

# Review of Networks in PeeringDB Ethernet Bandwidth Assessment ,Part II

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IEEE 802.3 NEW ETHERNET APPLICATIONS AD HOC  
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# Acknowledgement

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Thanks to Arnold Nipper, DE-CIX for help with accessing PeeringDB and for his review and input on this presentation.

# Introduction: PeeringDB

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- What is PeeringDB?
  - **Mission statement:** “PeeringDB, a nonprofit member-based organization, facilitates the exchange of user maintained interconnection related information, primarily for Peering Coordinators and Internet Exchange, Facility, and Network Operators.”
  - “Public tool for the growth and good of the Internet”
- <https://www.peeringdb.com/>
  - API is publicly accessible

# Definitions

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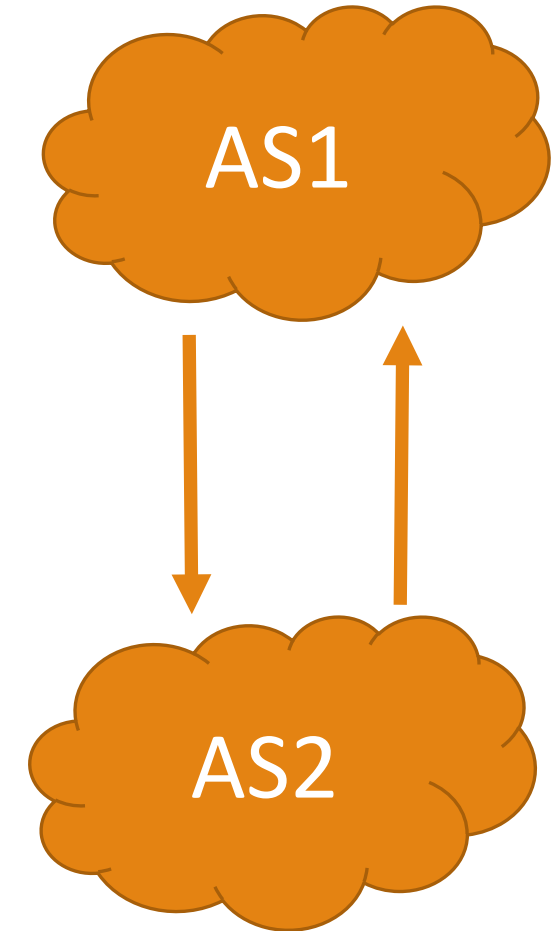
## Peering –

- the interconnection between two independently managed networks (Autonomous Systems (AS) that allows the exchange of traffic between users on the two networks.

## Autonomous System (AS)<sup>1</sup> –

- The unit of router policy, either a single network or a group of networks that is controlled by a common network administrator (or group of administrators) on behalf of a single administrative entity

1. DrPeering International, “What is Internet Peering?”, <http://drpeering.net/core/ch4-Internet-Peering.html>



# PeeringDB: Networks Database

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- Network Type
- Traffic Levels
- Traffic Ratio
- Geographic Scope
- General Peering Policy

# PeeringDB: Geographic Scope

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- Not Disclosed
- Regional –
  - "Regional" is not well defined, but typically means that the ASN is not covering the whole region where it belongs to (Europe, America, ...) but only a subregion.
  - "Regional" will most likely go away soon and will be replaced by something more meaningful.
- North America
- Asia Pacific
- Europe
- South America
- Africa
- Australia
- Middle East
- Global

# PeeringDB: Network Types

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- Blank
- Not Disclosed
- NSP (Network Service Provider)
- Content
- Cable/DSL/ISP
- Enterprise
- Educational/Research
- Non-Profit
- Route Server

