

A Revaluation of All Values

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The ability to master complexity is not the same
as the ability to extract simplicity

-S. Shenker

Examining Our Assumptions

What state belongs in distributed protocols?

What state must stay local to switches?

What state should be centralized?

What are the effects of each on:

- state synchronization overhead
- total control plane overhead
- system stability and resiliency
- efficiency in resource use
- control loop tightness

What are we looking for:

- control
- efficiency
- parsimony

In order to provide the former while maximizing the latter two, we require modularity and abstractions.

Abstractions

What are we looking for in a network abstraction layer?

- by definition, something that masks lower level complexity :P
- Capture intent, not mechanism

Basically a high level language and compiler with:

- guarantees of:
 - uniformity
 - target independent language
 - consistency and correctness
 - correct behavior in the face of failure
 - guaranteed behavior in the face of failure
- Static Verification

Abstractions

A very interesting start:

- FML
- Procera
- **NetCore**
- Procera

Questions

Addendum: My Usual Plug

Backbone Traffic Engineering Research

- Novel TE Optimizations
 - many only possible with some degree of centralization
- Ephemeral State Minimization
- Domain Egress Selection and Optimization