I2RS, Mistake or Solution or …?

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Quick Intro

In a way this is continuation from IETF #105

Network Automation Evolution

Presentation

Question To Ask Ourselves

Do we want to standardize split decision making between centrally located management and user applications and traditional routing protocols executed on network hardware?

Should all/most software run on the network hardware?

What should run on network hardware?

Are These Features Useful?

- Inject or retrieve information, policies and operational parameters to or from the routing system.
  - Read and write access to the Routing Information Base (RIB)
- Optimize, and choose network exit points. Base the decision on factors other than those provided by the routing protocols.
- Support a rapid, distributed reaction to network-based attacks. Reroute traffic for the destination under attack while maintaining normal operation for other routes.
- Modify service-layer routing to improve on existing hub-and-spoke traffic.
- Extract topology information from the network.

Do Traditional Vendors Support Something Similar?

- Yes, they do (or did in the past)
  - e.g. Junos SDK, Juniper JET, Cisco OnePK, …
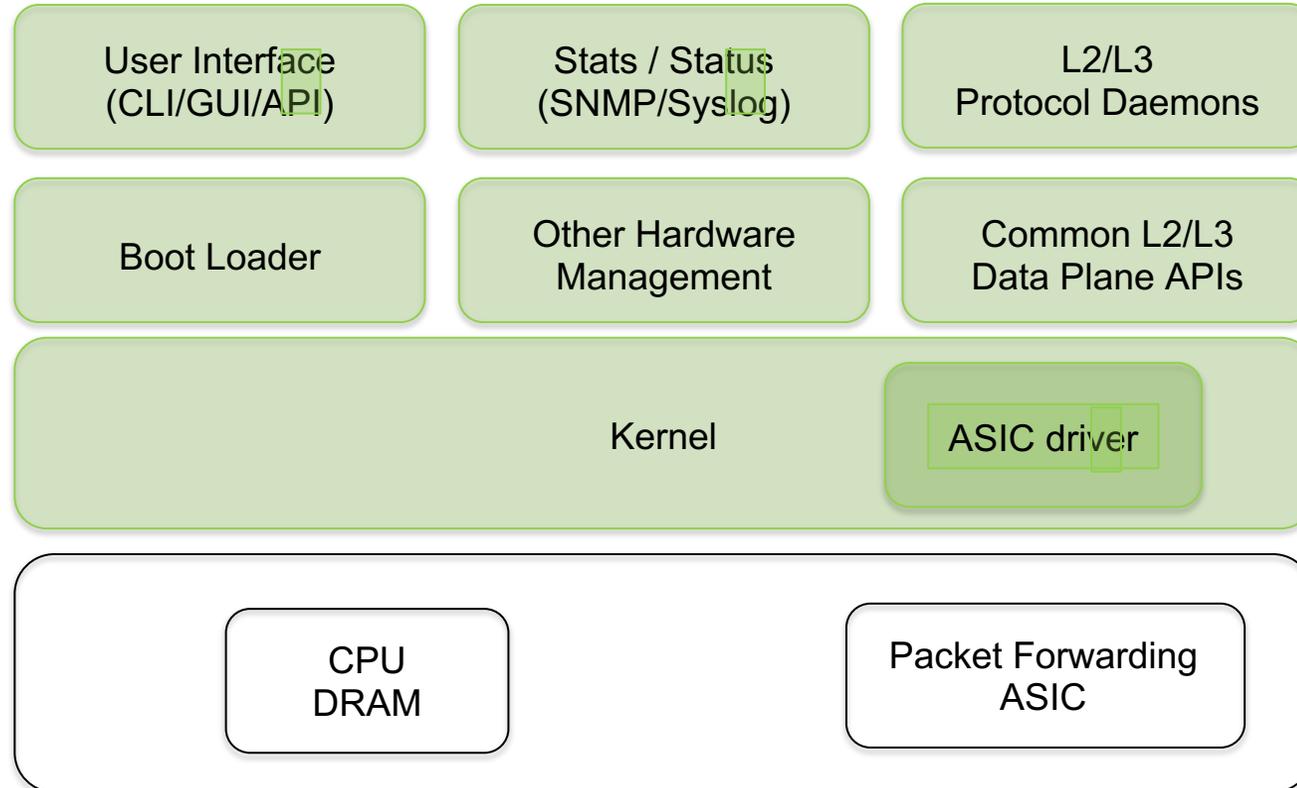- Proprietary interfaces, not the friendliest to third parties
- Lackluster support for it

