M-Root DNS Deployment update

Kazuhiro Kitamura

M-Root Deployment Manager

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Recent update of M-Root deployment Scheme

- In 2004, M-Root started anycast services

- In 2020, MoU among WIDE Project, JPRS, and APNIC concluded for global deployment of M-Root instances with focus on AP region

- Deployment of more anycast instances under way with funding support from APNIC Foundation/APIDT

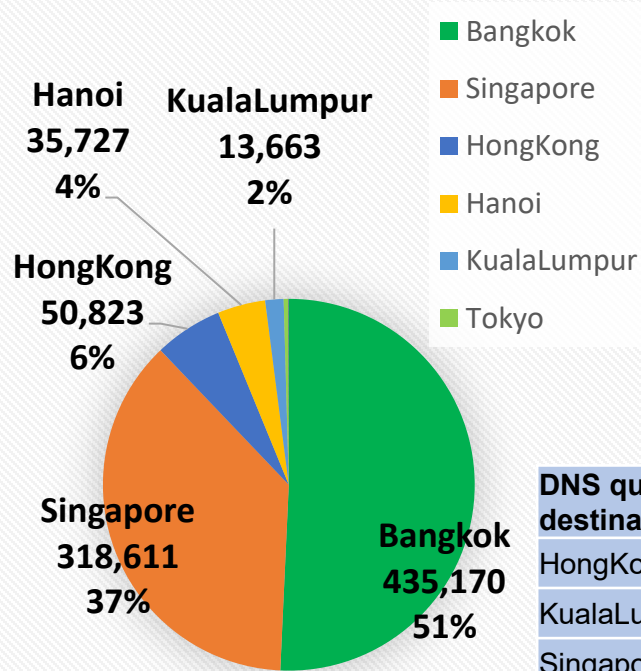- Kazuhiro Kitamura <kitamura@jprs.co.jp> is appointed as M-Root Deployment Manager

Update of M-Root deployment in AP region

	City/Country・Economy: connected IX etc	# of locations
2020	Brisbane/**AU** : MegaIX,QLD-IX	**1**
2021	Hanoi/**VN** : VNNIC	**1**
2022	**GU** : MARIIX, Kuala Lumpur/**MY** : MyIX, Bangkok/**TH** : BKNIX, **SG** : Equinix, SingAREN-SOE	**4**
2023	Kaohsiung/**TW** : TWIX, Jakarta/**ID** : IIX, OpenIXP, Ulaanbaatar/**MN** : MISPA-IXP, **HK** : HKIX, Phnom Penh/**KH** : CNX	**5**
2024 (Equipment delivered)	Dhaka/**BD** : BDIX, Quezon City/**PH** : PhOpenIX, Kathmandu/**NP** : NPIX, Lahore/**PK** : PKIX, Mumbai/**IN** : NIXI, Kolkata/**IN** : Kolkata IX, and coming more	**6+α**

Deployment Result

WIDE jPRS APNIC

✓ **M-Root@KH receives almost of queries to M-Root and makes RTT to M-Root shorter**
✓ **The total number of queries to the whole M-Root instances increases 20 times more because the queries to other letters might have changed to M-Root@KH due to its shorter RTT**

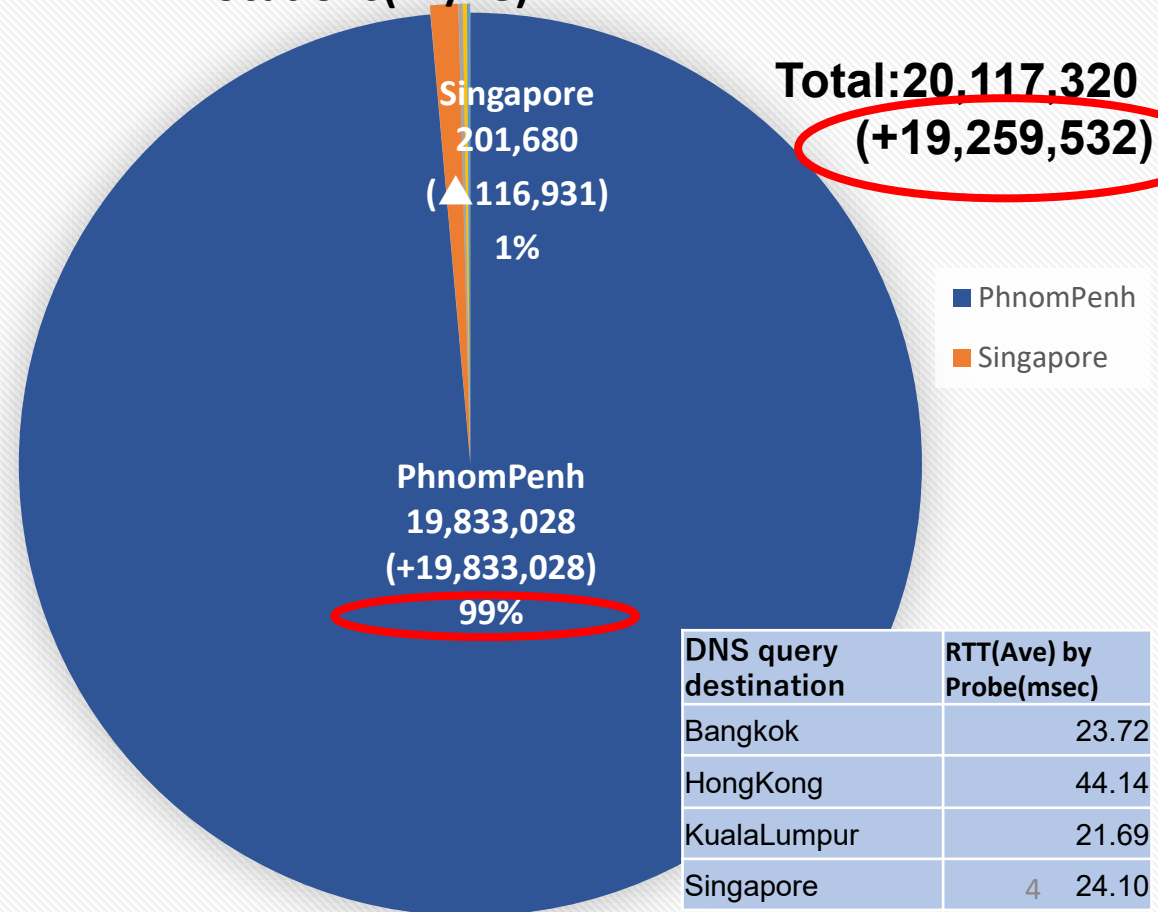**BEFORE : Queries from KH Received by Locations(12/21)**