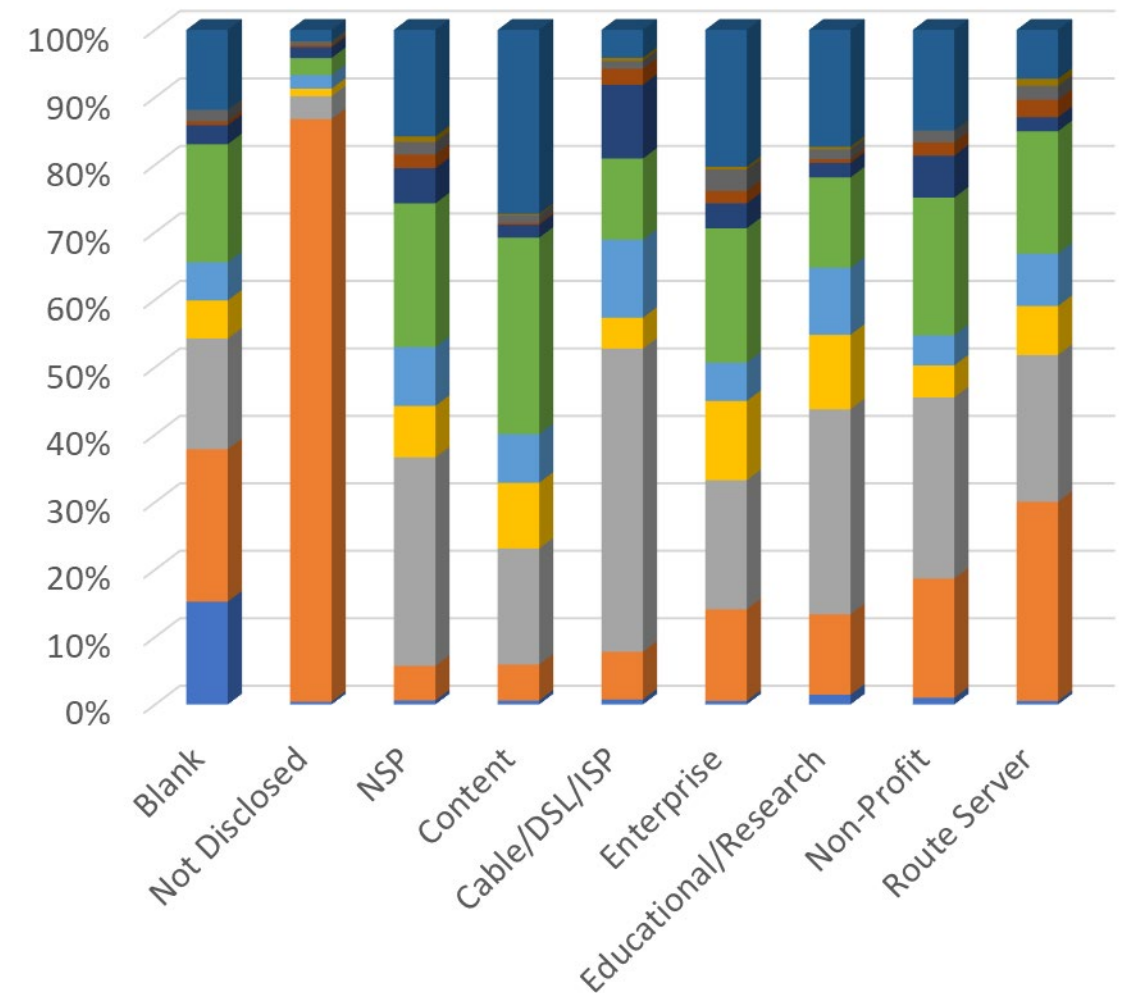
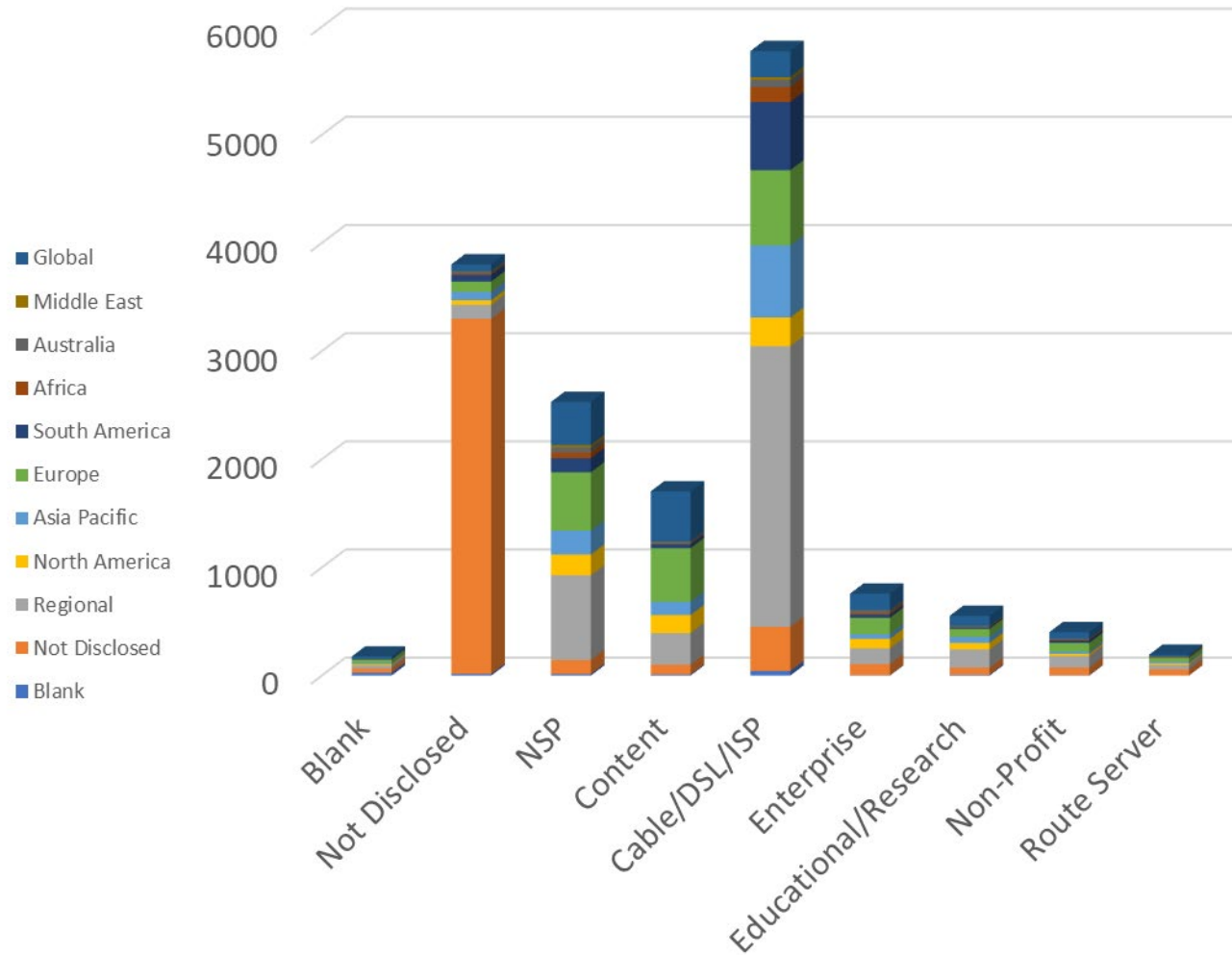
# PeeringDB: Traffic Levels