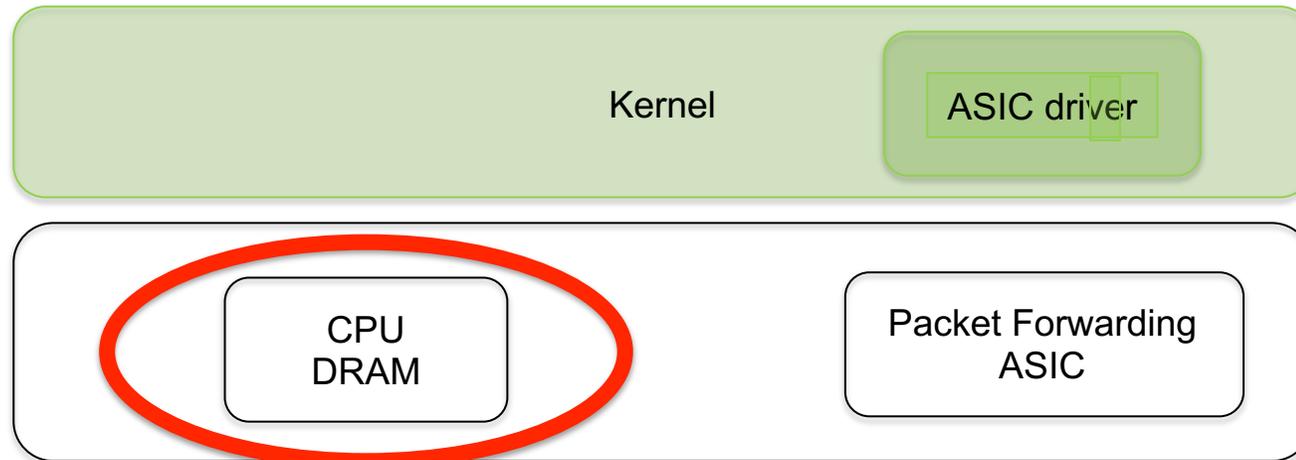# What Constitutes A Network Element?

