Mobile Video in the Encrypted Era

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CANTO 2015

Mobile operators are in the business of selling buckets of bytes

Voice and text are commodity add-ons to data packages in many markets

U.S. Cellular

300MB	1GB	...	40GB	50GB
$5.00/mo. + Device Connection Charge	$10.00/mo. + Device Connection Charge		$260.00/mo. + Device Connection Charge	$335.00/mo. + Device Connection Charge
Earn 50 reward points /mo.	Earn 75 reward points /mo.		Earn 1050 reward points /mo.	Earn 1300 reward points /mo.
ADD TO CART	ADD TO CART		ADD TO CART	ADD TO CART

VIVA

4G LTE Plan

Monthly Rental	Daily Capacity	Monthly Capacity
KD 9	3.5 GB	105 GB
KD 11	3.5 GB	105 GB
KD 13	5 GB	150 GB
KD 18	Unlimited*	Unlimited*

Fair Usage Policy applies.
Get a free 4G LTE router with a 12 month commitment.

Claro

Plan	Capacidad Incluida	CFM sin IVA	CFM con IVA del 16%	Solución Gratuita a la que puede acceder una vez consumida la capacidad del plan
Plan Sin Limite 1GB	1GB	$ 25.776	$ 29.900	Whatsapp
Plan Navegación 2GB	2GB	$ 35.427	$ 41.095	Chat (Joyn, Whatsapp, Yahoo Messenger, Gtalk),Mail yRedes Sociales (Facebook, Twitter y MySpace).
Plan Navegación 3GB	3GB	$ 44.307	$ 51.396	
Plan Navegación 5GB	5GB	$ 53.187	$ 61.697	
Plan Navegación 10GB	10GB	$ 88.704	$ 102.897	

TURKCELL

PAKET	3G İNTERNET	EK AVANTAJ	
Deneme Paketi	1 GB	–	3 TL / AY
250 MB Tanışma Paketi	250 MB	–	7 TL / AY
500 MB Tanışma Paketi	500 MB	–	9 TL / AY
1 GB Tanışma Paketi	1 GB	–	12 TL / AY

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Video is guaranteed to consume lots of bytes

So the mobile network *should be* a mobile **video** network

Video stalling is the dropped call of mobile broadband

If video drives usage and usage drives revenue, then stalling is a revenue killer!
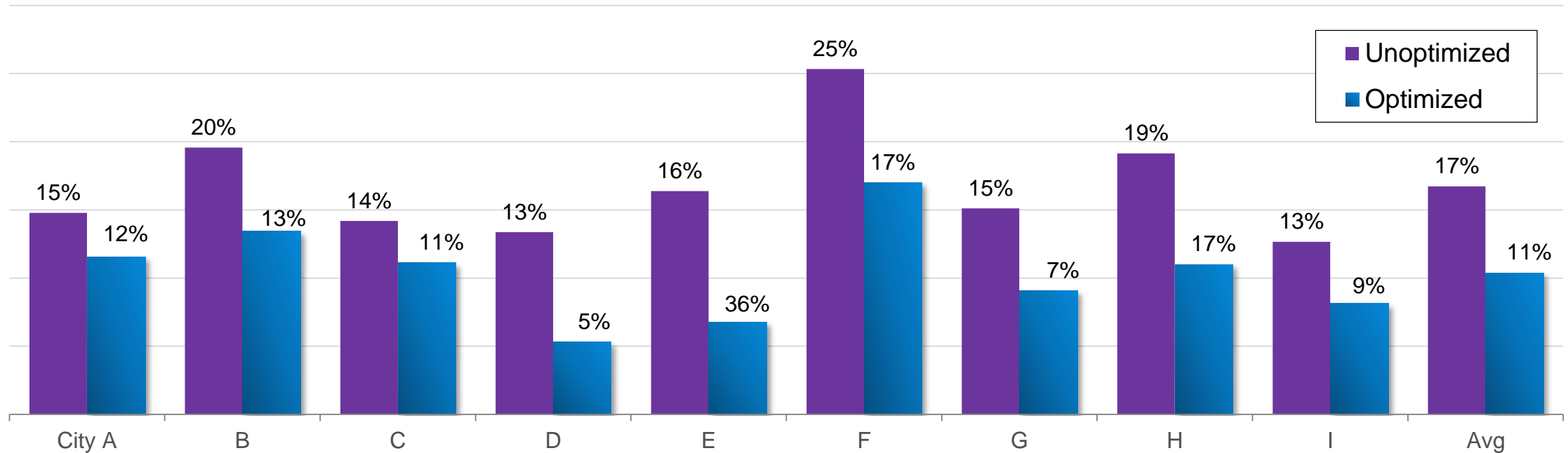
Key KPIs: **Then…**   **…and now**

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A video dashboard tells you how big the stalling problem is…

