THE BIRTH OF THE INTERNET

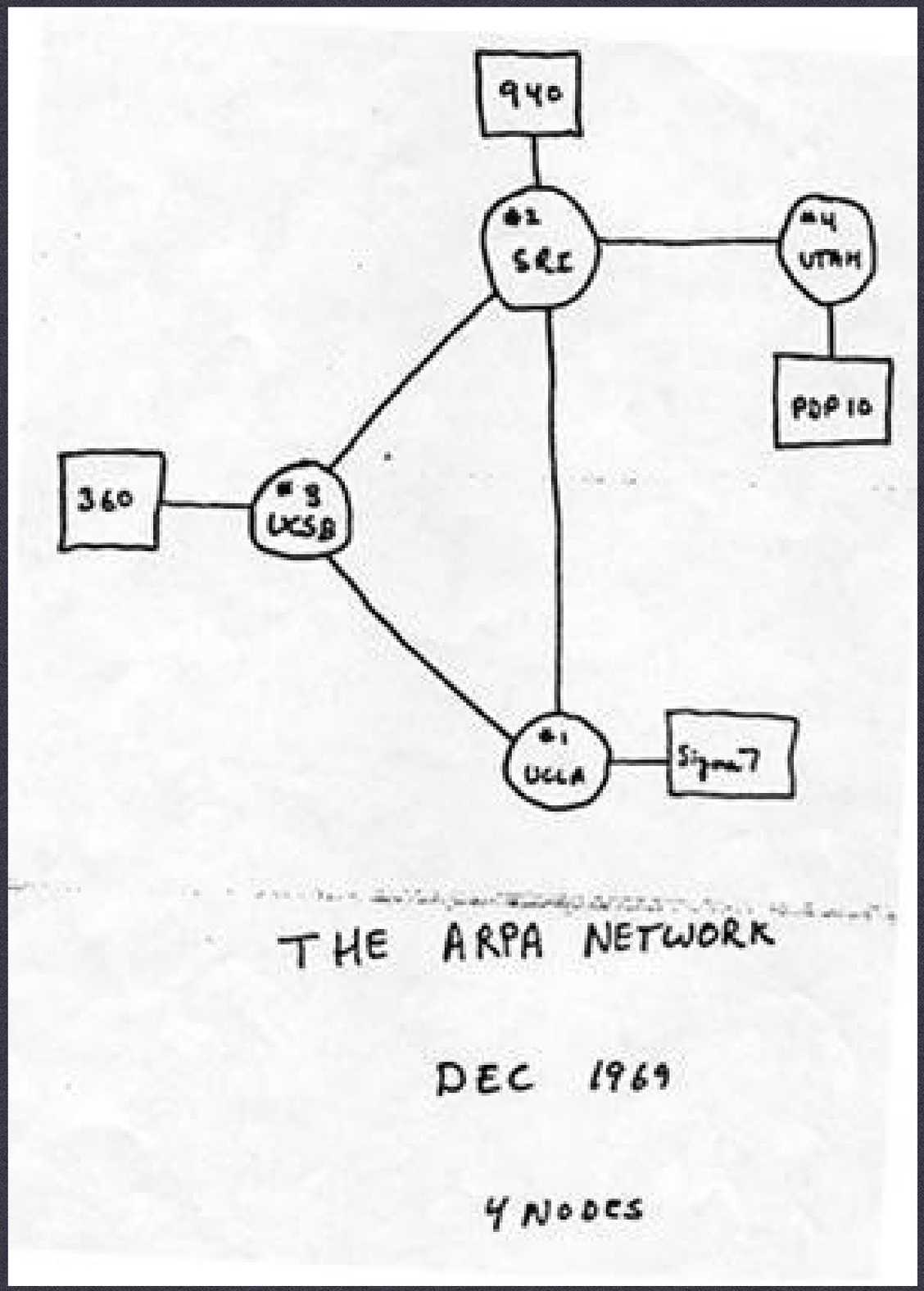
BEFORE THE WORLD WIDE WEB

1960: STAND-ALONE SYSTEMS

IBM 7090 COMPUTERS USED ON NASA'S PROJECT MERCURY (1962)

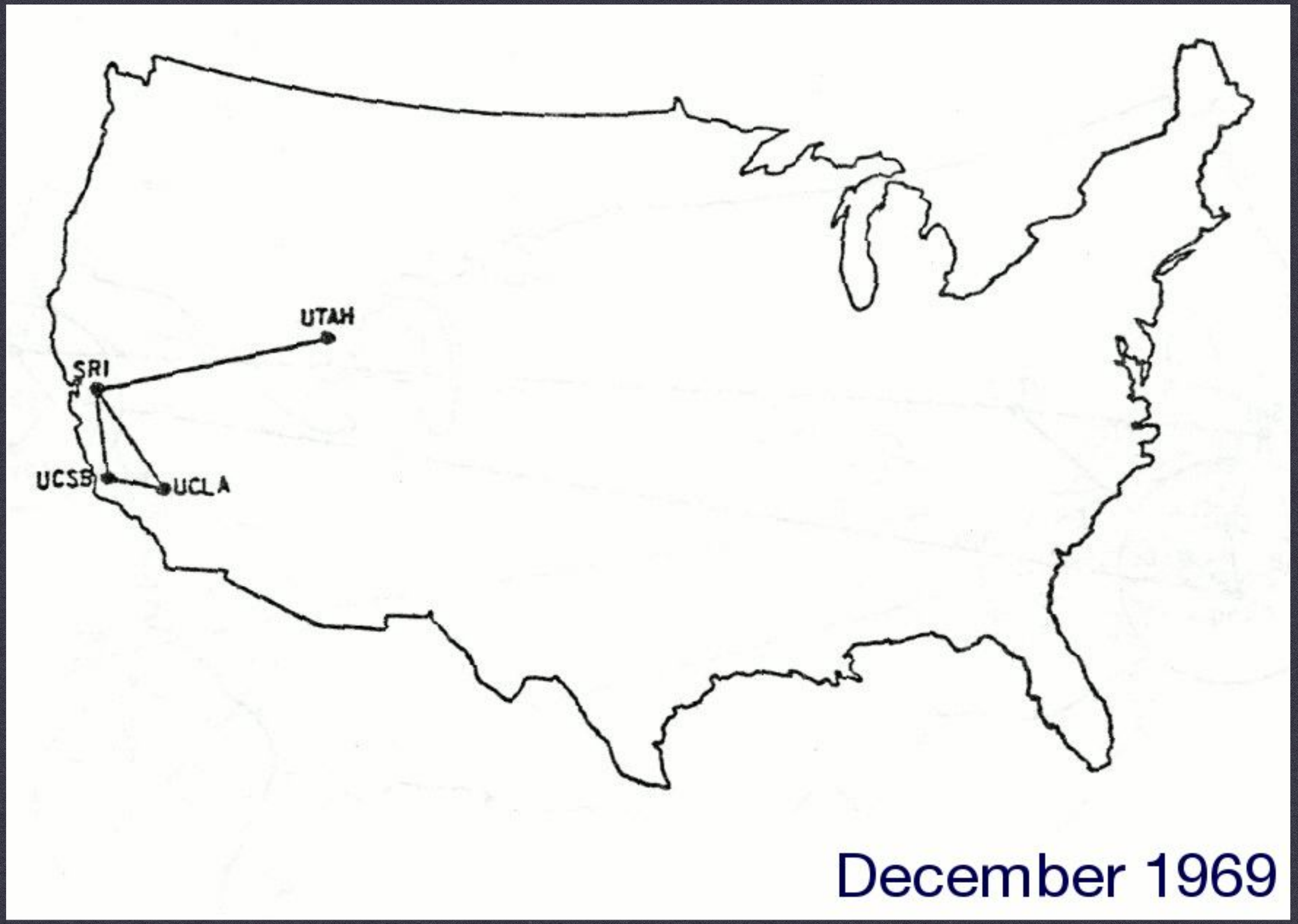
1965: TERMINALS AND TIME-SHARING

IBM SYSTEM/360 MODEL 65 (1965)



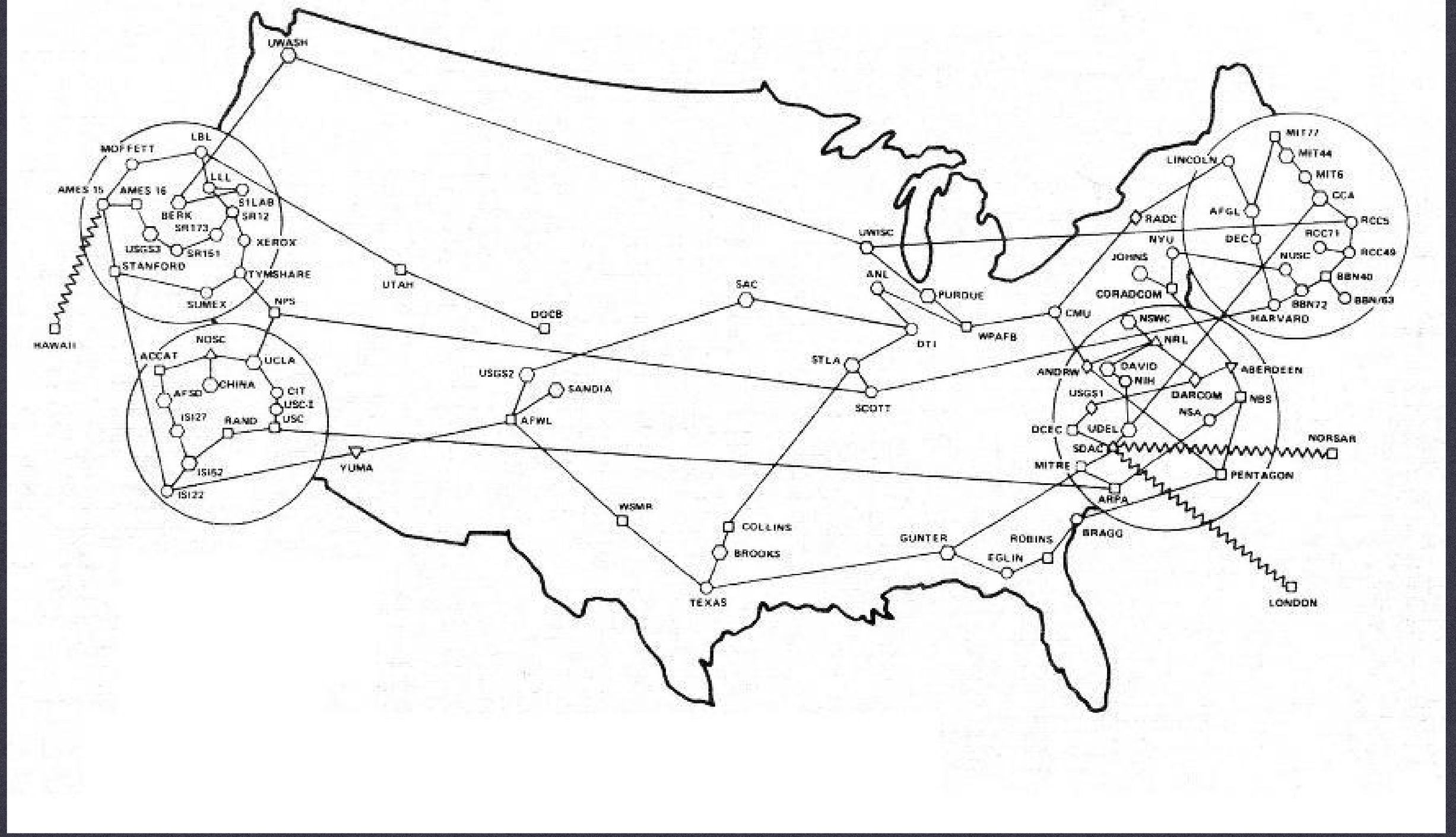
1970: THE ARPANET IS BORN

FIRST ARPA NETWORK MAP (LARRY ROBERTS, ARPANET PROGRAM MANAGER, 1969)



1970-1982: GROWTH AND REFINEMENT

ARPANET NETWORK MAPS, FROM THE COLLECTION OF J. NOEL CHIAPPA (1969-1982)



