New era, New generations, How those news habits are impacting and changing our networks

Barcelona - NetBCN

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S. CAMELO

bouygues TELECOM

Summary

Introduction : About Bouygues Telecom

What is the internet consumption, nowadays ?

Historical topologies and their constraints to the todays internet consumption

One of the most popular architecture for the growth of the demand in bandwith

The right place for the services most valuable for our customers

Spin off of future architectures : how should we place collectors of telemetry data

About Bouygues Telecom

⟩ Service Provider delivering Mobile & Fixed Network

- ⟩ Mobile subscribers (end T3 2019) : 11,4 Millions
- ⟩ Fixed subscribers (end T3 2019) : 3,8 Millions
- ⟩ For the second year in a row, Bouygues Telecom was recognized by the French telecoms regulator as the leading mobile operator in rural areas in France and second on average nationwide
- ⟩ More thant 10 Million FTTH premises marketed in 2019
- ⟩ More than 21K mobile sites

Just as starter…

Credits **photo** : Scoop

Credits : Not found

What is the internet consumption, nowadays ?

- How did we arrive to this explosion of internet bandwith consumption ?
  - Enablers :
    - **Smartphones**
    - **LTE Networks**
    - **FTTx Solutions more developped**
  - Paradigm changed with Millenials (People born between 80's and mid 90's) and Z generation (born after 1995 to nowadays)
    - **Addicted to Internet Content**
    - **Less oriented to IPTV Services**
    - **Binge streaming content**
    - **Social Networks**
    - **Online Gaming (e.g : Fortnite)**
    - **Less VoIP and SMS consumption (Z generation send maybe less than 20 SMS / per month)**

What is the internet consumption, nowadays ?

GLOBAL APPLICATION CATEGORY TRAFFIC SHARE

1	VIDEO STREAMING	57.69% ↓	22.43% ↑
2	WEB	17.01% ↓	20.98% ↑
3	GAMING	7.78% ↓	2.68% ↑
4	SOCIAL	5.10% ↓	3.73% ↑
5	MARKETPLACE	4.61% ↓	1.90% ↑
6	FILE SHARING	2.84% ↓	22.05% ↑
7	MESSAGING	1.72% ↓	8.12% ↑
8	SECURITY	1.41% ↓	7.48% ↑
9	STORAGE	1.41% ↓	9.37% ↑
10	AUDIO STREAMING	1.05% ↓	0.46% ↑

EMEA ↓ APPLICATION TRAFFIC SHARE **TOP 10**

1	YOUTUBE	16.10% ↓
2	NETFLIX	12.99% ↓
3	HTTP MEDIA STREAM	10.30% ↓
4	AMAZON PRIME	6.06% ↓
5	QUIC	5.41% ↓
6	PLAYSTATION DOWNLOAD	3.75% ↓
7	TWITCH	3.11% ↓
8	HTTP (TLS)	2.93% ↓
9	STEAM DOWNLOAD	2.84% ↓
10	HTTP DOWNLOAD	2.44% ↓

Video is almost **58%** of the total downstream volume of traffic on the internet

NETFLIX is **15%** of the total downstream volume of traffic across the entire internet

BITTORRENT is almost **22%** of total upstream volume of traffic, and over **31%** in EMEA alone

More than **50%** of internet traffic is encrypted, and TLS 1.3 adoption is growing

GAMING is becoming a significant force in traffic volume as gaming downloads, Twitch streaming, and professional gaming go mainstream

Alphabet / Google applications make up over **40%** of the total internet connections in APAC

Plus spotlights on:

Traffic share leaders for video, social networking, messaging, audio streaming, and gaming

Sources : Sandvine study(12/2018)