Percent of Videos That Stalled w/ and w/out Optimization

Legend:
- Unoptimized
- Optimized

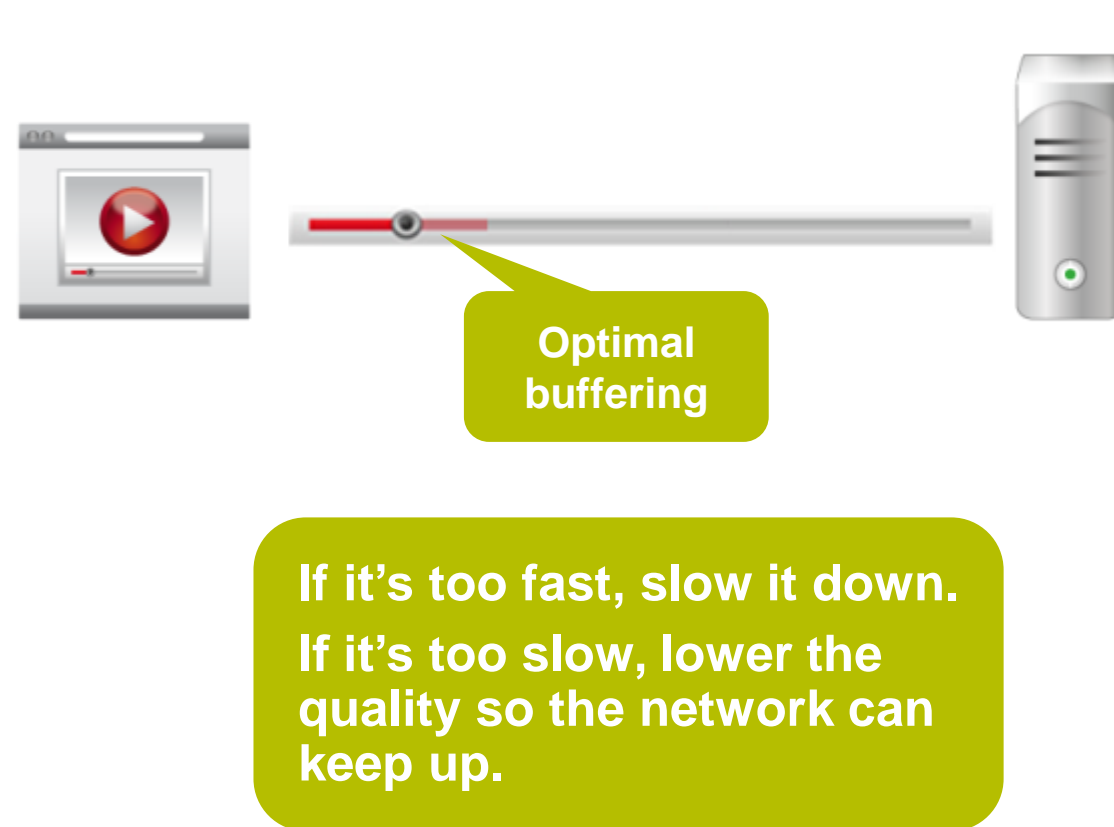|	City A	B	C	D	E	F	G	H	I	Avg
Unoptimized	15%	20%	14%	13%	16%	25%	15%	19%	13%	17%
Optimized	12%	13%	11%	5%	36%	17%	7%	17%	9%	11%

…and how well your optimization techniques are addressing it

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Optimization provides balance between experience and efficiency
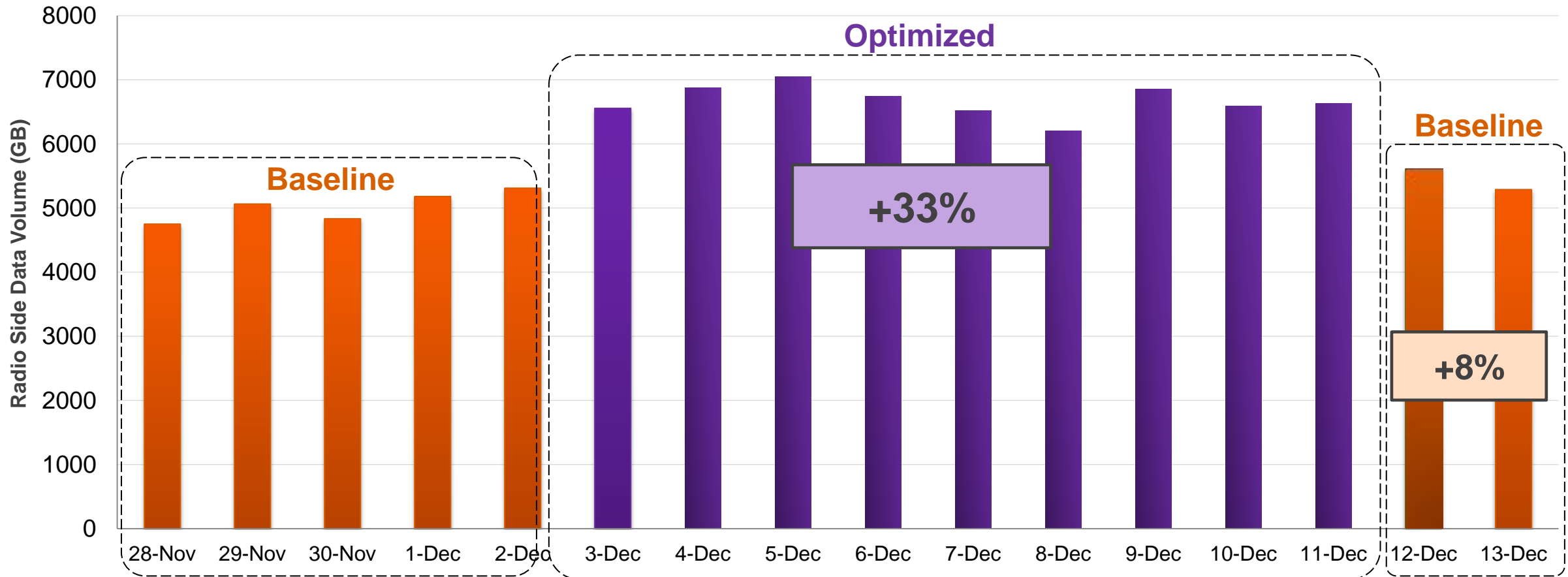
Without Optimization

With Optimization

Excessive buffering = waste

Optimal buffering

Stalling = poor experience

If it's too fast, slow it down.

