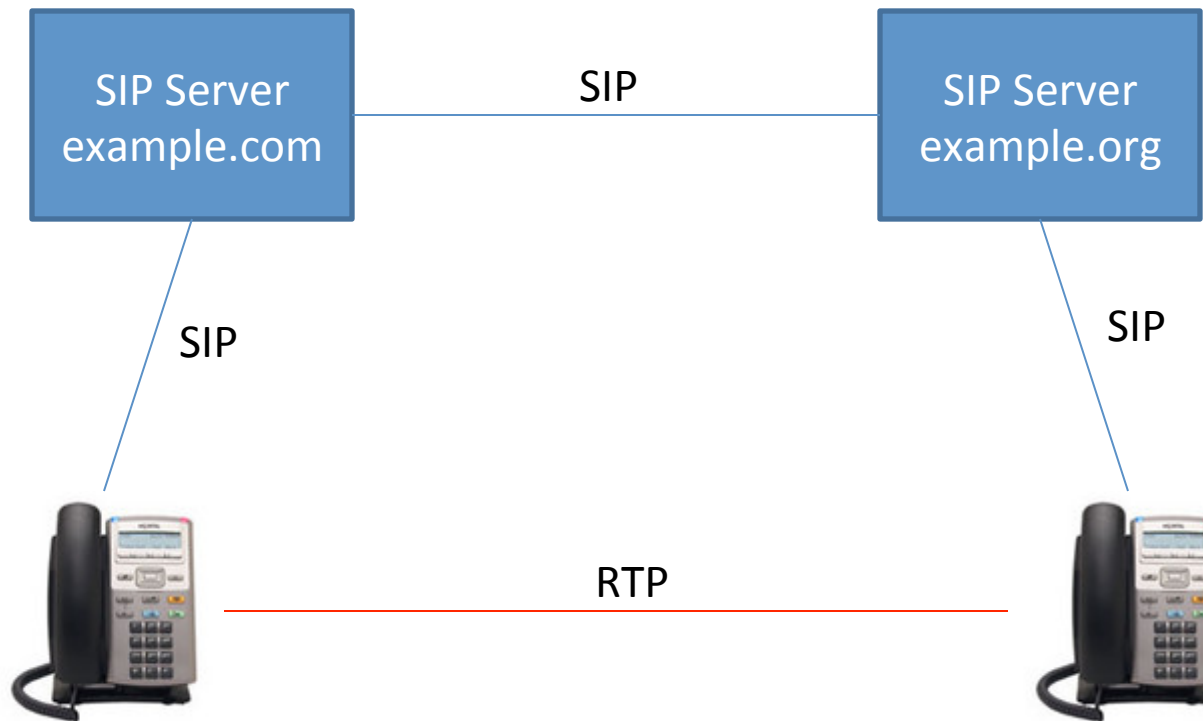# The End of Application Protocol Standardization (?)

Jonathan Rosenberg

Chief Technology Strategist, Skype

Outline

- Experiences and Lessons from SIP – the Telecoms Innovation Cycle

- (Obvious) Industry Trends

- The Internet Application Innovation Cycle and its Implications for IETF

SIP for Beginners

Example SIP Message
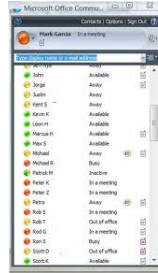
```
INVITE sip:+17327654321@example.com SIP/2.0
From: J. Rosenberg <sip:+14082321122@example.com>
 ;tag=76ah
Subject: Conference Call
To: John Smith <sip:+17327654321@example.com>
Via: SIP/2.0/UDP 1.2.3.4;branch=z9hG4bK74bf9
Call-ID: 1997234505.56.78@1.2.3.4
Content-type: application/sdp
CSeq: 4711 INVITE
Content-Length: 187

v=0
o=user1 53655765 2353687637 IN IP4 1.2.3.4
s=Sales
c=IN IP4 1.2.3.4
t=0 0
m=audio 3456 RTP/AVP 0
```