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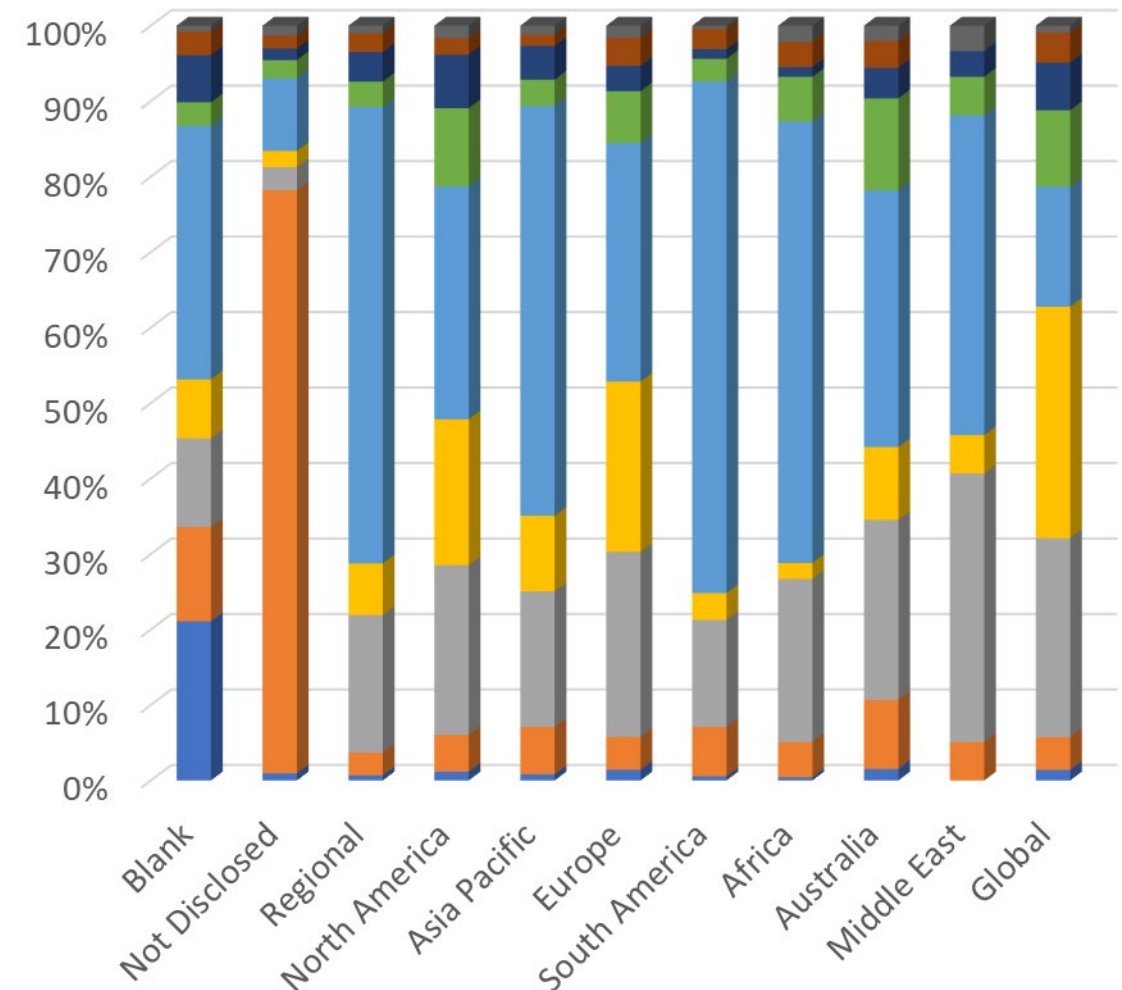
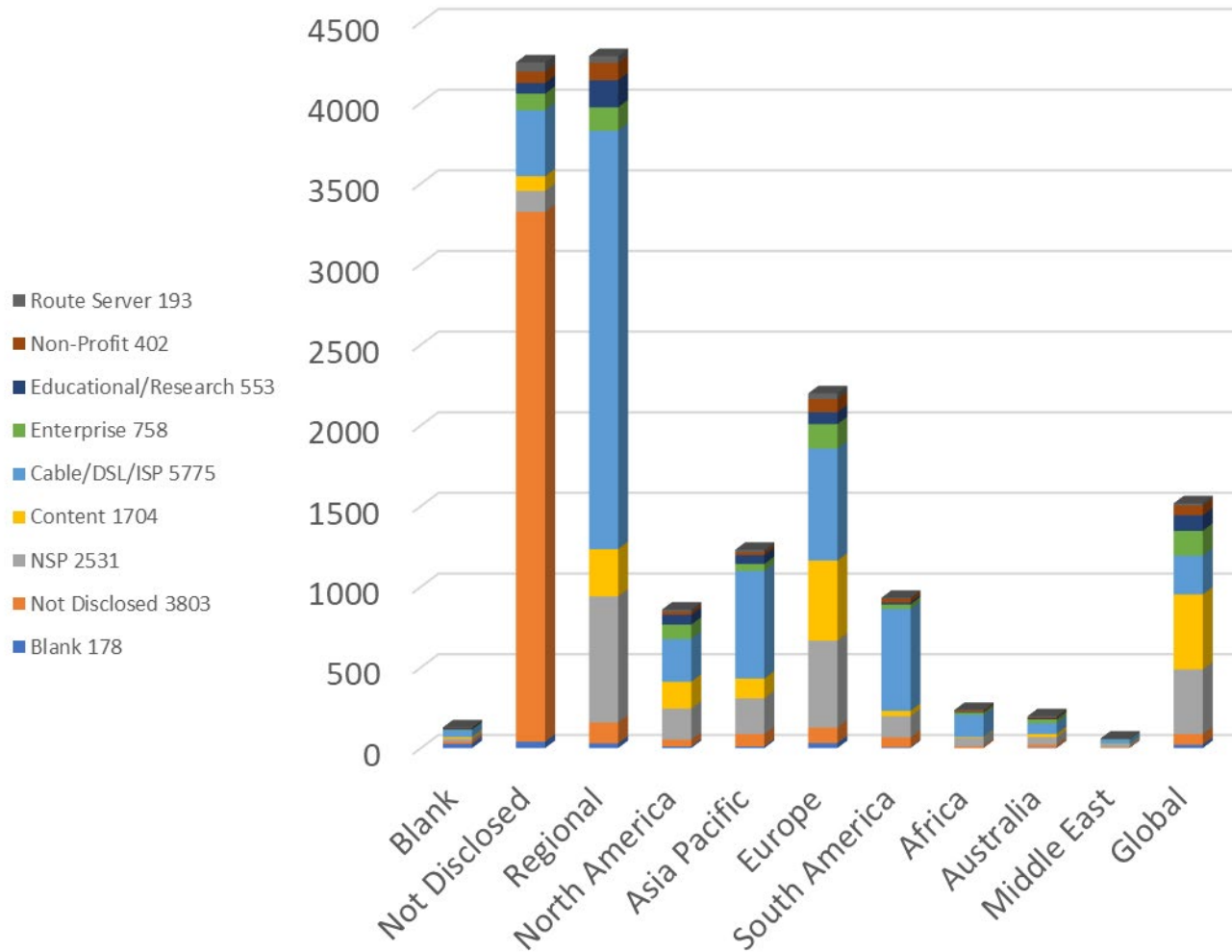
- Not Disclosed
- 0-20 Mbps
- 20-100 Mbps
- 100-1000Mbps
- 1-5Gbps
- 5-10Gbps
- 10-20Gbps
- 20-50 Gbps
- 50-100 Gbps
- 100-200 Gbps
- 200-300 Gbps
- 300-500 Gbps
- 500-1000 Gbps
- 1 Tbps+
- 10 Tbps+