If it's too slow, lower the quality so the network can keep up.

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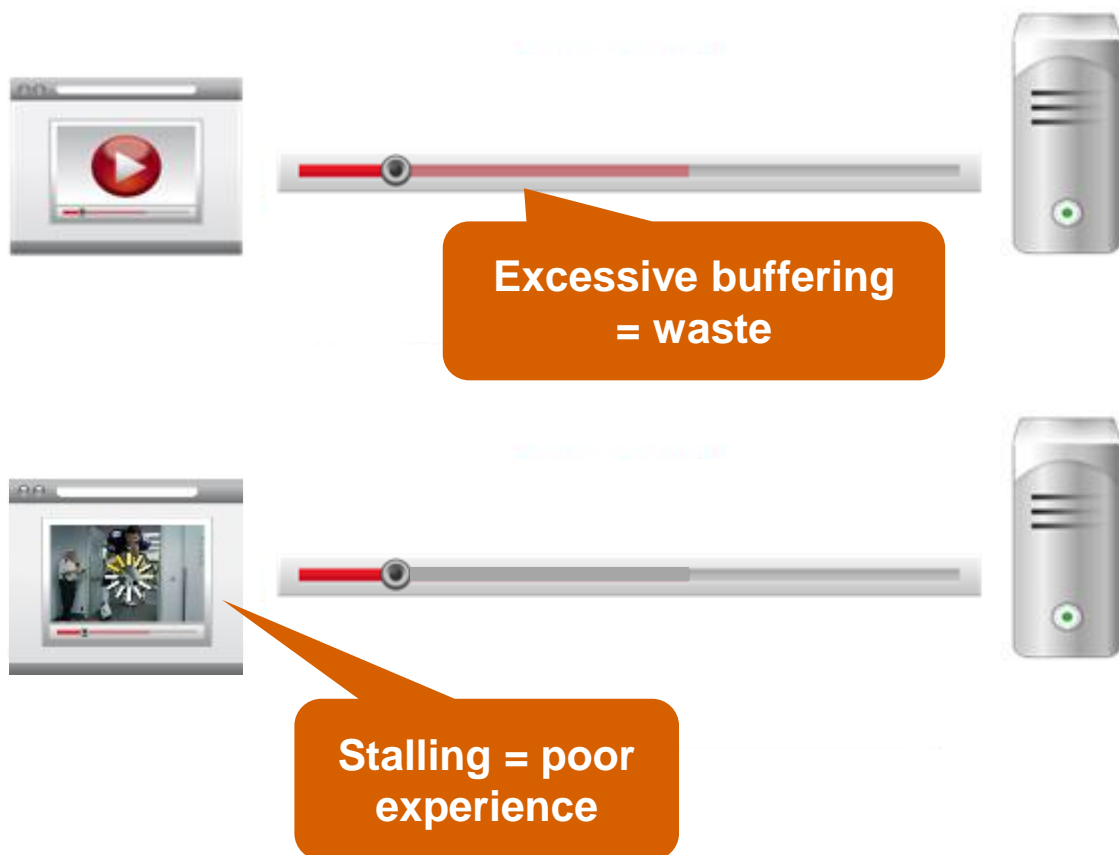
An optimized video experience leads to more data consumption

Aggregate 24-hr data consumption by optimization level applied

… more data consumption yields higher data revenue

Once video is optimized, it becomes a differentiator

Vodafone Turkey advertisement: "Best network for video"