SIP Success: Products

Hard Phones
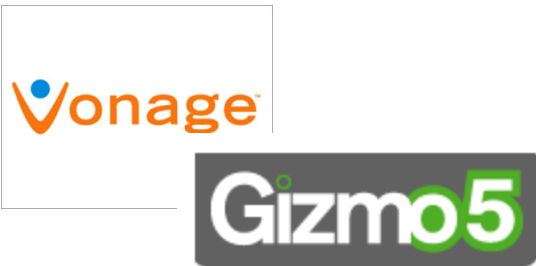

Soft Phones

PSTN Gateways

Firewalls

Session Border Controllers

SIP Success: Service Providers
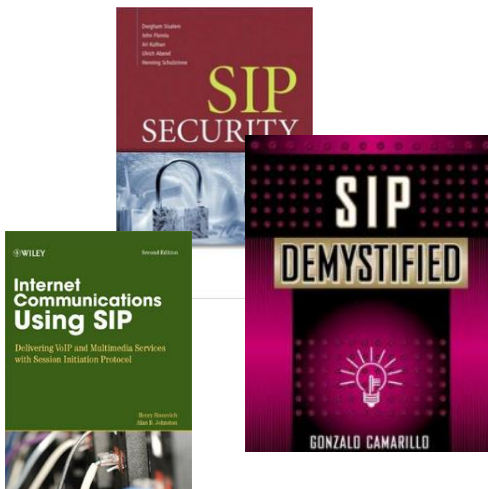

e2e SIP

Backhaul, Peering
