EU Commission

Transparency – traffic management and speeds

No blocking/slowing down/degrading/discrimination against specific websites/classes of traffic

Preferential treatment permitted, so long as does not impair in a recurring or continuous manner the general quality of internet

Traffic management only permitted to prevent serious crime/security **but traffic management limited to temporary or exceptional congestion provided equivalent traffic treated equally**

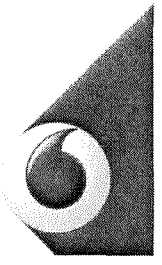
EU Parliament

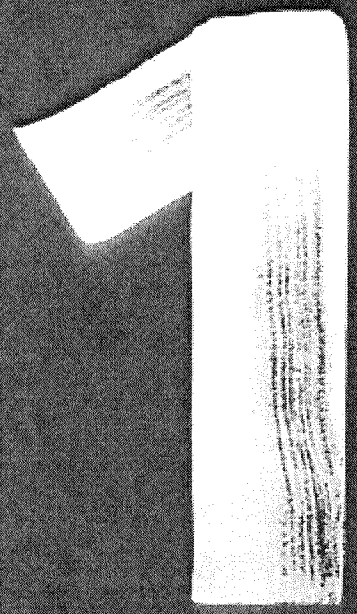
Transparency – traffic management and speeds

No blocking/slowing down/degrading/altering/discrimination against specific websites/classes of traffic

Preferential treatment permitted provided that: **(1) it is provided on logically distinct capacity (2) it is not to the detriment of the availability or quality of internet access services and (3) no discrimination**

Traffic management only permitted to (1) where required by court order (2) security (3) to manage **temporary or exceptional congestion provided equivalent traffic treated equally**





Consumer Harm

Consumer Harm

- No voluntary blocking of child abuse material on IWF block list
- No parental controls, which block over 18 content
- No spam blocking, even with consent of the end user

BBC

Child abuse row

Concerns have been raised that the net neutrality amendment passed in parliament could be exploited to allow child abuse images to be shared.

A section that originally stated that sites could be blocked if it was necessary to "implement a legislative provision or a court order, or prevent or impede serious crimes" was shortened in the final version to refer only to court orders.

At present a UK-based organisation called the Internet Watch Foundation maintains a list of web pages containing images of child abuse so that ISPs can block the content - a process that does not involve court orders.

As farfetched as it might seem that the EU would make it easier to share such material, some politicians do fear that the amendment in its current state could make this the case.

The Conservative Party's Vicky Ford MEP warned that the current draft was "dangerous" and said that it would have to be revised.

Labour's Richard Howitt MEP tweeted that he too opposed the proposed law, which he said "could weaken [the] fight against online child sex abuse images".

Vicky Ford Facebook blog

Richard Howitt tweet

THE TIMES | Friday May 2 2014

EU threat to child-abuse crackdown

Nic Fildes
Technology & Communications Editor

A new EU law could hamper efforts to crack down on child abuse images online, lawyers have warned.

Telecoms companies will no longer be able to block websites that show such material, under legislation designed to create an "open" internet.

Instead internet service providers will have to wait for organisations such as the Internet Watch Foundation to obtain a court order before blocking access to the sites.

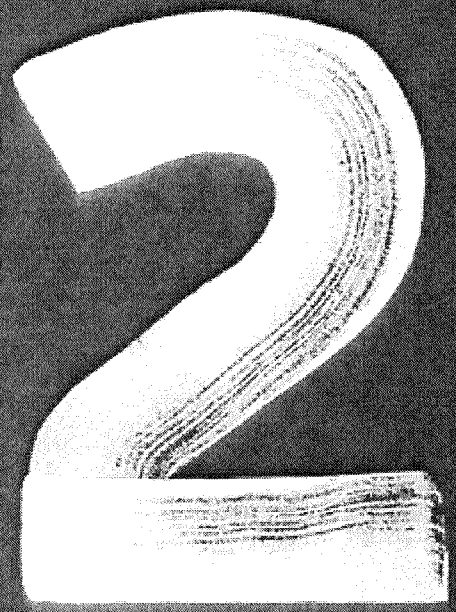
The new telecoms package, which was passed earlier this month, could also disrupt David Cameron's plans to force internet users to "opt in" to access adult content online, according to senior figures in the telecoms industry who said spam filters could also be banned.

The European parliament voted in a telecoms package last month, which was praised for ending excessive roaming charges. It also ushered in an era of the "open" internet. The legislation said that telecoms companies could engage in "traffic management" only to ease congestion on the network, to ensure the security of the network or to implement a court order.

The original proposals submitted by the European Commission included a clause designed to ensure that the blocking of illegal content by telecoms companies such as BT and Vodafone would be preserved. However the phrase covering this was deleted by European ministers before being passed.