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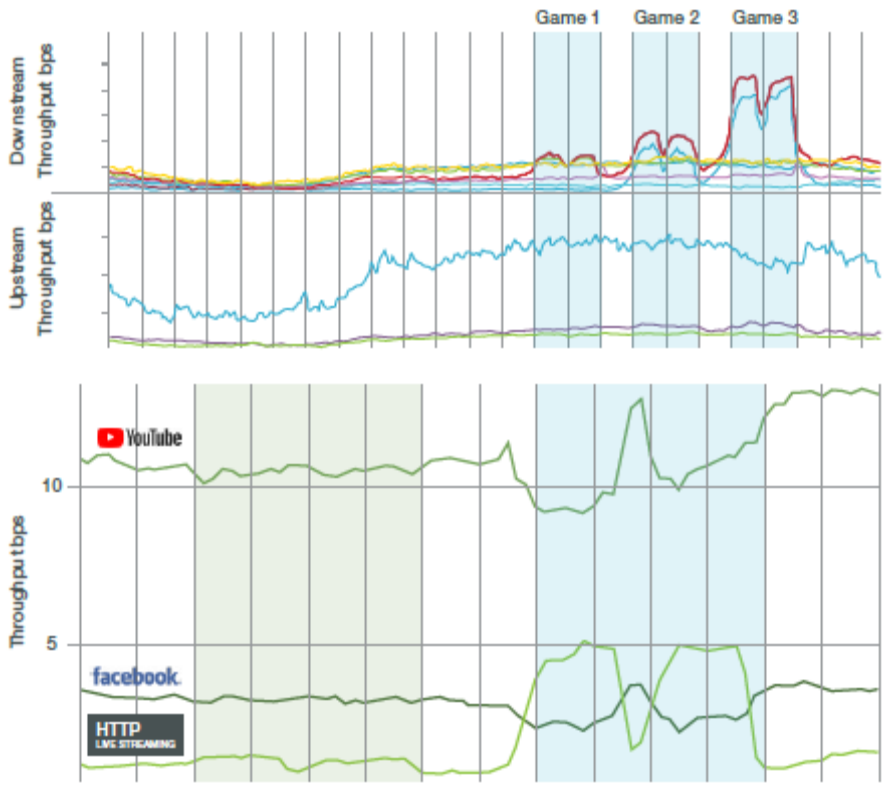
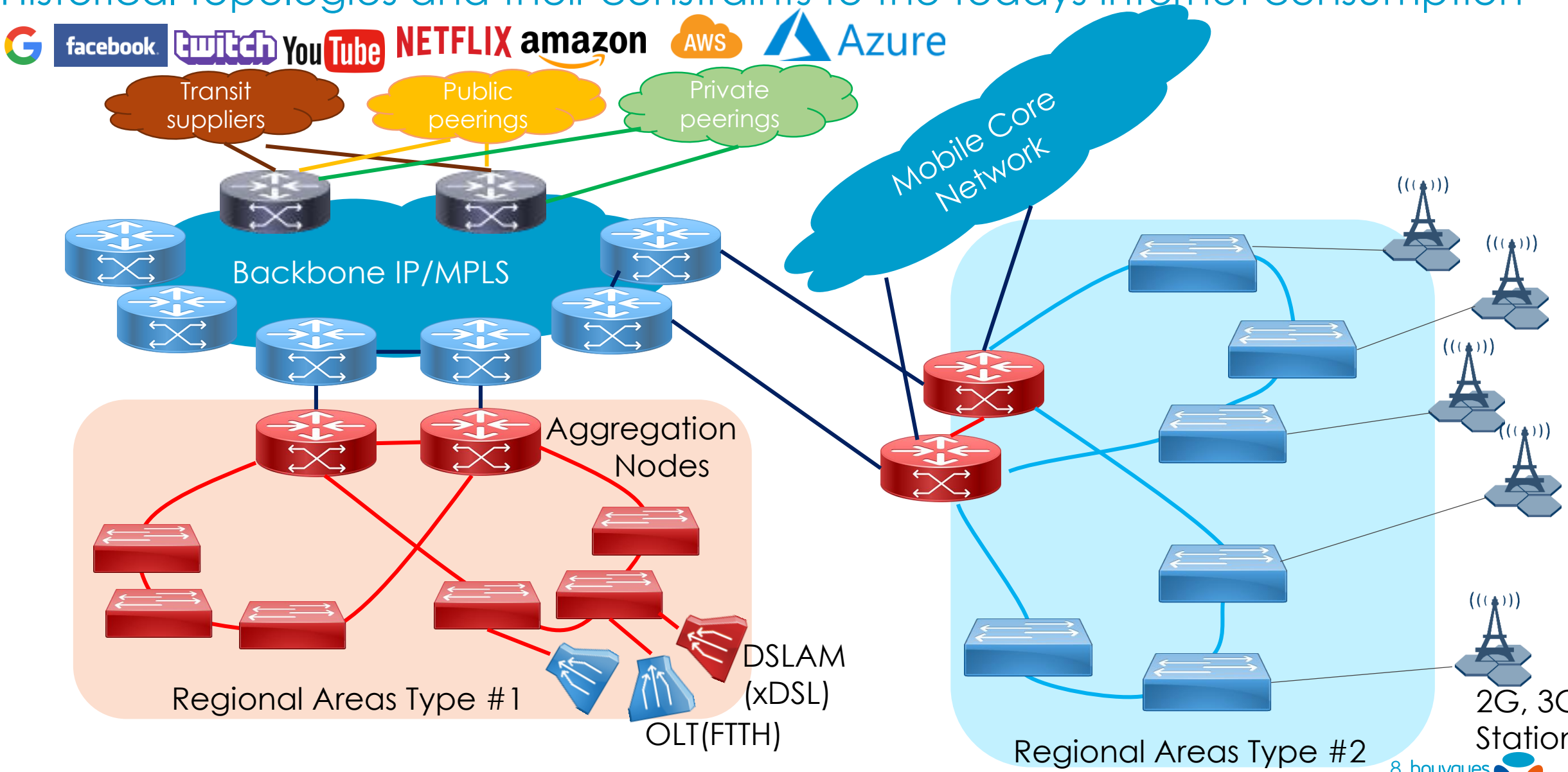