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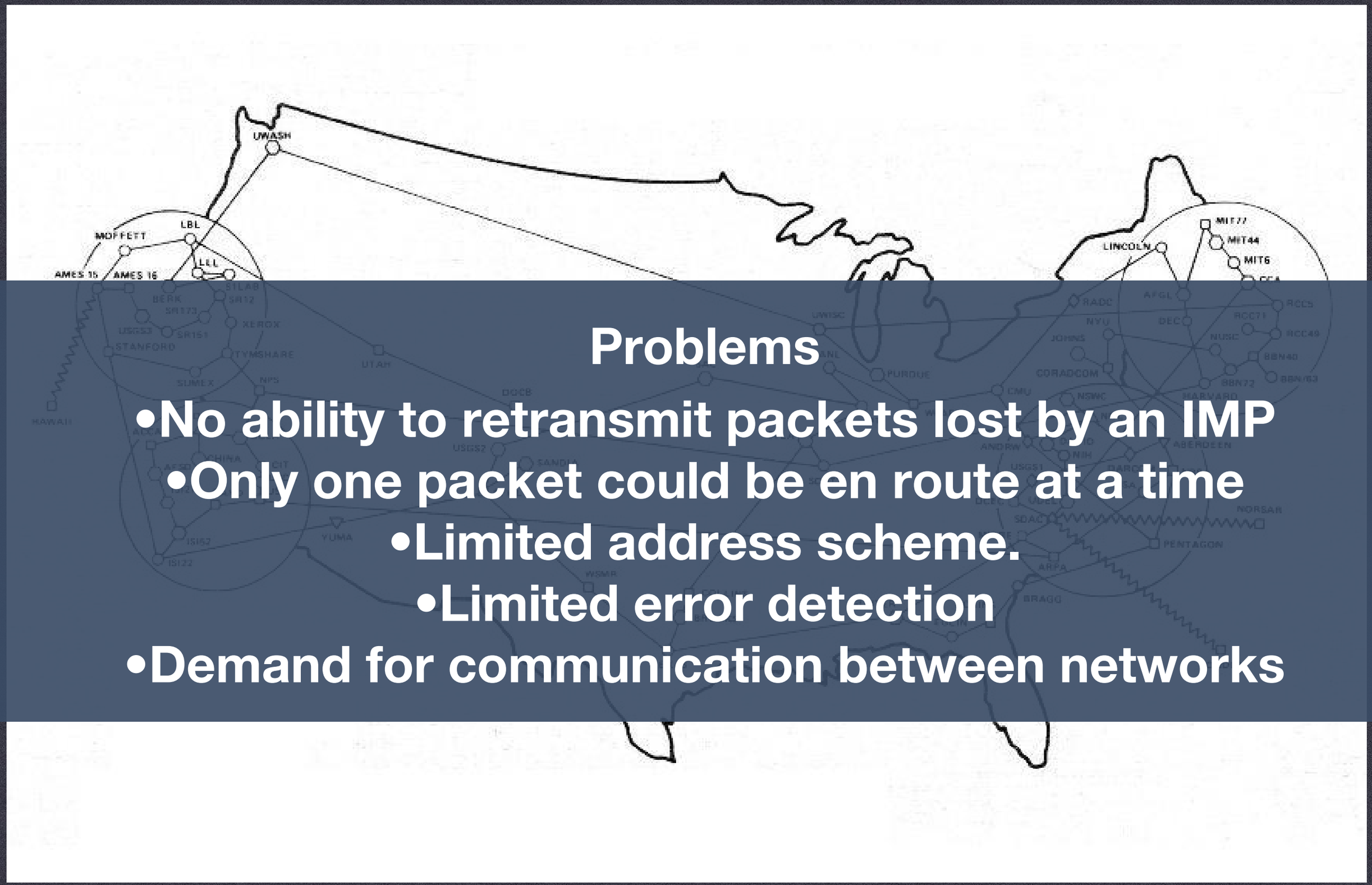
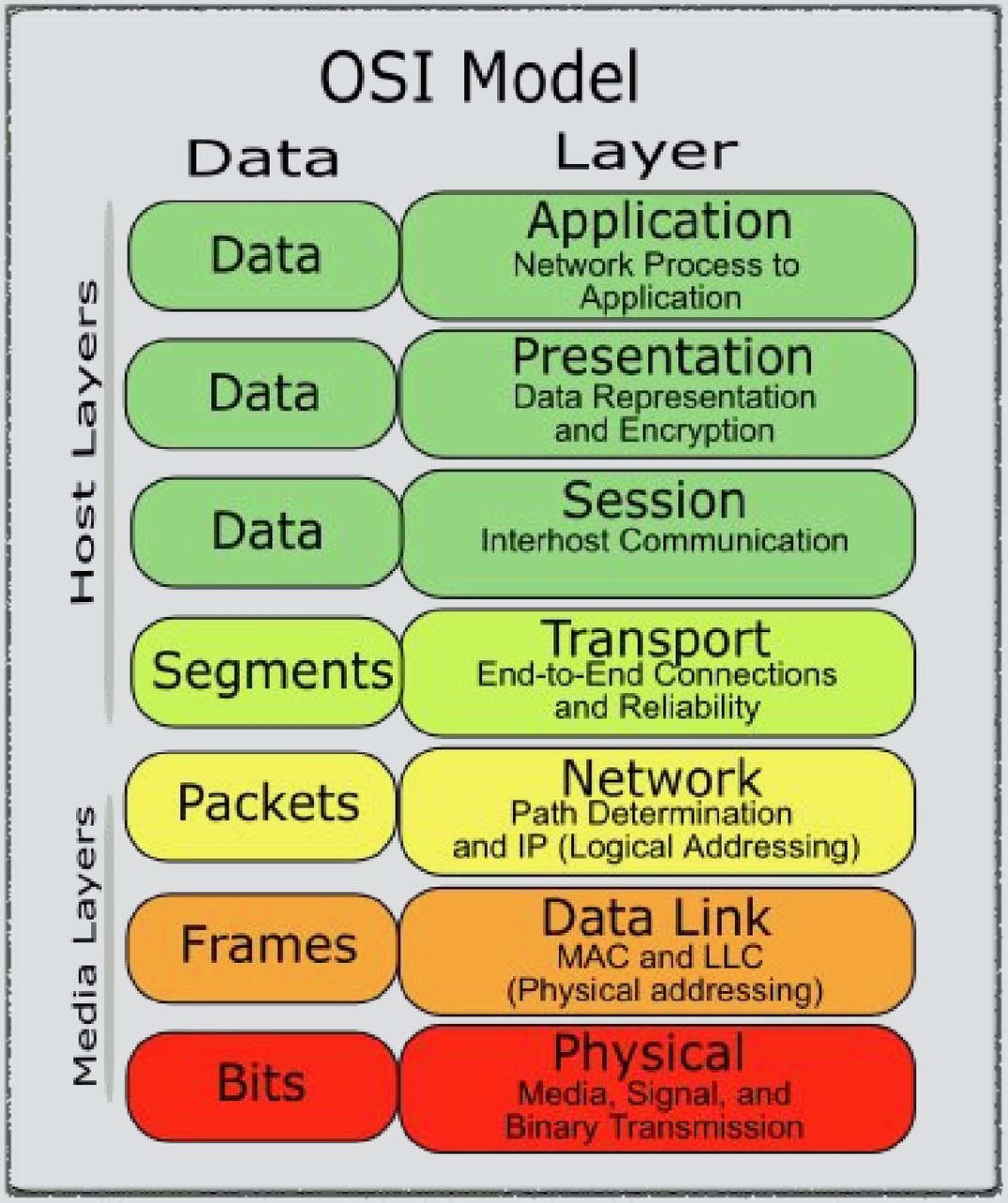


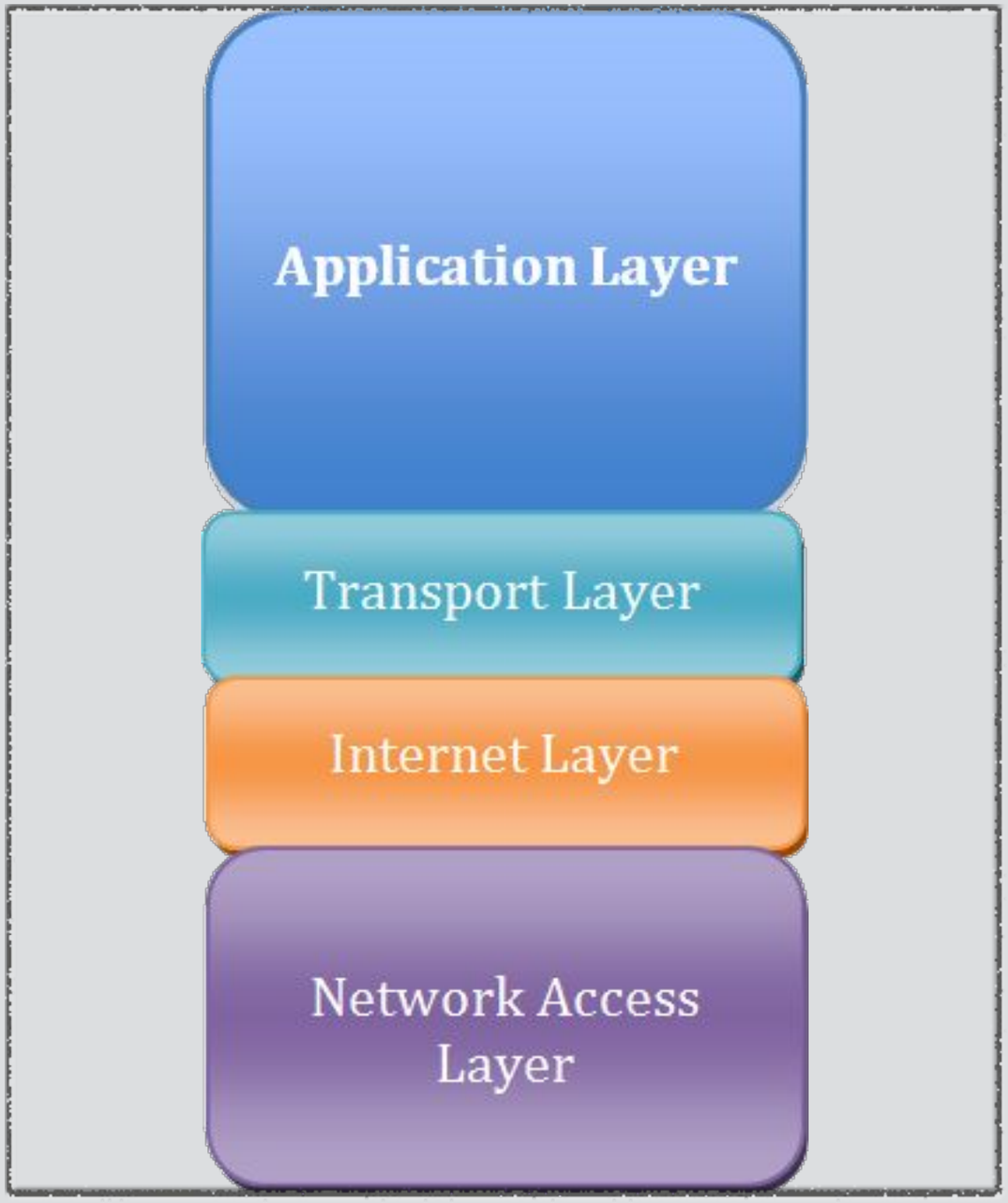
Problems

- No ability to retransmit packets lost by an IMP
- Only one packet could be en route at a time
- Limited address scheme.
- Limited error detection
- Demand for communication between networks

