

ยินดีต้อนรับสู่

# CYBER SECURITY WORKSHOP

A magnifying glass is positioned on the left side of the slide, focusing on the word "DNS". The magnifying glass has a black frame and a silver handle. The word "DNS" is written in a large, light blue, sans-serif font inside the lens of the magnifying glass.

DNS

## Basics

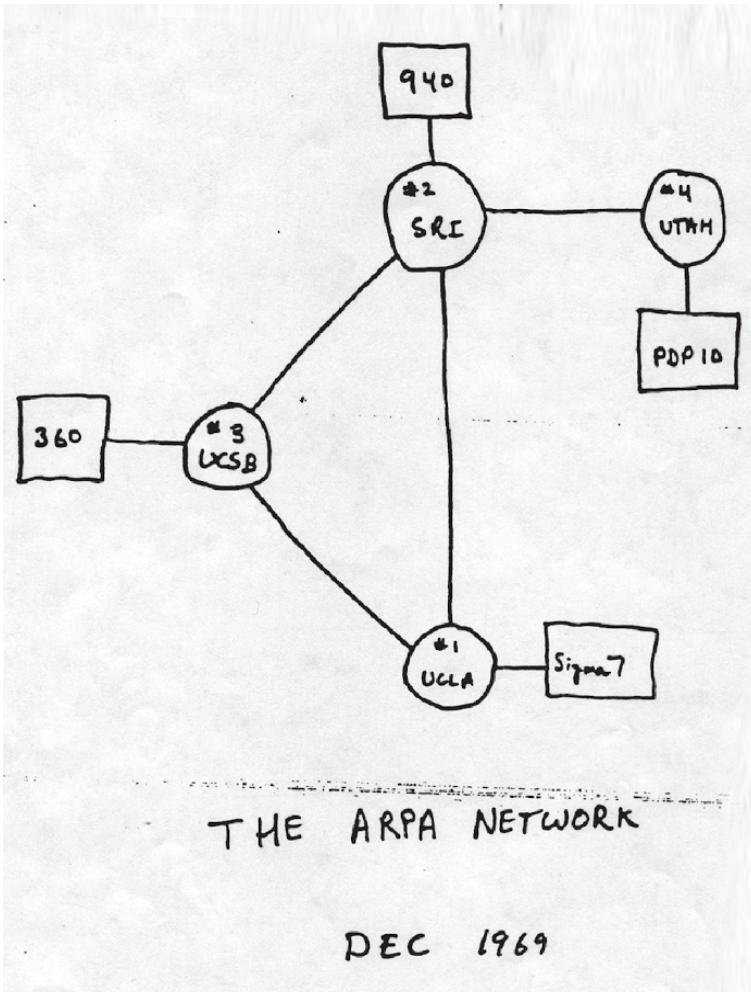
Bangkok  
8-9 May 2019

# Name Space on the Internet

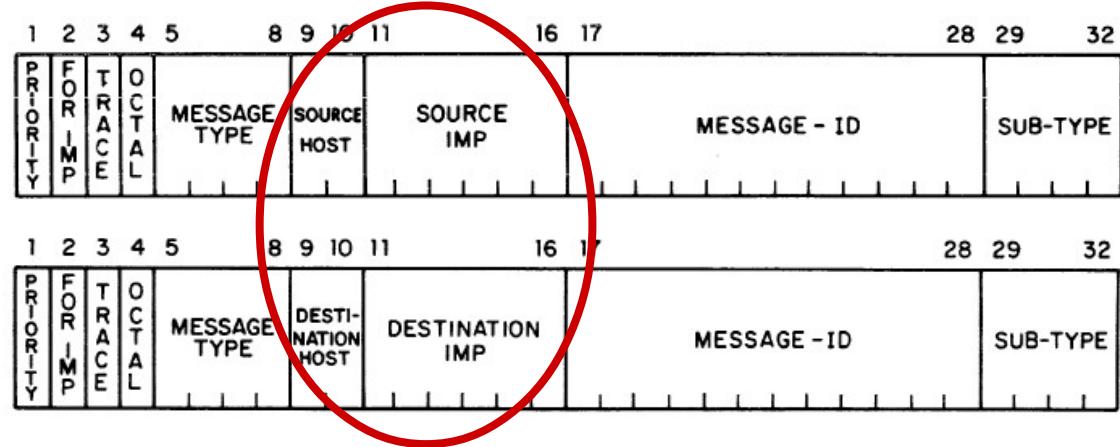


- Finding IP addresses
  - Start with a domain name (human form)
  - Translating to an IP address (machine form)
- What is the IP address of [www.bangkok.lol](http://www.bangkok.lol)?
  - Client asks server
  - Server responds with answer
  - ... case closed?

