

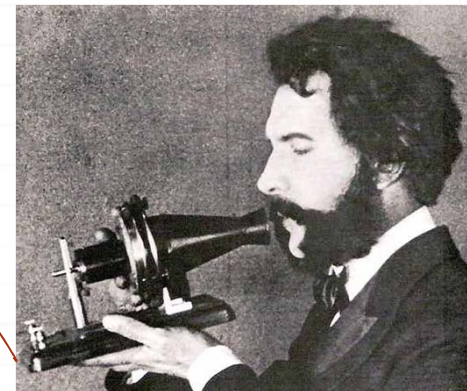
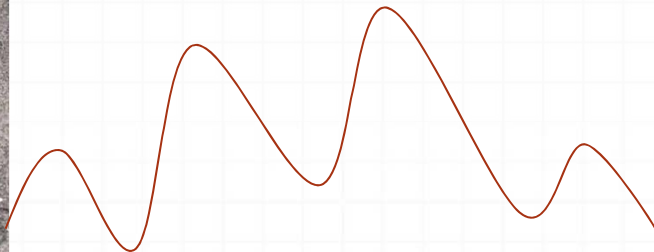
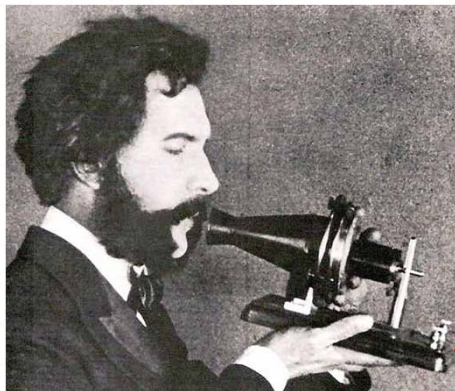


Service-Centric Networking with SCAFFOLD

Written by: Michael J. Freedman, et al.
Presented by: Mert Coskun

The Problem

- o ARPANET (1968), IP4 (1981)
- o Telephone Network



The Problem

- o WWW(1991) : A New Era Begins!

- o Content



- o Software As a Service (2001)