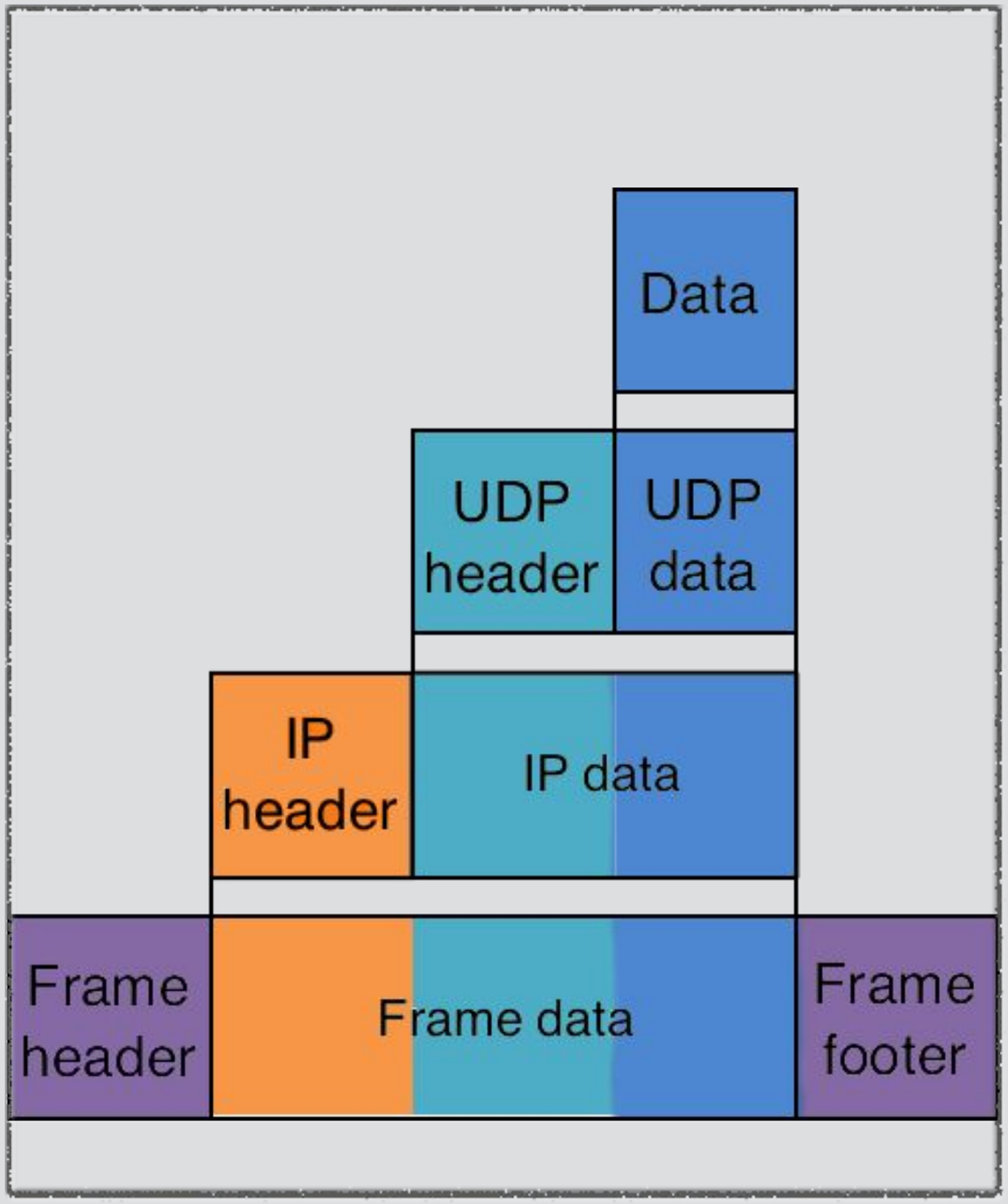
1970-1982: GROWTH AND REFINEMENT

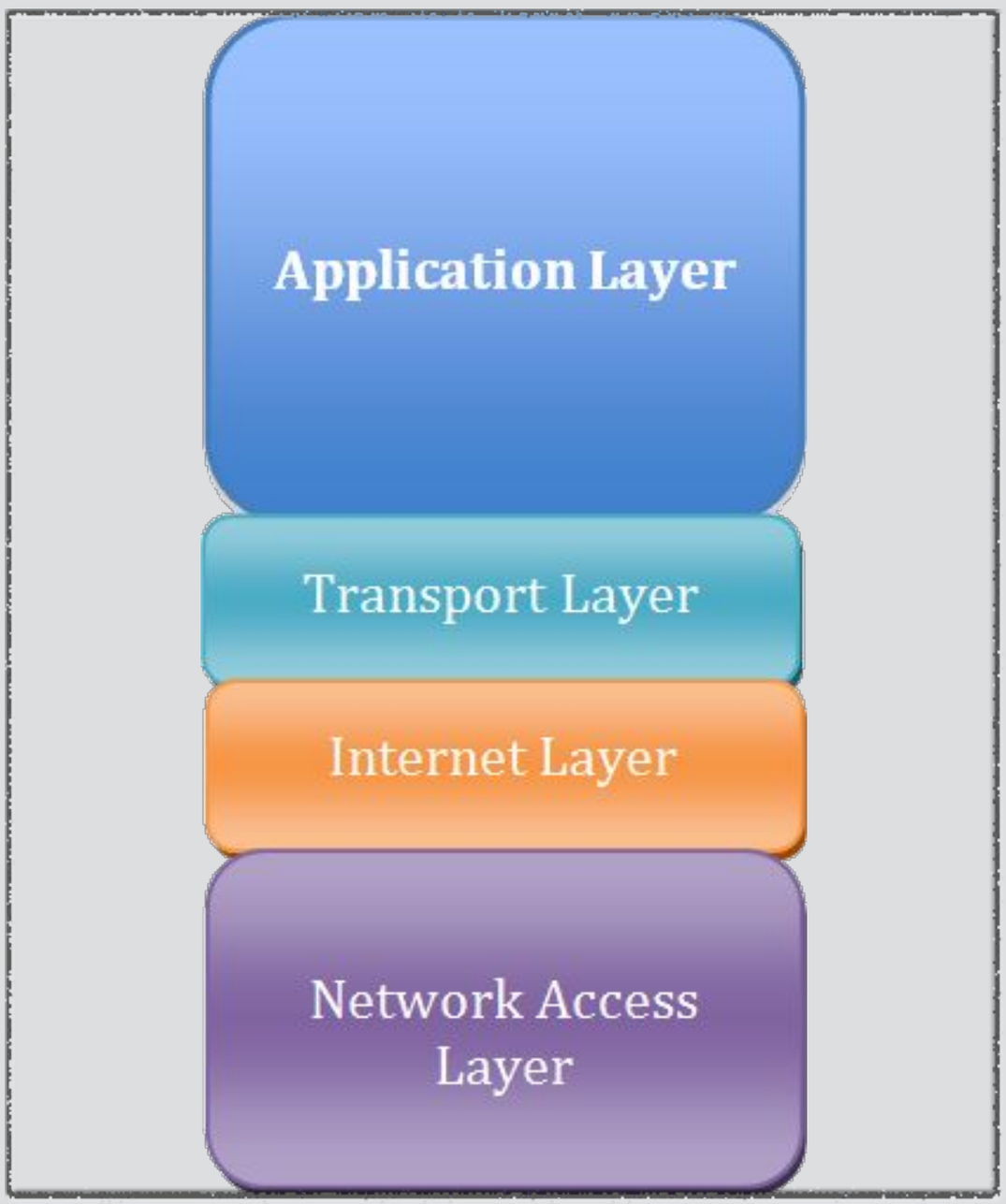
ARPANET NETWORK MAPS, FROM THE COLLECTION OF J. NOEL CHIAPPA (1969-1982)


OSI Model
Data
Layer
Host Layers
Data
Application
Network Process to Application
Data
Presentation
Data Representation and Encryption
Data
Session
Interhost Communication
Segments
Transport
End-to-End Connections and Reliability
Media Layers
Packets
Network
Path Determination and IP (Logical Addressing)
Frames
Data Link
MAC and LLC (Physical addressing)
Bits
Physical
Media, Signal, and Binary Transmission

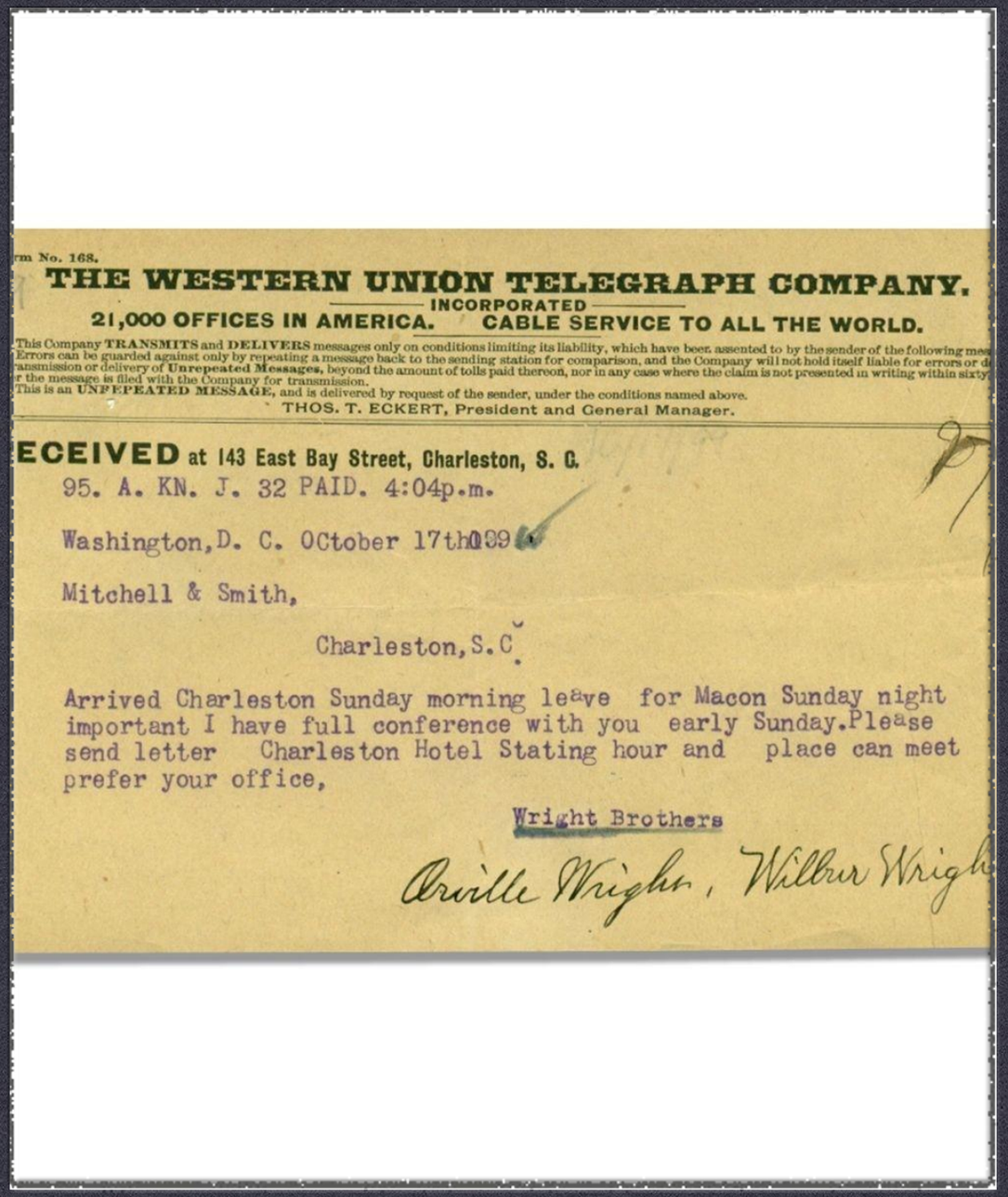

Application Layer
Transport Layer
Internet Layer
Network Access Layer

OSI MODEL





INTERNET MODEL



rm No. 168.

THE WESTERN UNION TELEGRAPH COMPANY.

INCORPORATED

21,000 OFFICES IN AMERICA. CABLE SERVICE TO ALL THE WORLD.

This Company TRANSMITS and DELIVERS messages only on conditions limiting its liability, which have been assented to by the sender of the following mes
Errors can be guarded against only by repeating a message back to the sending station for comparison, and the Company will not hold itself liable for errors or d
ransmission or delivery of Unrepeated Messages, beyond the amount of tolls paid thereon, nor in any case where the claim is not presented in writing within sixty
r the message is filed with the Company for transmission.
This is an UNREPEATED MESSAGE, and is delivered by request of the sender, under the conditions named above.

THOS. T. ECKERT, President and General Manager.

ECEIVED at 143 East Bay Street, Charleston, S. C.

95. A. KN. J. 32 PAID. 4:04p.m.

Washington,D. C. OCtober 17th 1903

Mitchell & Smith,

Charleston,S.C.

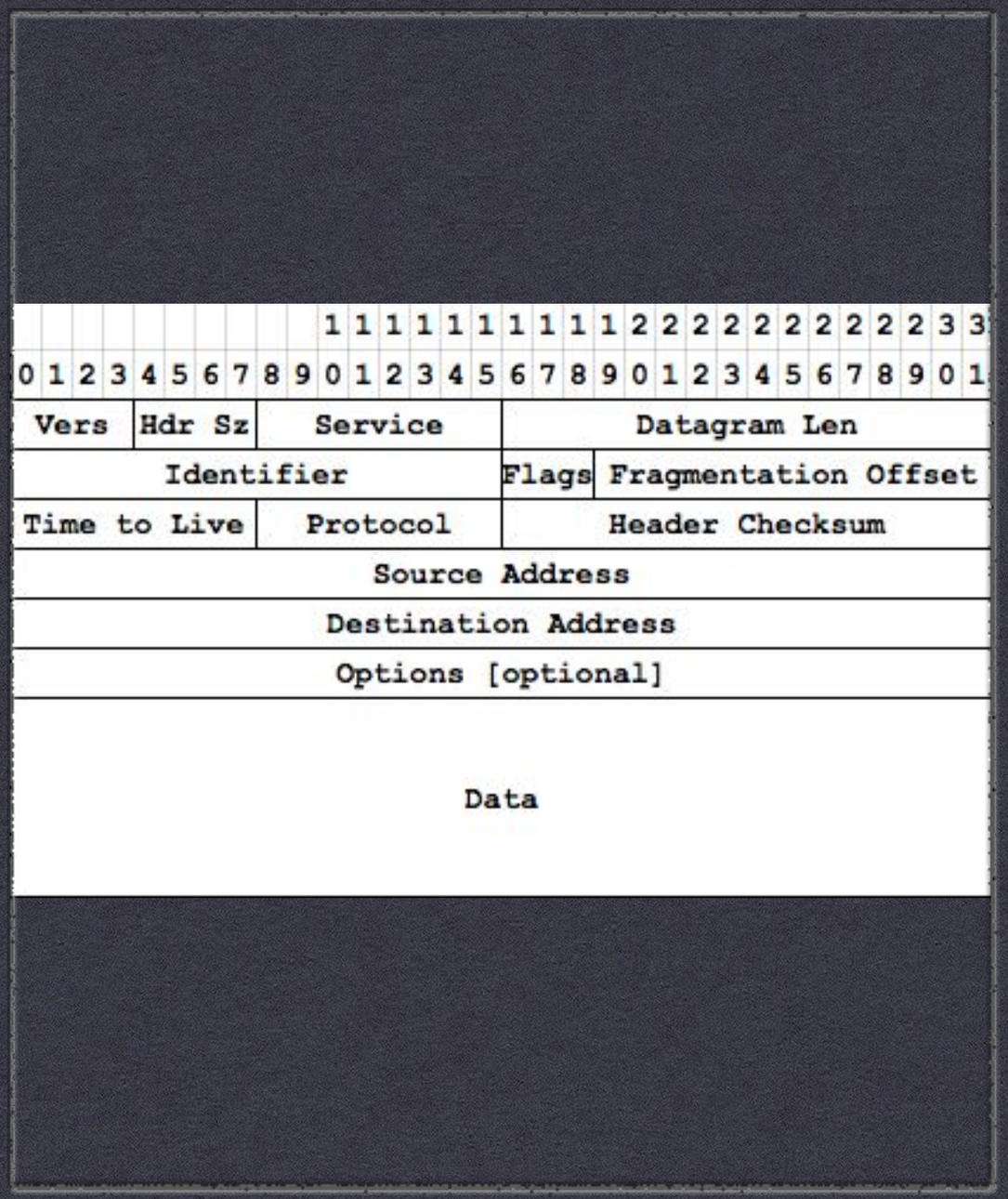
Arrived Charleston Sunday morning leave for Macon Sunday night important I have full conference with you early Sunday.Please send letter Charleston Hotel Stating hour and place can meet prefer your office,