# Name Space on the Internet



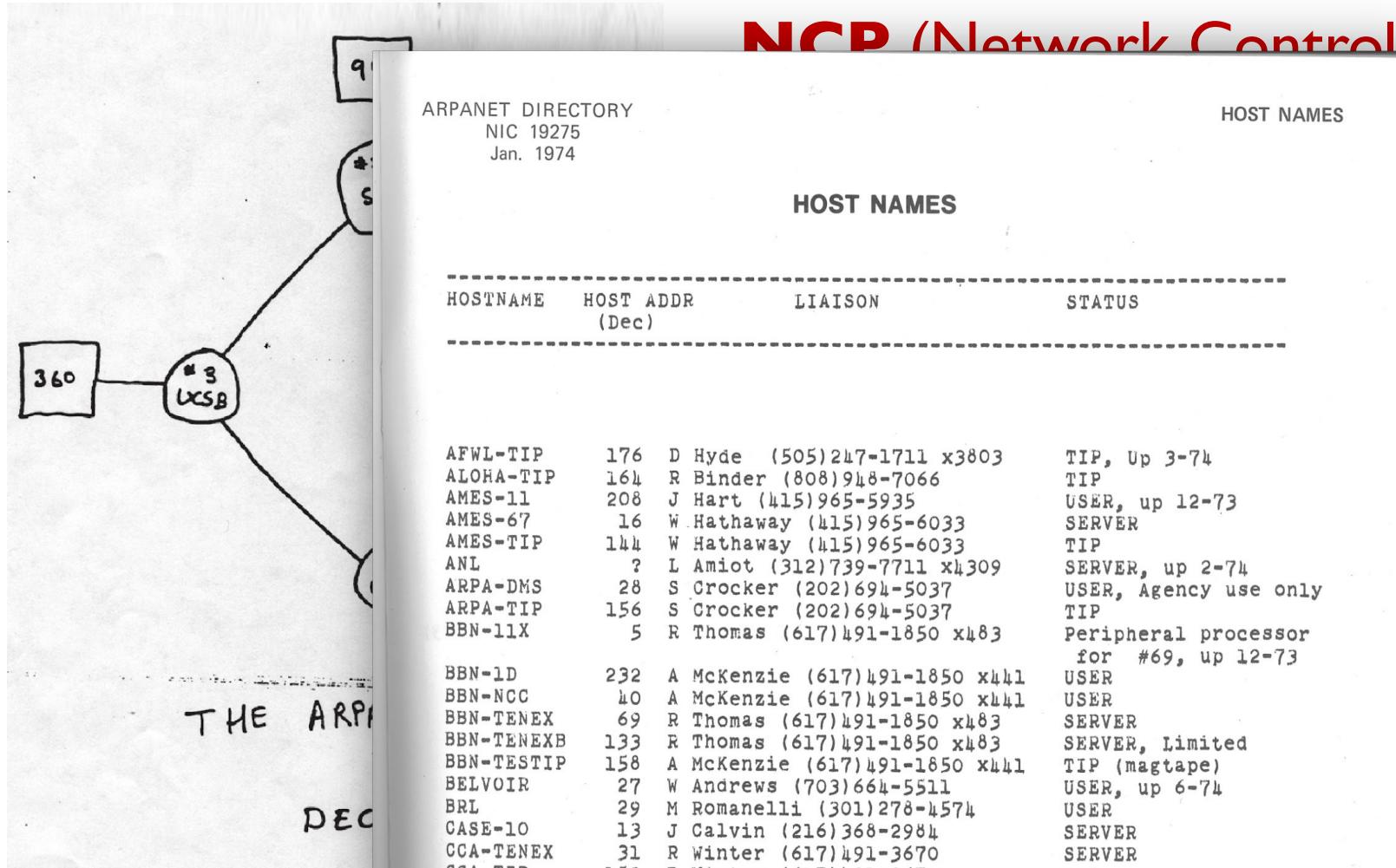
## NCP (Network Control Program)



- December 1973  
HOSTS.TXT (RFC 606)

# Namespace on the Internet

NCP (Network Control Program)



