

# **CSC4200/5200 – COMPUTER NETWORKING**

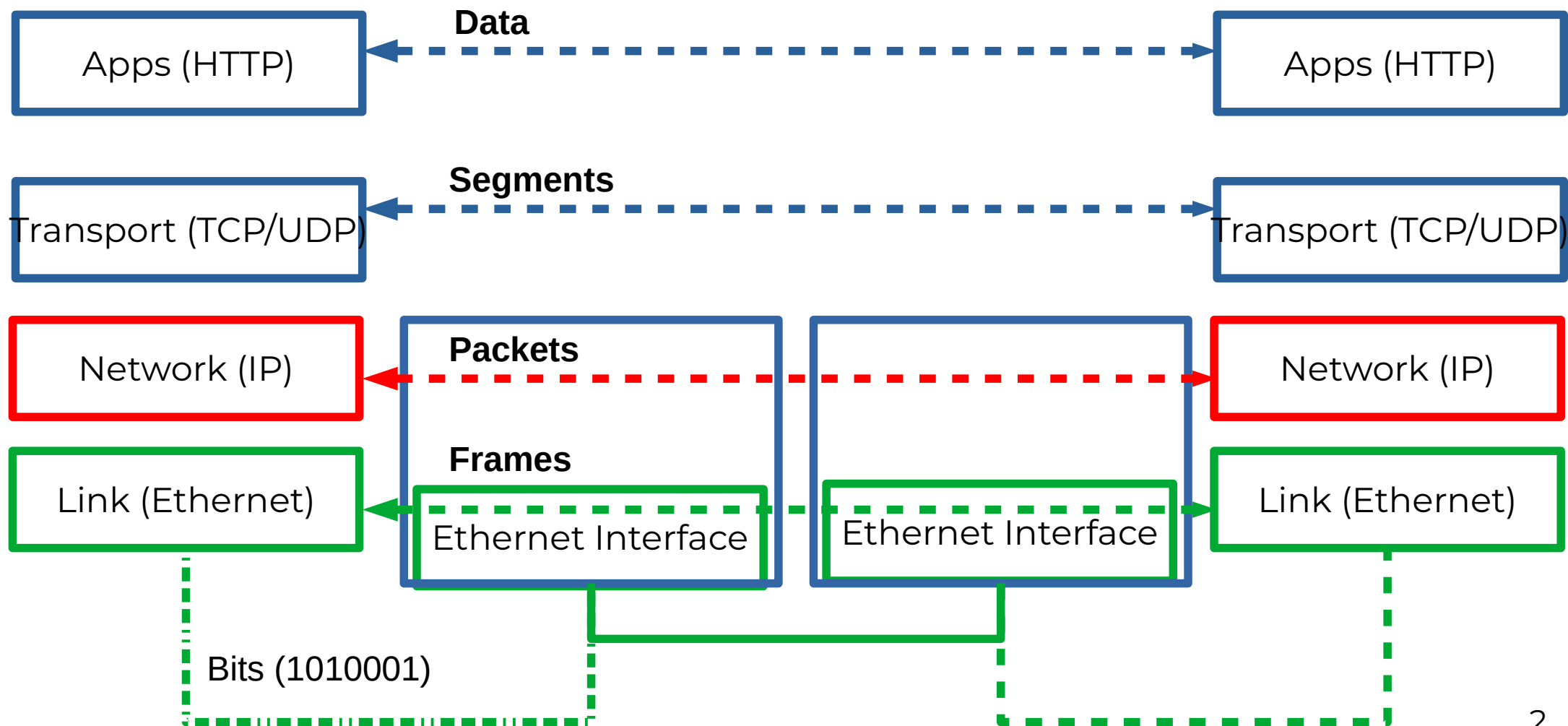
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**GLOBAL INTERNET**

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# So far...

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- Routing  
How do we scale routing?

# Back to Addressing

- A 32 bit number in quad-dot notation
- Identifies an **Interface**
  - ***A host might have several interfaces!!!***