Wright Brothers

Orville Wright, Wilbur Wright

- Self-contained
- Conveys data
- Independent
- Ignorant of its medium

TELEGRAMS

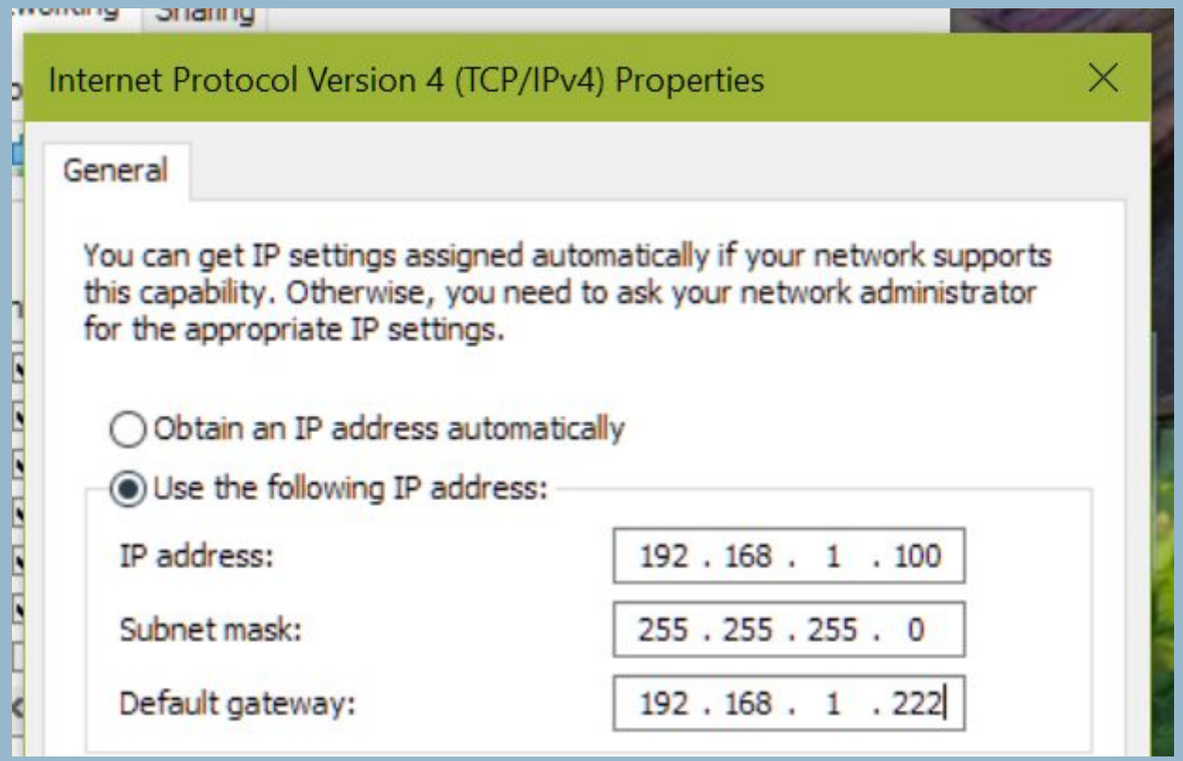


“A self-contained, independent entity of data carrying sufficient information to be routed from the source to the destination computer without reliance on earlier exchanges between this source and destination computer and the transporting network.”

—RFC1594

1983-1993: TCP/IP AND THE INTERNET

MAP OF THE INTERNET (BBN COMMUNICATIONS CORP., 1985)



425-629-5076

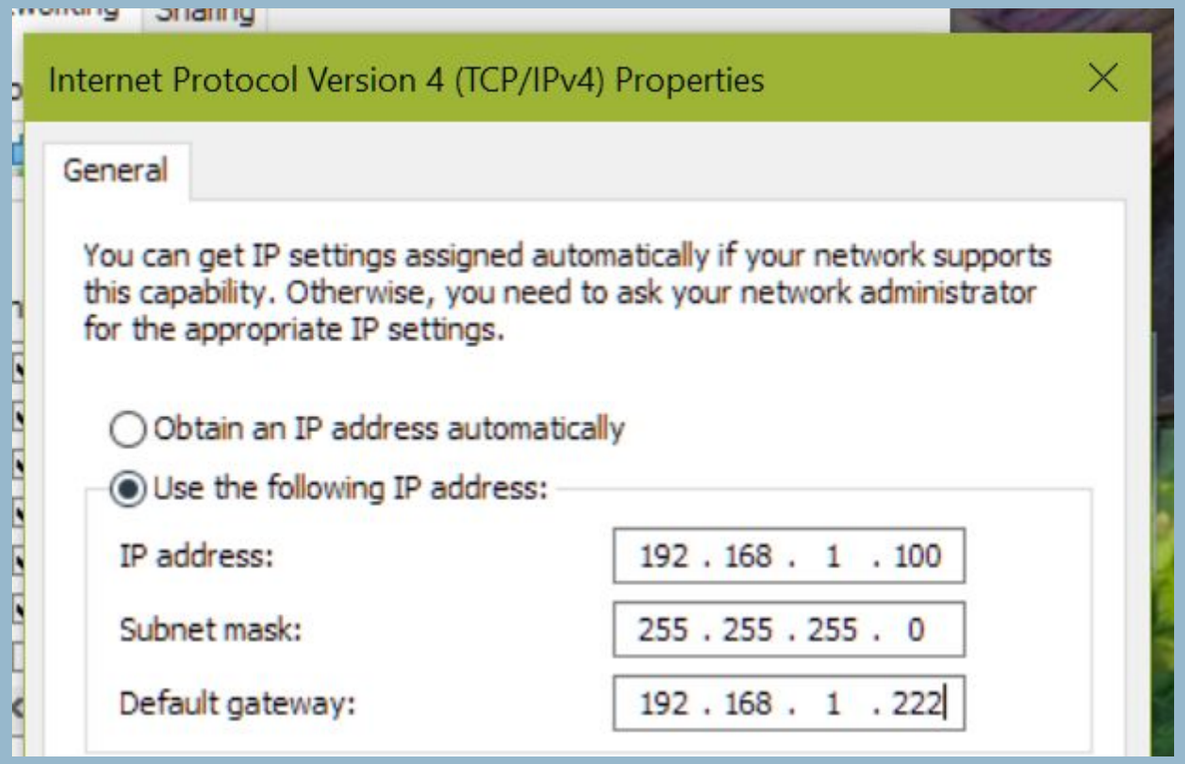
Area network

Local network

Node

TCP/IP ADDRESSING

IP ADDRESS CONFIGURATION DIALOG (WINDOWS NT 4.0, 1997)

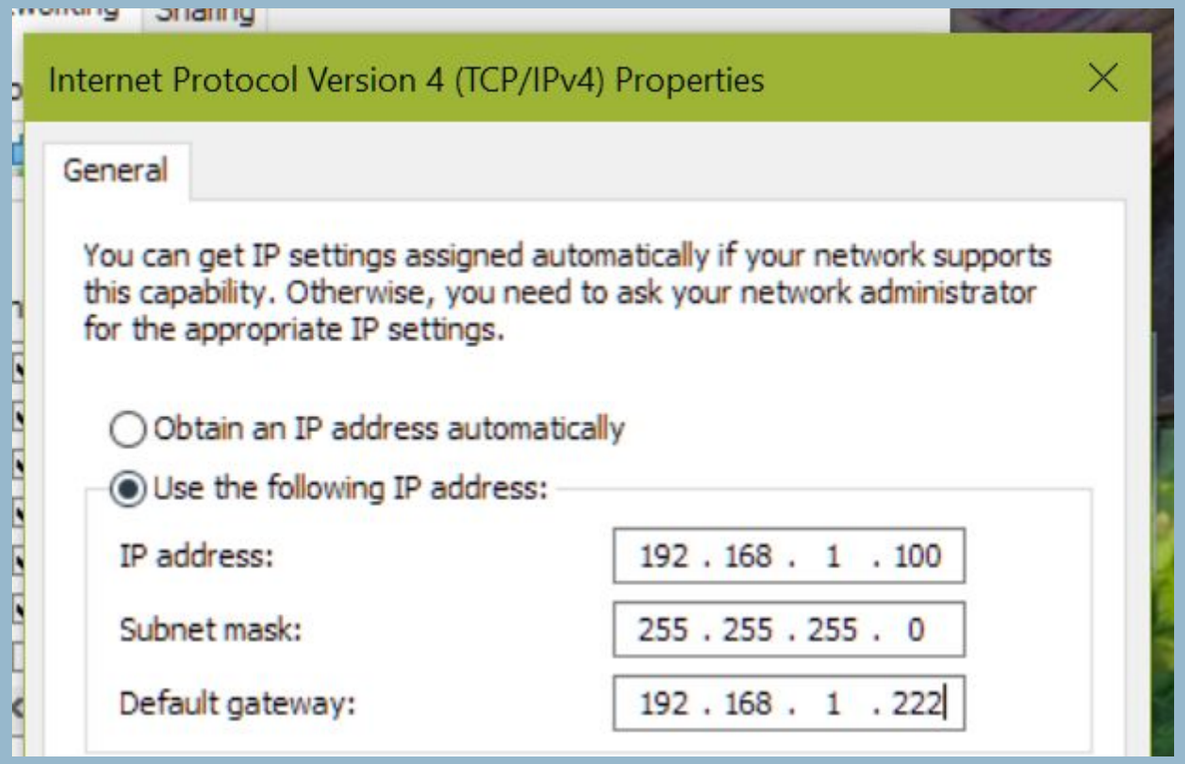


192.168.1.100

255.255.255.0

TCP/IP ADDRESSING

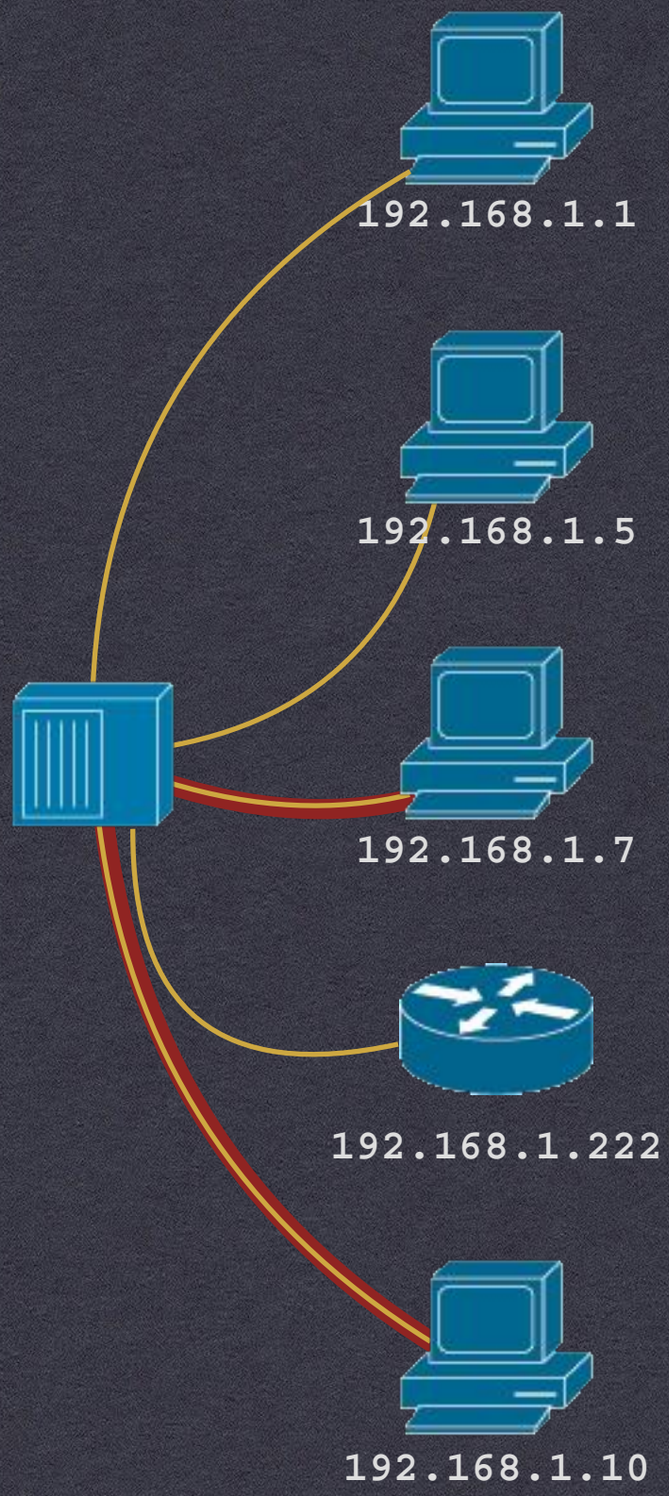
IP ADDRESS CONFIGURATION DIALOG (WINDOWS NT 4.0, 1997)




```
11000000.10101000.00000001.01100100
11111111.11111111.11111111.00000000
11000000.10101000.00000000.
                           ________
                           01100100
```