HOST NAMES		
28	29	32
- ID		SUB-TYPE
-----	-----	-----

HOST NAMES		
28	29	32
- ID		SUB-TYPE
-----	-----	-----

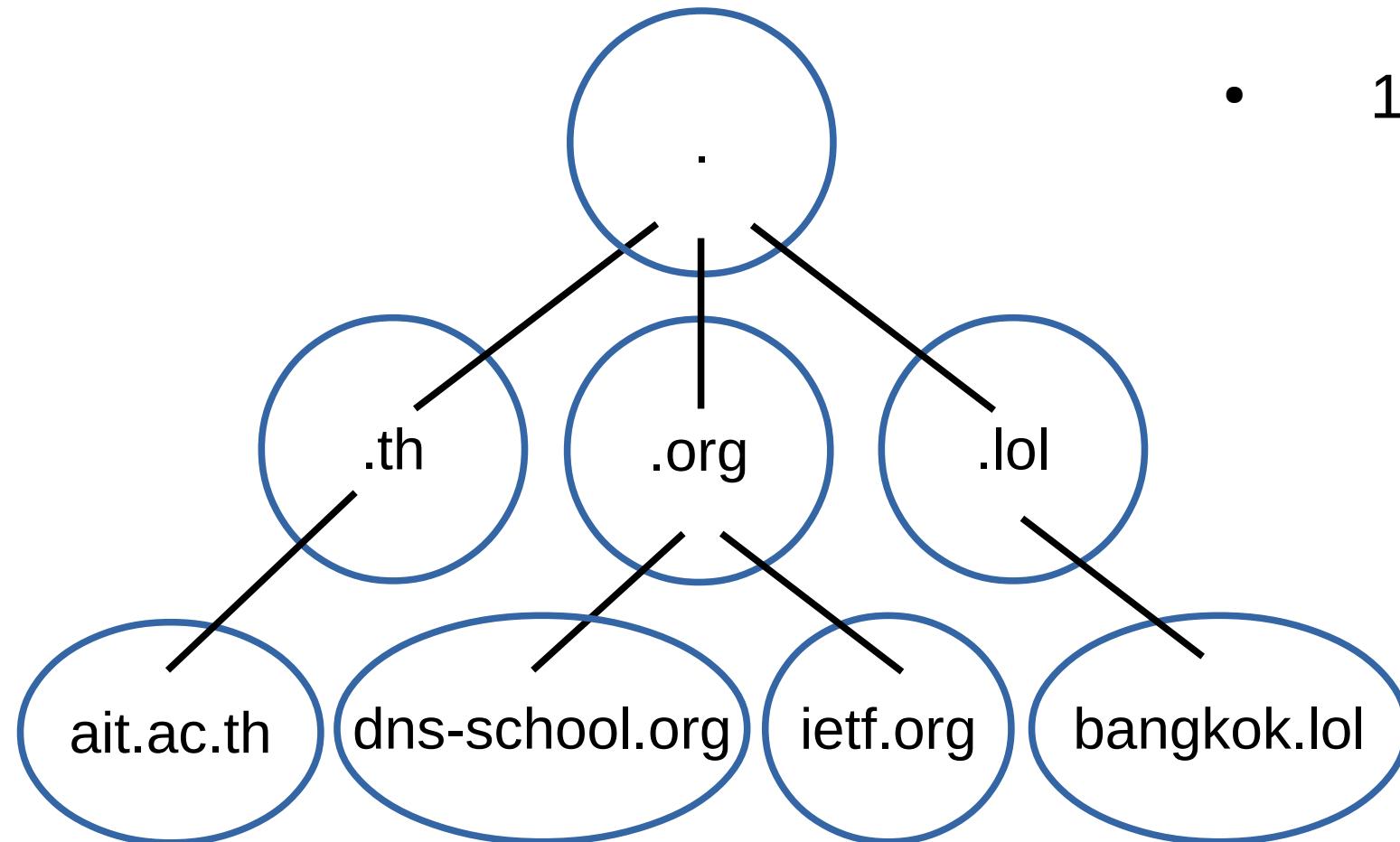
C 606)