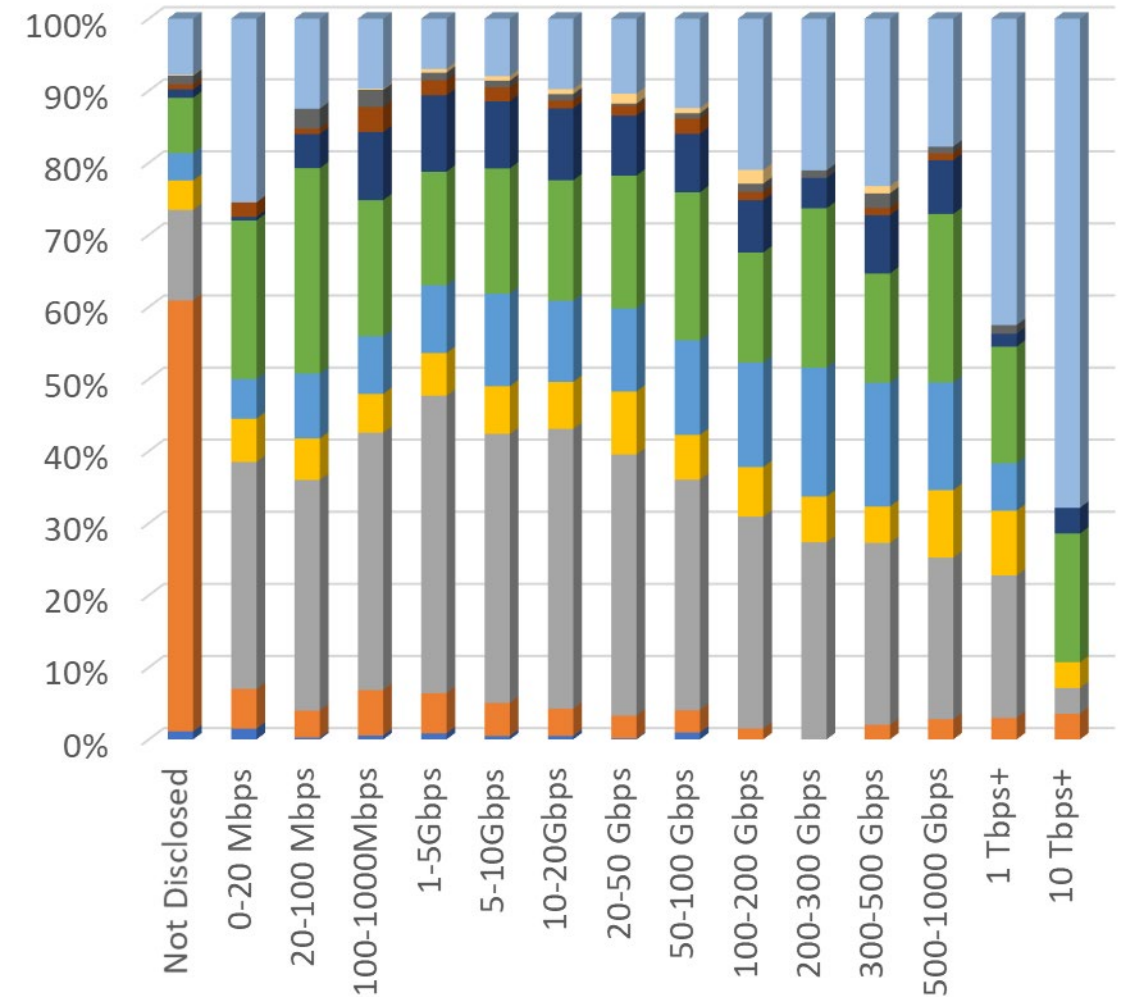
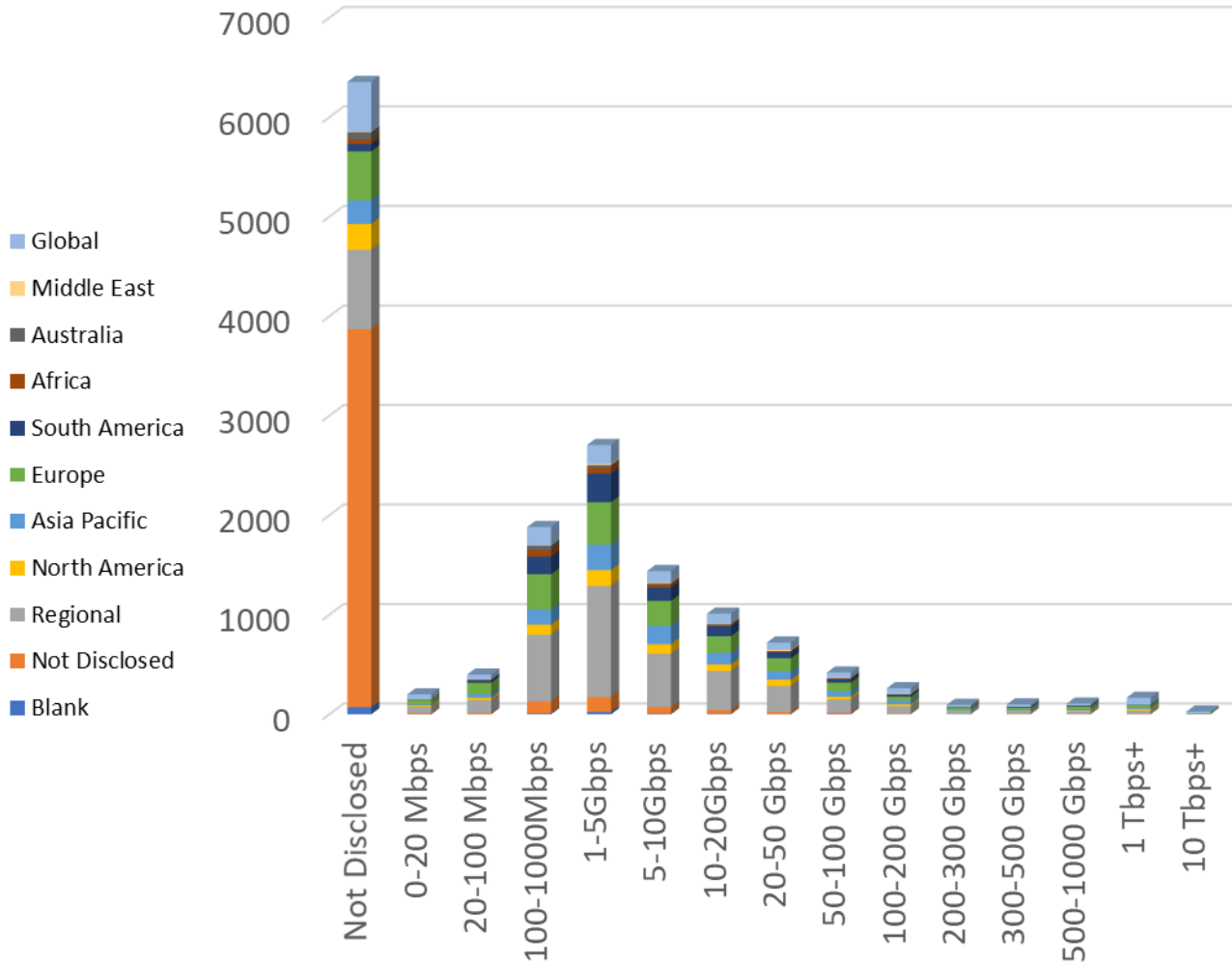
# Network Type Distribution