Tim Ward, QC, said that the current system for blocking access would no longer be permitted as a result. "In the UK, we have a voluntary system that falls between the cracks," he said. The IWF sends emails twice a day to telecoms companies about sites that contain harmful material. It identified 13,182 websites containing child sexual abuse last year, a 31 per cent rise, over half of which contained violence. A change in the law to force the organisation to get a court order to block access would impede attempts to crack down on child abuse. "With the best will in the world, you can't get that many court orders twice a day," said Mr Ward.

Children's charities expressed alarm at the potential consequences. Claire Lilley, NSPCC head of child safety online, said: "We would be deeply concerned about the introduction of any legislation that results in internet service providers not being able to shut down sites containing child abuse images until they get a court order."



Quality of service reduced

Traffic management?

What is it?

It is how the Network would deal with customer data flows to make it more efficient and increase the effective capacity of the Network to improve the end to end user experience

Why we need it?

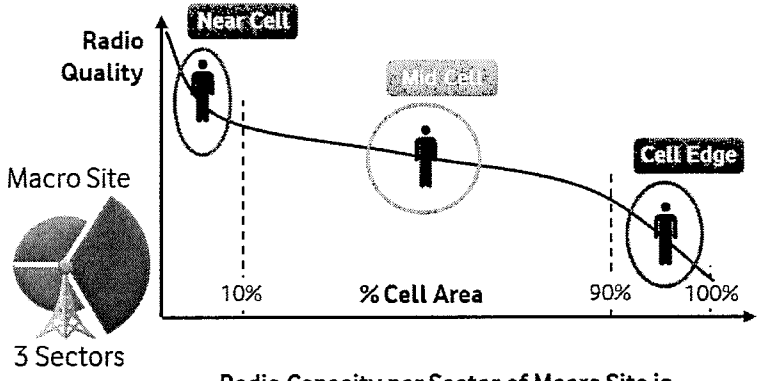
It provides the control needed to maintain user experience and quality even if:

- Different application race for network resources independently and randomly
- Network conditions change due to customer mobility and concentration of traffic

The science of radio dictates that capacity and user performance decreases the further users are from the radio site

- The capacity and user performance delivered by a radio site varies by user location
- If users are at cell edge e.g. deep indoors, the radio signal struggles to reach them lowering the network capacity
- A HD Video has a typical data rate of 2.5Mbps: if 2 users at the cell edge both try and view an HD video, both users are likely to experience video stalling
- To add the same capacity for serving video as the content optimisation, would require more than double the site density

Radio Quality varies across the coverage area of a Macro Site



Radio Capacity per Sector of Macro Site is dependent on Radio Quality (Mbps)

	Near Cell		Mid Cell		Cell Edge
HSPA 7.2	7		2.7		1
HSPA 43.2	32	OR	9.5	OR	2.5
LTE800	70		20		4

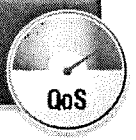
Types of Traffic management

- It targets the best user experience that sustains over changing mobile environment due to mobility or congestion

Optimization

- The goal of QoS is to provide guarantees on the ability of a network to deliver predictable results dependent on service & traffic type

QoS & Prioritization



- Storing the frequently used content by customers in a specific area, city or country as close as possible to accelerate content delivery

Caching

- Control of traffic delivery and policies to ensure that the congestion impact is minimized and sensitive traffic is not impacted

Congestion management

- Intelligent analysis of email patterns and identification of spam senders

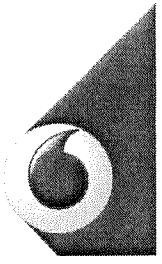
Spam Filters

Optimization

it is primarily about providing the best possible video experience

http://www.youtube.com/watch?v=C-U_D0GO6G8&feature=share&list=PLl9V6UQ7-7H0f7W9rf3xeOLMG8j9WTztP

http://www.youtube.com/watch?v=IGR7lW-oSbE&feature=share&list=PLl9V6UQ7-7H0f7W9rf3xeOLMG8j9WTztP&index=1

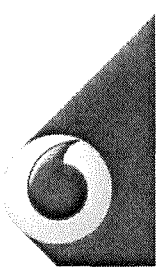


QoS & prioritization

- Every application has different needs dependent on its nature.
- Some applications can tolerate delays (e.g. emails, chat,..)
- Some applications require much more bandwidth than others (e.g. Video)