https://www.youtube.com/watch?v=ZtUn48_-X-w

A better video experience attracts new subscribers
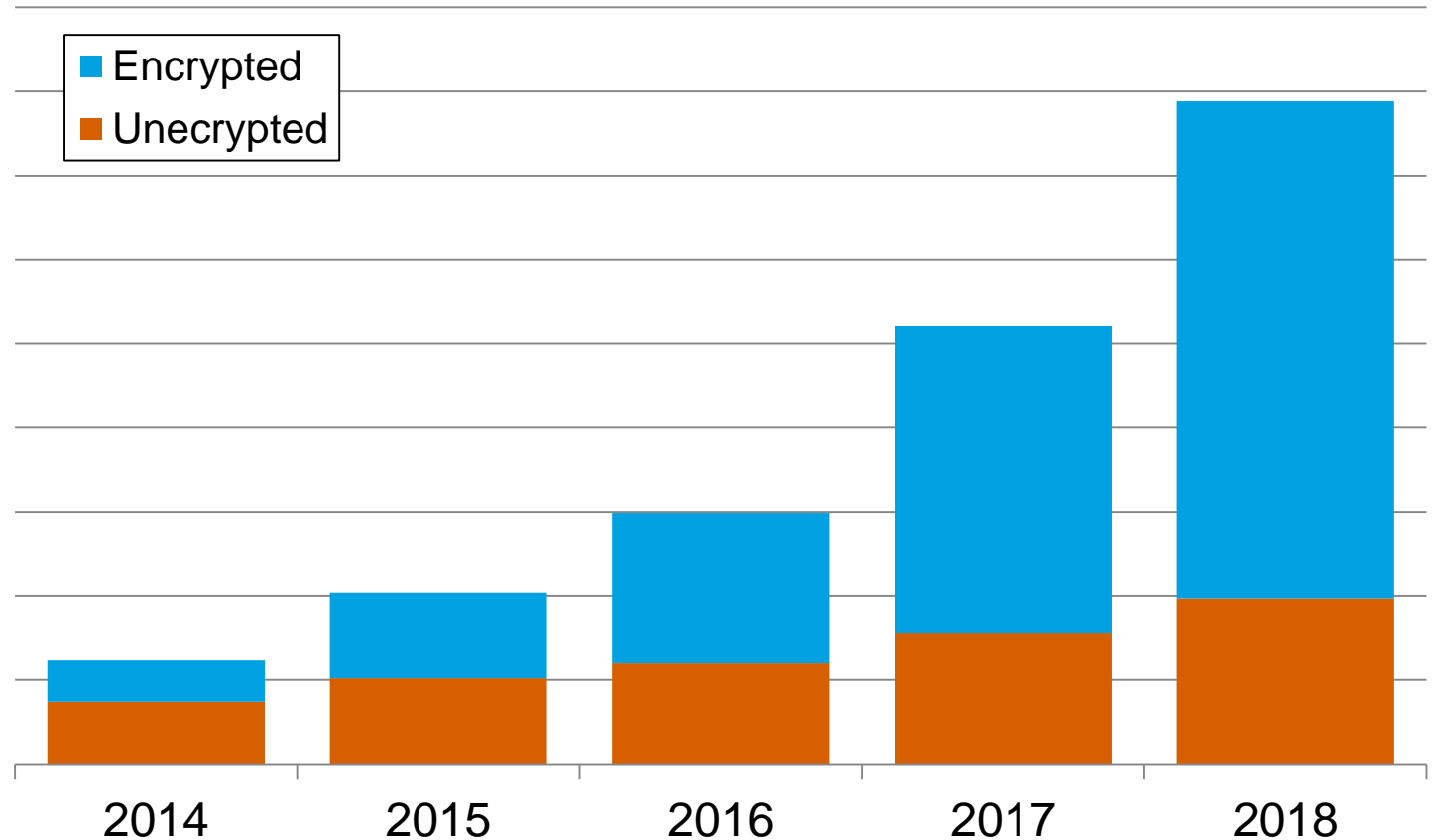
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The impact of encryption:

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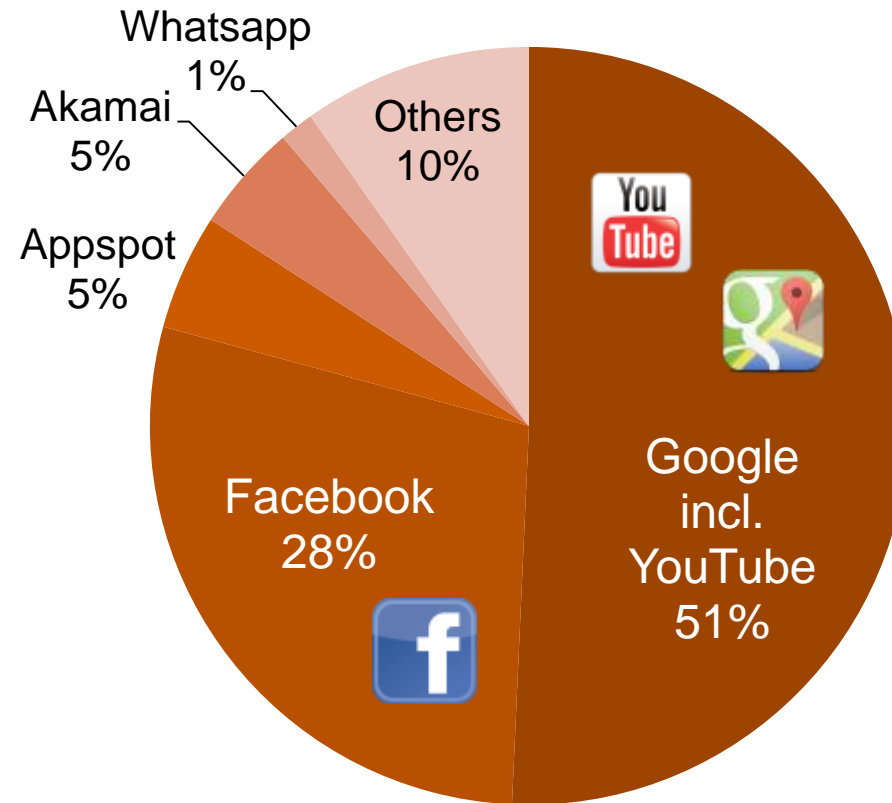# More than 50% of mobile data is encrypted today, and rising fast

Citrix Mobile Data Forecast: 2014 - 2018

Citrix forecasts that 75% of mobile data traffic will be encrypted by 2018.