Network OS

Network hardware

Typical Network Device Components

Bolting On More And More Things

Applications
Shared Infrastructure

Kernel   ASIC driver

CPU
DRAM   Packet Forwarding
                          ASIC

I2RS Architecture
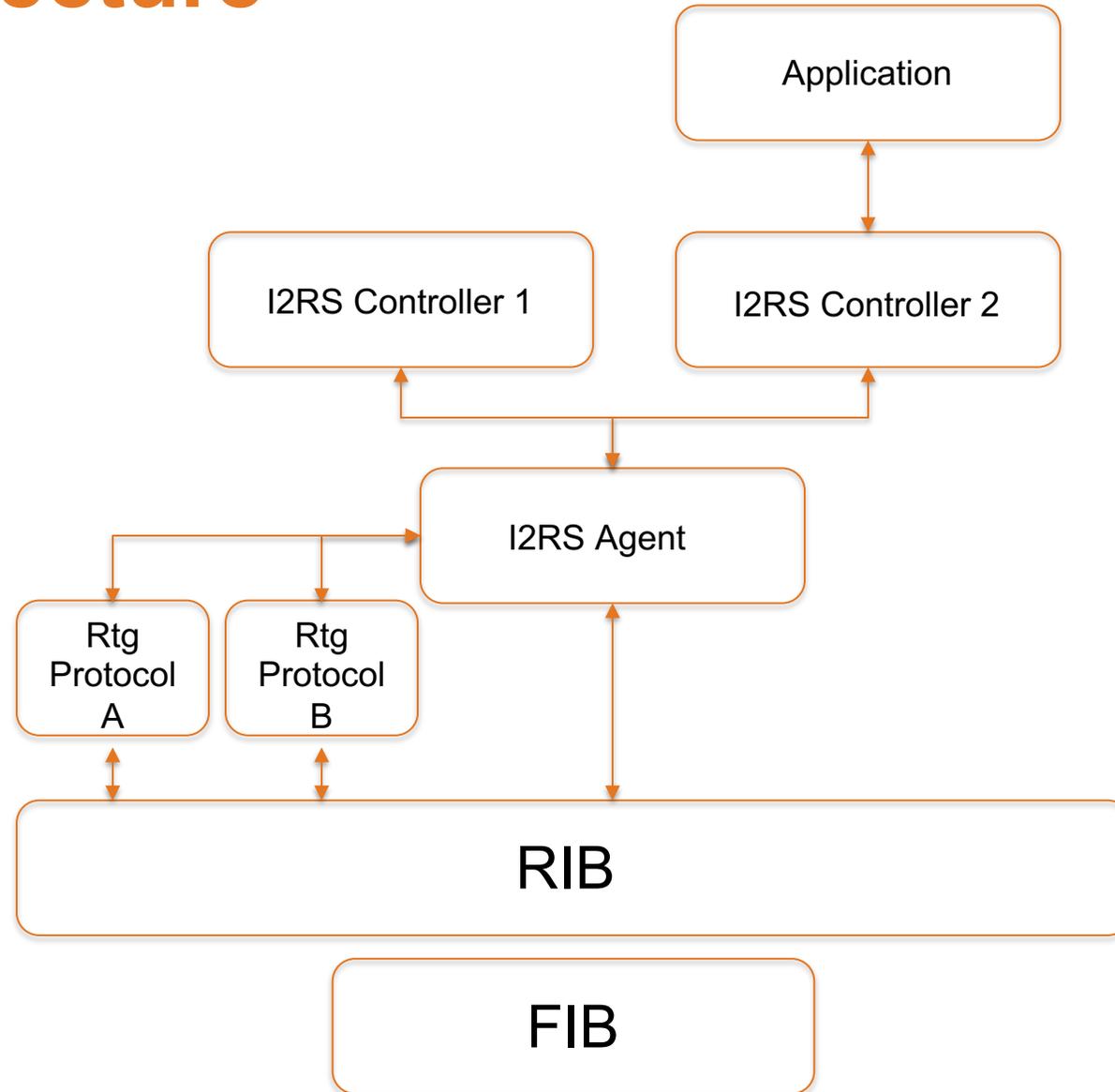
I2RS Architecture
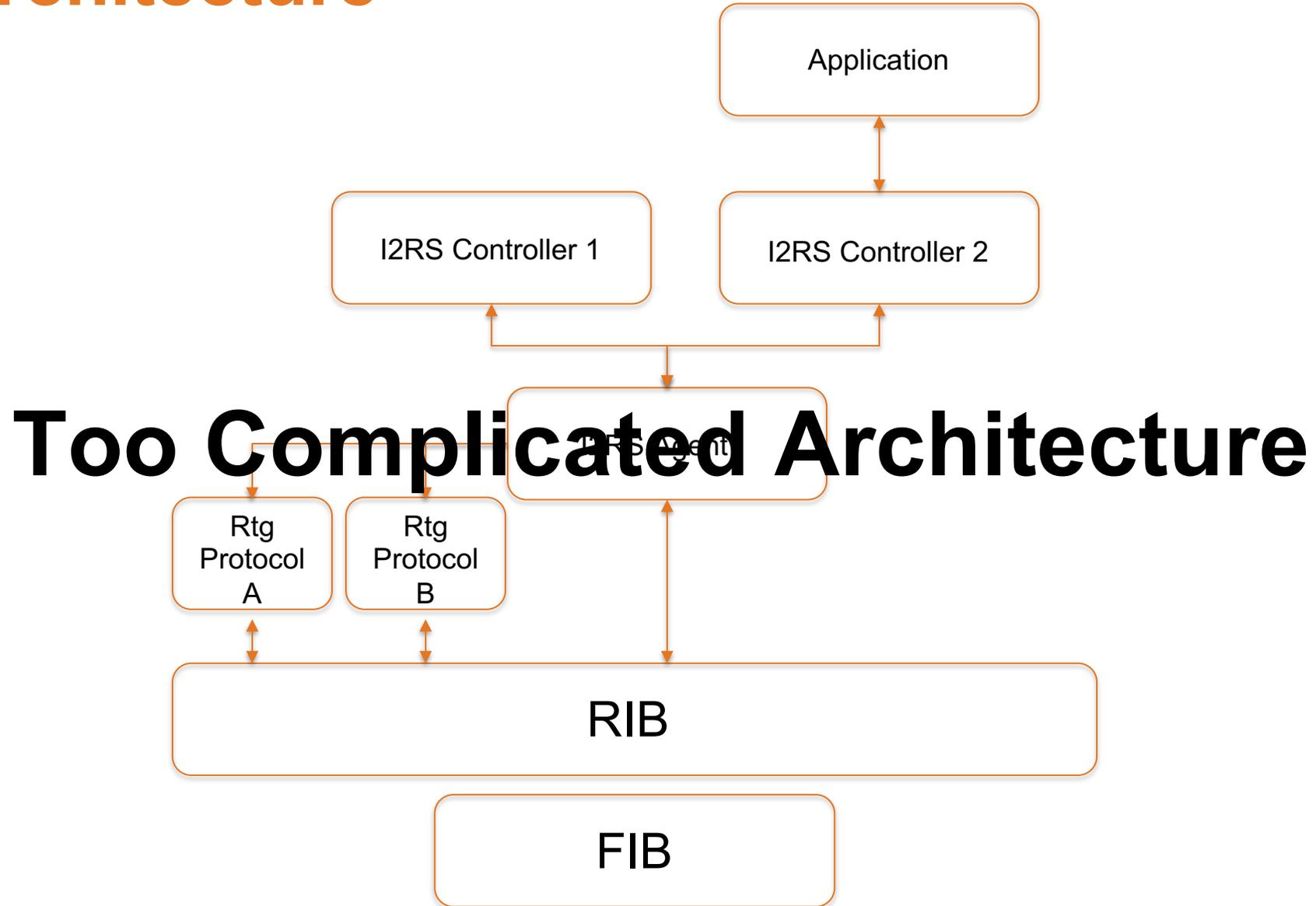
Initial Services Included In I2RS