- 129.82.138.254

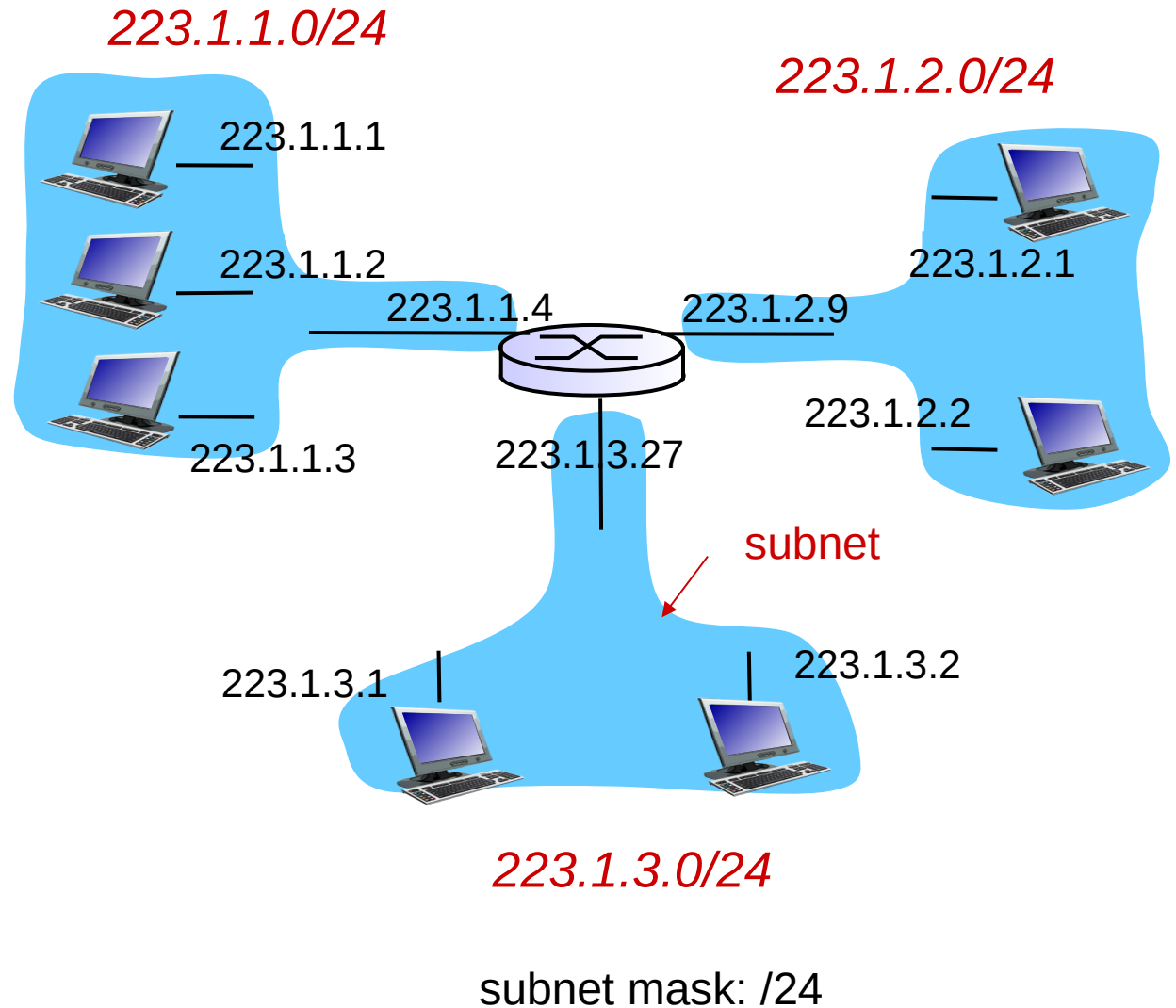
10000001.01010010.10001010.11111110



# Subnets Revisited

## Recipe:

- Create isolated networks
  - *subnets*
- No longer need to know individual Ips – knowing the subnet is enough
  - *223.1.1.0/14 → Interface 2*



# Subnets – Class based

- Originally – only rigid boundaries
  - Class A – 5.0.0.0/8 - 0\*
  - Class B – 149.149.0.0/16 - 10\*
  - Class C – 129.82.138.0/14 - 110\*
  - Class D – 224.0.0.0 – 1110\*
  - Class E - reserved