# Name Spaces on the Internet



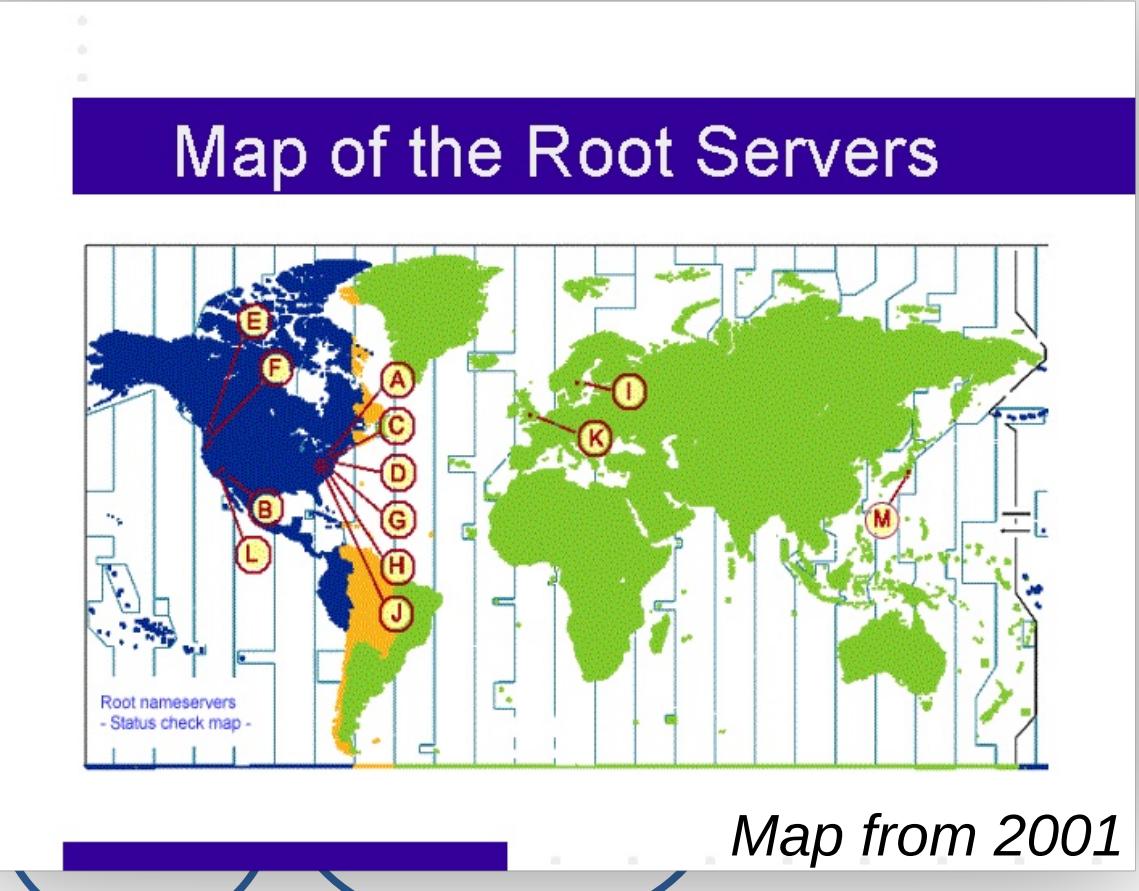
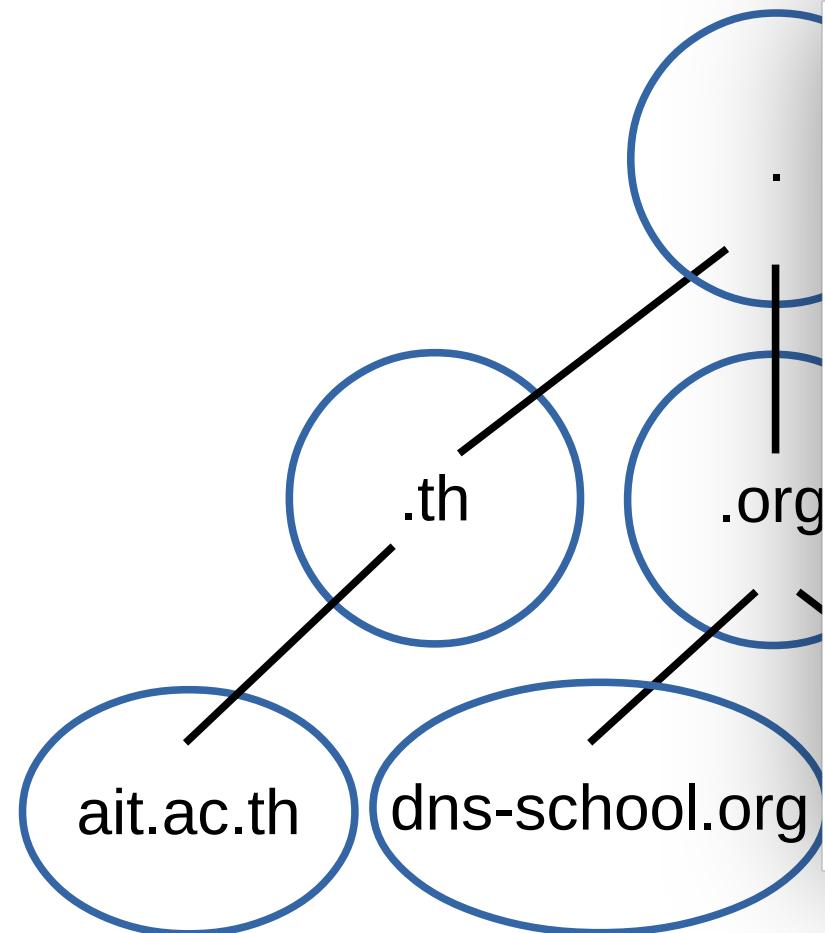
- 1 January 1983 NCP → IP/TCP  
*flagday*
- max 256 → max 4.294.967.296 hosts
- November 1983 DNS (RFC 882)  
*Domain Name System*
- November 1987 STD13  
(RFC 1034 & RFC 1035)