Total:857,788

Legend:
- Bangkok
- Singapore
- HongKong
- Hanoi
- KualaLumpur
- Tokyo

Hanoi 35,727 4%
KualaLumpur 13,663 2%
HongKong 50,823 6%
Singapore 318,611 37%
Bangkok 435,170 51%

DNS query destination	RTT(Ave) by Probe(msec)
HongKong	43.93
KualaLumpur	22.79
Singapore	24.34

Measured by Atlas probe

AFTER : Queries from KH Received by Locations(12/28)

Total:20.117.320
(+19,259,532)

Singapore 201,680 (▲116,931) 1%
PhnomPenh 19,833,028 (+19,833,028) 99%

Legend:
- PhnomPenh
- Singapore

DNS query destination	RTT(Ave) by Probe(msec)
Bangkok	23.72
HongKong	44.14
KualaLumpur	21.69
Singapore	24.10

Measured by Atlas probe

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DNSPerf view before deployment in KH

jPRS APNIC

How we measure DNS Performance

All DNS providers are tested every minute from 200+ locations globally. All tests are over IPv4 with a 1-second timeout. The public data is updated once per hour, but contact us for real-time data.

AUTHORITATIVE DNS PROVIDERS   PUBLIC DNS RESOLVERS   **DNS ROOT SERVERS**

https://www.dnsperf.com/

DNS Root Servers

Location:	Type:			Period:
Cambodia ▾	**Raw Performance**	Uptime	Quality	November, 2023 ▾

	DNS name	Query Speed	0	20	40	60	80	100	120	140	160	180	200
1	e.root-servers.net	2.36 ms											
2	d.root-servers.net	2.42 ms											
3	i.root-servers.net	2.44 ms											
4	b.root-servers.net	26.31 ms											
5	l.root-servers.net	33.77 ms											
6	f.root-servers.net	48.75 ms											
7	m.root-servers.net	50.14 ms											
8	h.root-servers.net	59.64 ms											
9	k.root-servers.net	82.17 ms											
10	g.root-servers.net	100.68 ms											
11	j.root-servers.net	206.54 ms											
12	a.root-servers.net	206.89 ms											
13	c.root-servers.net	208.57 ms											

Less is better

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DNSPerf view after deployment in KH

WIDE jPRS APNIC

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DNS Root Servers

Location:	Type:			Period:
Cambodia ▾	**Raw Performance**	Uptime	Quality	January, 2024 ▾

	DNS name	Query Speed	0	20	40	60	80	100	120	140	160	180	200
1	m.root-servers.net	1.84 ms											
2	e.root-servers.net	2.38 ms											
3	d.root-servers.net	2.46 ms											
4	i.root-servers.net	2.49 ms											
5	l.root-servers.net	24.49 ms											
6	b.root-servers.net	26.39 ms											
7	f.root-servers.net	45.91 ms											
8	h.root-servers.net	62.22 ms											
9	k.root-servers.net	89.45 ms											
10	g.root-servers.net	92.31 ms											
11	j.root-servers.net	204.3 ms											
12	a.root-servers.net	204.74 ms											
13	c.root-servers.net	210.81 ms											

D/E/F/I/K/M-root is located in Phnom Penh according to www.root-servers.org

Summary

✓ M-Root deployment expands rapidly in AP region as the project funded by APNIC Foundation

✓ M-Root deployment helps the diversity and resilience of Root Server System, and also helps for the county/economies of hosting M-Root,

   - Queries to M-Root instances remains within local as KH case
   - Number of Queries to local M-Root increases after the deployment, which would be caused by keeping queries local from other Root servers outside the country shown as KH case

If you are interested in hosting an M-Root instance, please contact

m-root-eoi@jprs.co.jp

or

Kazuhiro Kitamura (M-Root Deployment Manager)

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