- o **Service**



NAT



ARP Spoofing



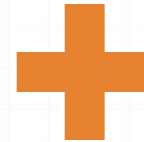
DNS with Short TTL

GSLB



VIP Load Balancing

HTTP Redirection



More



SCAFFOLD

SCAFFOLD

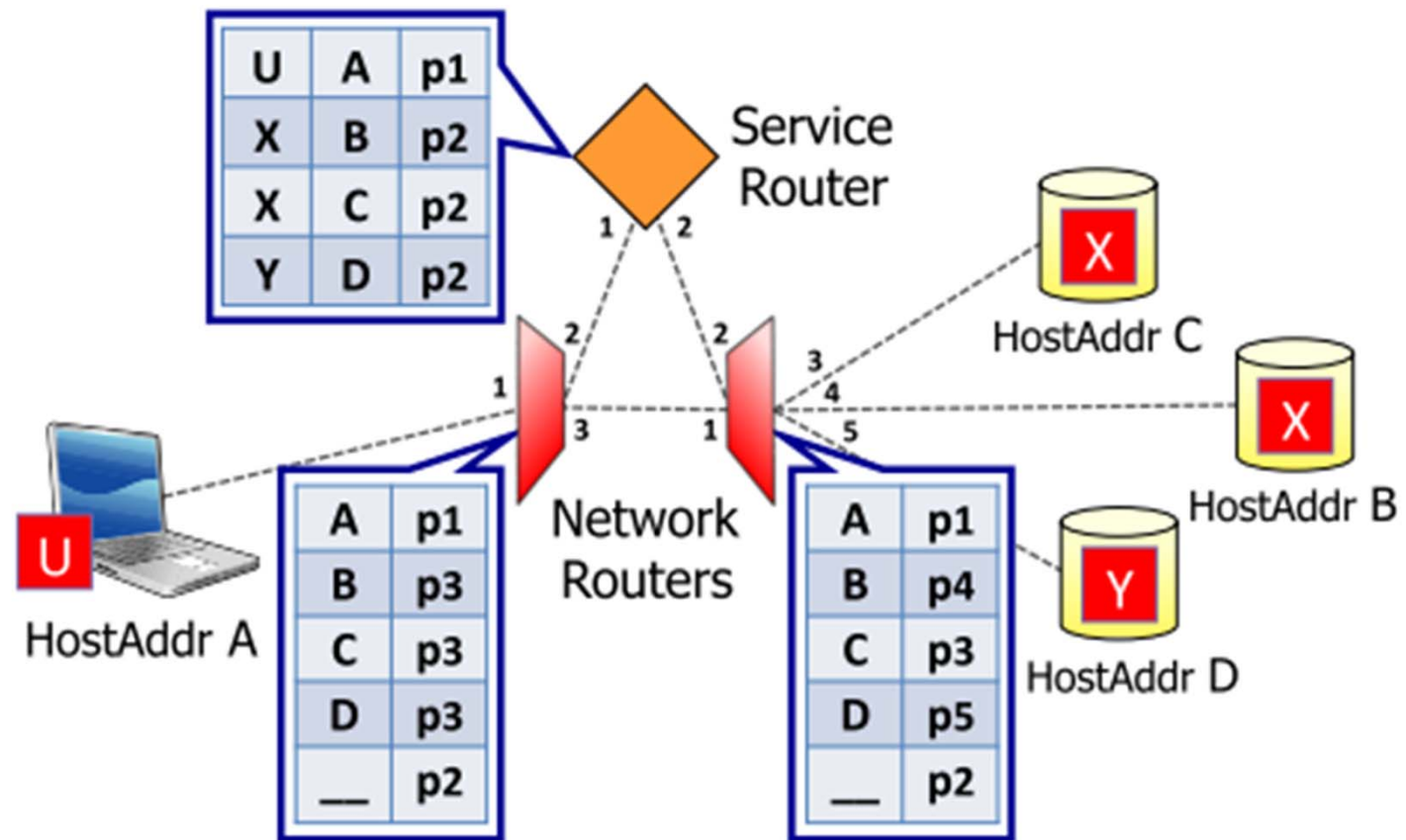
o CLEAN SLATE

o Focus: Replication & Dynamism

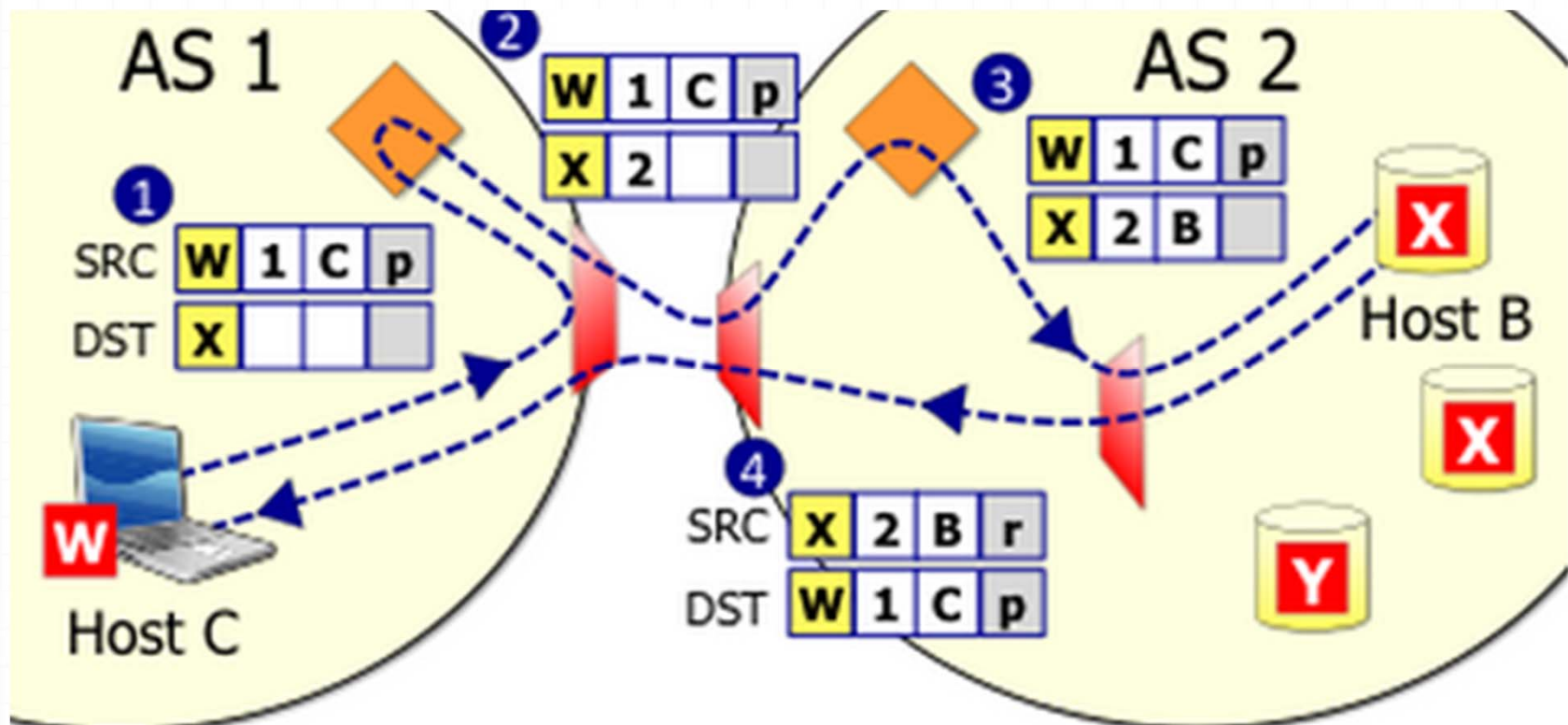
o Solution: **Flow-Based Anycast**

o My Opinion: GSLB + IPNL in Network Layer

Architecture



Replication & Dynamism



Three Pillars of SCAFFOLD

- New Header

- Service Identifier + Network Address (LISP/HIP)