# Domain Name Space – scale



- 13 root servers

# Domain Name Space – scale



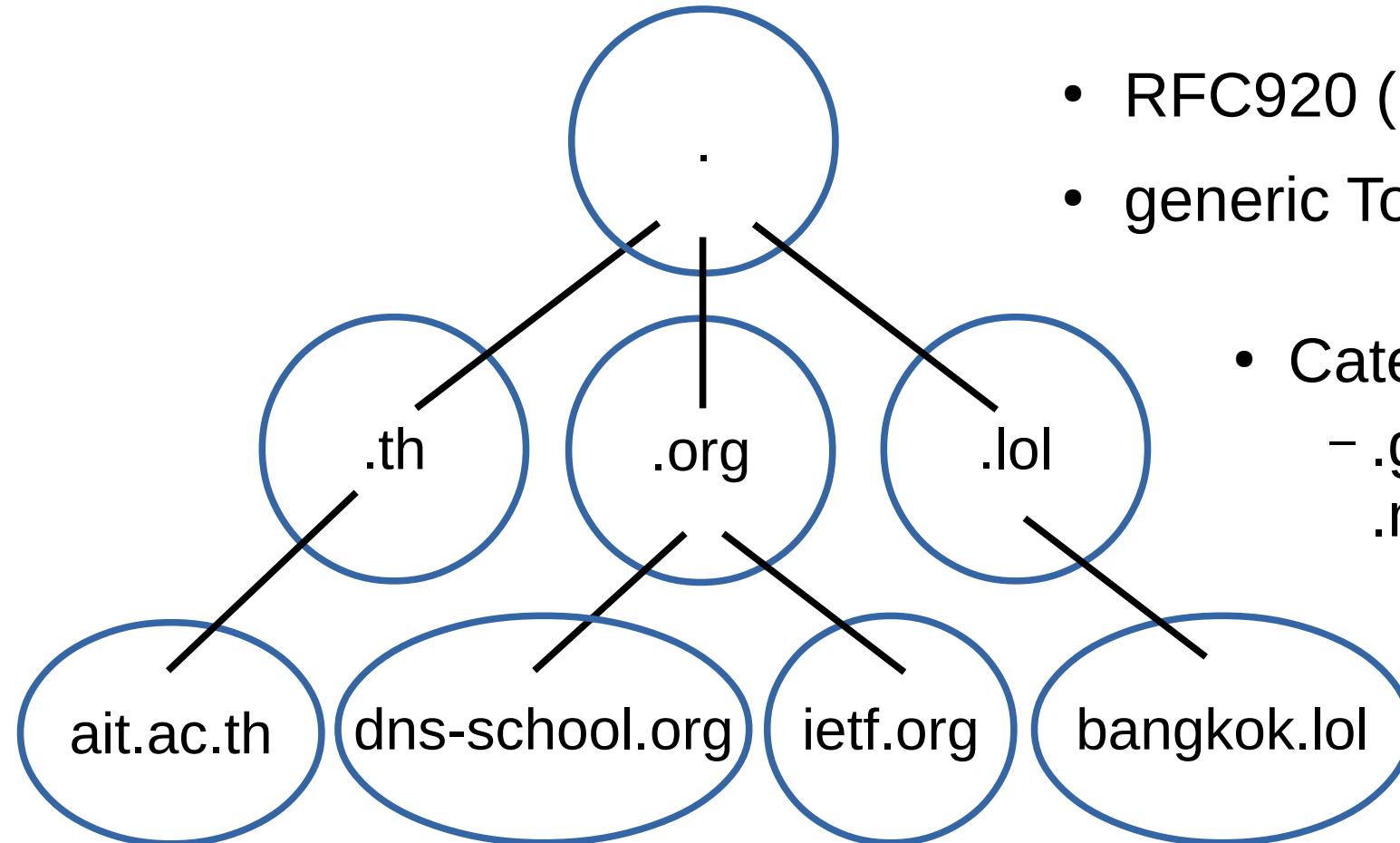
# Domain Name Space – scale

A	VeriSign	198.41.0.4 2001:503:BA3E::2:30	H	US Army	128.63.2.53 2001:500:1::803f:235
B	USC-ISI	192.228.79.201 2001:478:65::53	I	Netnod	192.36.148.17 2001:7fe::53
C	Cogent	192.33.4.12 2001:500:2::c	J	VeriSign	192.58.128.30 2001:503:C27::2:30
D	Uni Maryland	199.7.91.13 2001:500:2d::d	K	RIPE NCC	193.0.14.129 2001:7fd::1
E	NASA	192.203.230.10 2001:500:a8::e	L	ICANN	199.7.83.42 2001:500:3::42
F	ISC	192.5.5.241 2001:500:2f::f	M	WIDE Project	202.12.27.33 2001:dc3::35
G	DoD	192.112.36.4 2001:500:12::d0d			