Legend: Encrypted, Unecrypted

2014 2015 2016 2017 2018

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But the sources of encrypted traffic are few

Total Encrypted Traffic

Whatsapp 1%

Akamai 5%

Appspot 5%

Others 10%
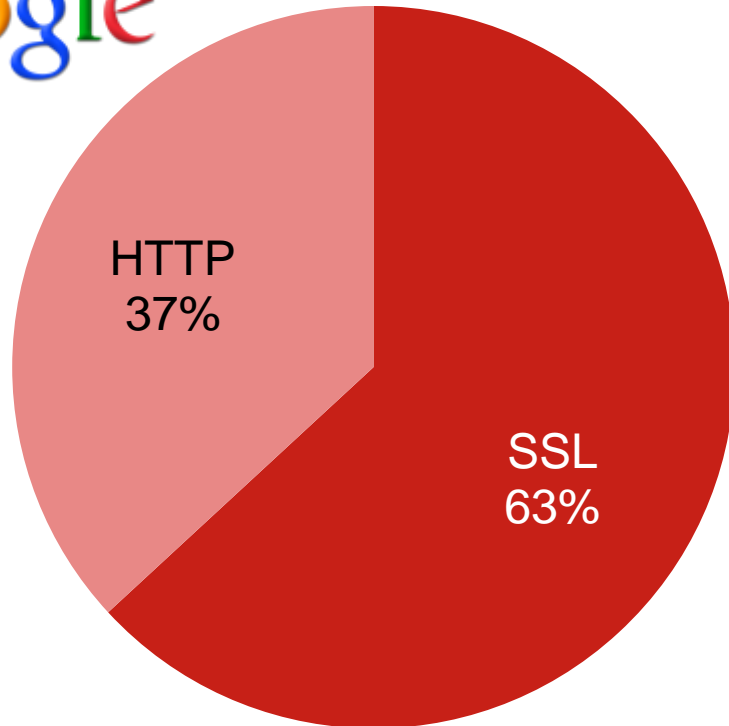
Facebook 28%

Google incl. YouTube 51%

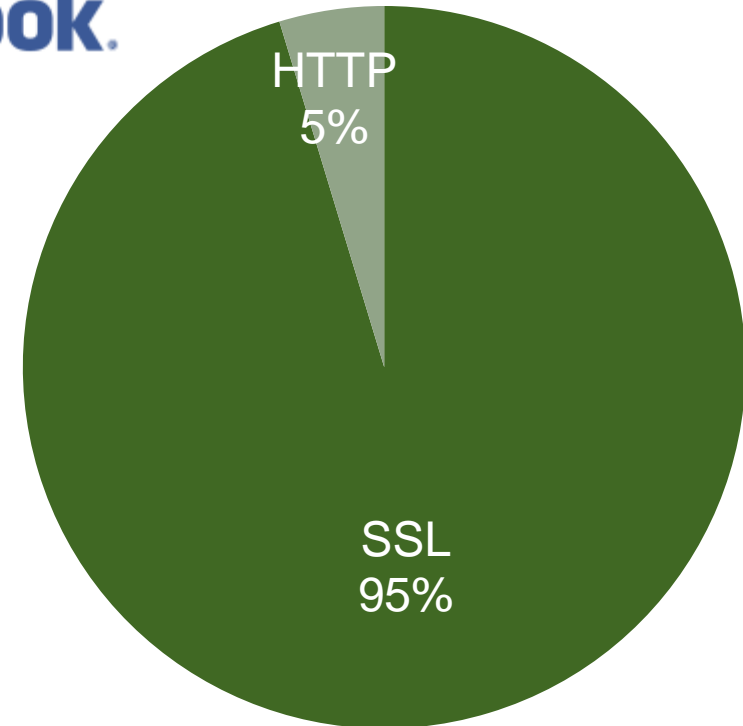**Three sites account for the majority of encrypted traffic**

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Only 2/3 of Google traffic is encrypted at the moment

Vast majority of Facebook content is encrypted

Google
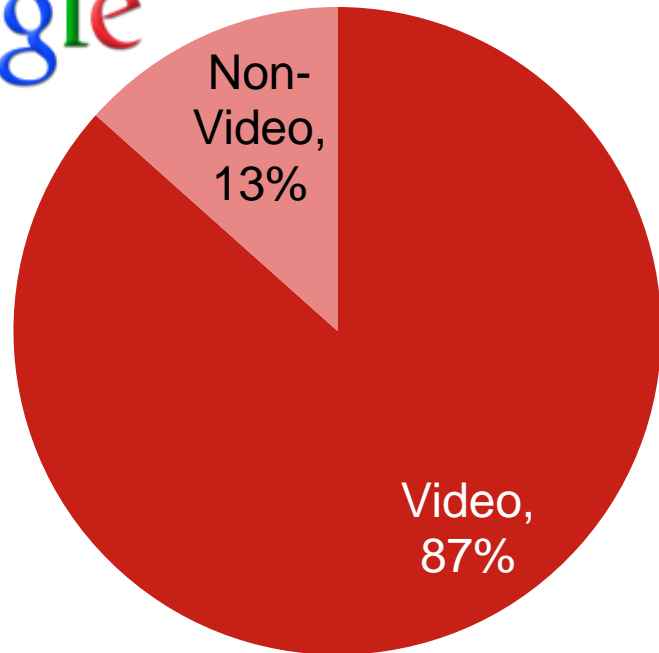
HTTP
37%

SSL
63%

facebook.