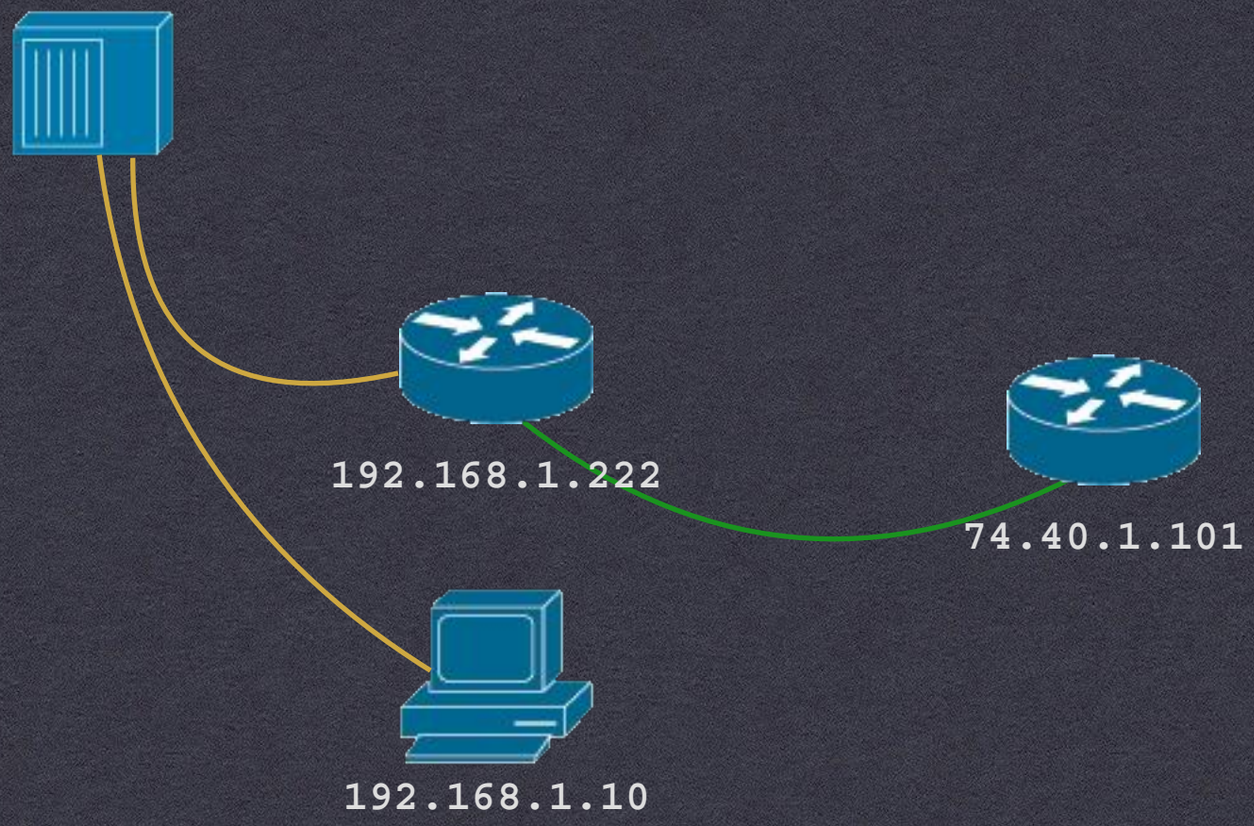
TCP/IP ADDRESSING

IP ADDRESS CONFIGURATION DIALOG (WINDOWS NT 4.0, 1997)



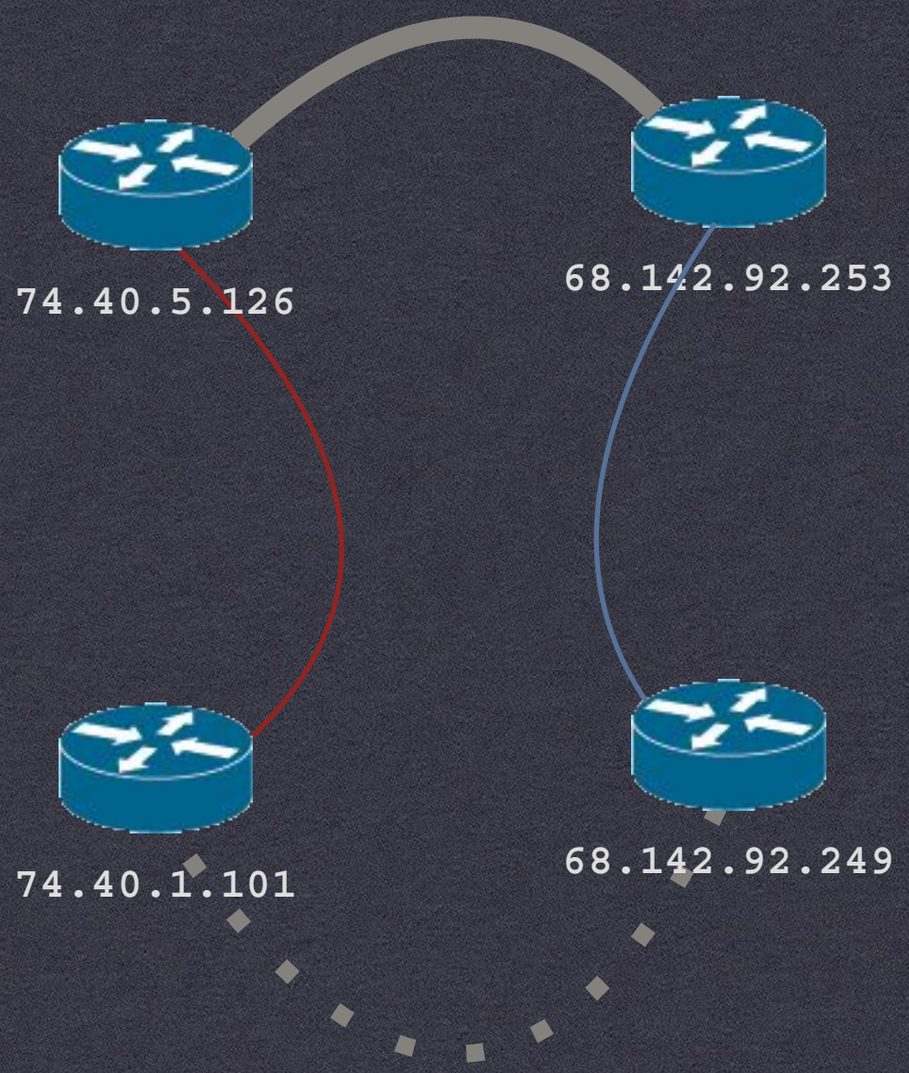
TCP/IP ROUTING

LOCAL AREA NETWORK (LAN): “PING 192.168.1.7”



TCP/IP ROUTING

WIDE AREA NETWORK (WAN): “`PING 68.142.77.176`”



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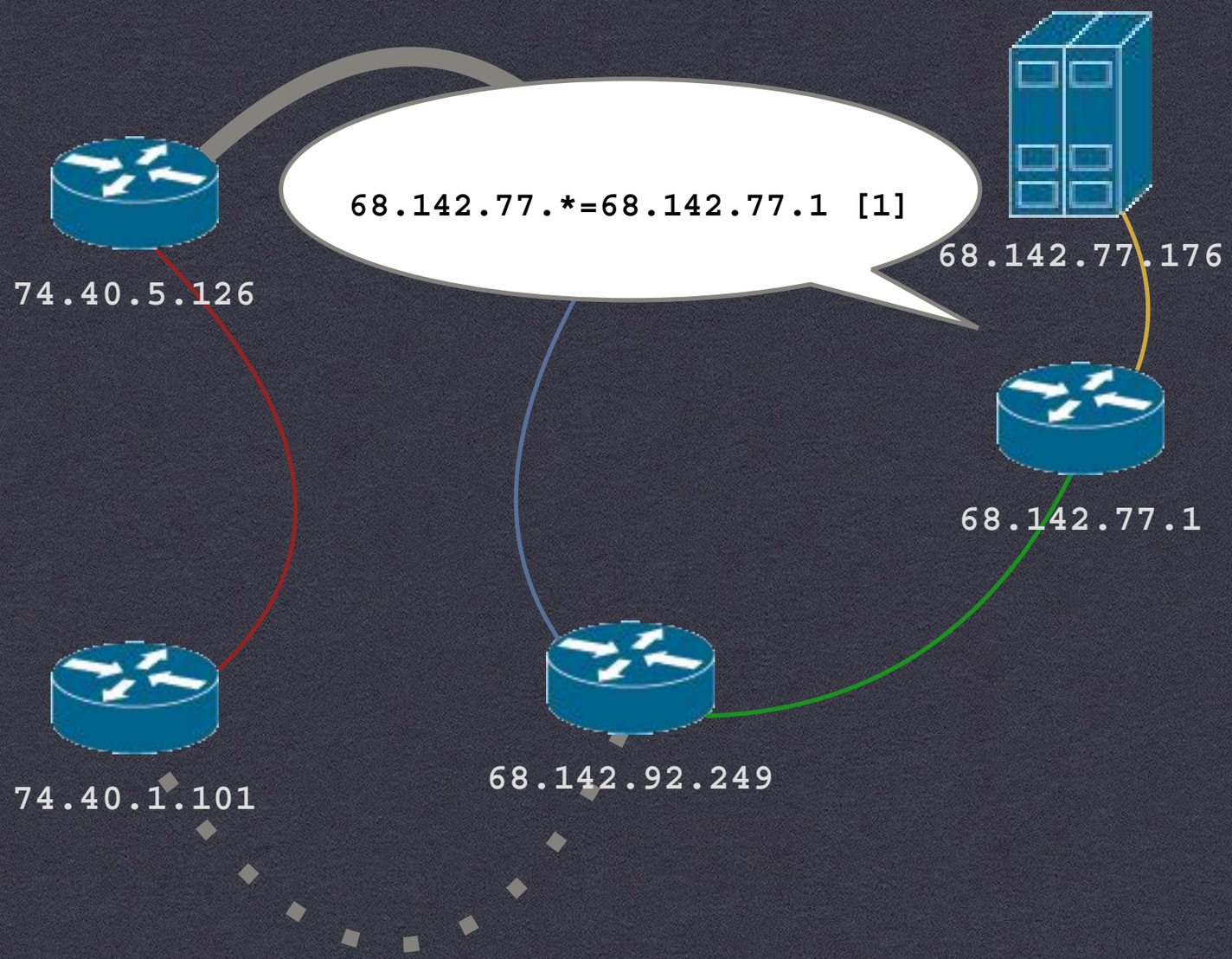

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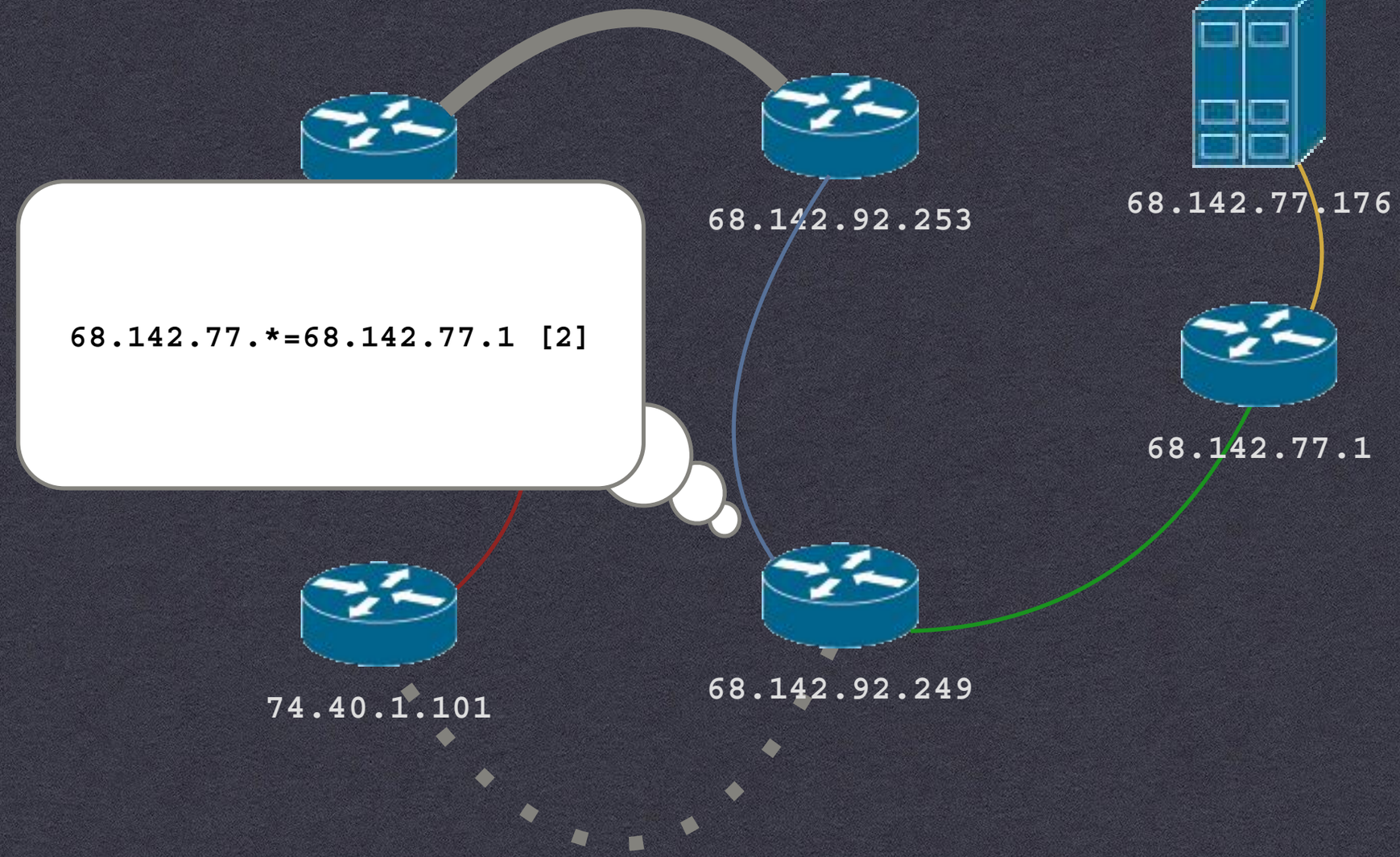