# Subnets – Classless CIDR

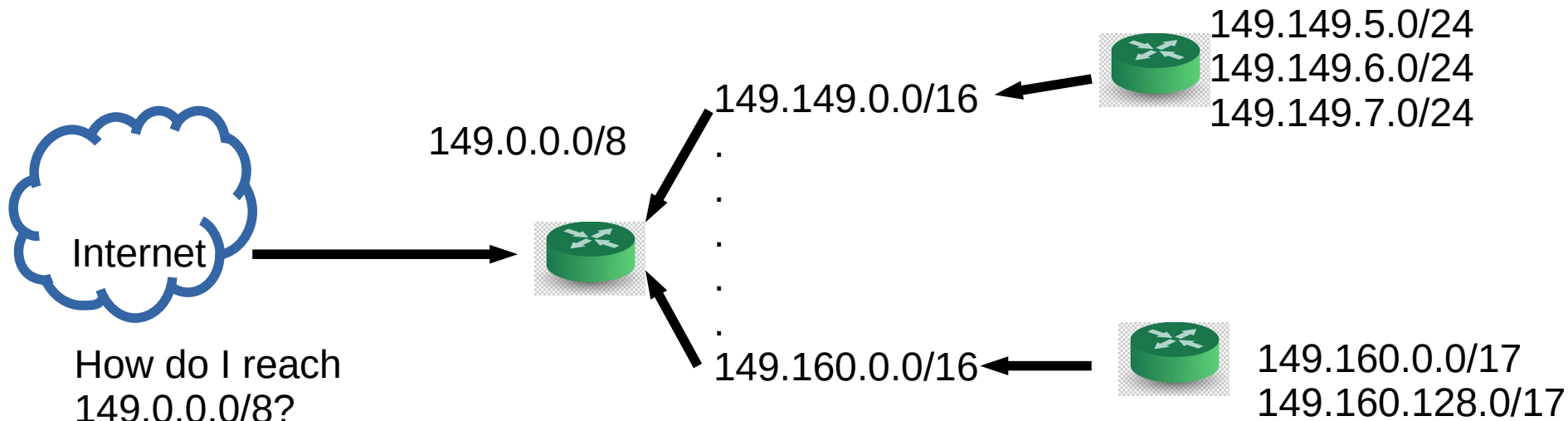
- No rigid boundaries

- 129.82.138.0/25

10000001.01010010.10001010.10000000

# Subnets (Prefixes) scales the Internet

- Addresses are allocated in contiguous prefixes (tntech 149.149.0.0/16)
- Routing protocols operate based on prefixes (how do I reach 149.149.0.0/16)?



How do I reach  
149.0.0.0/8?

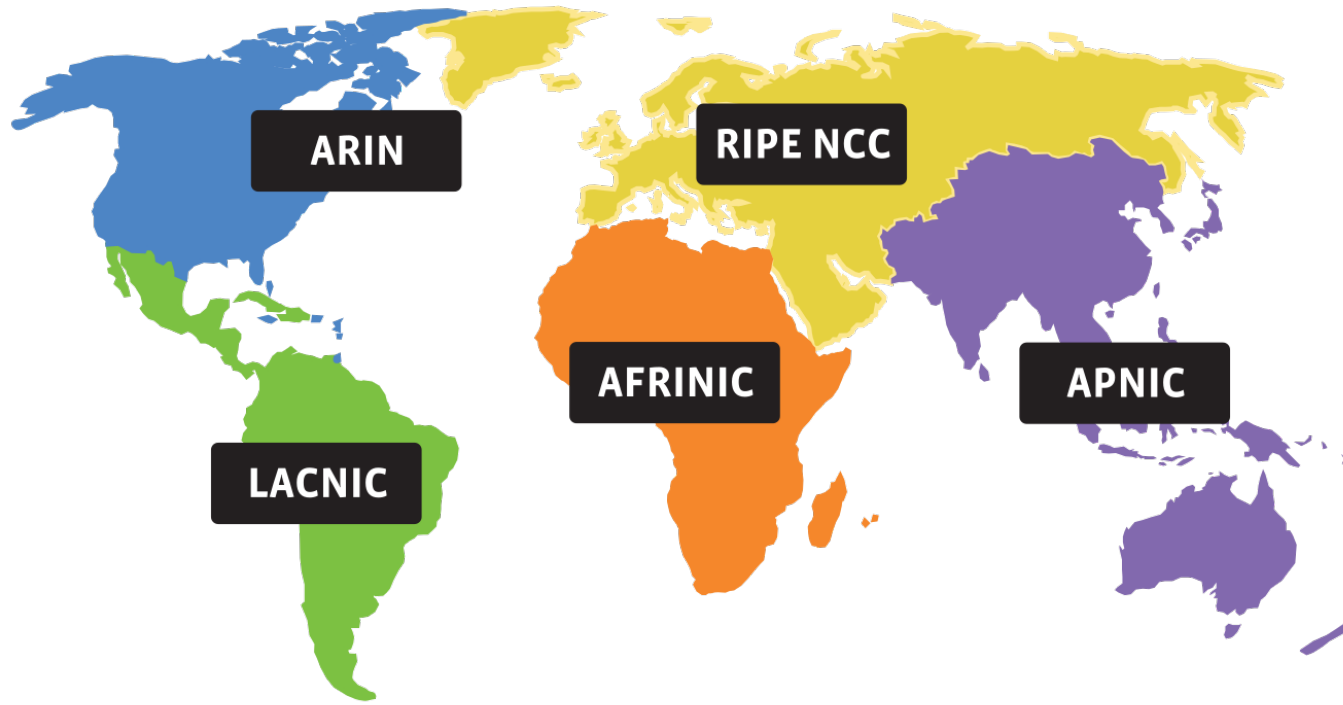
**Not**

How do I reach 149.149.5.0/24  
How do I reach 149.149.6.0/24



# Who gets what prefix?

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0. Internet Corporation for Assigned Names and Numbers (ICANN) – Decides which RIRs get what address