# Domain Name Space – scale

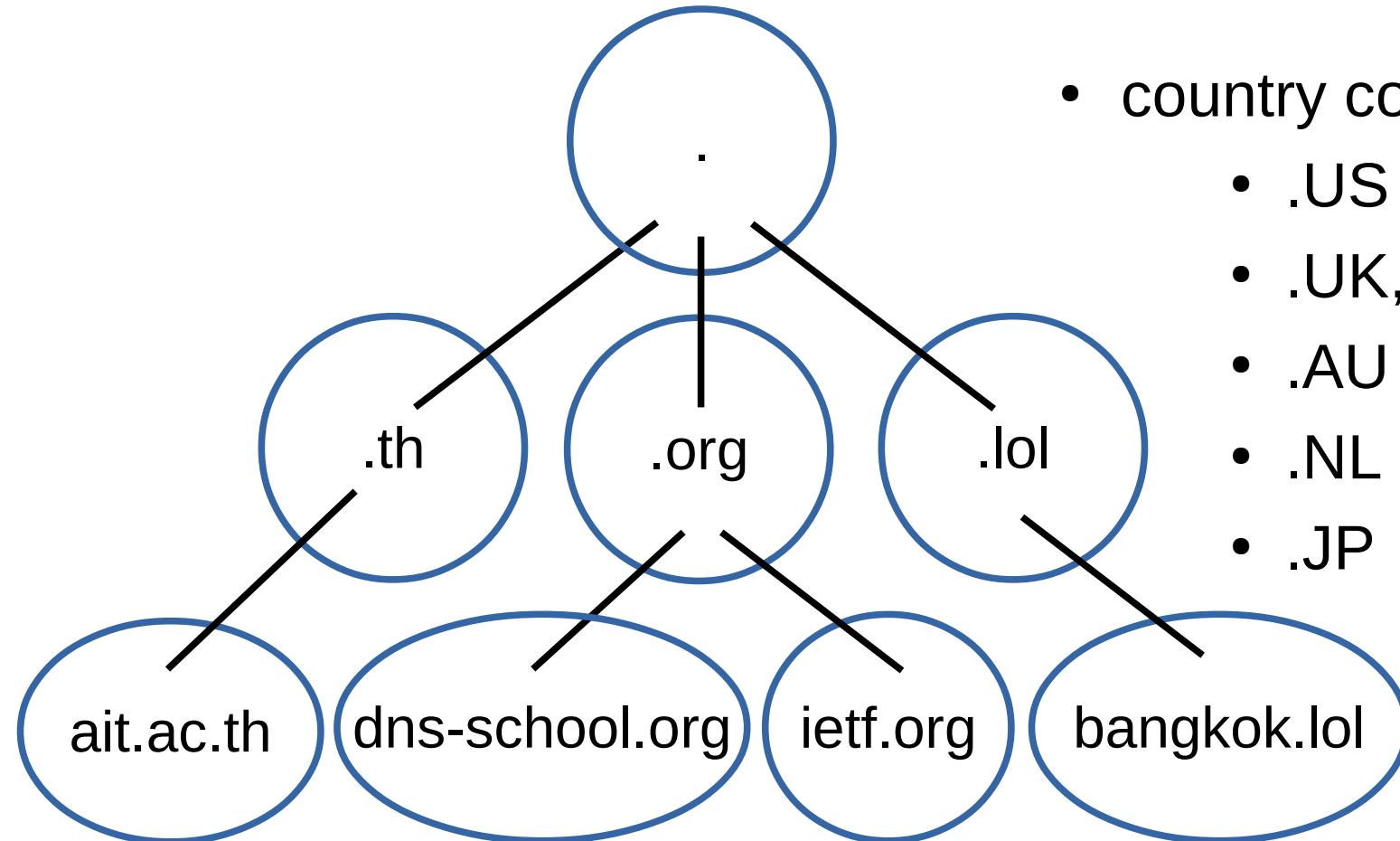


# Domain Name Space – scale



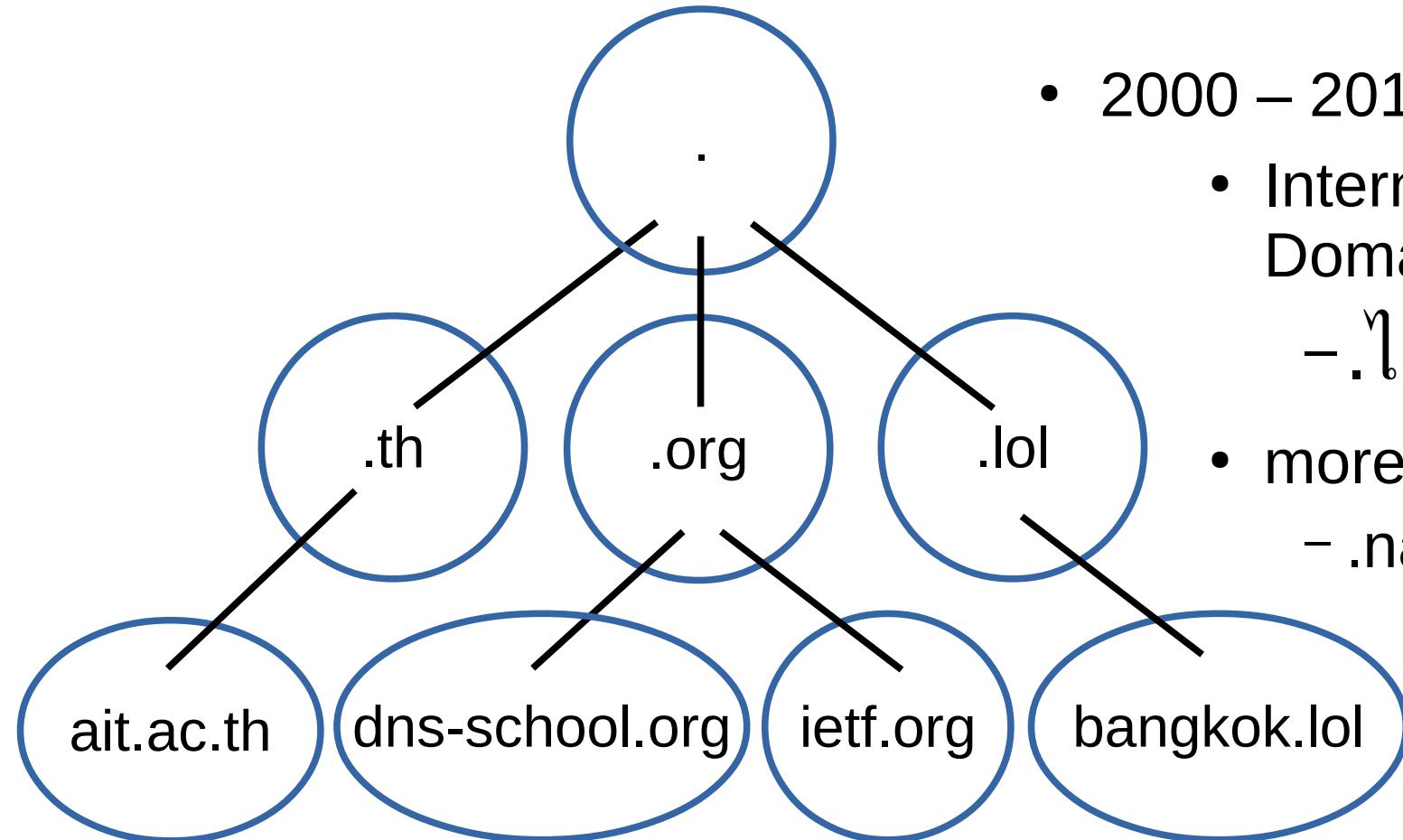
- RFC920 (1984)
- generic Top Level Domains (gTLDs)
- Categories
  - .gov .edu .com  
.mil .org .net