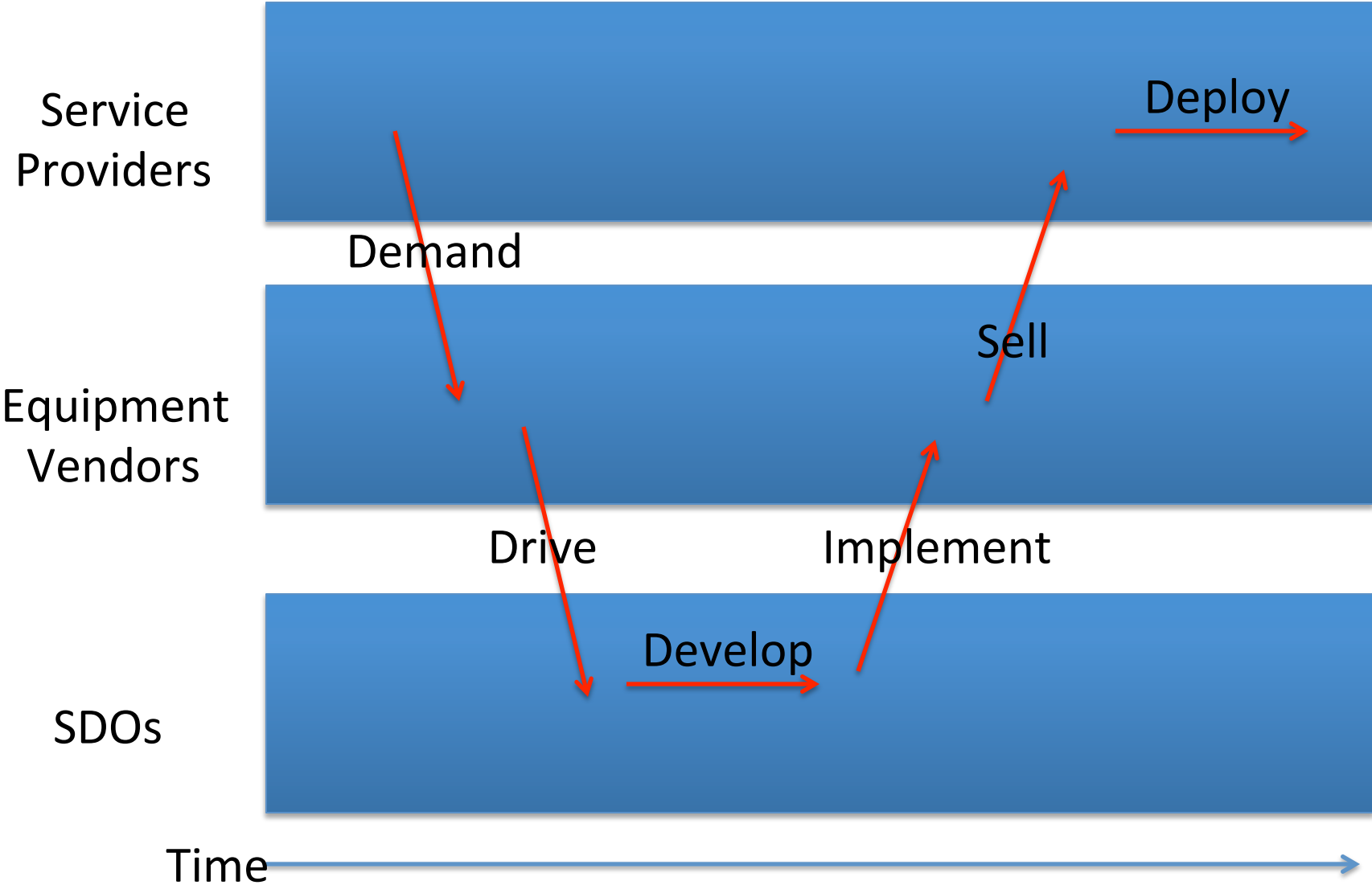

Termination

SIP Trunking

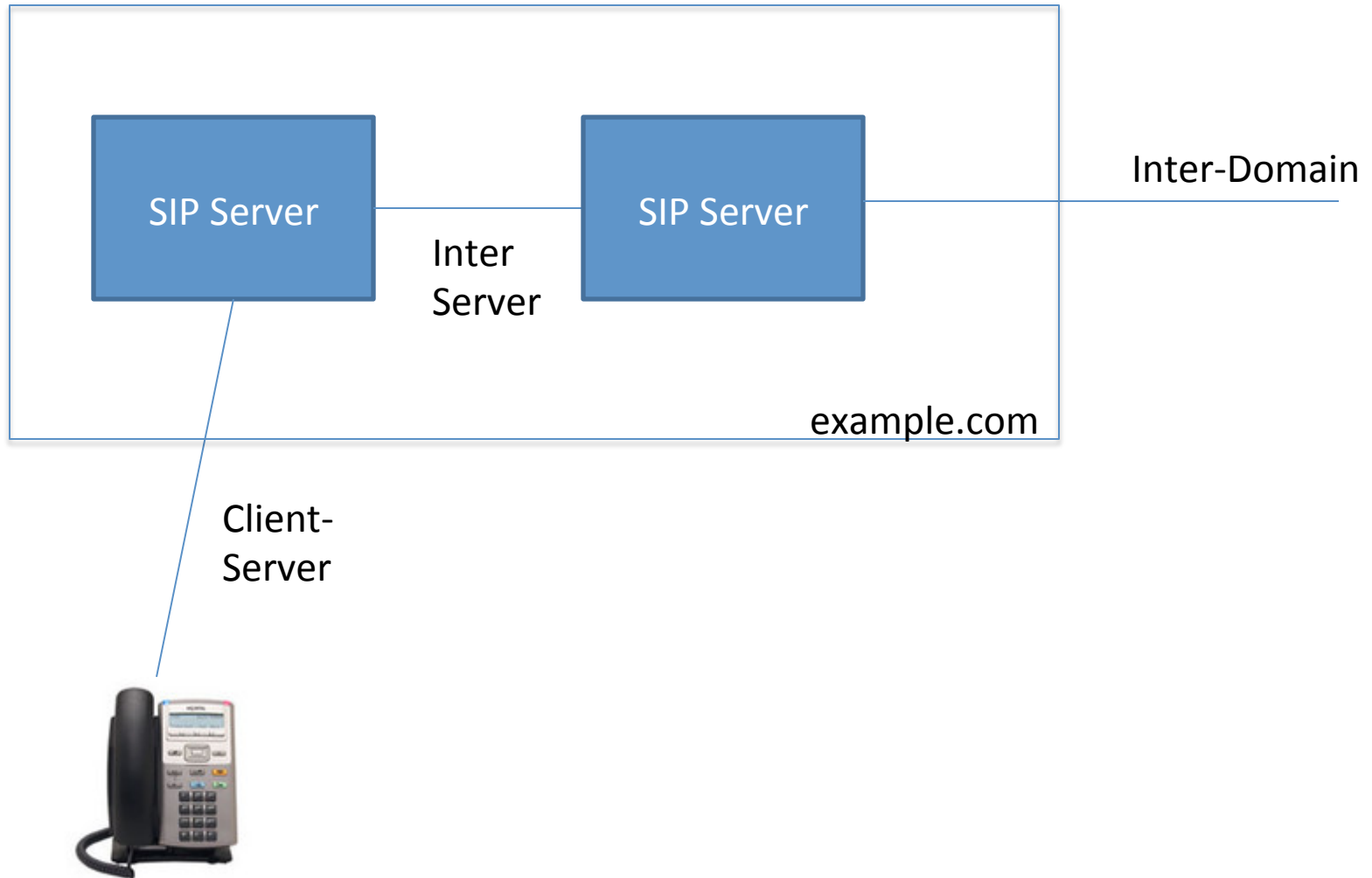# SIP Success: Industry

SIP Failure #1: Same Old Telephony

The Telecom Innovation Cycle

Service Providers

Deploy

Demand

Equipment Vendors