HTTP
5%

SSL
95%

If Google and Facebook encrypt 100%, total encryption will rise another ~15%

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Vast majority of encrypted Google traffic is video
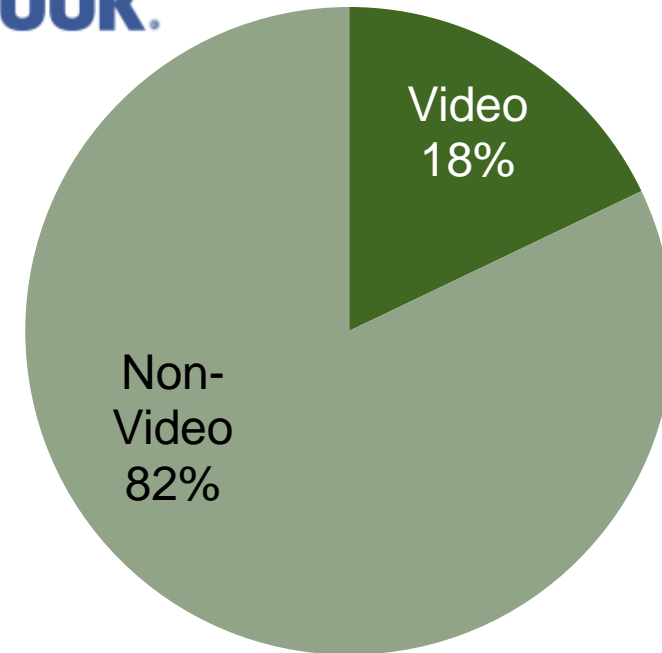
Only a small amount of encrypted Facebook traffic is video

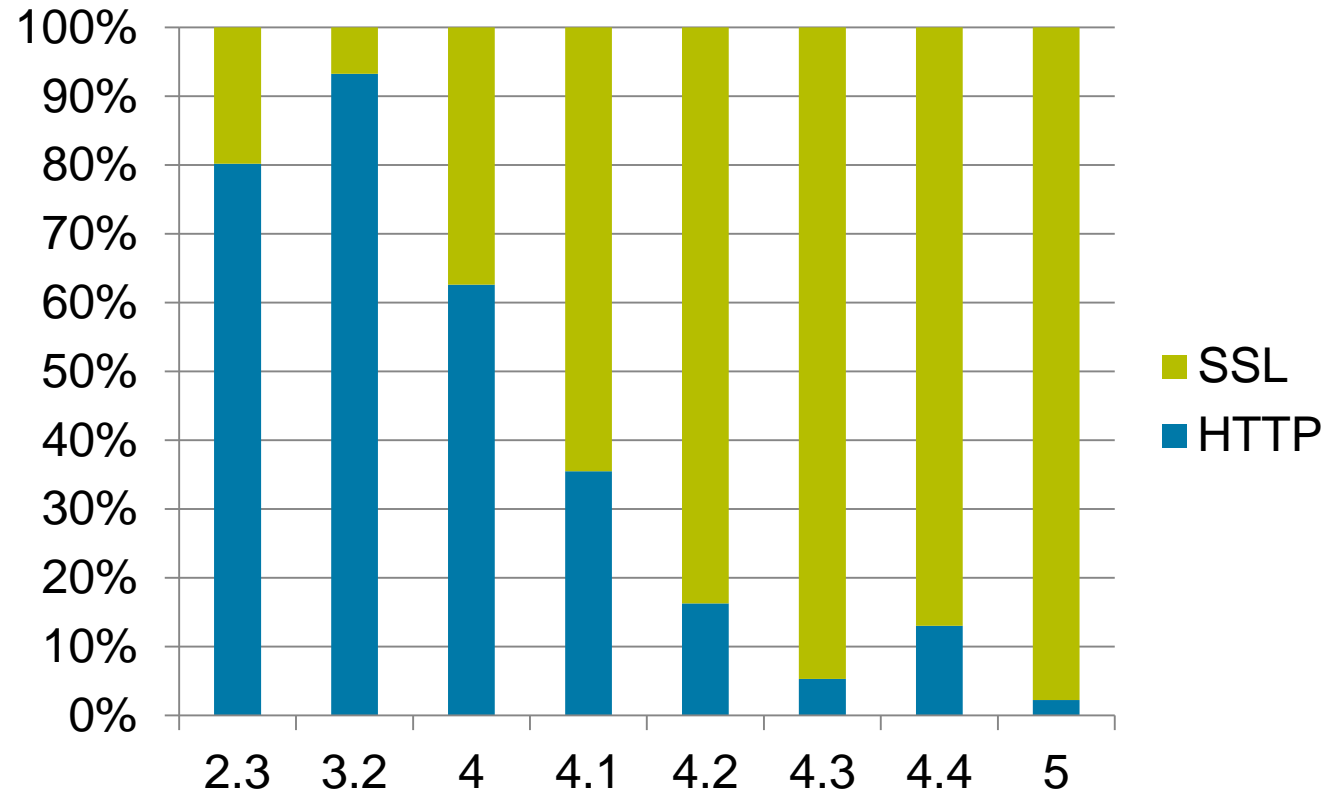**Total Encrypted Google Traffic**

Total Encrypted Facebook Traffic

Non-Video, 13%

Video, 87%

Video 18%

Non-Video 82%

Roughly half of encrypted traffic is video. Without proper tools, this content is unmanageable.