# Domain Name Space – scale



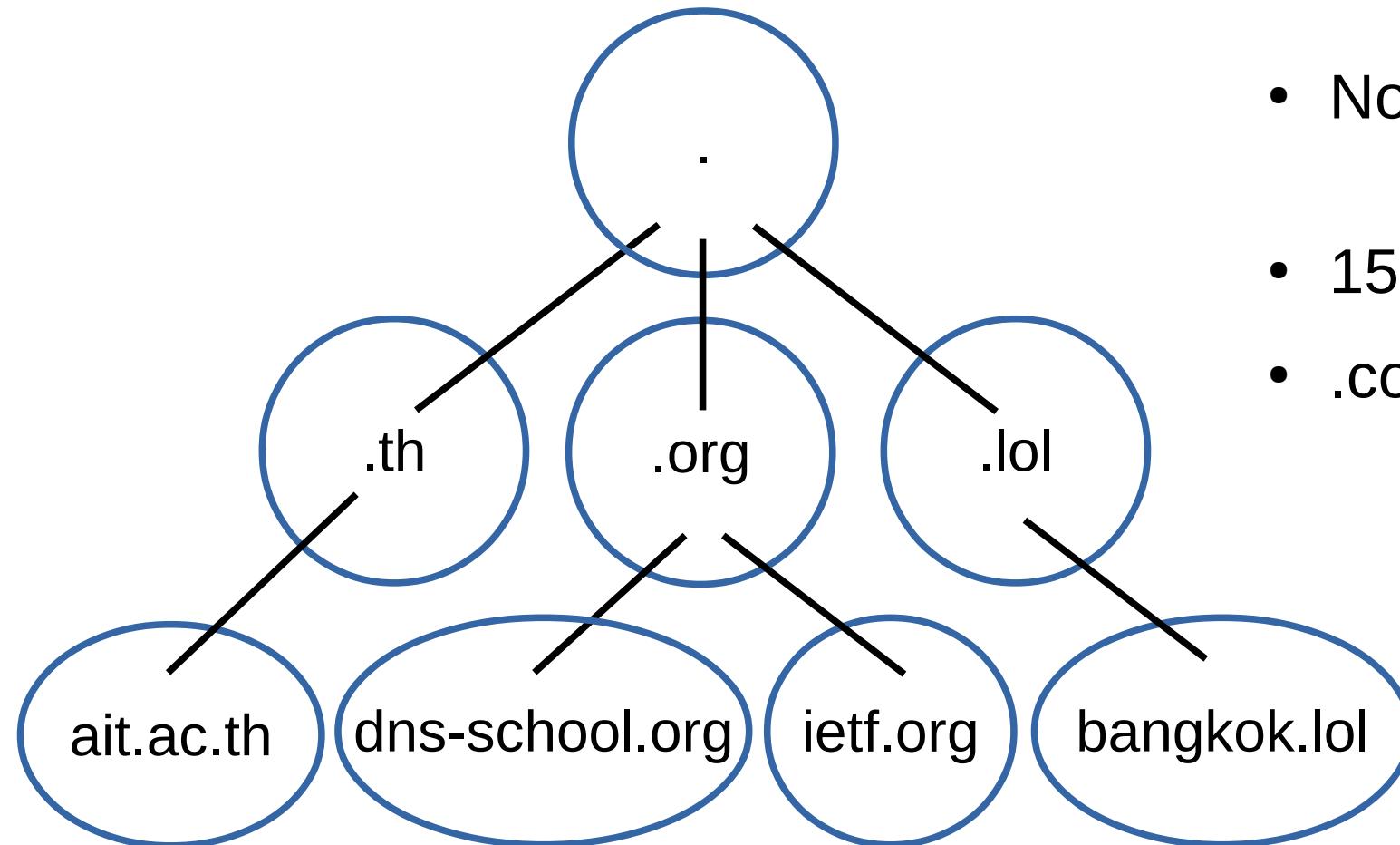
- country code TLD (ccTLD)
  - .US (15 Feb 1985)
  - .UK, GB (24 Jul '85)
  - .AU ( 5 Mar 1986)
  - .NL (25 Apr 1986)
  - .JP ( 5 Aug 1986)
  - .TH (1988)

# Domain Name Space – scale



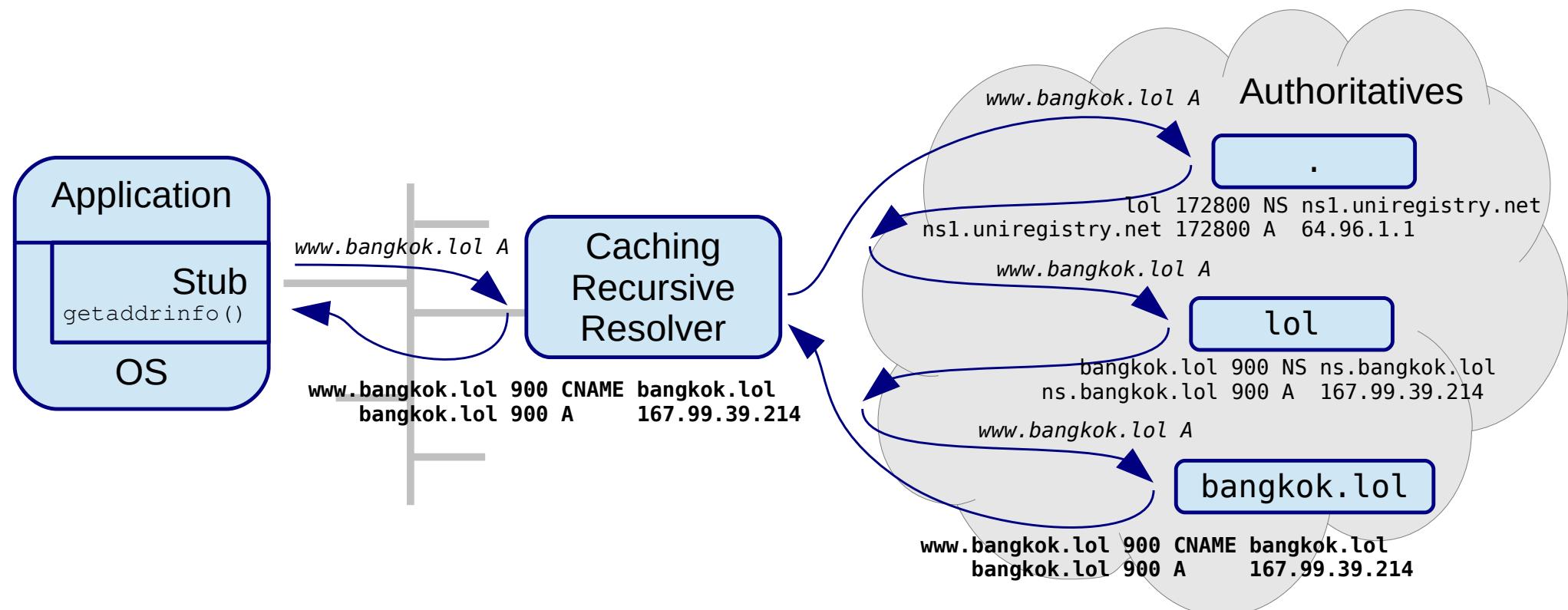
- 2000 – 2012
  - Internationalized Domain Names
    - .ไทย
  - more gTLDs, including
    - .name .pro .biz  
*(restricted)*