Sell

Drive

Implement

SDOs

Develop

Time

SIP Innovation Failure: Why

- Stuck in the telecom innovation cycle
- Adopted by service providers with modest goals for innovation
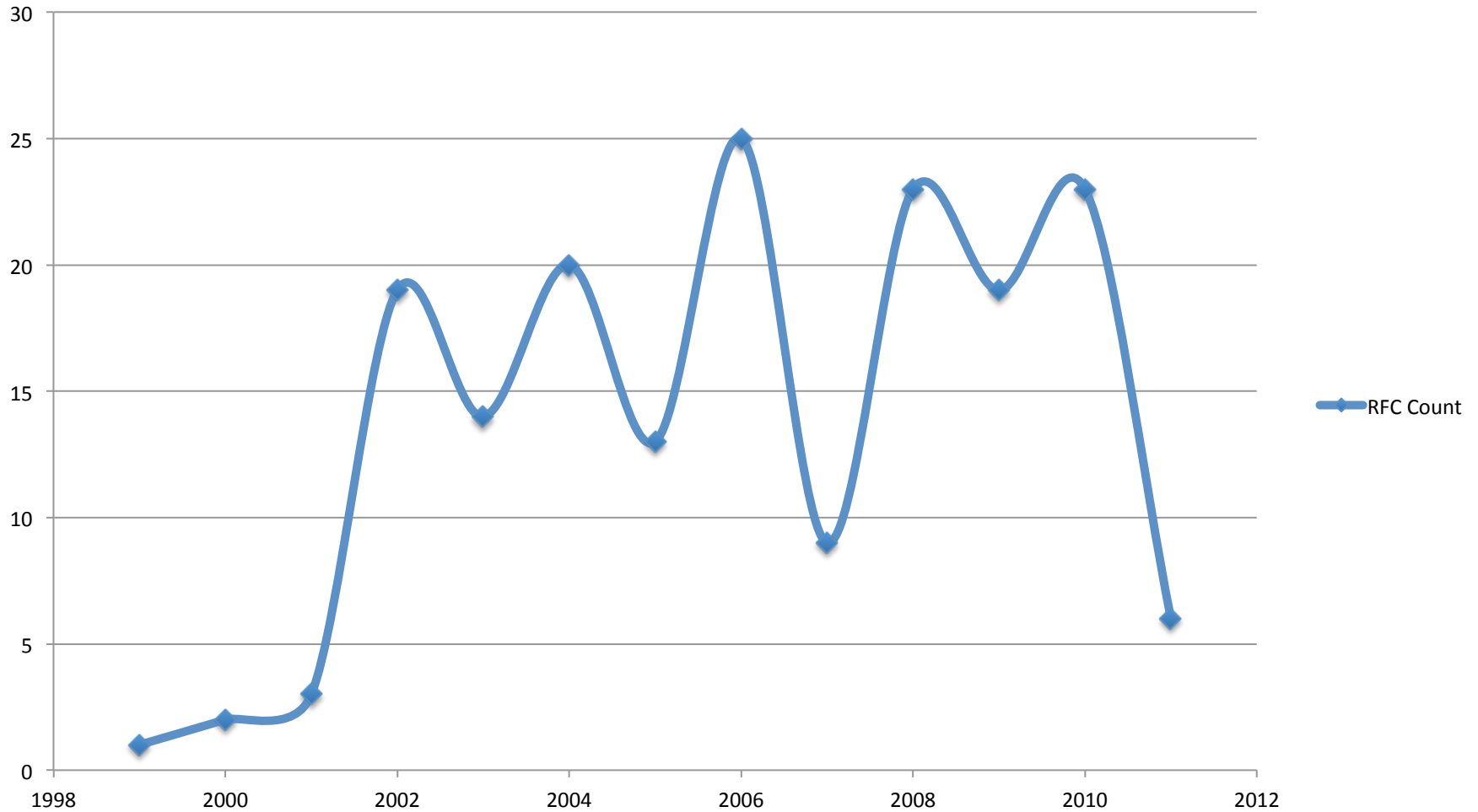
SIP Failure #2: Interoperability