1. Regional Internet Registries (RIRs) – Which orgs get what address

2. ISPs – Which customers get which address

# How do you know who has a prefix?



whois tntech.edu

whois

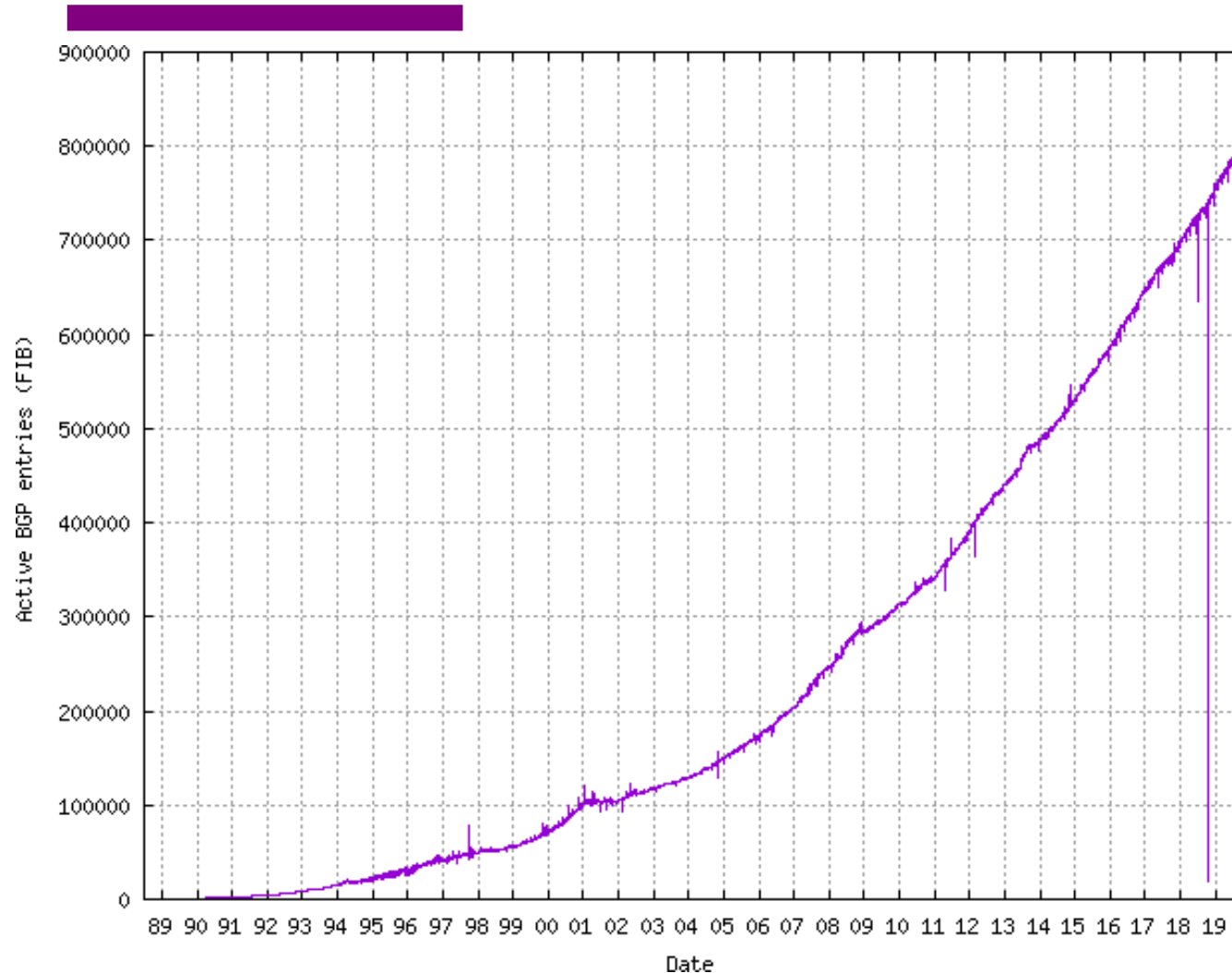
Domain Name: TNTECH.EDU

Registrant:

Tennessee Technological University  
Information Technology Service  
1010 N. Peachtree Street  
Cookeville, TN 38505  
USA

Domain record activated: 09-Sep-1992  
Domain record last updated: 26-Sep-2019  
Domain expires: 31-Jul-2020

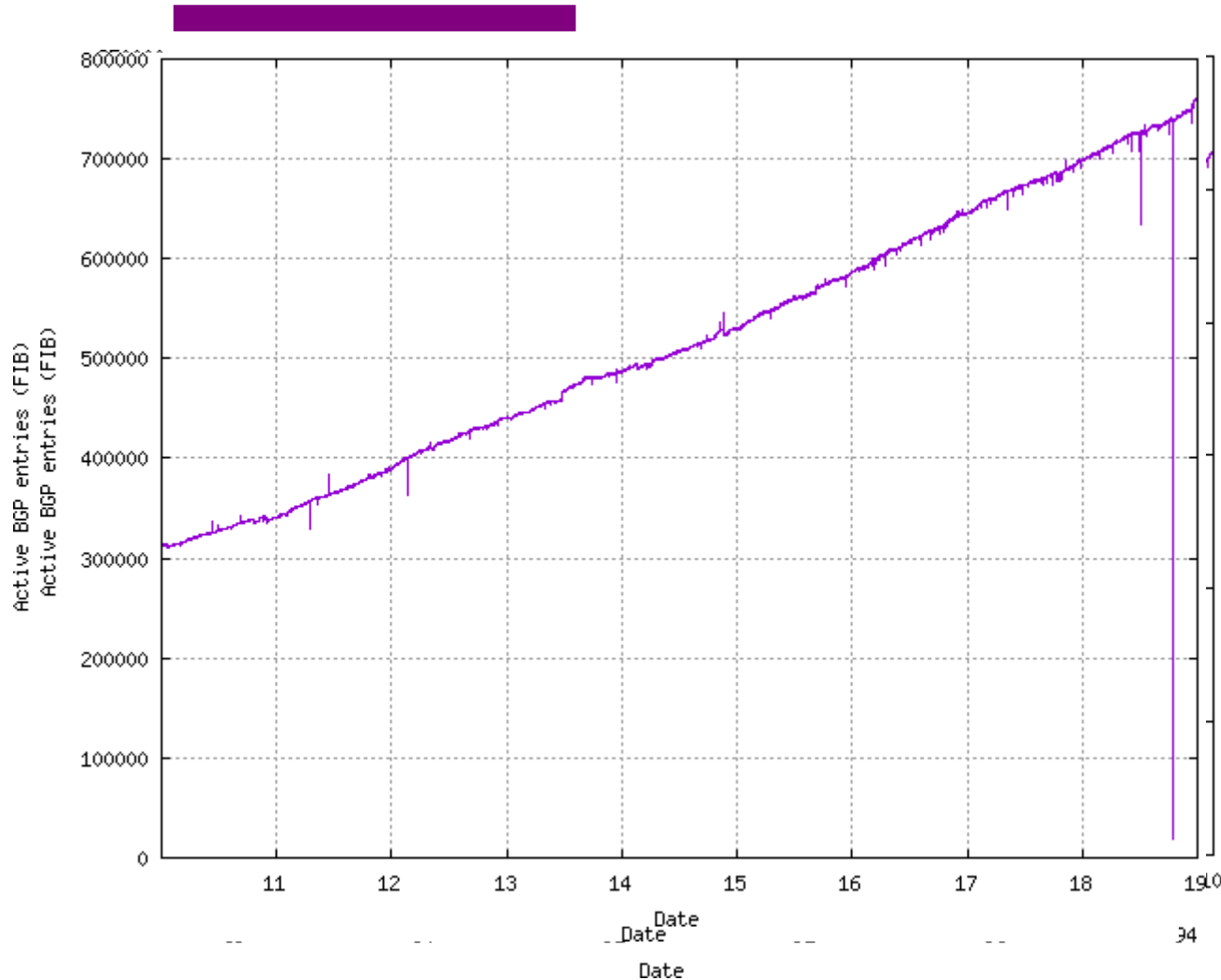
# How many prefixes are there?



<https://www.cidr-report.org/>

100K in 2001 → 800K in 2019

# Bit of history – how the Internet evolved



'88-'94 - 0 → 14000  
'94-'00 - 90000 - Linear growth  
'00-'10 - up to 300,000  
'10-'19 - up to 800,000

# Next steps



## **Monday – Midterm review and Solutions to homework 3**

Homework due on the 6<sup>th</sup>, Sunday, 10PM CST

More on Internet routing and policies.