

Root DNS Update: Yet Another Root Server coming to Thailand

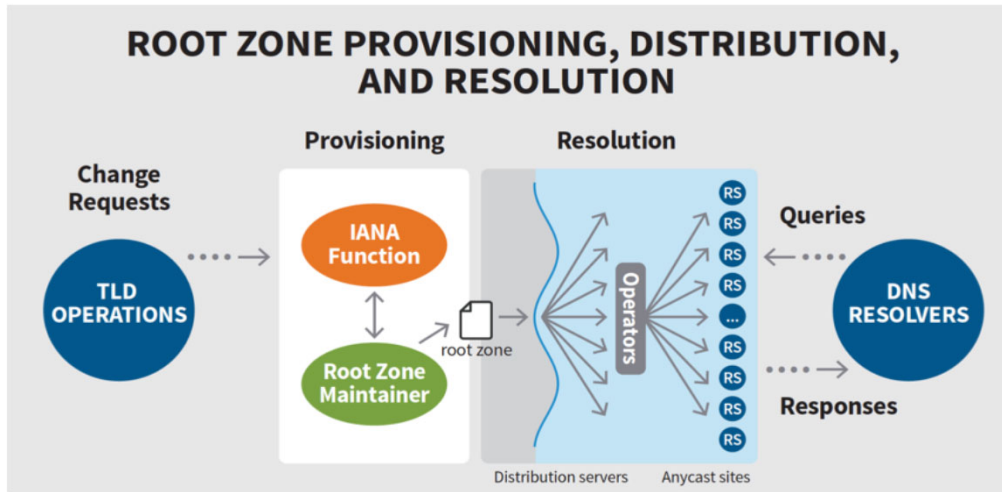
BKNIX Peering Forum 2022

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JPRS / WIDE / M-Root

2022-05-23













What is Root DNS



- Root Server System Principles
 - Globally unique public namespace (source=IANA)
 - Stable, reliable, resilient system
 - Operation with integrity and ethos
 - Transparency in operation
 - Neutrality and impartiality
 - ...