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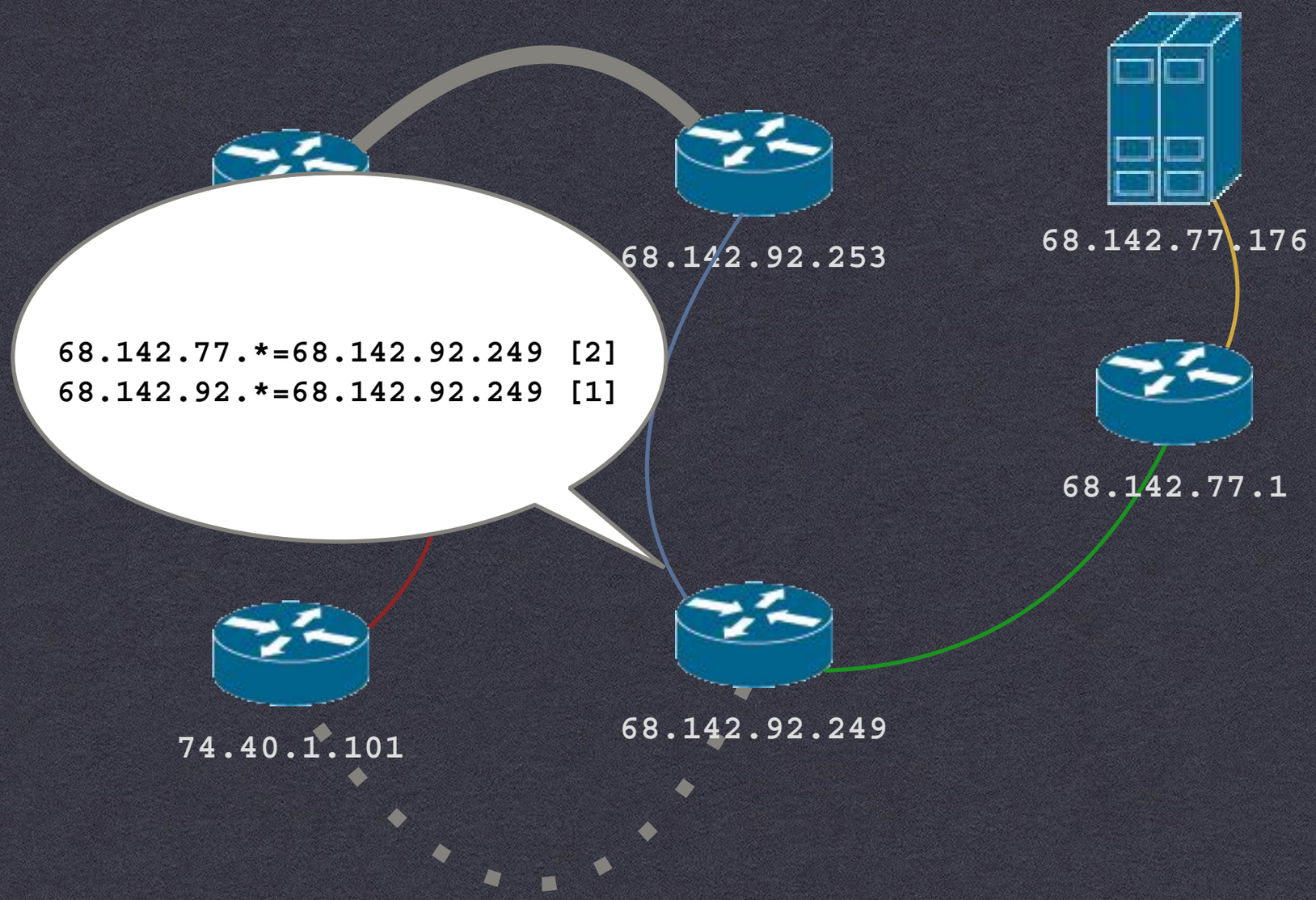

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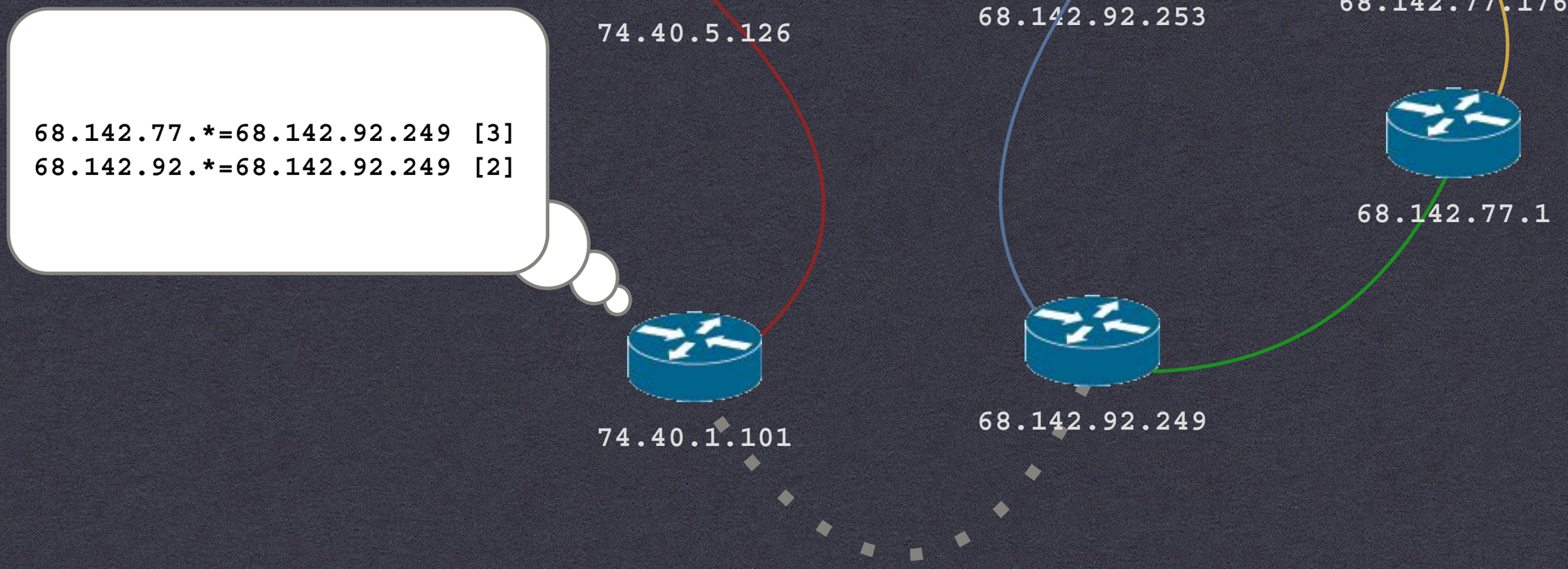

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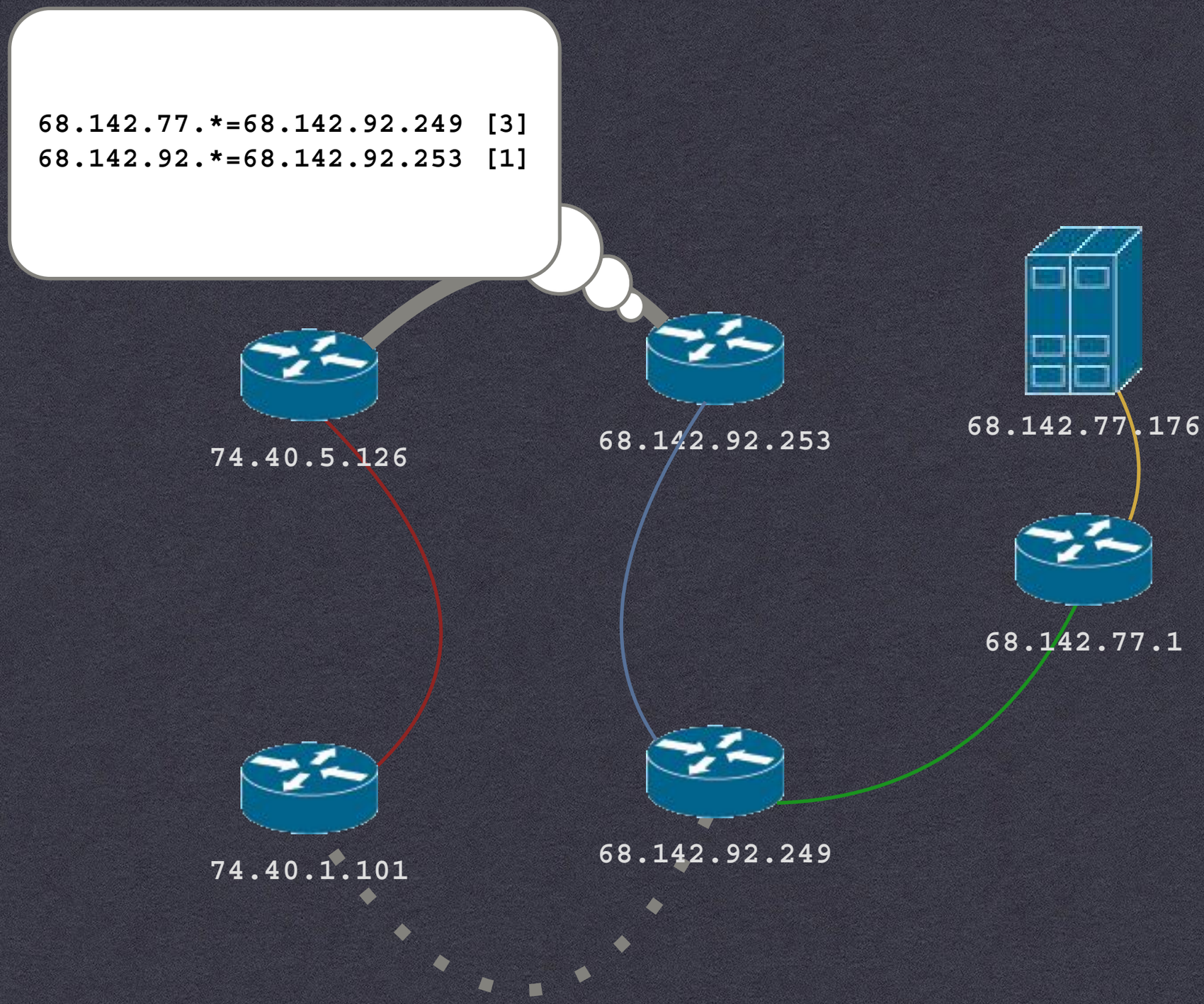

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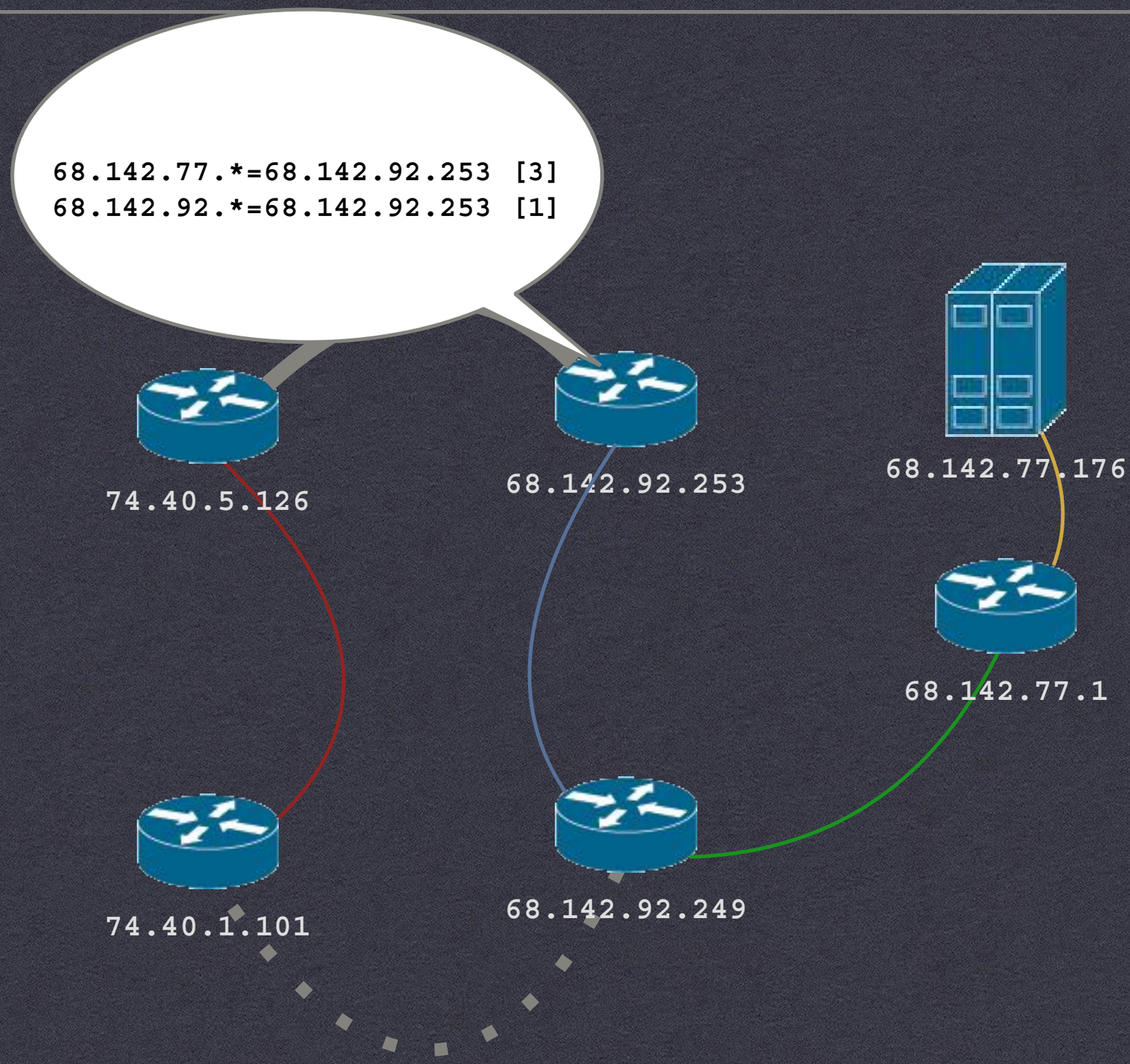