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Encryption is more prevalent for newer Android devices

YouTube Traffic Mix – Android

Android device use of SSL is highly dependent on version #

Legend:
- SSL
- HTTP

Chart data (stacked bar, HTTP vs SSL percentages by Android version):

Version	HTTP	SSL
2.3	80%	20%
3.2	93%	7%
4	63%	37%
4.1	35%	65%
4.2	16%	84%
4.3	5%	95%
4.4	13%	87%
5	2%	98%

Android upgrade cycle will shift more video traffic to use SSL

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ABR video formats are more prevalent on newer OS
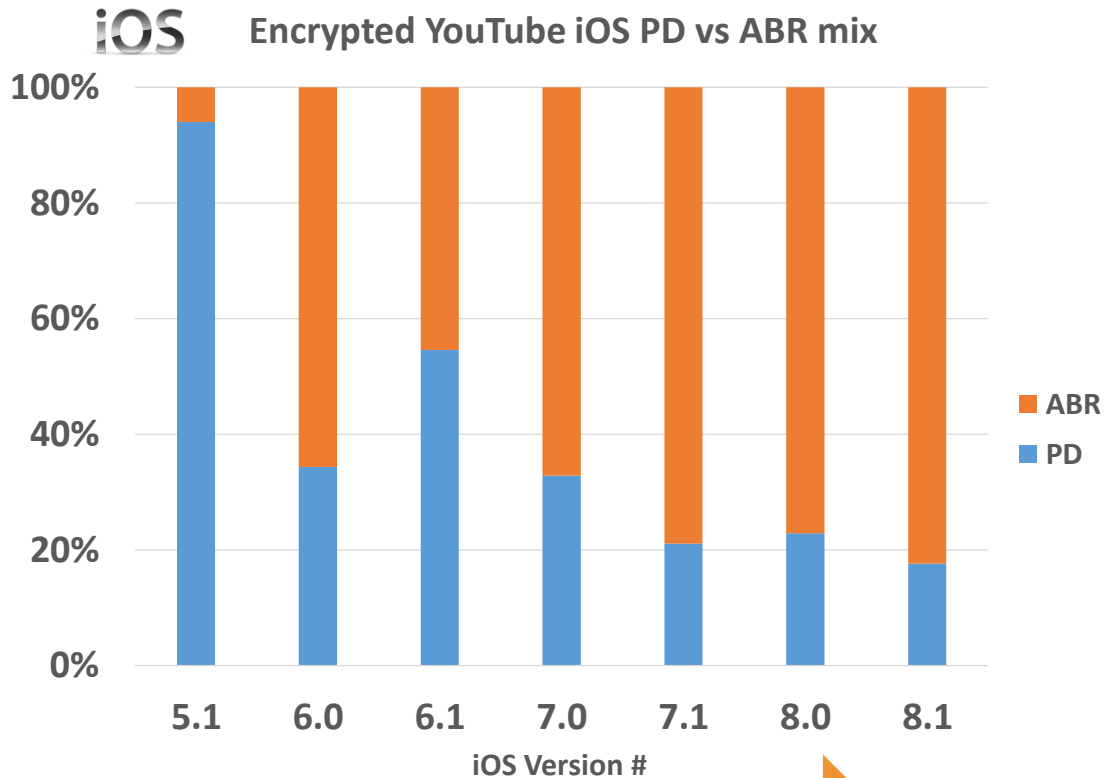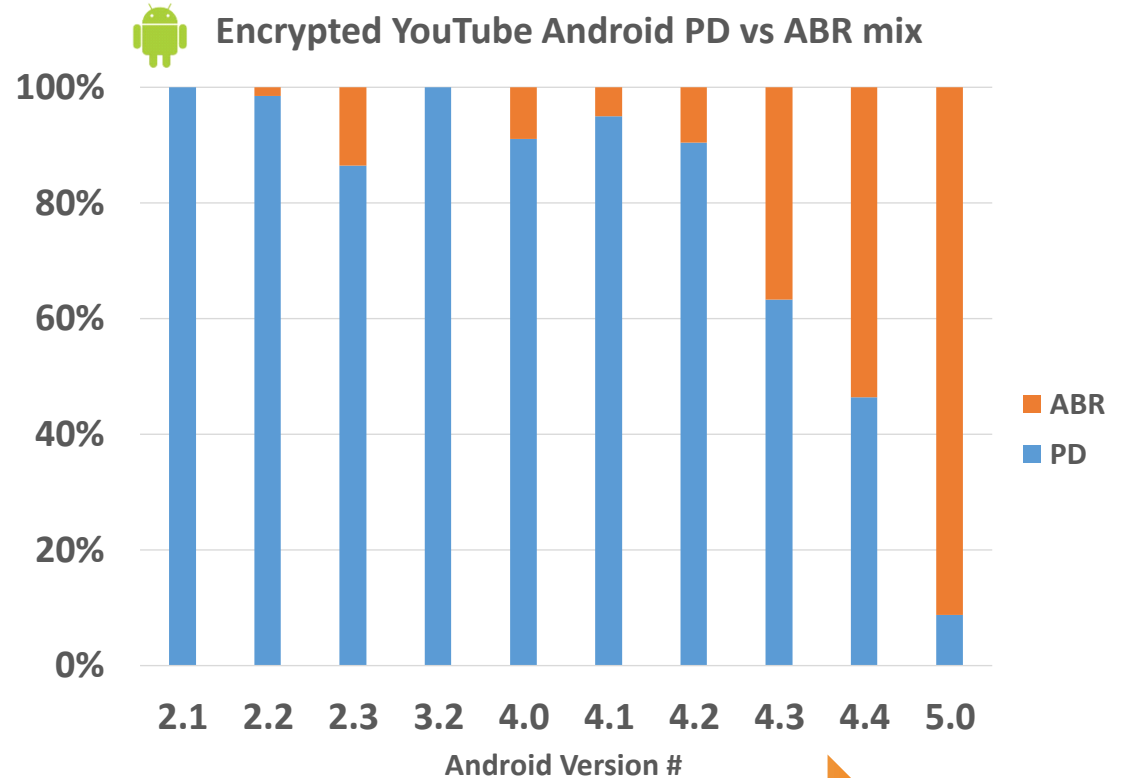
Smartphone device upgrade cycle will shift more YouTube video toward ABR protocols

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Encrypted ABR Video will become the single largest traffic class

Encrypted and Unencrypted ABR video will account for nearly 60% of mobile data traffic by 2018.

