

**facebook**

# The Importance of Wise Protocol Semantics in the Design of Microservices

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computer 🙄

distributed systems 🤯

**microservices === distributed systems**

# How To Make Distributed Systems that Don't Require a Crystal Ball to Use.

# 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

```
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.

[adult swim]

**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
<b>Thrift</b>	Facebook	Apache
<b>gRPC/Protocol Buffers</b>	Google	BSD
<b>Cap'n Proto</b>	Sandstorm	MIT

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



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