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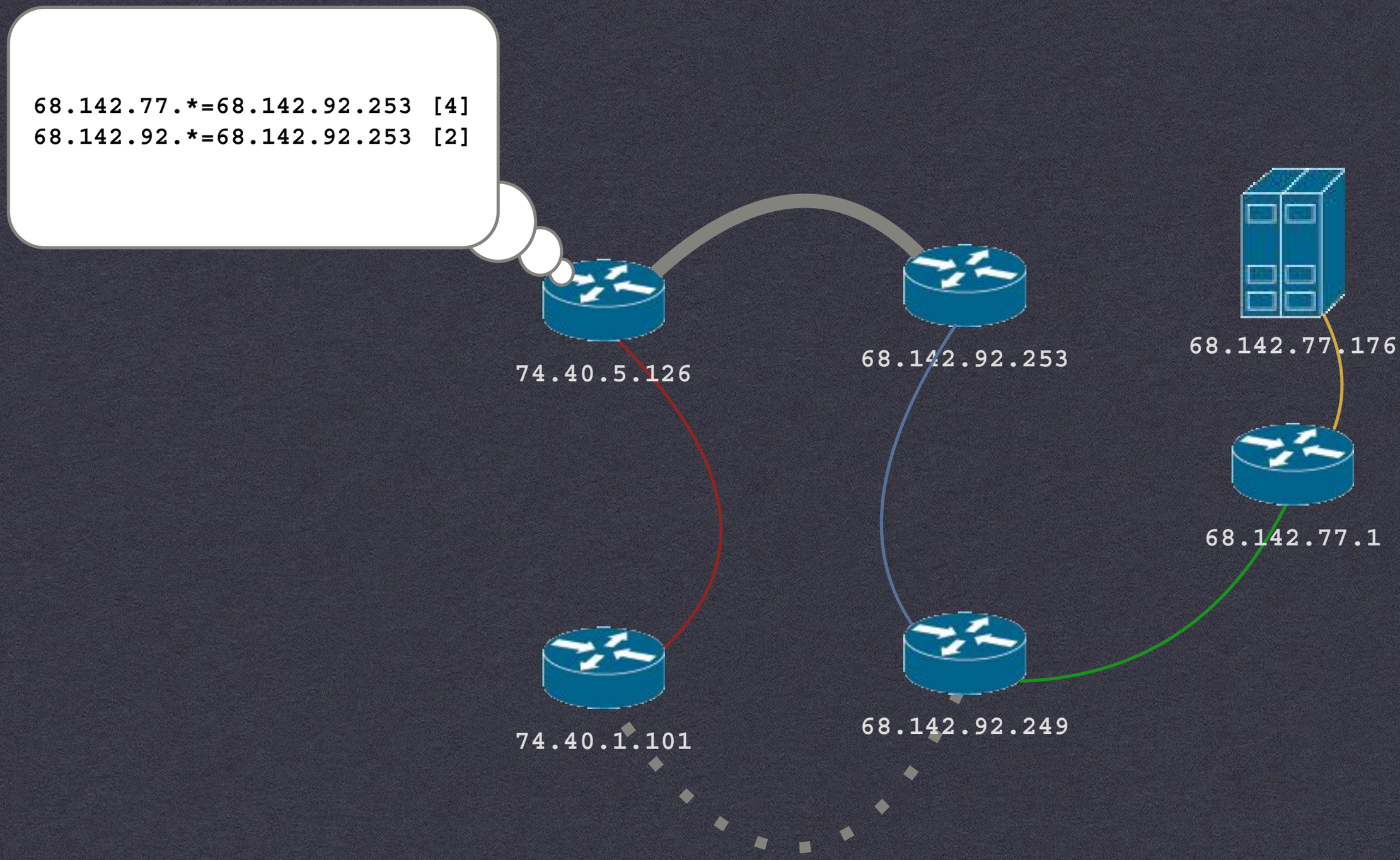

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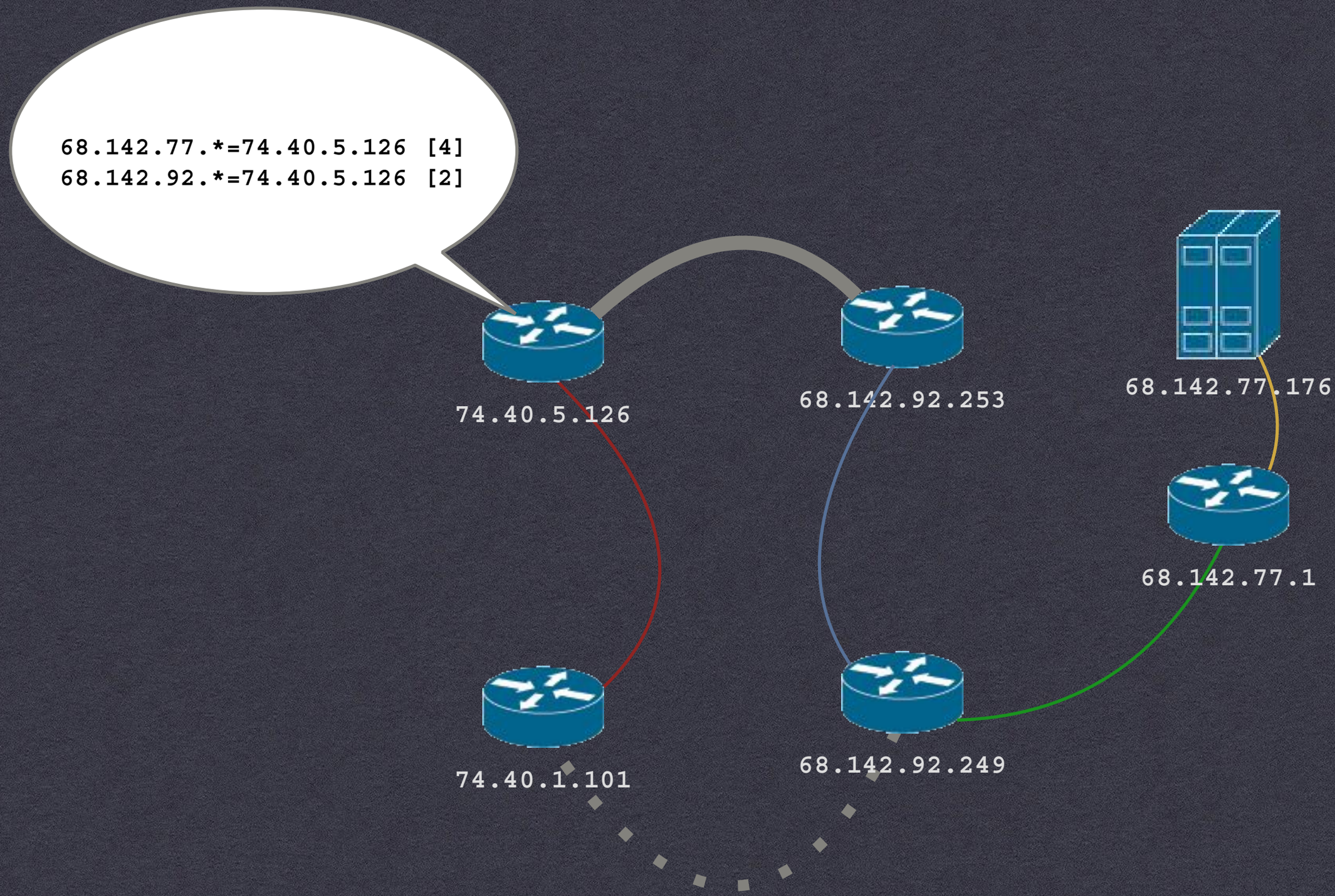

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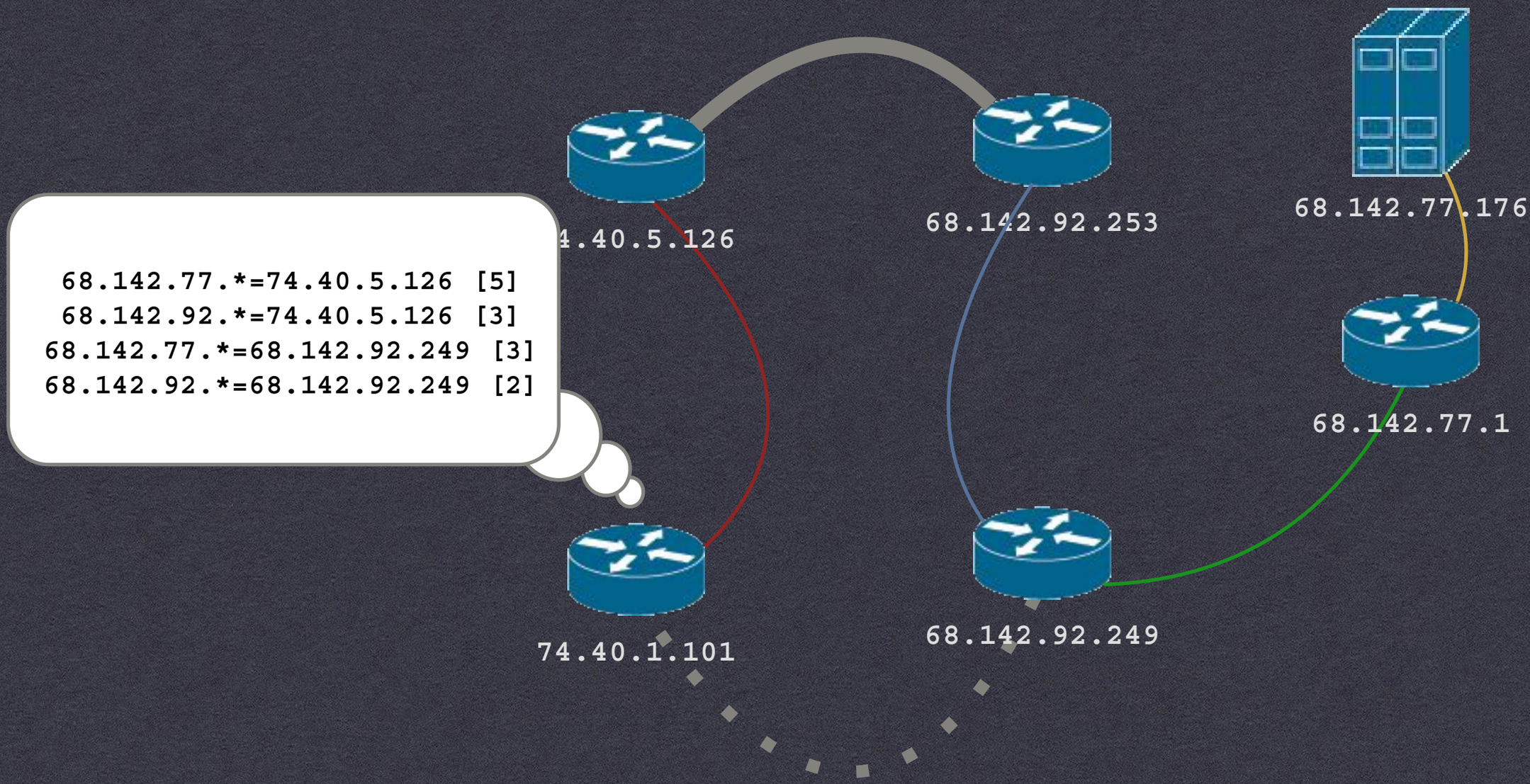