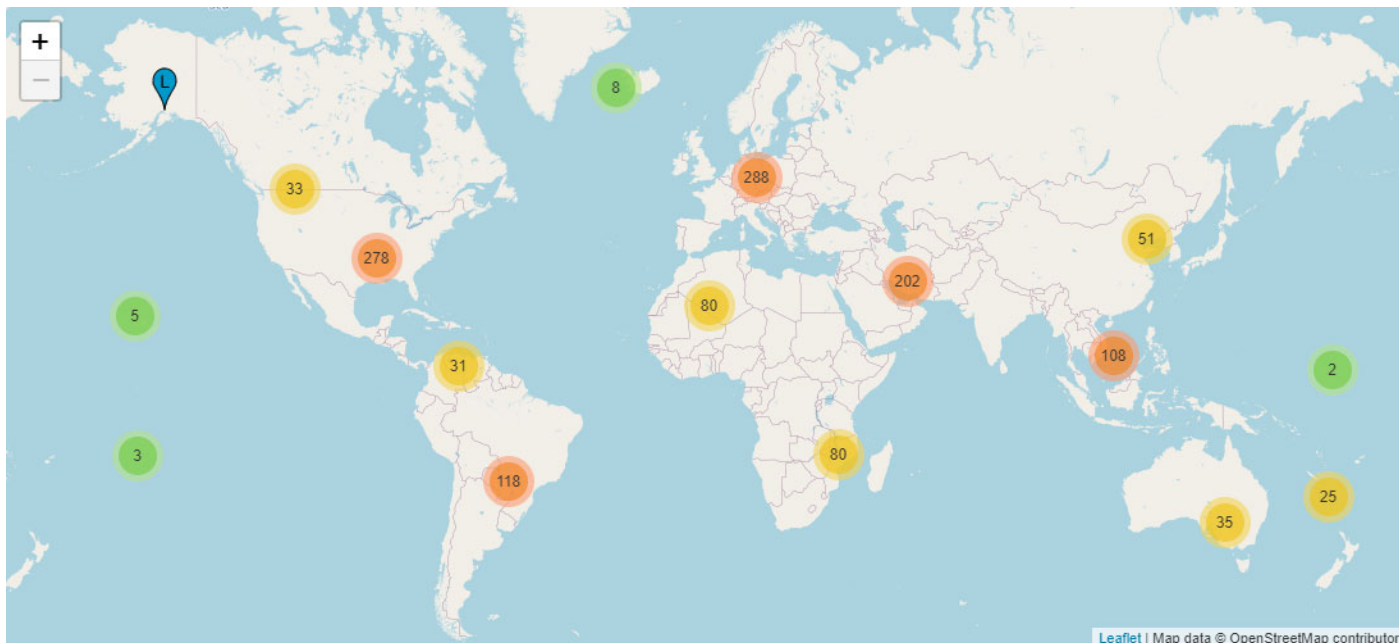
Who Operates Root Servers

- 12 independent organizations operate Root Servers

name		Operator	Organizational type
A-Root / J-Root		Verisign, Inc.	Company (domain name registry)
B-Root		Univ. of Sothern California, Information Sciences Inst.	University (laboratory)
C-Root		Cogent Communications	Company (ISP)
D-Root		Univ. of Maryland	University
E-Root		NASA Ames Research Renter	Government (laboratory)
F-Root		Internet Systems Consortium (ISC)	Nonprofit organization (DNS soft. developer)
G-Root		U.S. DoD Network Information Center	Government
H-Root		U.S. Army Research laboratory	Army (laboratory)
I-Root		Netnod	Nonprofit organization (operator of IX)
K-Root		RIPE NCC	European Regional Internet Registry
L-Root		ICANN	Nonprofit organization
M-Root		WIDE Project & JPRS	Research project & Company (domain name registry)

M-Root is the only Operator based in AP region

Root Servers deployed around the World



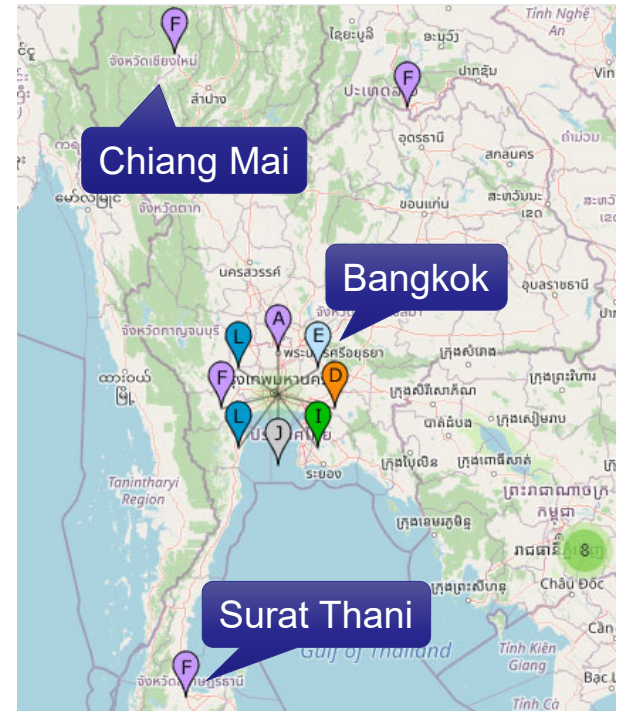
<https://root-servers.org/> 2022-05-19

Root Server System consists of **1600+** instances

Root Servers in Thailand

- 7 Letters, 10 Sites, 21 Instances
 - Bangkok A / D / E / F / I / J / L / L
 - Chiang Mai F
 - Surat Thani F

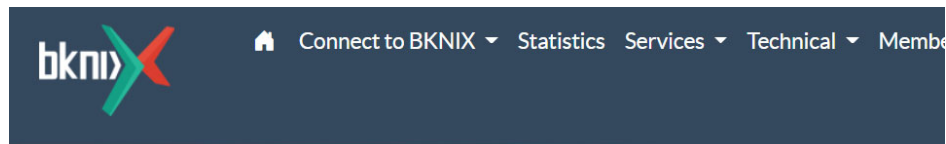
No M-Root in Thailand...



BKNIX Case

- 2 Root Servers in BKNIX
 - D-Root (Univ. of Maryland)
 - via PCH (AS42)
 - J-Root (Verisign)

No M-Root in BKNIX...



Root servers

A root name server is a name server for the root zone of the Domain Name System (DNS) of the Internet. BKNIX supports root name server hosting which is available as a common service. Members can reduce the latency of querying the root zone here, resulting in a better Internet user experience.

Below is the list of root server operators offered by BKNIX.