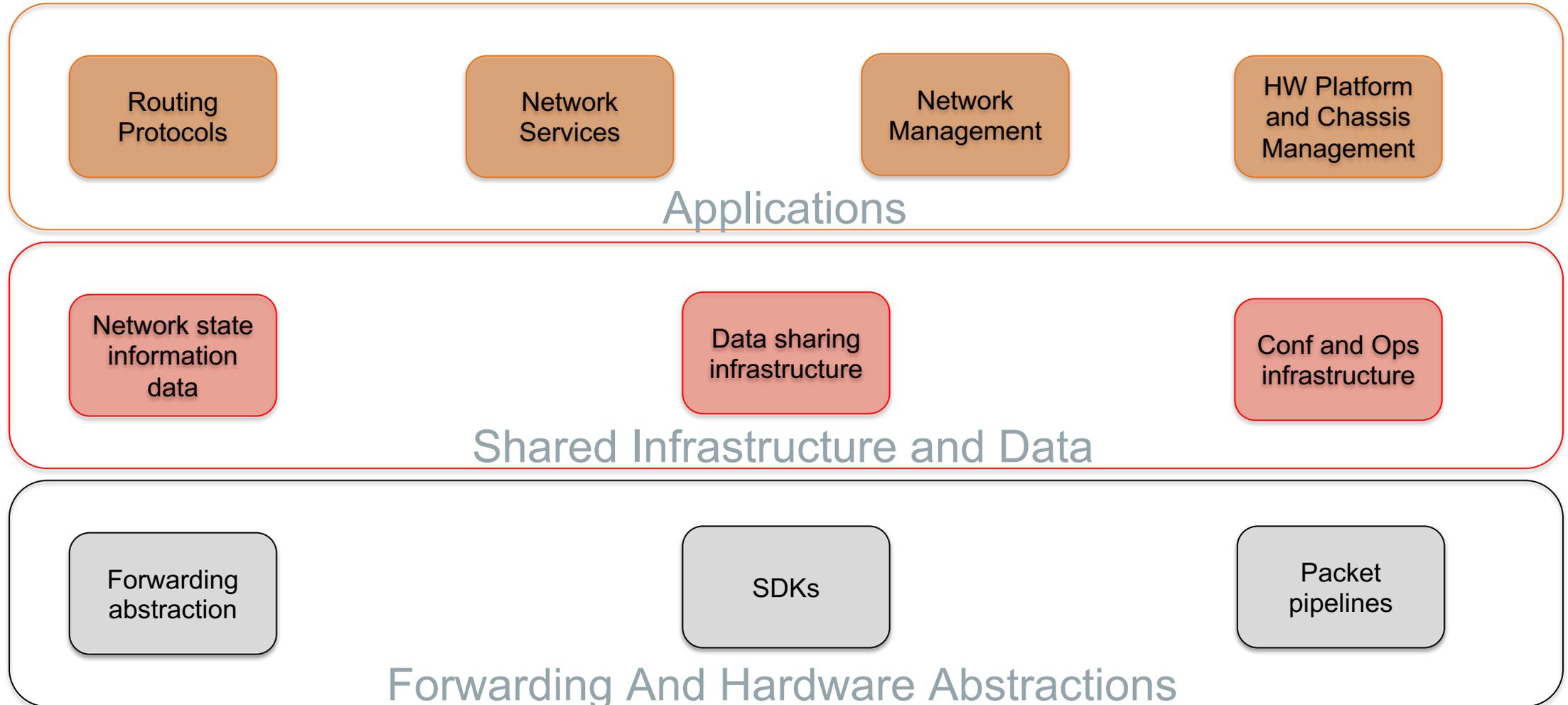| EGP	Interfaces	Dynamic data and statistics
IGP	PIM	MPLS