Sources : Sandvine study(12/2018)

Historical topologies and their constraints to the todays internet consumption



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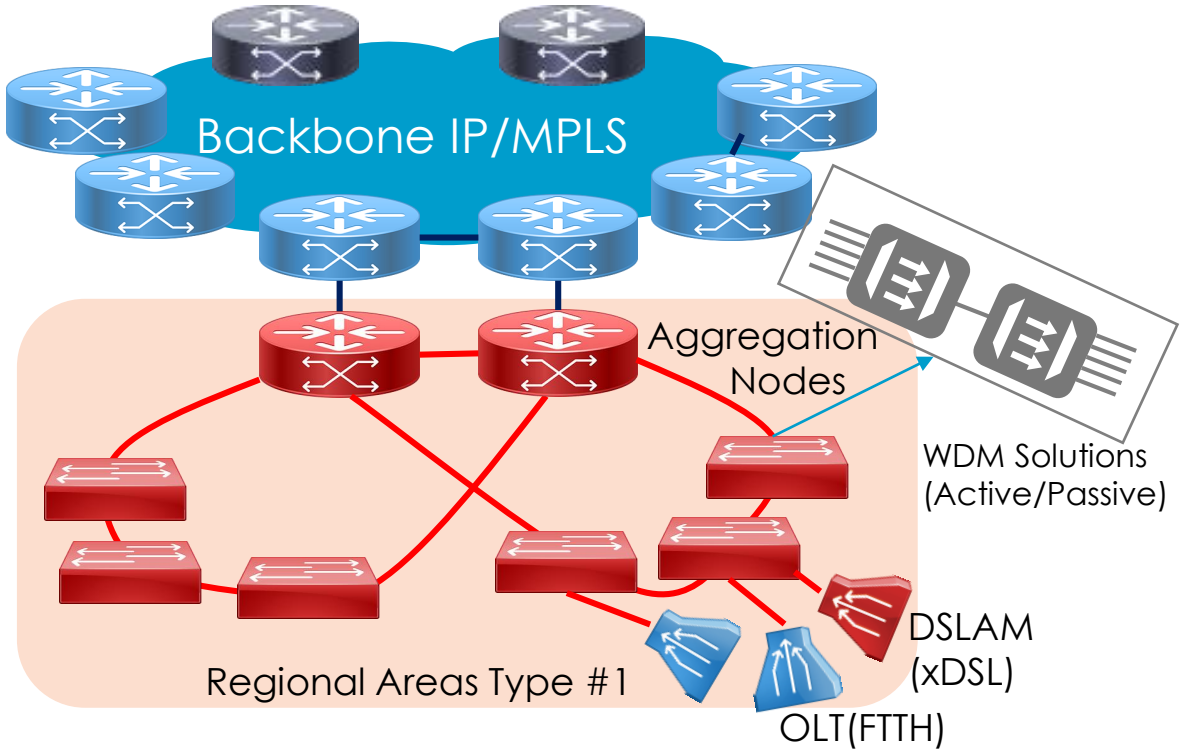


