```
struct Comment {
  1: i64 id
  2: i64 taskID
  3: i64 uid
  4: string text
  5: i64 created
}
```

Data Formats

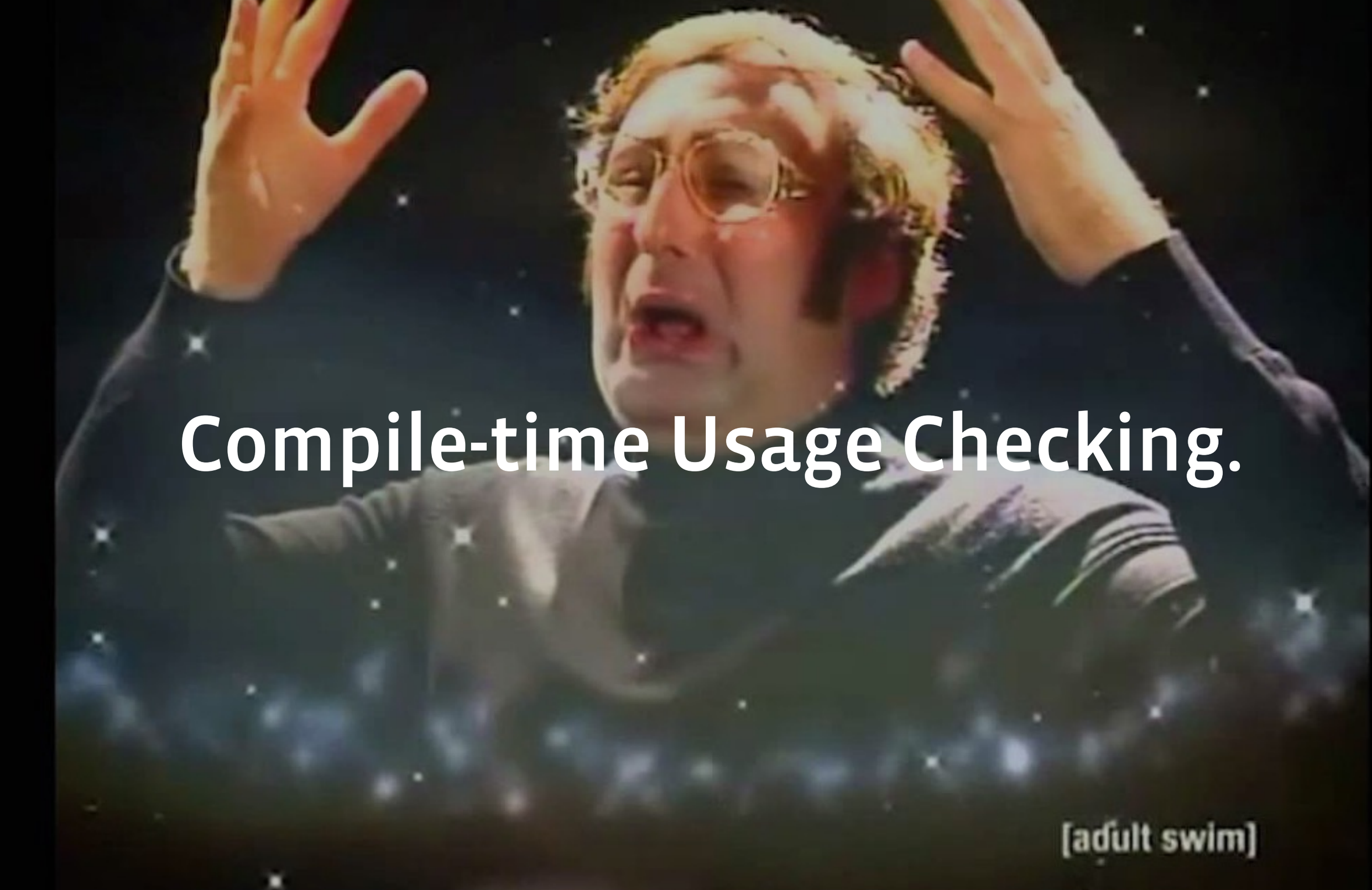
Or, how I Learned to Stop Worrying and Love Thrift

```
service TaskService {
  // Pass in a mostly-filled Task struct, returns ID of the new Task.
  i64 createTask(1:Task t)
}
```

Data Formats

Or, how I Learned to Stop Worrying and Love Thrift

```
service TaskService {
  // Get all the comments on a particular task.
  list<Comment> getCommentsForTask(1:i64 taskID)
}
```



Compile-time Usage Checking.

Make Computers Do the Work For You.

3. Smarter People than You or I have Already Built What You Need.

Open-Source Transport/Protocol Formats

It's OK to Stand on the Shoulders of Giants

Name	Creator	License
Thrift	Facebook	Apache
gRPC/Protocol Buffers	Google	BSD
Cap'n Proto	Sandstorm	MIT

"There are three types of lies: lies, damn lies, and consistency guarantees."

❤️!

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