

IPv6 Deployment Status in Bangladesh

Md. Abdul Awal

BdREN

awal@bdren.net.bd

Acknowledgement and Disclaimer

- Most of the statistics are collected from APNIC, Cisco, Google, RIPE, Hurricane Electric, Alexa, ISOC and many other sources.
- Statistics, tools and materials of Eric Vyncke, Philip Smith and Mark Prior have been used to prepare the slides. Sincere thanks to them.
- Please check the sources for latest updates.
- Corrections and updates are welcome 😊

Resources Delegated to BD

504 - AS Numbers

633 - v4 Prefixes (\leq /24)

224 - v6 Prefixes (\leq /48)

<https://stats.apnic.net/>

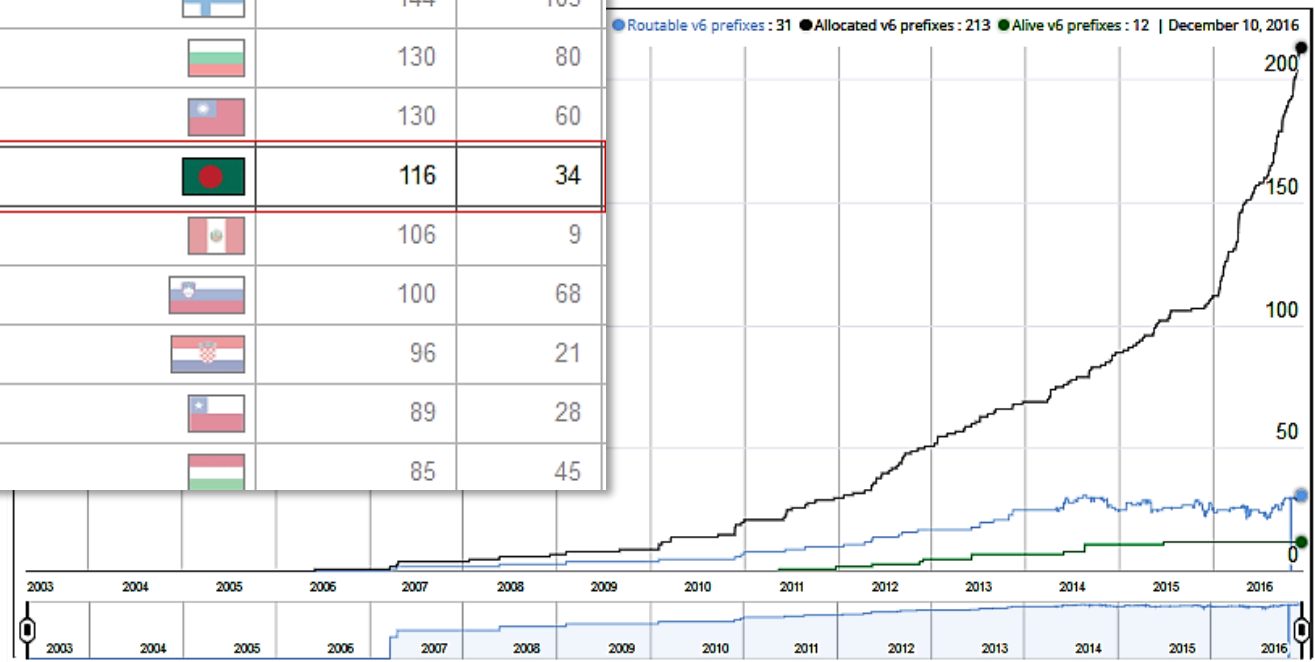
BD's IPv6 Journey

- First IPv6 Assignment: AS17469(Jun 2, 2006)
- First IPv6 prefix announced: AS17806 (Jan 4, 2011)
- First IPv6 traffic seen: AS24122 (May 16, 2011)
- Total prefixes seen in BGP table: 111 (≤ 48)
- Never announced prefixes: 174 (≤ 48)
- World IPv6 Day (Jun 8, 2011) participants: None
- v6 prefixes that generated traffic till today: 10

<ftp://ftp.apnic.net/pub/stats/apnic/delegated-apnic-latest>
<https://www.vyncke.org/ipv6status/detailed.php?country=bd>