Interop Report Card

Subject	Grade	Comments
Client to Server	D	Verbose, yet still missing basics.
Server to Server	B	Basic calling broadly interoperable. Not much beyond that.
Interdomain	C	Still waiting for mass-market inter-domain calling.

Too Many Standards
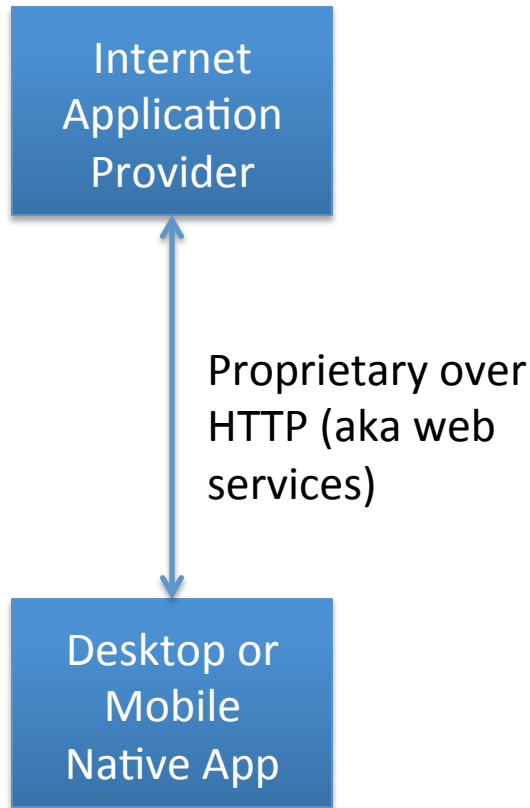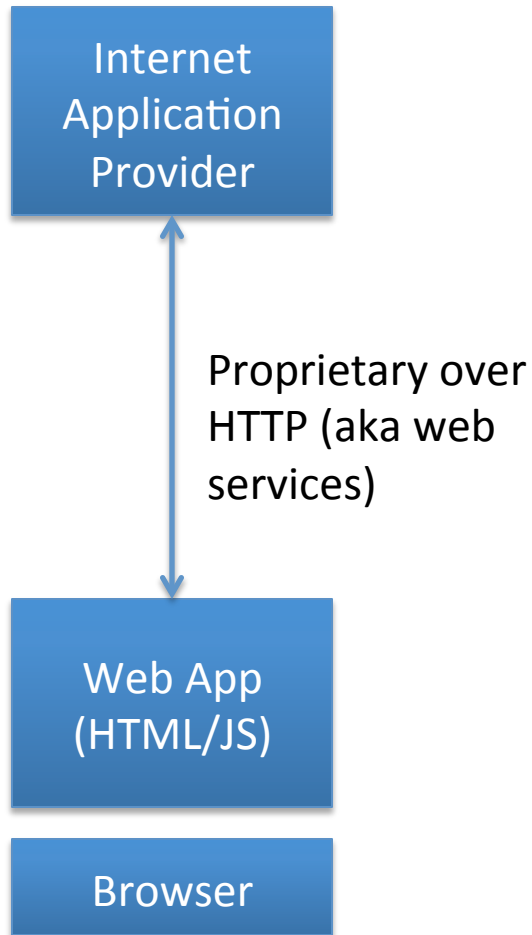