- New Routers

- Service and Network Routers (SR = GSLB+R ? /IPNL)

- New API

- **Bind to SERVICE**

Application Portability

Application	Version	Codebase	Changes
Iperf	2.0.0	5,934	240
TFTP	5.0	3,452	90
PowerDNS	2.9.17	36,225	160
Wget	1.12	87,164	207
Elinks browser	0.11.7	115,224	234
Mongoose web server	2.10	8,831	425
Memcached server	1.4.5	8,329	159
Memcached client	0.40	12,503	184
Apache Benchmark / APR	1.4.2	55,609	244

Performance

	Mean	Stdev
Stack	Mbit/s	Mbit/s
TCP/IP	929.8	5.3
SCAFFOLD (kernel)	596.6	17.0
SCAFFOLD (user)	110.1	16.1
SCAFFOLD (user with tracing)	82.3	8.8
Router	Kpkts/s	Kpkts/s
Service (Resolution)	12.99	0.17
Network (Data forwarding)	13.25	1.47

The Cool



- o Service Name
 - o Network Layer Security
 - o Self-certifying
- o Late Binding
 - o Flexibility (replication)
 - o Automatic mobility/adaption
- o API
 - o Address are Transparent to Application
 - o Simple Addition / Replacement / Subtraction

The Questionable



- o No Connectionless Communication?
- o Current System Works!
- o The Prototype & Evaluation
- o Virtual Machine Migration
 - o Remus?

The Bad



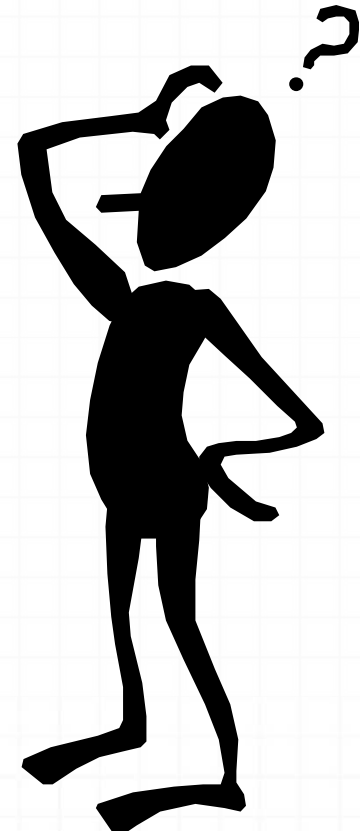
- New Routers
 - Change / +1 Hop
 - More Work
- New API
- No backwards compatibility
- No obvious incentive

My Opinion

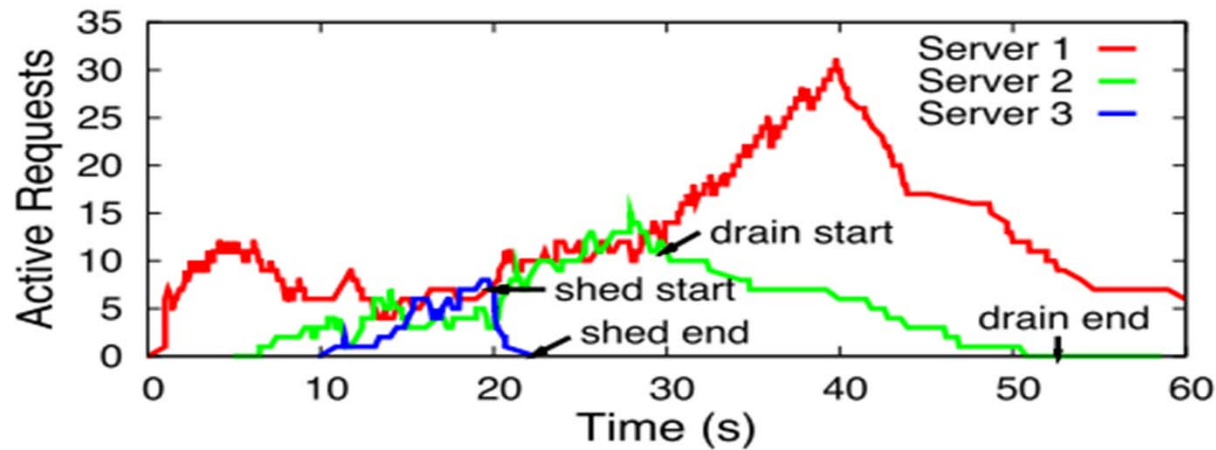
- o Cool **BUT** Too Revolutionary for wide Adoption
- o **May be** used within data centres
- o P2P Services?
- o Motivation for evolutionary research

THANK YOU!

Questions?



Load Balancing



Requests / second

2000
1500
1000
500