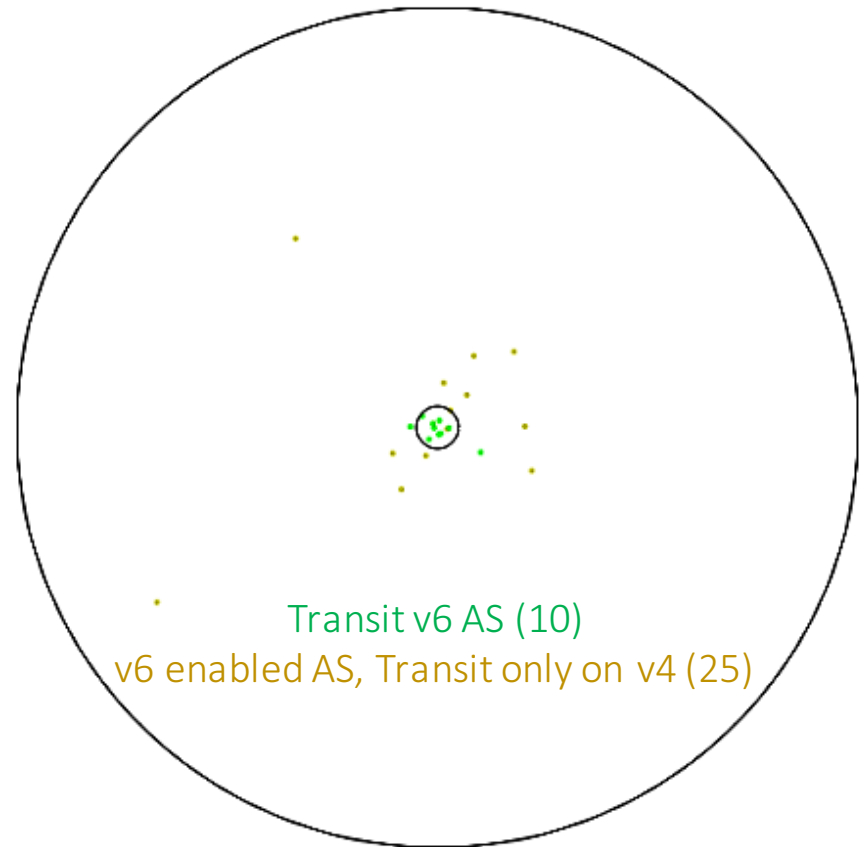
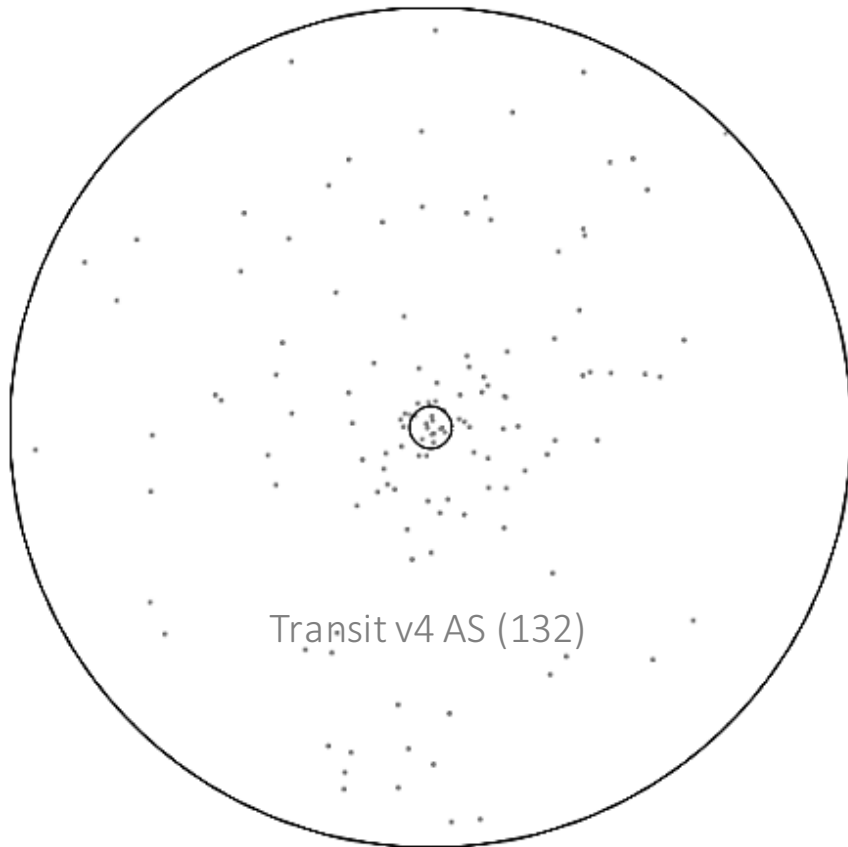
IPv6 Prefix Report