Pros :

→ No changes of topologies

→ Architecture herited from L2 solutions

→ Pay as you grow solutions without any changes in the topologies

Cons:

→Expensive solution (upgrades to plan on each links (in the Metro area)

→ Physical limits achieved quickly for simple routers deployed in Cos

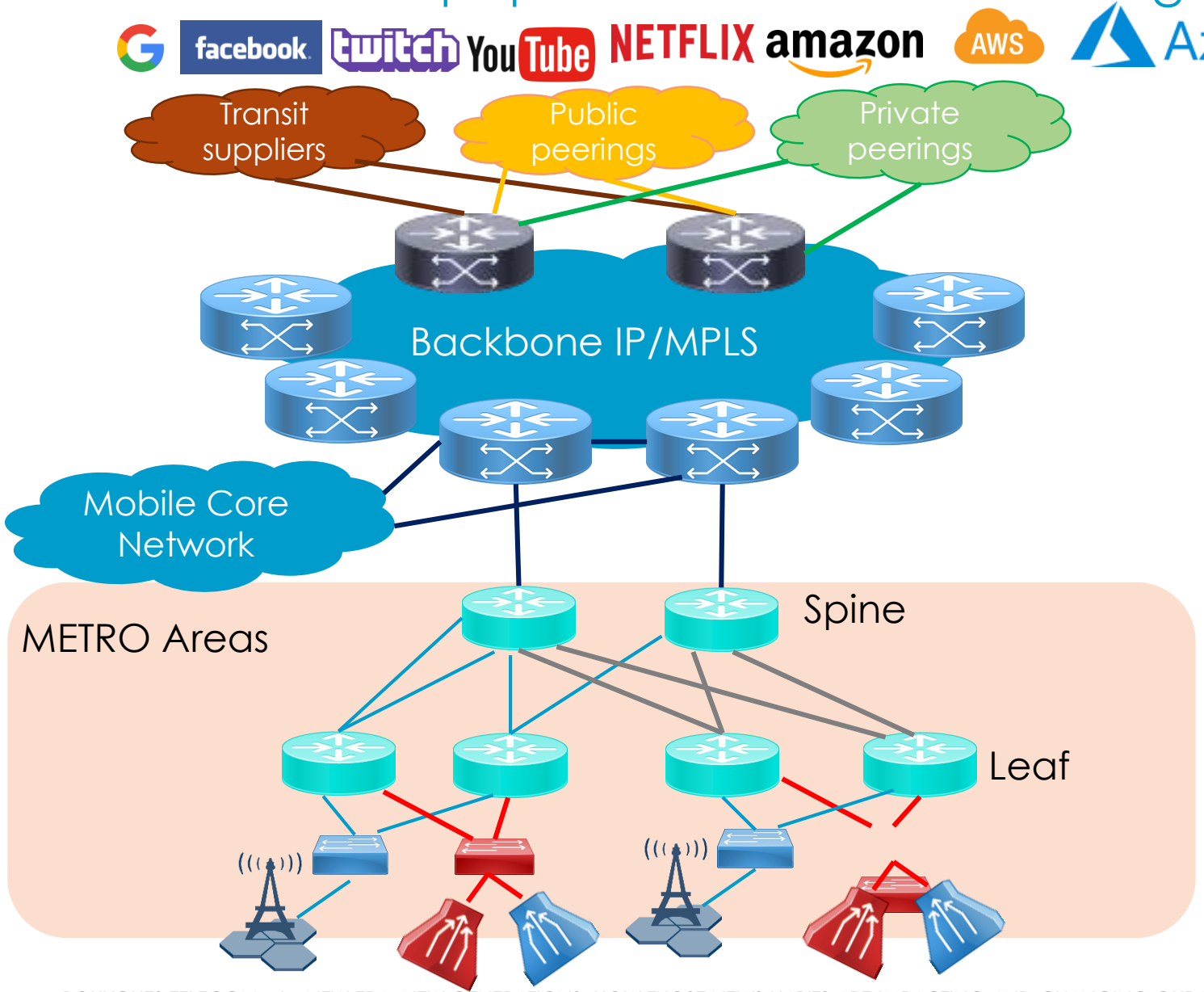
→ Evolution of architectures limited

→ N/A applicable for the new requirements (e.g : 5G, contents got instantly)

→ Scaling UP/Down more and more expansive

→ Heteregeneous architectures that become complicated to maintain

One of the most popular architecture for the growth of the demand in bandwith



Pros :

→Expansion horizontally gives more flexibility & agility

→Leaf deployed nearer to the client

→ Homogeneous Architectures

→ Easier to support

→ More visibility