Operator	Instance
	d.root-servers.net
	+ ccTLDs, gTLDs
Operator	Instance
 VERISIGN	j.root-servers.net, b.gtld-servers.net
	.com, .net

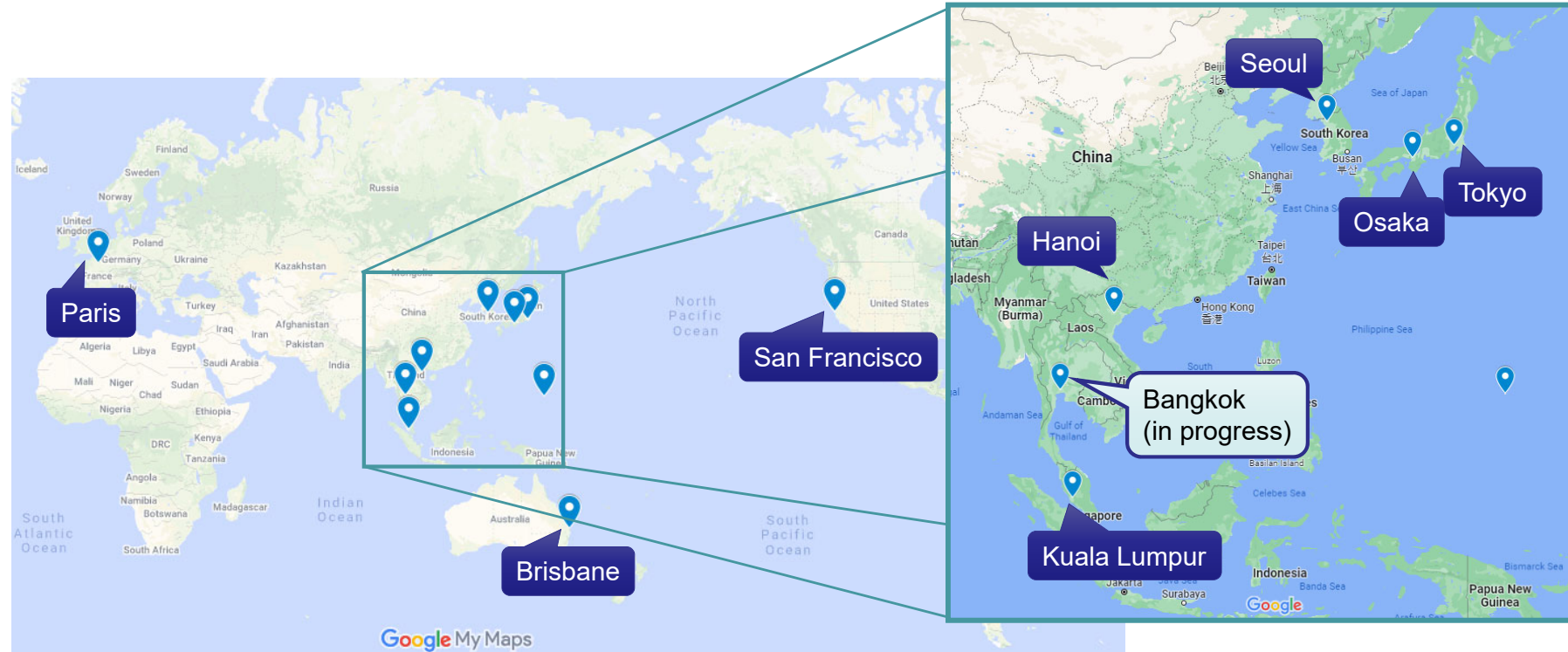
<https://bknix.co.th/en/service/rootservers/>

M-Root Anycast Deployment

- Until 2019, only small number of anycast nodes are deployed
 - Tokyo (JP), Osaka (JP), Paris (FR), San Francisco (US), Seoul (KR)
- Deployment of more anycast instances by local nodes started
 - Main focus in **AP Region**
 - In collaboration with **APNIC**
 - With minimum set of equipment (1 server, 1 switch)
 - 4 sites launched, since 2020
 - Brisbane (AU), Hanoi (VN), Guam (GU), Kuala Lumpur (MY)
 - **10+ more sites**, including **Bangkok (TH)** under way

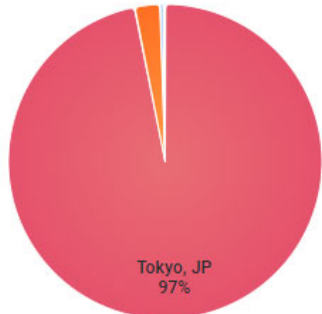
MoUs signed with Local Hosts, but
service launch **delayed** by **so slow delivery** of network gears