Country	IPv6 Prefix	ASN
Colombia	158	40
South Africa	153	87
Finland	144	103
Bulgaria	130	80
Taiwan	130	60
Bangladesh	116	34
Peru	106	9
Slovenia	100	68
Croatia	96	21
Chile	89	28
Hungary	85	45



http://bgp.he.net/report/prefixes#_countriesv6
<http://6lab.cisco.com/stats/cible.php?country=BD&option=all>

IPv6 Transit Radar

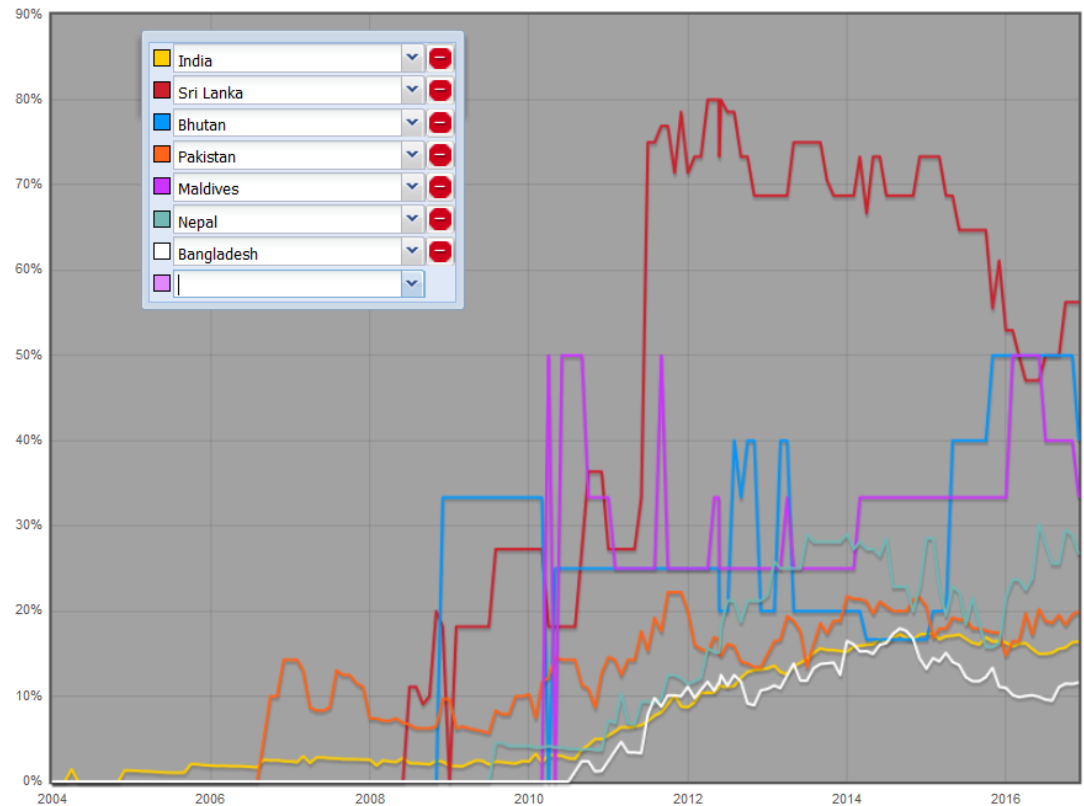


<http://6lab.cisco.com/stats/cible.php?country=BD&option=all>

IPv6 Status Among Neighbors

APNIC Index	CC	Internet Users	IPv6 User Ratio
20	IN	377,519,157	14.00%
44	LK	5,380,347	2.15%
62	BT	271,112	0.29%
127	PK	28,803,621	0.01%
130	BD	52,248,336	0.01%
149	MV	183,682	0.00%
183	NP	4,466,707	0.00%