RIB Manager
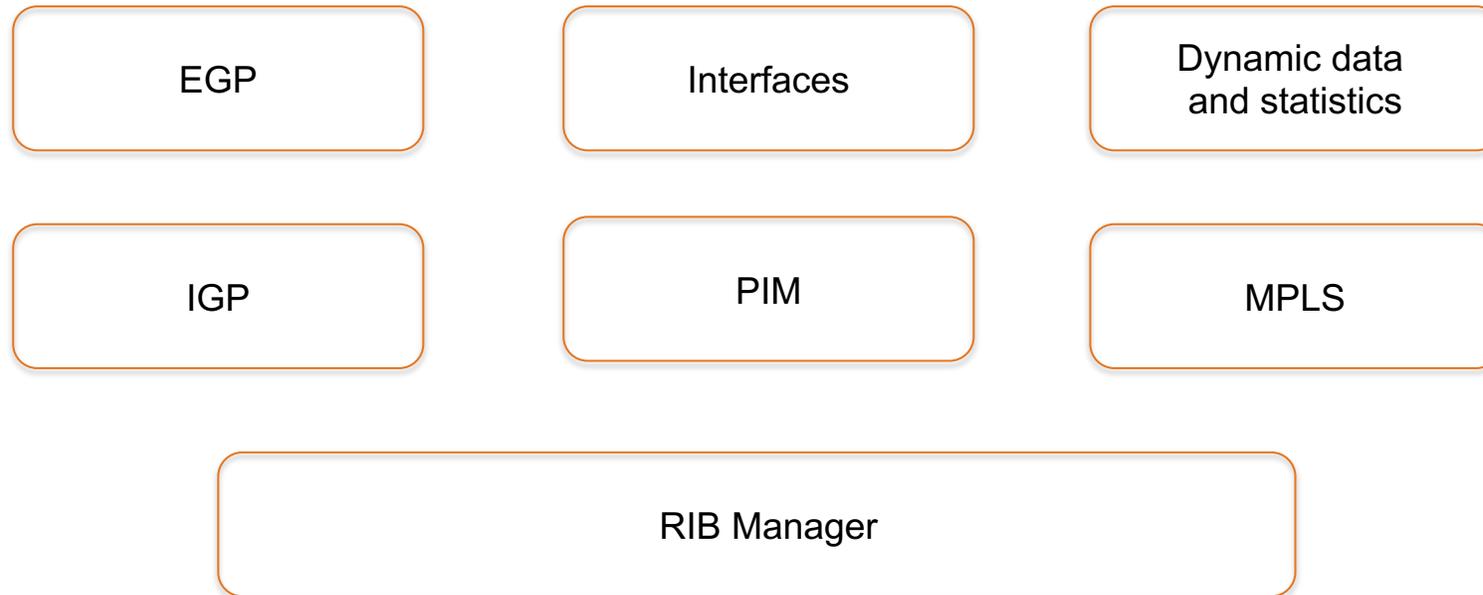
Network Elements Layers

Applications

Shared Infrastructure and Data

Forwarding And Hardware Abstractions

Network Elements Layers

Routing Protocols	Network Services	Network Management	HW Platform and Chassis Management

Applications

Network state information data	Data sharing infrastructure	Conf and Ops infrastructure

Shared Infrastructure and Data

Forwarding abstraction	SDKs	Packet pipelines

Forwarding And Hardware Abstractions

Network Elements Layers

Routing Protocols

Network Services

Network Management

HW Platform and Chassis Management

Applications

Data models

APIs

Data models

Network state information data

Data sharing infrastructure

Conf and Ops infrastructure

Shared Infrastructure and Data

Data models

APIs

Data models

Forwarding abstraction

SDKs

Packet pipelines

Forwarding And Hardware Abstractions

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There Is Something Similar Already Out There
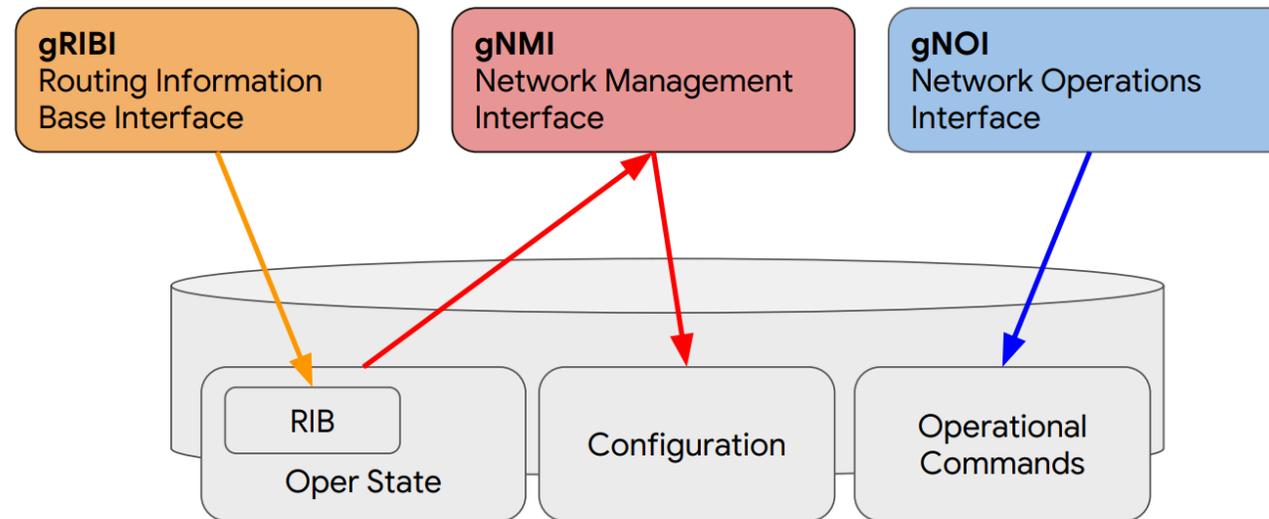
What Thought Experiments Can We Do?

- **RIP I2RS**
  - There are some good ideas, but the learnings from the group should be used in a new work
- Do we see a need to organize our work around new system architecture across multiple layers?