M-Root Nodes in the Map



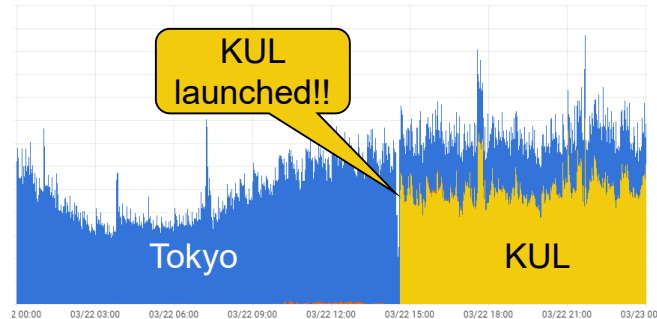
What's good with Local Node? (Malaysia Case)

- Without local node, queries from Malaysia to M-Root were handled 100% by foreign nodes
 - After Kuala Lumpur (KUL) node launched, 83% are handled within Malaysia
 - Queries handled by KUL node have advantage of short RTT (Tokyo 97ms vs KUL 11ms)
- (RTTs are measured by 21 RIPE Atlas probes in Malaysia)

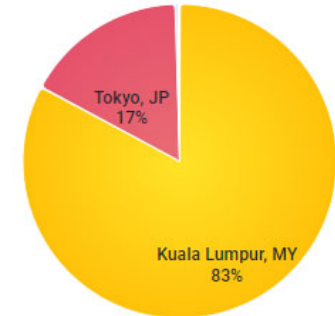


2022-03-01

Node	Query rate	Ave. RTT
Tokyo	97%	101ms
Seoul	3%	NO DATA



2022-03-22
M-Root KUL launched

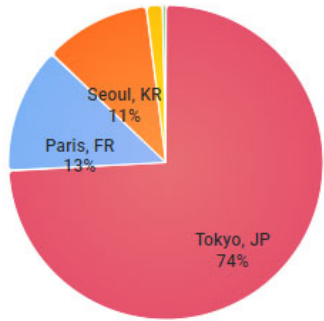


2022-04-01

Node	Query rate	Ave. RTT
KUL	83%	11ms
Tokyo	17%	97ms

Thailand Perspective

- Queries from Thailand to M-Root are mostly handled by Tokyo and KUL now
- Average RTT of KUL (36ms) is not bad, but Tokyo (140ms) is rather high
(RTTs are measured by 13 RIPE Atlas probes in Thailand)

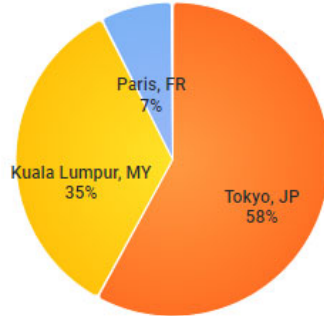


2022-03-01

Node	Query rate	Ave. RTT
Tokyo	74%	125ms
Paris	13%	211ms
Seoul	11%	NO DATA



Side effect of KUL node

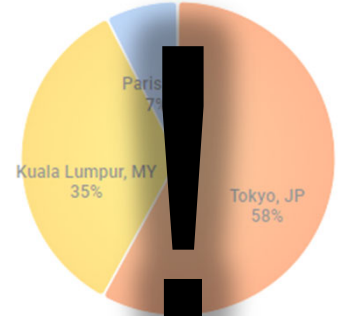


2022-04-01

Node	Query rate	Ave. RTT
Tokyo	58%	140ms
KUL	35%	36ms
Paris	7%	217ms



Bangkok node is coming! Achieve 100% in country by BKK node!



2022-mm-dd

Node	Query rate	Ave. RTT
BKK	100%?	10ms?
Tokyo	0%?	140ms
KUL	0%?	36ms

To BKNIX Members

- M-Root BKK to be ready **in September**, hopefully...
 - Pray for no more delays on delivery of the gears
- **Peering** Please!

BTW, it is not about the Anycast deployment, but...

Please also consider the following:

- **QNAME Minimisation (RFC7816)**
- **NSEC/NSEC3 Aggressive Use (RFC8198)**

to **reduce traffic** to Root DNS servers

Thank You !