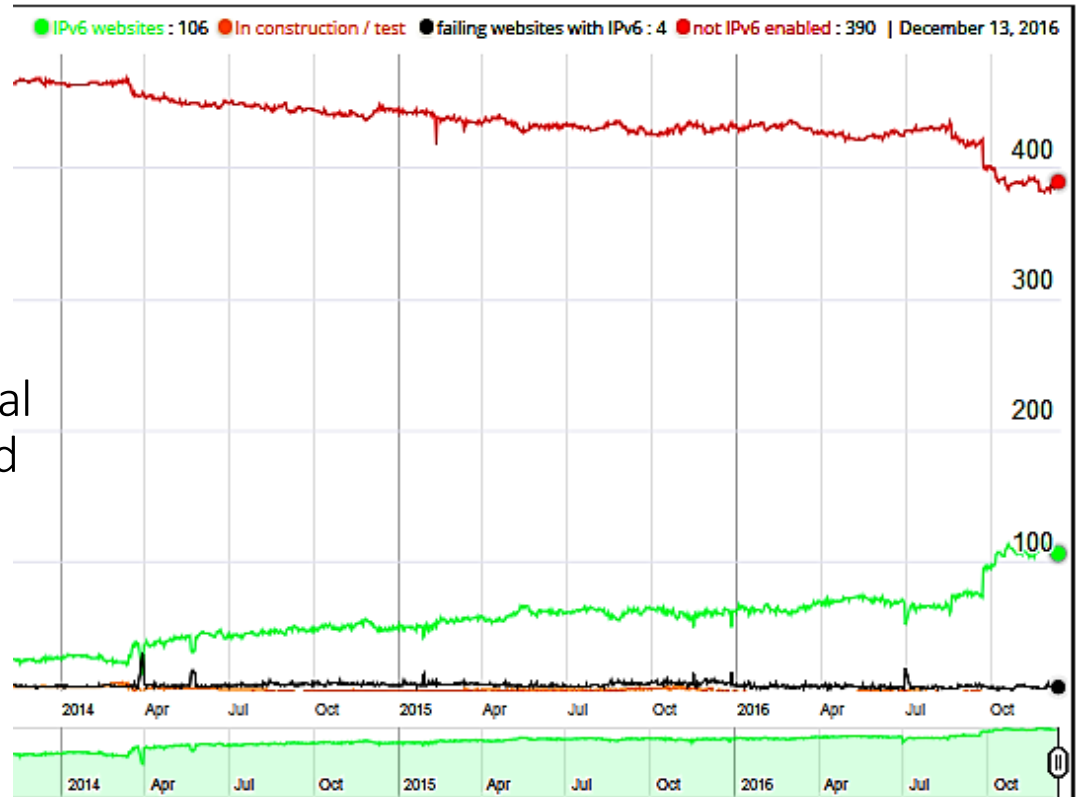
This graph shows the percentage of networks (ASes) that announce an IPv6 prefix for a specified list of countries or groups of countries



<http://labs.apnic.net/dists/v6dcc.html>
<http://v6asns.ripe.net/v/6>

IPv6 Enabled Contents

- Total 106 websites are IPv6 enabled including international sites
- Local contents:
 - Out of Alexa's top 500 websites less than 50 local websites are IPv6 enabled
 - More than 90% websites are resolved through Cloudflare



<http://6lab.cisco.com/stats/cible.php?country=BD&option=all>
<https://www.vyncke.org/ipv6status/detailed.php?country=bd>
<http://www.alexa.com/topsites/countries/BD>