→ Long term architecture for the next network evolutions

Cons:

→ Big investments

→ Long time needed for the deployment of all the capillarity

The right place for the services most valuable for our customers

→Facts :

- More services coming from the big Actors consumed by the customers
- Impact on the bandwith consumption of the Service Providers Networks

→Divide and rule :

- Deliver a better user experience for our customers
  - Cache services at the nearest place of the customers
  - Put our valuable services in the same place
  - Reduce the latency to access the services
- Reduce the bandwith consumption in the entire network

● Major places for private/public peerings with the main Internet Actors (e.g : Google,Amazon, Microsoft, etc.)

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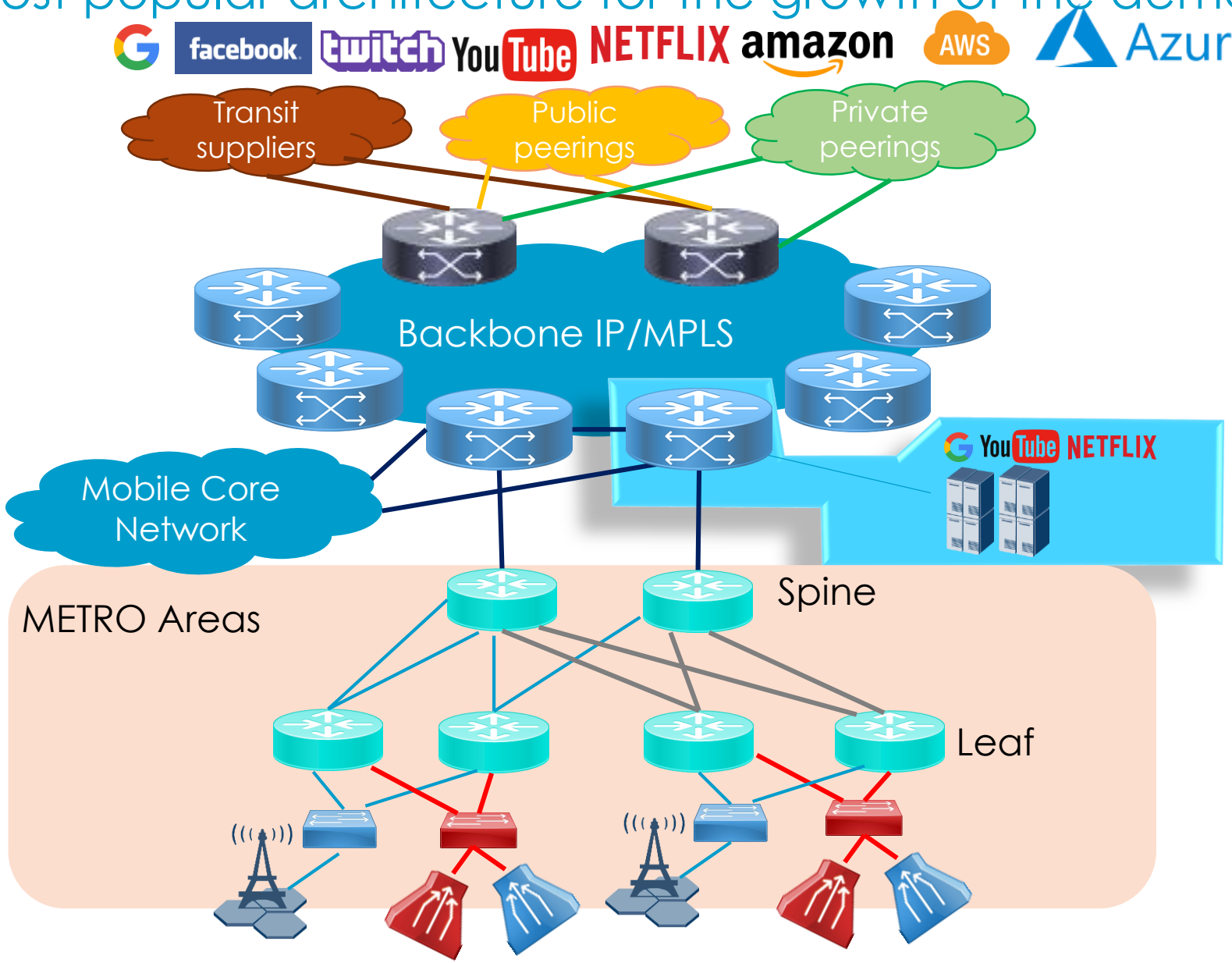