RFC Count

SIP Interop Failure: Why

- Too Many Standards

- Proprietary Features

- Telecom Innovation Cycle (Supply/Demand)
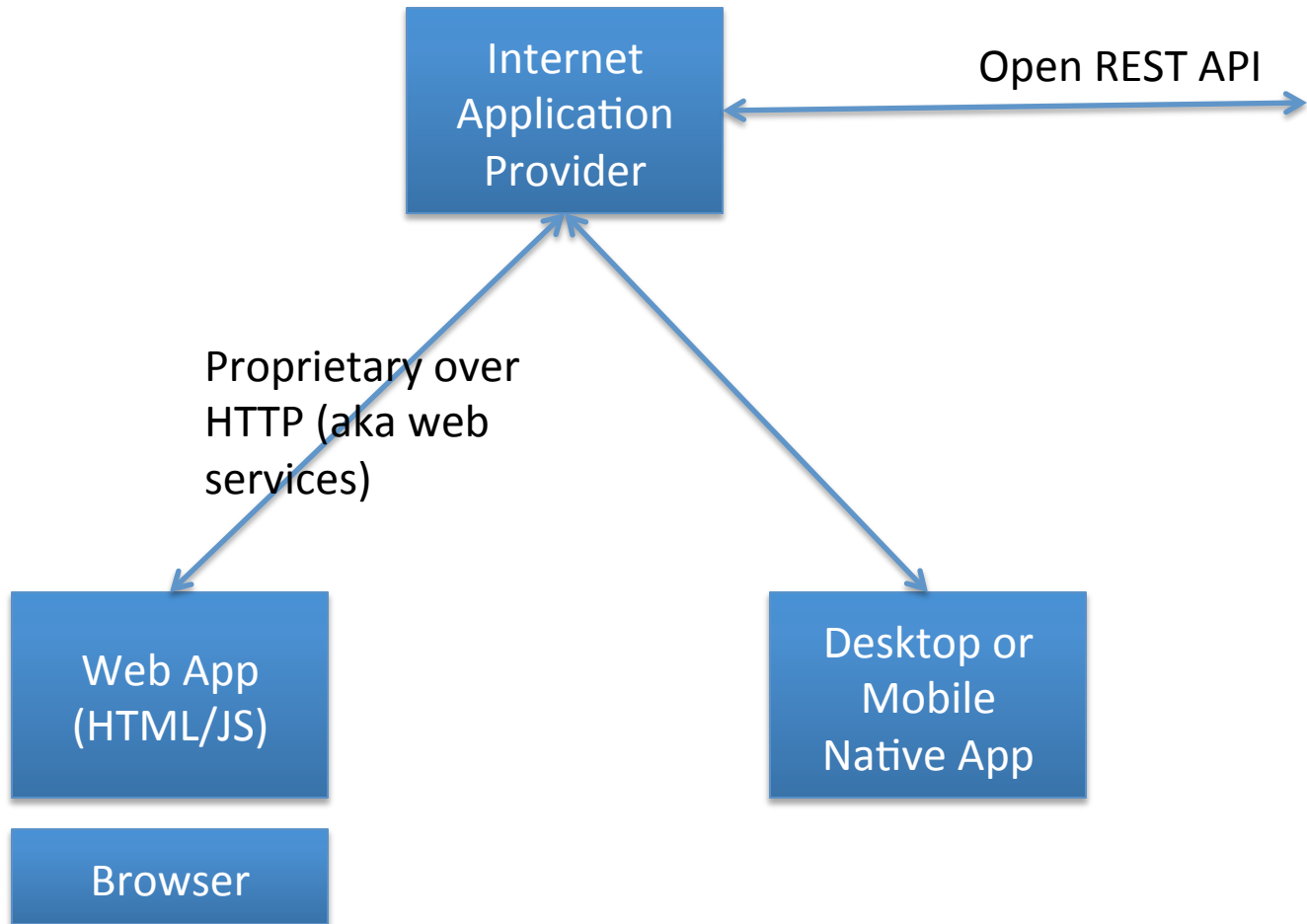
Trend #1: "Cloud Apps"