.bd ccTLD Readiness

- AAAA Glue records not supported yet

```
;; AUTHORITY SECTION:
bd.          144257  IN      NS      dns.bd.
bd.          144257  IN      NS      surma.btcl.net.bd.
bd.          144257  IN      NS      jamuna.btcl.net.bd.






;; ADDITIONAL SECTION:
surma.btcl.net.bd.  10651  IN      A       203.112.194.232
surma.btcl.net.bd.  10651  IN      AAAA    2407:5000:88:4::232
jamuna.btcl.net.bd. 10651  IN      A       203.112.194.231
jamuna.btcl.net.bd. 10651  IN      AAAA    2407:5000:88:4::231
dns.bd.        21368  IN      A       209.58.24.3
```

.bd TLD Report



Description: Bangladesh

Delegated to: Ministry of Post & Telecommunications

Nameserver Status 
IPv4 Enabled Nameservers 
A Glue in the Root Zone 
IPv6 Enabled Nameservers 
AAAA Glue in the Root Zone 

Domains: 5,061
A records: 2,974
A glue: 7,980
AAAA records: 1
AAAA glue: 0
Updated: 23 Jun 2010 03:44 PST






<http://bgp.he.net/report/dns/bd>







.বাংলা IDN Readiness

.xn--54b7fta0cc TLD Report

Description: Bangladesh

Delegated to: Not assigned

Nameserver Status 
IPv4 Enabled Nameservers 
A Glue in the Root Zone 
IPv6 Enabled Nameservers 
AAAA Glue in the Root Zone 

Nameservers for .xn--54b7fta0cc TLD and SOA Query Test				
Nameserver	Pass	A	Pass	AAAA
bd-ns.anycast.pch.net		204.61.216.108		2001:500:14:6108:ad::1
bayanno.btcl.net.bd		180.211.212.213		2407:5000:88:2::3
ekushey.btcl.net.bd		123.49.50.51		2407:5000:88:1::2

<http://bgp.he.net/report/dns/xn--54b7fta0cc>

BDIX

```
BGP router identifier 74.80.104.4, local AS number 3856
RIB entries 99, using 6336 bytes of memory
Peers 38, using 94 KiB of memory
Peer groups 8, using 128 bytes of memory
```

Neighbor	V	AS	MsgRcvd	MsgSent	TblVer	InQ	OutQ	Up/Down	State/PfxRcd
2001:500:15:2900::1									
	4	42	264488	264150	0	0	0	1d03h04m	47
2001:de8:b:2900::1									
	4	65534	286318	259337	0	0	0	3d03h19m	49
2001:de8:b:2900::5									
	4	65534	0	0	0	0	0	never	Active
2620:0:872::231:55									
	4	3856	244177	283605	0	0	0	01:19:50	0

Total number of neighbors 4

<https://prefix.pch.net/applications/lq>

Service Providers

Category	ASN having IPv4 Prefix	IPv6 Prefix		
		Announced	Never announced	No assignment yet
Telco	6	1	3	2
BWA/WiMAX	3	1	1	1
IIG/ITC/ISP/Enterprise	348	29	170	149

<https://www.vyncke.org/ipv6status/detailed.php?country=bd>
<http://bgp.he.net/country/BD>

Government Portals and Educational Institutes

- Approximately 2000 .gov.bd domains, not IPv6 enabled
- Many more government portals are providing services with IPv4 only
- Websites of some universities and educational institutions are IPv6 enabled, mostly through CDNs
- Lacks awareness as well as technical expertise