Spin off of future architectures : how should we place collectors of telemetry data

Telemetry : the Nirvana of the network engineers

- Gives you better visibility
- Self described with the good keys
- At the end : easier to implement when it will be completely experienced by the IT/network engineers
- A real + at the end for SDN & close loop automation
- God the model driven is just so cool ☺

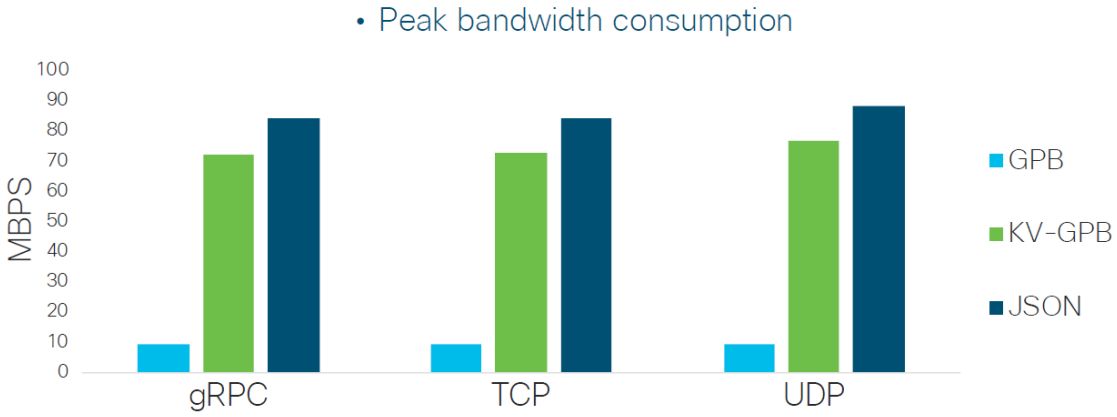
Oh yeah but…

- The gNMI is a good way for the standardization but will it be folllowed by acts by the industry ?
- Standardized way for the communication and the compression of the data still in progress (even internally to the vendors)
- Not all the equipments are fully implemented for telemetry
- How deal with the different equipment versions / vendors data ?
- Bandwith consumption can be so huge depending on the interval & what you're collecting

Spin off of future architectures : how should we place collectors of telemetry data

How deal with that ?