# Domain Name Space – scale



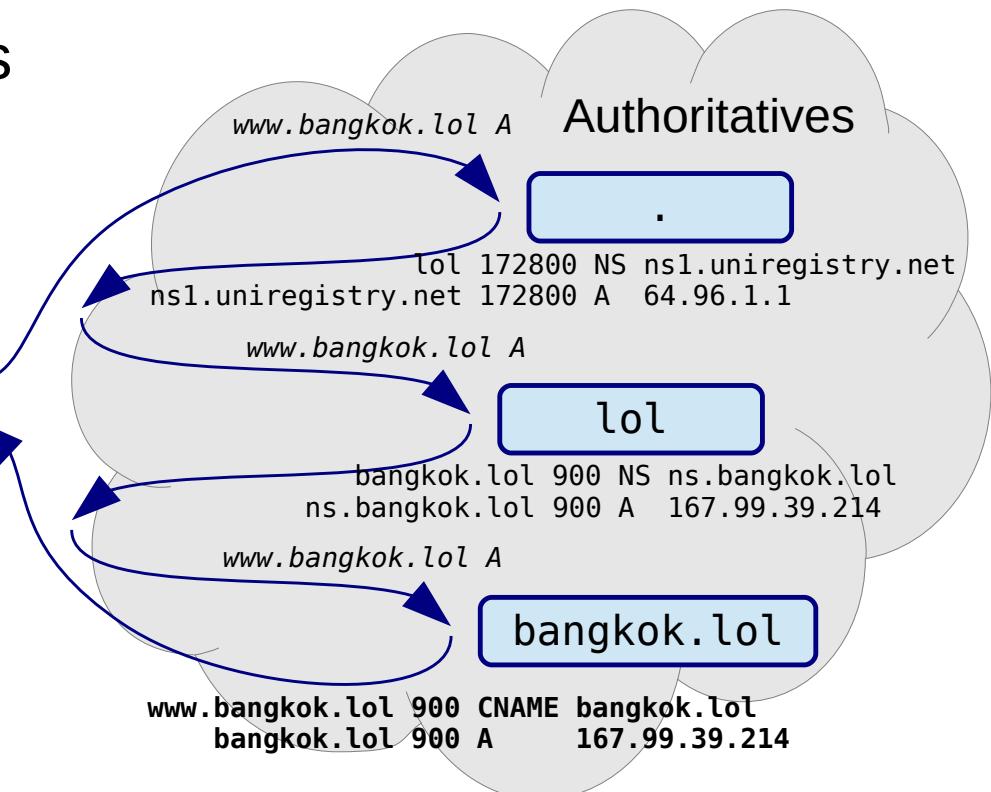
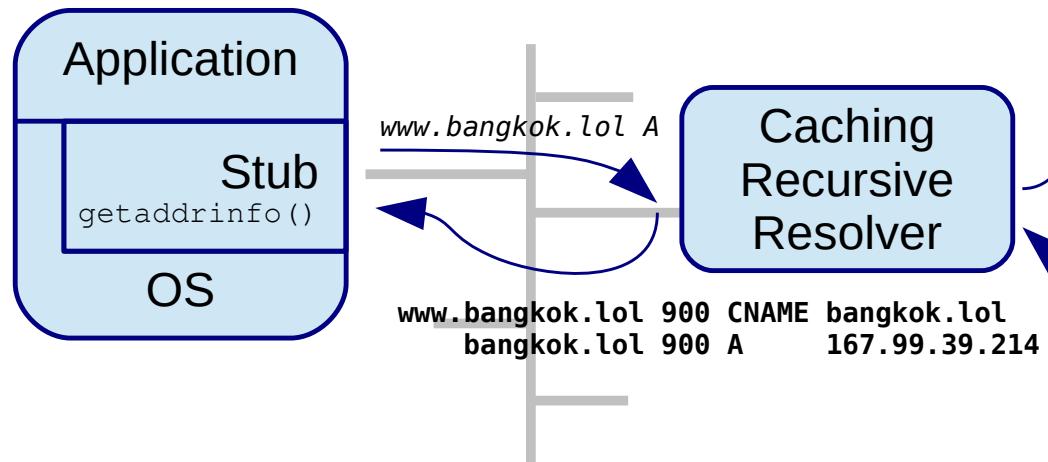
- Now: Unlimited  
\$186,000
- 1532 TLDs
- .com 141,600,000  
.tk 23,700,000  
.de 14,600,000  
.nl 5,500,000  
.th ?

# Domain Name System - scale



# Domain Name System - scale

- **UDP** = No State on authoritatives
- **Caching Recursive Resolvers**:
  - Reduce load to authoritatives
  - Reduce latency to stub



# Lab time!



- Hands on: <http://bangkok.lol/>
- 1. Setup a Caching Recursive Resolver