IPv6 Capability and Preference

ASN	AS Name	IPv6 Capable	IPv6 Preferred ▼	Samples
AS58587	FIBERATHOME-BD FiberHome Limited	0.94%	0.77%	11,416
AS38712	TELNET-AS-BD-AP Telnet Communication Limited	0.61%	0.61%	7,756
AS24122	BDCOM-BD-AS-AP BDCOM Online Limited	0.21%	0.20%	24,930
AS59361	DESCO-AS-AP Dhaka Electric Supply Company Limited (DESCO)	0.18%	0.18%	546
AS63961	BDREN-UGC-AS-AP Bangladesh Research and Education Network (BdREN)	0.17%	0.17%	6,384
AS38030	ALAP-AS-BD ALAP COMMUNICATION LTD. DOMESTIC DATA CONNECTIVITY SERVICE	0.14%	0.14%	729
AS58813	DTECH-BD Dtech Limited	0.03%	0.03%	3,775
AS23991	RANKS-AS-BD Ranks ITT Ltd.	0.02%	0.02%	5,189
AS134159	MAHIENTERPRISE-AS-AP Mahbub Morshed ta Mahi Enterprise	0.02%	0.02%	4,840
AS38313	FUSION-NET-BD Fusion Net. Internet Service Provider, Dhaka.	0.02%	0.02%	4,064
AS58717	SUMMITCOMMUNICATIONS-BD Summit Communications Ltd	0.01%	0.01%	19,726
AS55406	HRCTECH-01-AS-AP 26 Shyamoli, Bir Uttam A. W. Chowdhury Road	0.01%	0.01%	17,275
AS63526	SSDTL-BD Systems Solutions development Technologies Limited	0.01%	0.01%	15,661
AS38744	AONB-AS-AP AlwaysOn Network Bangladesh Ltd	0.01%	0.01%	12,470
AS133888		0.01%	0.00%	3,333

<http://stats.labs.apnic.net/ipv6/BD>

Challenges and Progress

Telecom Operators

- Ready but not really ready
- Not feeling the urge to do it right now
 - IPv4 works fine
 - Do not want to make changes unless absolutely necessary
 - No pressure from user end
 - Not much pressure from the regulators/Govt.
 - NAT/CGN works
 - Reverse Proxy works
- *Smaller players are waiting for the market leaders to do it first*

ISP

- Many of them are dual stack at the backbone
- No major technical challenges
- Still not providing IPv6 to end users
 - Not feeling the urge
 - Happy with NAT
 - Customers do not care as long as Internet works
 - No pressure from regulators

Enterprises, Banks, Govt. Websites

- No major progress
- Running on NAT
- Users don't care as long as it works
- Needs awareness among the technical team as well as the management
- *Government should play catalytic role*
 - All Govt. websites should be dual stack

BdREN and Universities

- BdREN is dual stack since early 2016
 - Offers dual stack peering for clients
 - Uses dual stack connectivity at its offices
- Universities are not ready yet
 - *Mainly due to lack of technical expertise/awareness*
 - Only one university has dual stack at the backbone but not offering IPv6 connectivity to the end users
 - Rest of the universities have either hardware issues or lack of awareness/technical expertise
 - BdREN works closely to promote IPv6 in the campuses, organizes capacity building workshops and offers technical assistance

Challenges at a Glance

- Mindset
 - My IPv4 works fine, I won't need IPv6
 - Martian Law: Don't change it unless it is broken
 - Wait: Let's see how others deal with it
 - Lack of confidence: If anything goes wrong, it's because of IPv6
- Technical
 - Lack of awareness: IPv6 seems too complicated
 - Compatibility: Hardware and software not supported
 - Upgrade: Involves \$\$\$
 - Organization specific issues

Efforts

- SANOG, bdNOG, ISPAB: Hosting at least 2 workshops each year with active support from APNIC.
- ISOC-BD: Hosted capacity building and awareness development program on IPv6.
- Government: Arranged seminars and workshops for IT Teams of government agencies.
- BdREN: Conducted several workshops and capacity building programs on IPv6 deployment in campus networks.

BTRC Directives (2014-2015)

- Government Should
 - Mandate IPv6 in the e-governance platforms
 - Mandate IPv6 compatibility in its own procurement of IT systems and support
 - Organize workshops and seminars to bring awareness about IPv6
 - Enable dual stack network in all Government organizations by December 2017
- *The IPv6 should be included in the curriculum of technical courses*

Way Forward...

- IPv6 Roadmap, National IPv6 Taskforce: needs to be initiated by Government.
- More awareness development: ISP association, ISOC-BD should take drives.
- Technical expertise and capacity building for the technical team: need to bring them in NOG meetings
- IPv6 deployment in campuses: BdREN is committed to create awareness and expertise among campus network management team

Questions?