Citrix Mobile Data Forecast: 2014 - 2018

- ■ Encrypted ABR
- ■ Encrypted PD
- ■ Encrypted Non-Video
- ■ Unecrypted ABR
- ■ Unecrypted PD
- ■ Unecrypted Non-Video

ABR

2014   2015   2016   2017   2018

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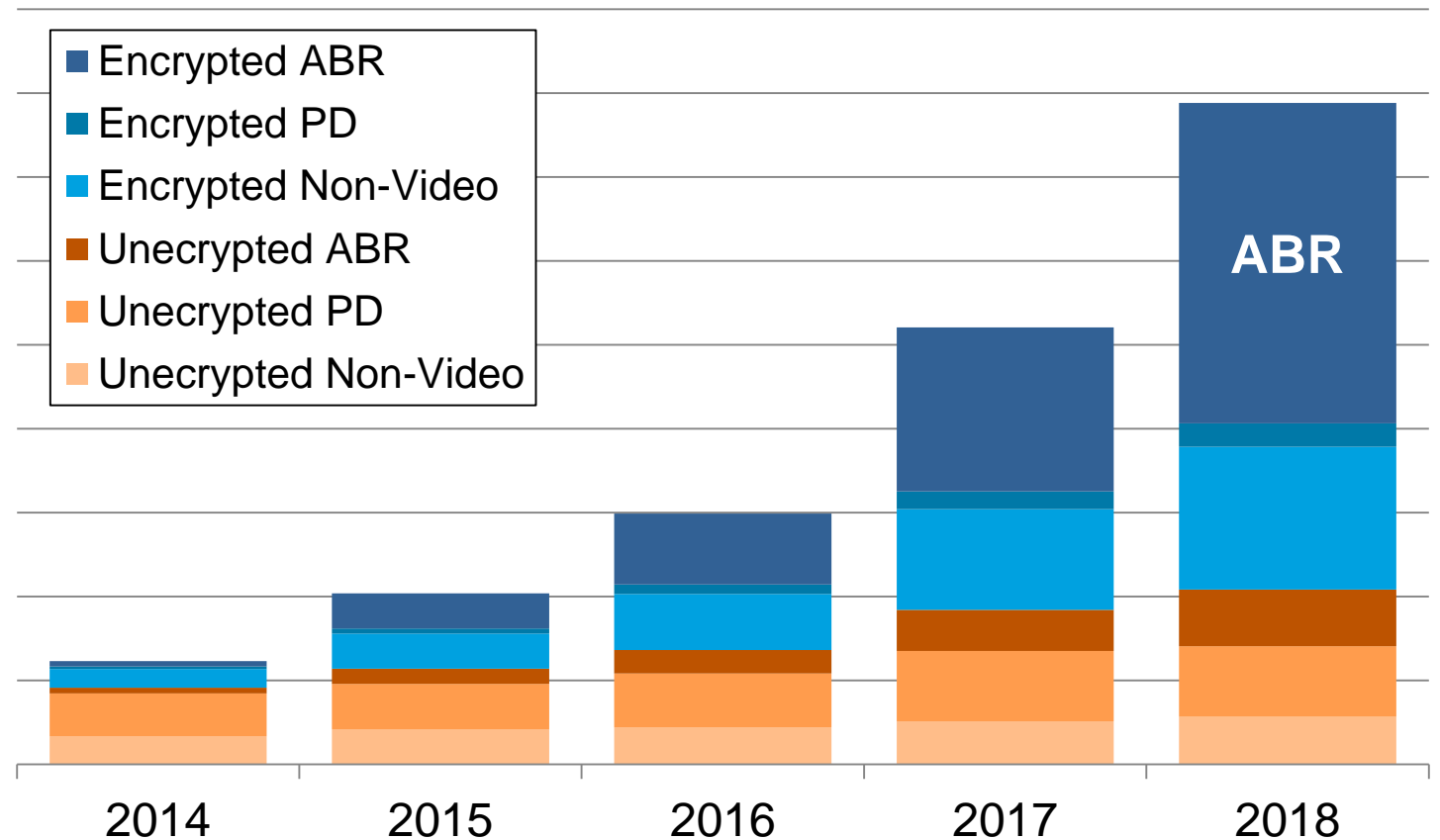
Why do mobile operators deploy ByteMobile?

Application Visibility	Enables fine-grained monitoring of application trends and experience, usage and efficiency KPIs
Improved Customer Experience	Improves the mobile data experience, providing competitive advantage, "best network" perception
Increased Network Efficiency	Reduces wasted data − data that doesn't create more revenue or improve experience
Increased Data Usage	A better experience leads subscribers to consume more revenue-producing data

These benefits apply whether the data traffic is <u>encrypted</u> or <u>unencrypted</u>

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ELEVATE THE MOBILE EXPERIENCE

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