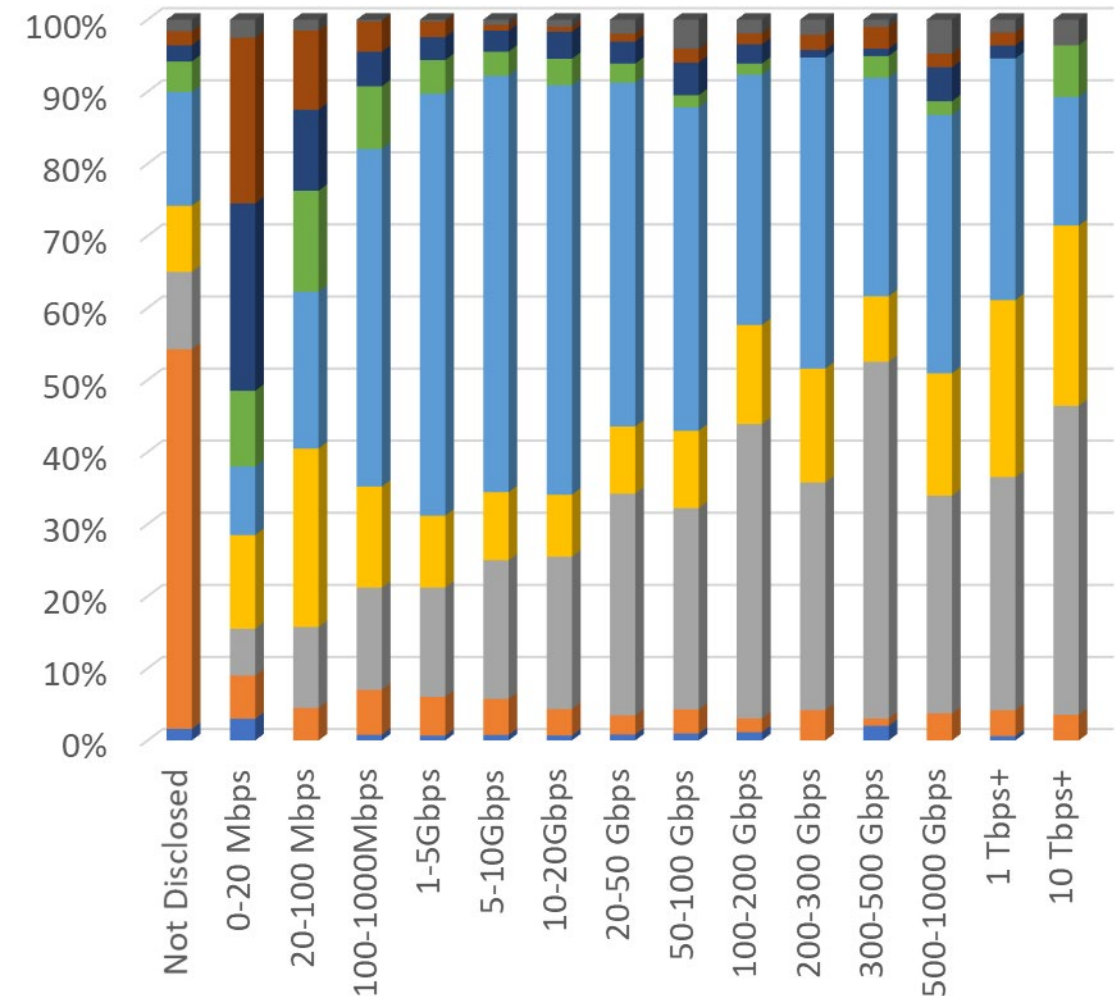
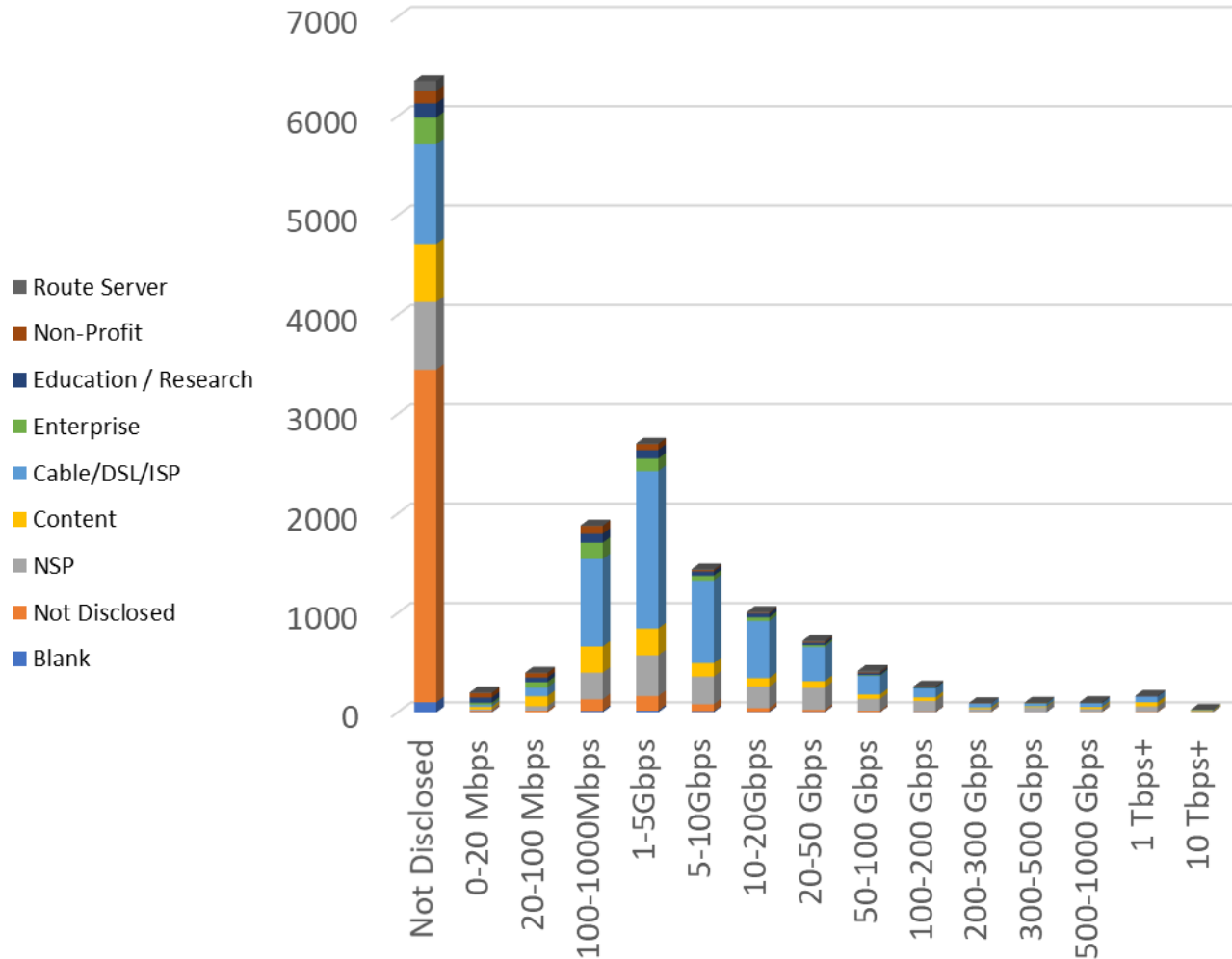
# Network Distribution Per Region