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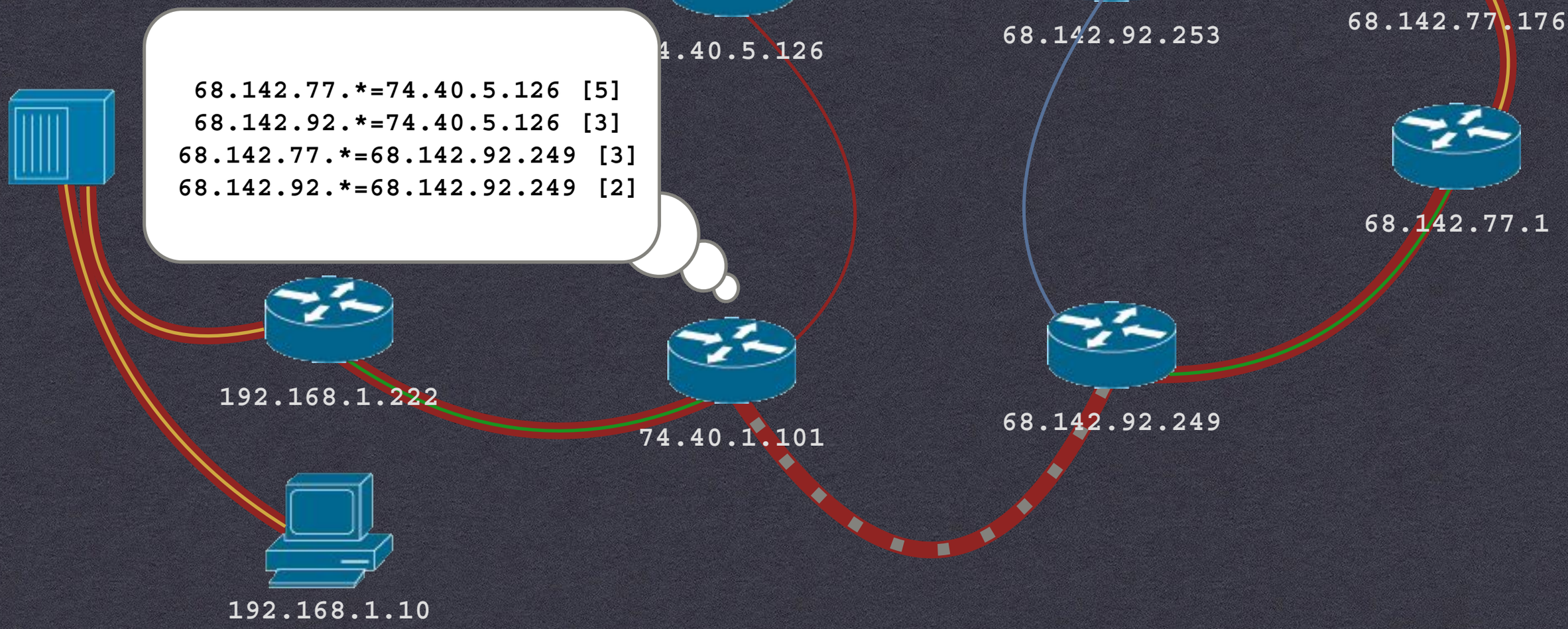

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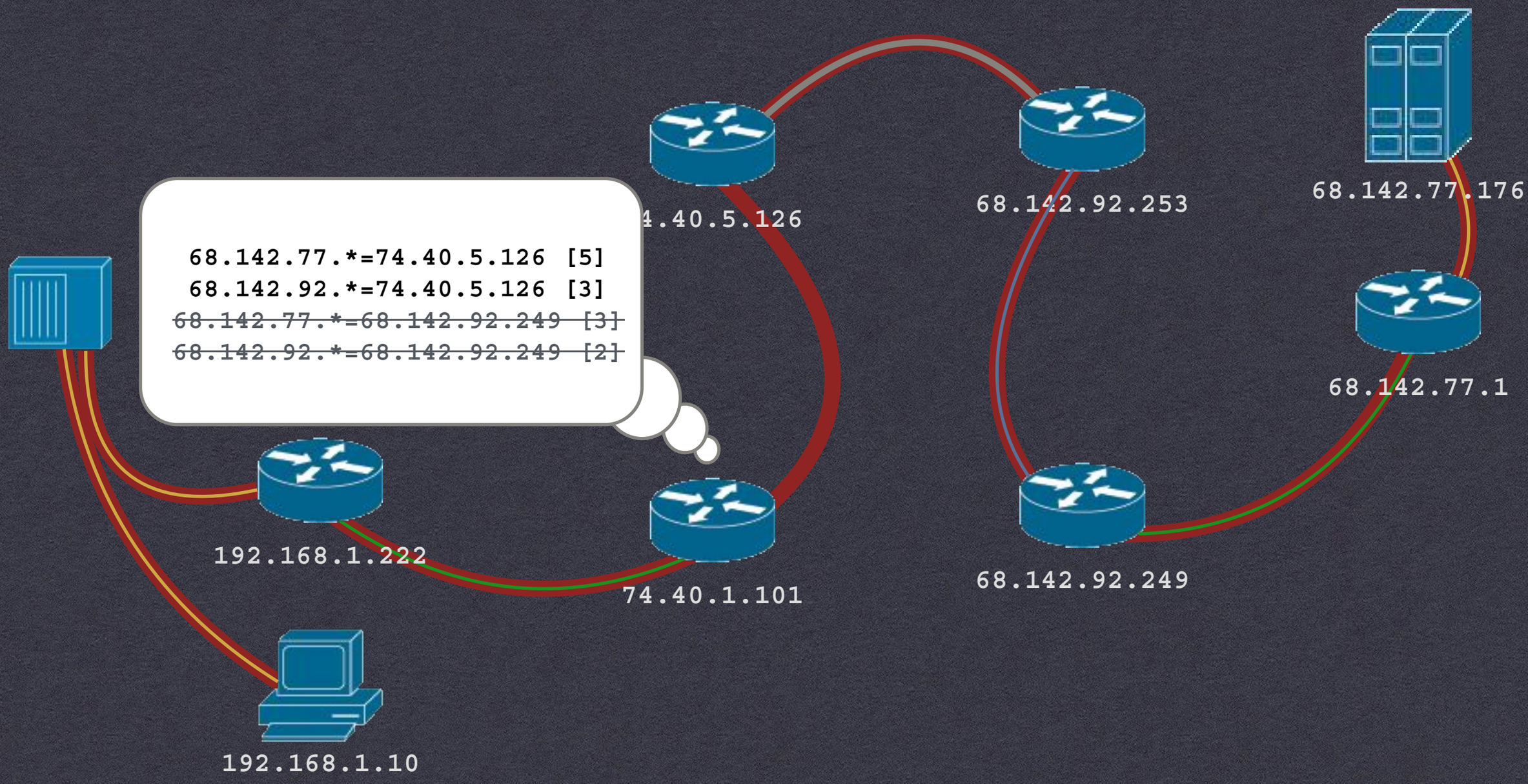

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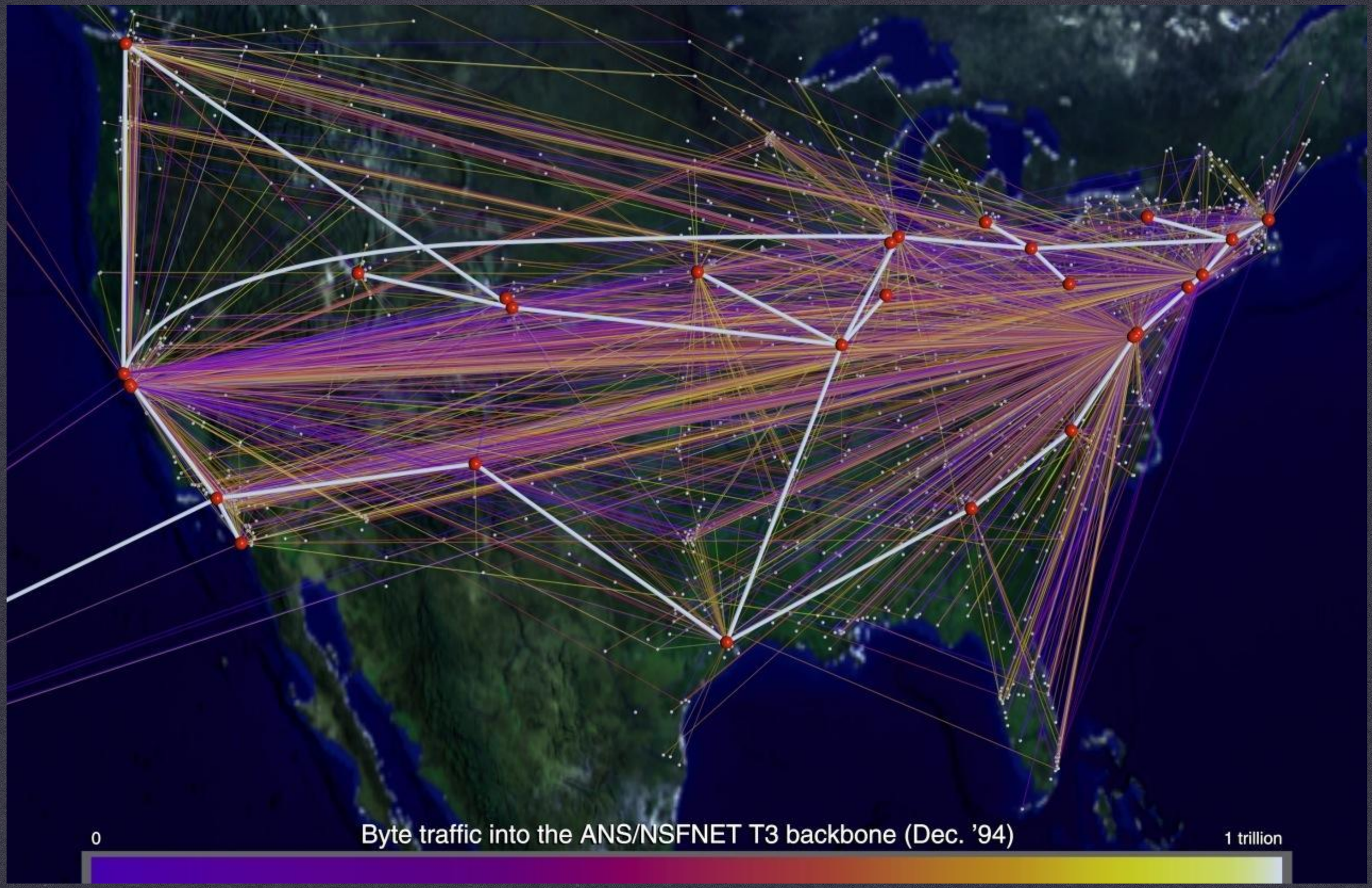
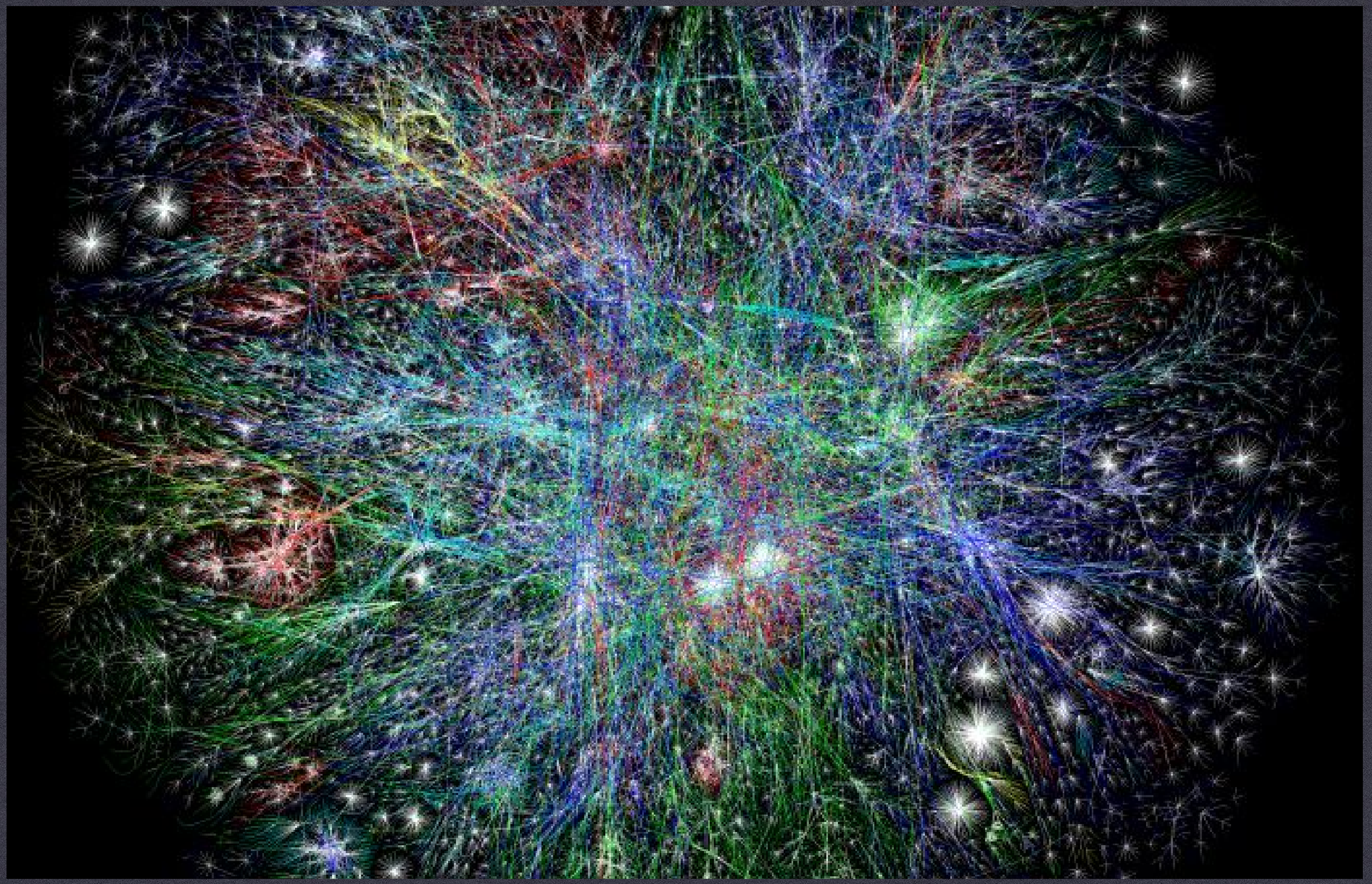


1994: PRIVATIZATION

NSFNET TOPOLOGY (NATIONAL CENTER FOR SUPERCOMPUTING APPLICATIONS, 1996)



2003: EXPLOSIVE GROWTH

INTERNET TRACEROUTE MAP (BARRETT LYON AND LYONLABS LLC, 2003)

The Birth of the Internet

- Began as ARPANET, a network of special-purpose computers designed to allow host computers to share resources across the country.
- Networking software was moved to the hosts, with a networking protocol (TCP/IP) designed to hide implementation details.
- Self-configuring routing system resulted in robust and open network.