Internet Application Provider

Proprietary over HTTP (aka web services)
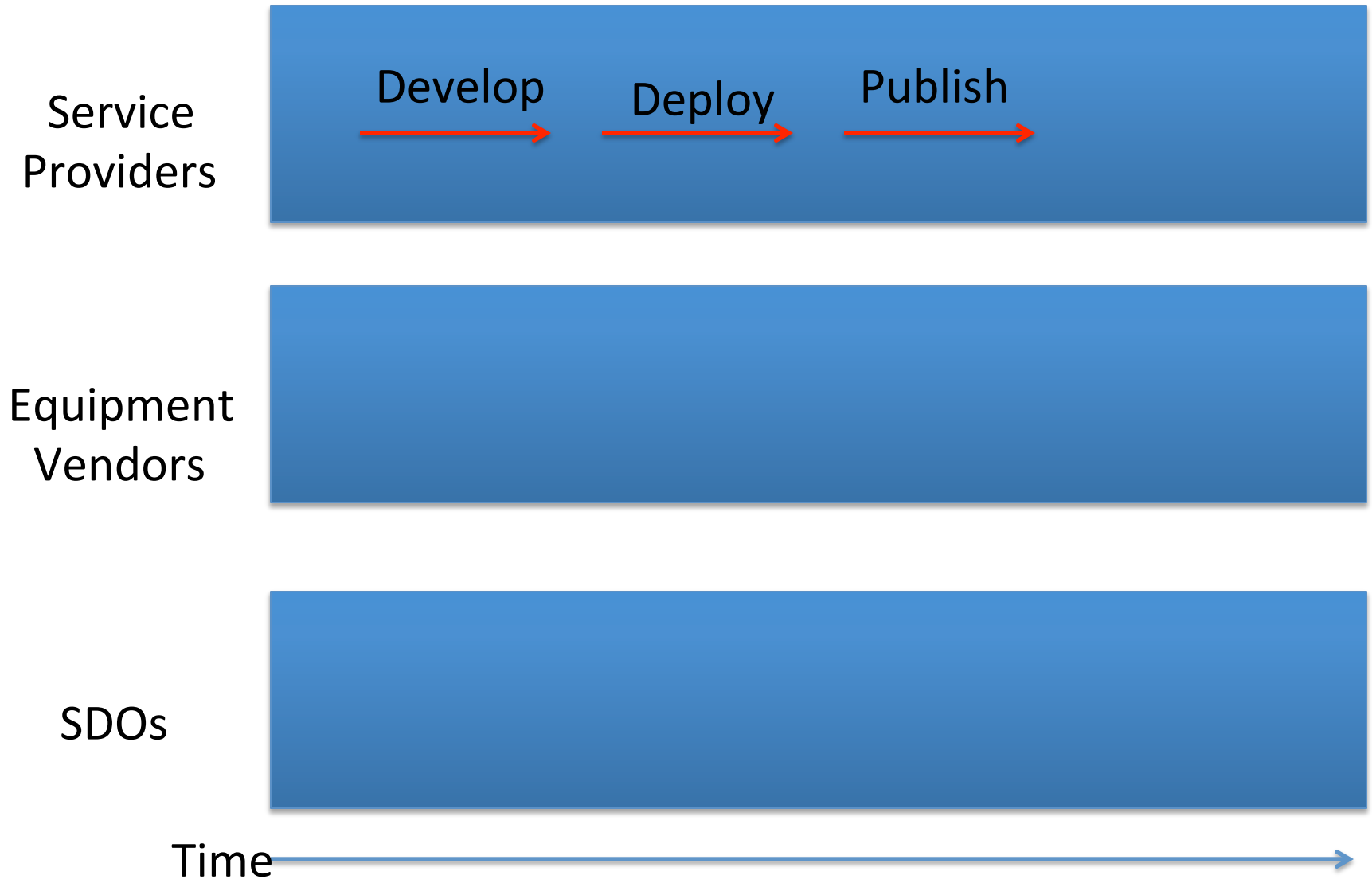
Desktop or Mobile Native App

Trend #2: Web Apps

Trend #3: Inter-domain "REST" APIs

The Internet Software Innovation Cycle

Telecoms vs. Internet Application Cycles

Criteria	Telecom Cycle	Internet Application Cycle
Speed	Slow	Fast
Dependencies	Many	None
Primary Service Concern	Inter-Provider	Intra-Provider
Standards	First	Last (if Ever)
Hardware Ecosystem	Yes	No
Scalable to > hundreds of providers	Yes	No
Service Offerings	Homoegeneous	Heterogeneous

Implications for the IETF

- Standards provide enabling technologies – not application specific

- Inter-domain application standardization only when it is following the telecoms paradigm – many small providers

- Client/Server application standardization only when software distribution to the client is not possible