# Bandwidth Per Region



# Bandwidth Per Network Type



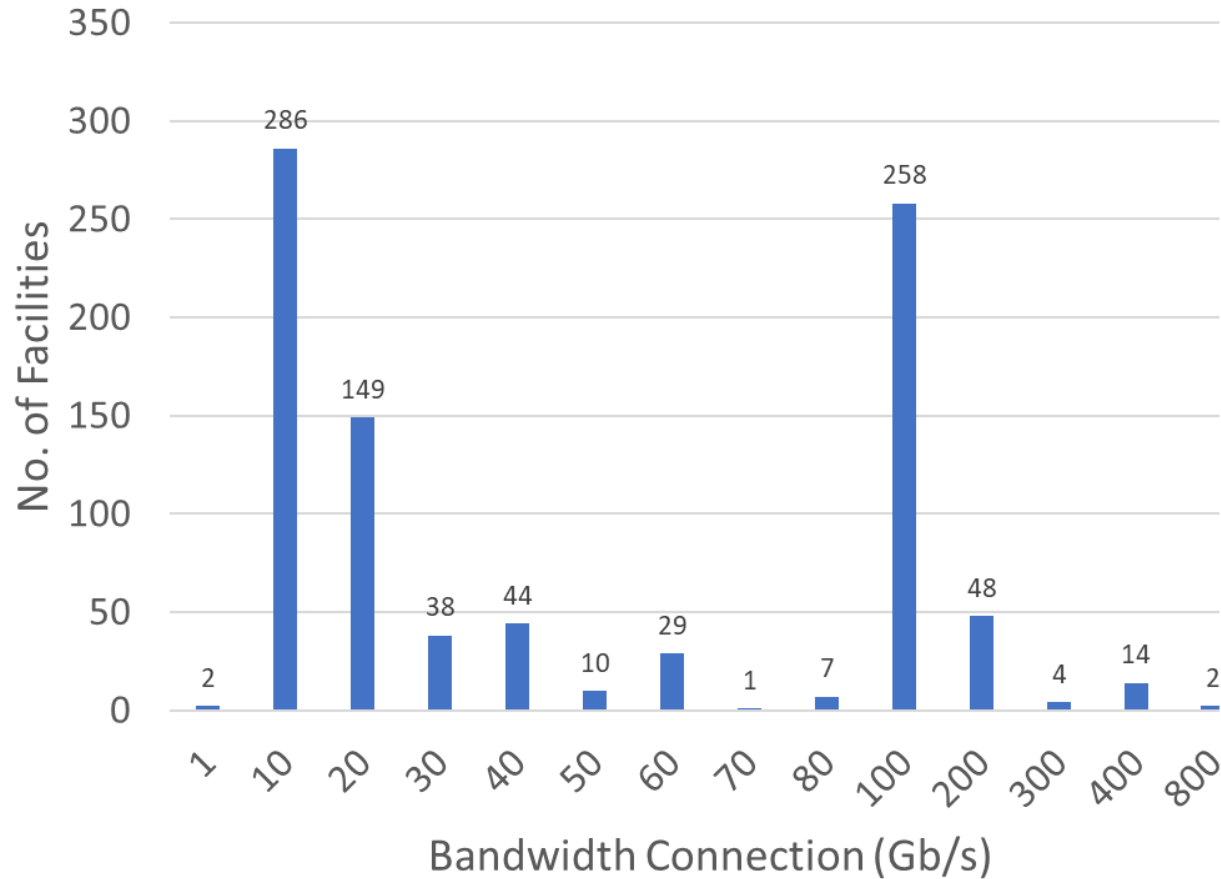
# Review of Hyperscalers in PeeringDB

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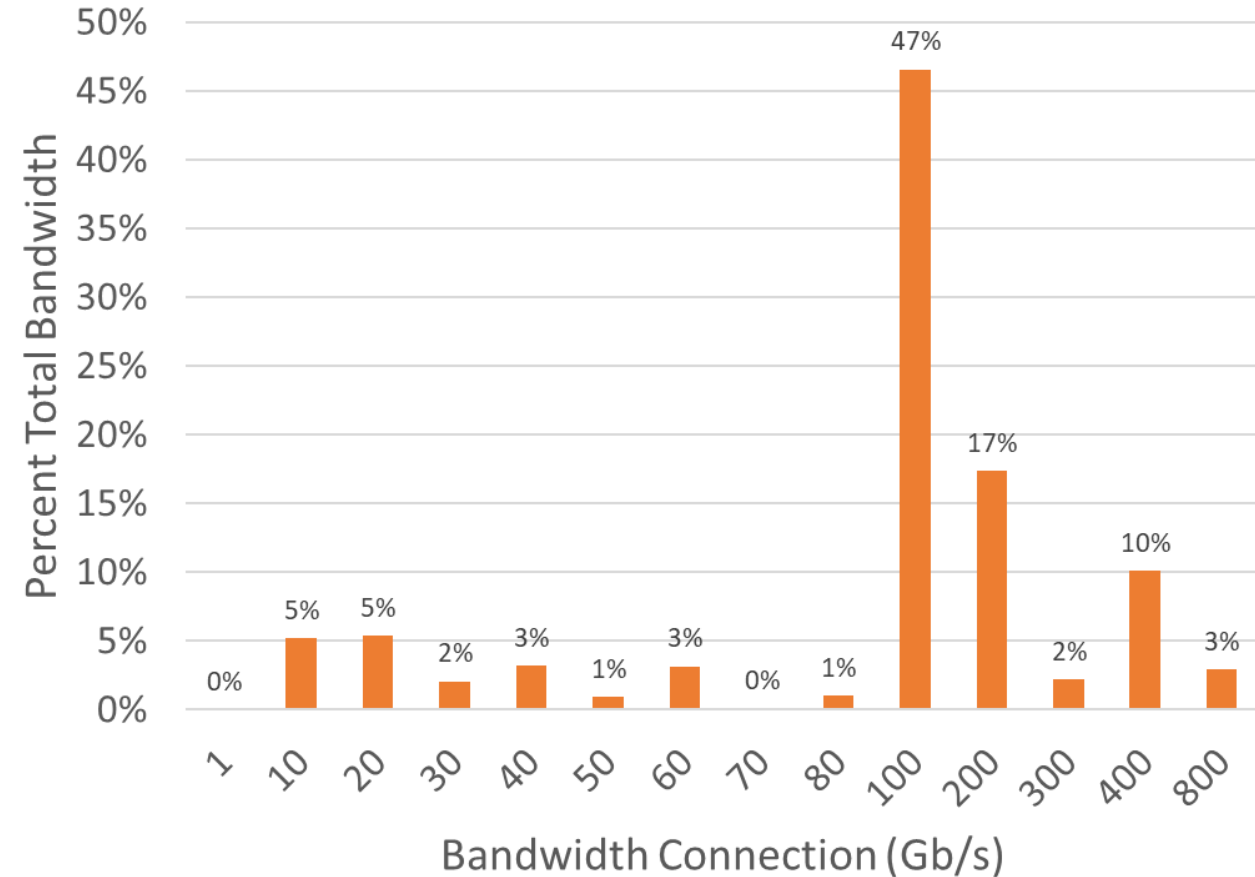
- Presence of Hyperscalers by (ASN) in PeeringDB reviewed (8/23/19)
  - Alibaba
  - Amazon
  - Baidu
  - Facebook
  - Google
  - Microsoft
  - Tencent
- Note - some hyperscalers had more than one associated ASN.
  - Data for all ASNs for a given hyperscaler were not accessible. All noted hyperscalers had data for at least one ASN accessible.
- Interesting Stats
  - 9 ASN's – 55.7 Tb/s Total Interconnection Bandwidth
    - Range - 1.1 Tb/s to 15.3 Tb/s
  - The maximum capacity had balanced traffic ratio, all others were mostly to heavy outbound

# Hyperscalers in PeeringDB

## # Network Connections



## Percent Total Bandwidth



# Summary

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- These numbers represent the peering space – it looks at the interconnection between networks.
- Total bandwidth not calculated, as 40% BW usage not disclosed.
- Diversity highlighted throughout ecosystem – bandwidth needs per region and application
- Small number of high bandwidth links can overwhelm the total capacity

# Appendix

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# Network Types by Region\*

	Blank	Not Disclosed	Regional	North America	Asia Pacific	Europe	South America	Africa	Australia	Middle East	Global	Total