- Work by microservices :
  - Per couple : Vendor/type of equipment/version
  - Standardized collectors
  - Standardized data exposed to third parties
- Know what you want collect :
  - Collect efficiently your indicators to use efficiently:
    - Storage
    - Bandwith in the network
    - Ressources to retrieve the data
- Work in distributed mode for the collect of the data



Source : Cisco

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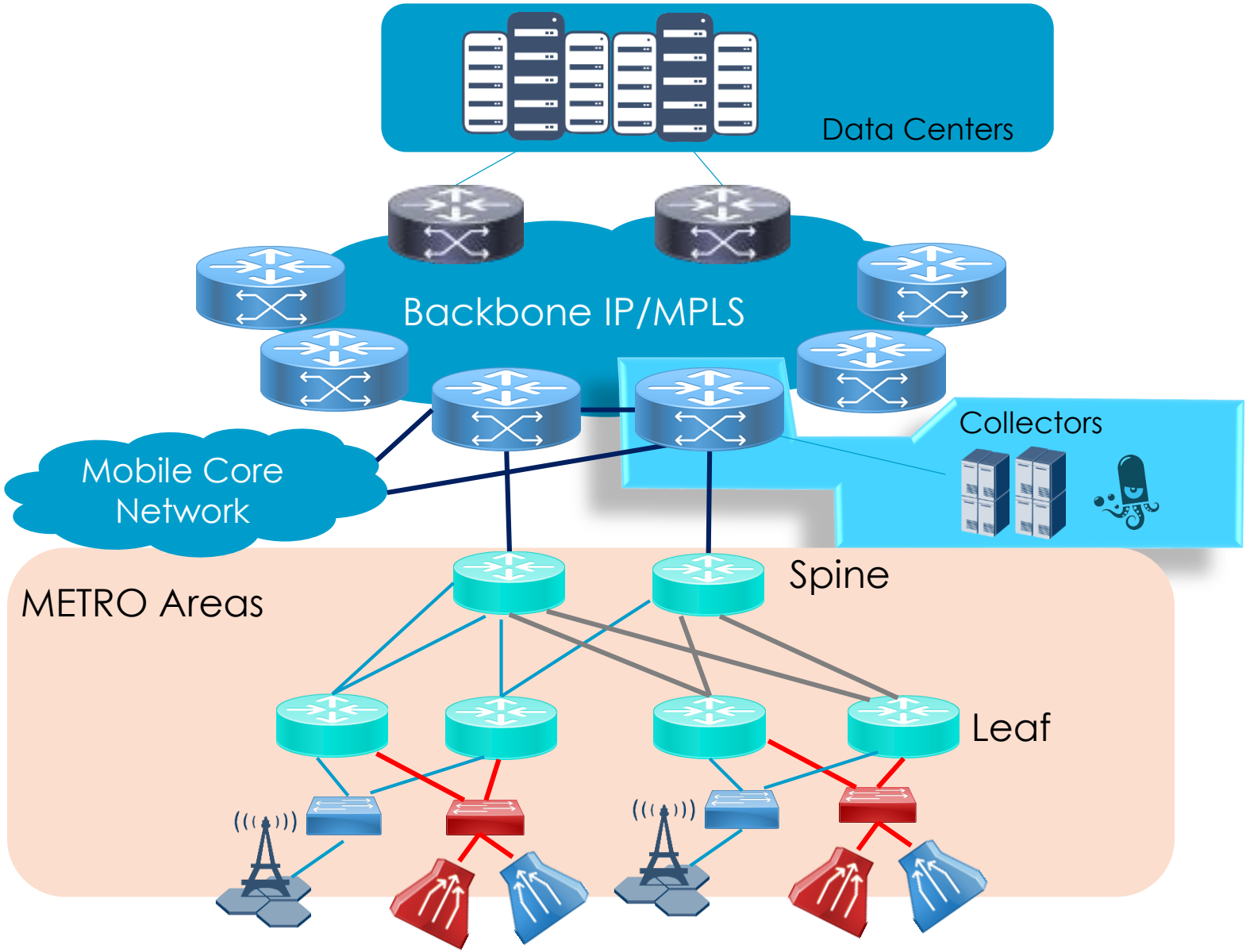

Conclusion

- There's no perfect architecture :
  - All depends of the traffic consumption profile in your network
  - More you optimize application consumming more you save money

- Legacy data collection is not dead yet
  - All the equipments are not « telemetry ready »
  - There's no generic way to collect data per vendor (e.g : GPB vs GBP-Kv)
  - That's not because you will have all the data in the plate that you will need it (The « All you can eat » is not the good way of thinking ☺)
  - Monitoring and collecting the data of your network : YES !
  - Congest a network for that : NO !