Blank	27	40	29	10	10	31	5	1	3	0	21	177
Not Disclosed	16	3284	129	42	77	96	61	11	18	3	66	3803
NSP	15	130	782	193	221	539	132	51	47	21	400	2531
Content	10	91	293	166	123	496	33	5	19	3	465	1704
Cable/DSL/ISP	43	409	2594	265	667	695	631	138	67	25	241	5775
Enterprise	4	103	145	89	43	151	28	14	24	3	154	758
Educational/Research	8	66	168	61	55	74	12	3	8	2	96	553
Non-Profit	4	71	108	19	18	82	25	8	7	0	60	402
Route Server	1	57	42	14	15	35	4	5	4	2	14	193
											Total	15896
											Known	
											Total	11916

\* PeeringDB data queried 01 July 2019

# Bandwidth by Region \*

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	Blank	Not Disclosed	NSP	Content	Cable/DSL/ISP	Enterprise	Education / Research	Non-Profit	Route Server	Total
Not Disclosed	102	3347	682	584	1003	269	142	125	102	6254
0-20 Mbps	6	12	13	26	19	21	52	46	5	194
20-100 Mbps	0	18	45	99	87	56	45	44	6	400
100-1000Mbps	15	117	267	264	881	164	90	79	5	1867
1-5Gbps	18	146	410	270	1585	126	86	59	7	2689
5-10Gbps	11	72	277	136	832	48	42	12	10	1429
10-20Gbps	7	37	214	87	575	37	38	7	10	1005
20-50 Gbps	6	19	222	67	344	19	22	8	14	715
50-100 Gbps	4	14	117	45	188	7	19	8	17	415
100-200 Gbps	3	5	107	36	91	4	7	4	5	259
200-300 Gbps	0	4	30	15	41	0	1	2	2	95
300-500 Gbps	2	1	49	9	30	3	1	3	1	97
500-1000 Gbps	0	4	32	18	38	2	5	2	5	106
1 Tbps+	1	6	54	41	56	0	3	3	3	166
10 Tbps+	0	1	12	7	5	2	0	0	1	28
									Total	15719
									Known Total	9465