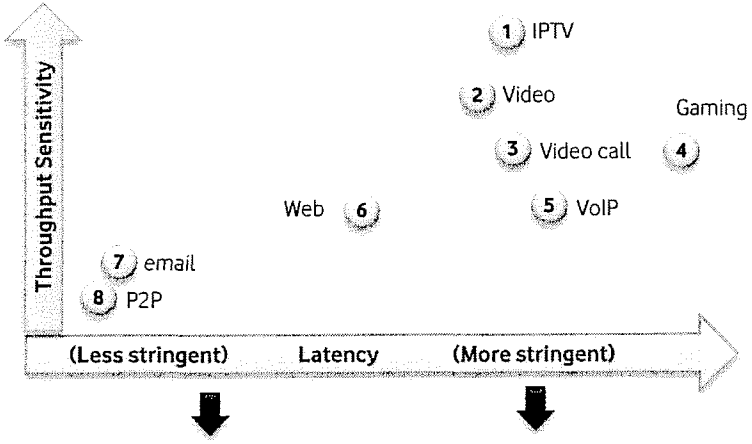
QCI	Bearer Type	Priority	Packet Delay	Packet Loss	Example
1	GBR	2	100 ms	10^{-2}	VoIP call
2		4	150 ms	10^{-3}	Video call
3		3	50 ms		Online Gaming (Real Time)
4		5	300 ms	10^{-6}	Video streaming
5	Non-GBR	1	100 ms		IMS Signaling
6		6	300 ms		Video, TCP based services e.g. email, chat, ftp etc
7		7	100 ms	10^{-3}	Voice, Video, Interactive gaming
8		8	300 ms	10^{-6}	Video, TCP based services e.g. email, chat, ftp etc
9		9			

LTE traffic classification as defined by 3GPP standards



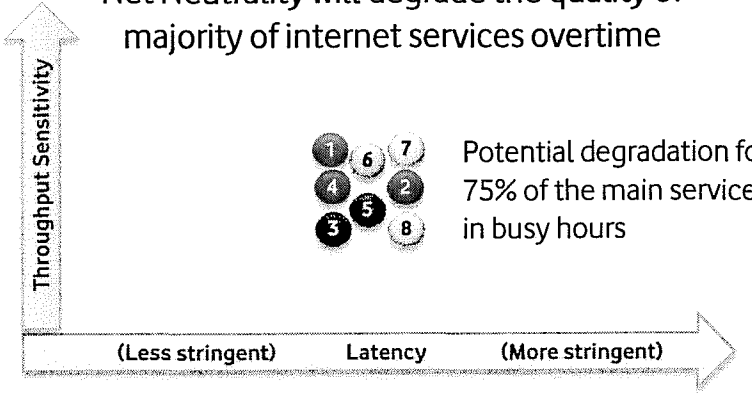
End User **Experience** is Content dependent

- Standards and consequently Networks evolved from a 'dedicated resources' to 'shared pool of resources', where the resources pools are managed on the basis of QoS requirements for different services
- Standards define different QoS per services based on service characteristics.



Net Neutrality will degrade the quality of majority of internet services overtime

- Without the possibility to allocate and manage shared resources across the network intelligently, there will be QoE degradation
- This is valid especially for real-time services which rely by nature on higher QoS, thus also limiting Innovation



Potential degradation for 75% of the main services in busy hours

Caching

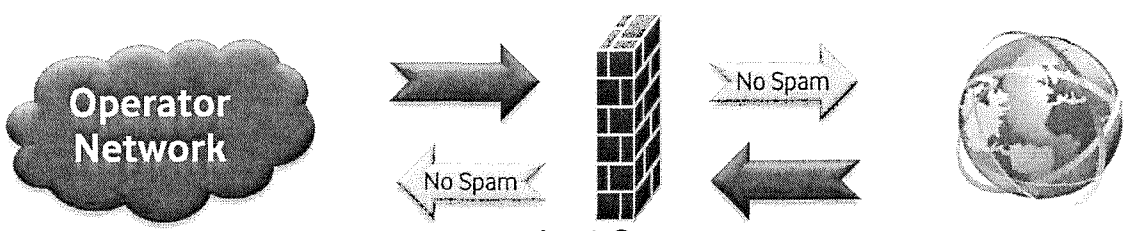
Internet content is spread around the world and getting it closer reduces latency and improves user experience, but is only applicable for some types of traffic that are non encrypted and non real time content (e.g. Live TV)

Caching

Internet content is spread around the world and getting it closer reduces latency and improves user experience, but is only applicable for some types of traffic that are non encrypted and non real time content (e.g. Live TV)

Spam filters are bi-directional (preventing incoming and outgoing spam)

- Spam distorts users and can block networks due to loads of illegitimate traffic
- Example: an employee on vacation can find out that his mailbox is full and losses important emails because he received 100s of spam that consumed his/her inbox capacity
- An ISP (Internet Service Provider) can suffer latency or even reach a Denial of service as it receives millions of spam emails blocking its capacity for legitimate use



Anti-Spam filter

In IE (@Vodafone.ie) we measured <10% of outgoing email being spam

In IE (@Vodafone.ie) we measured ~95% of incoming email being spam

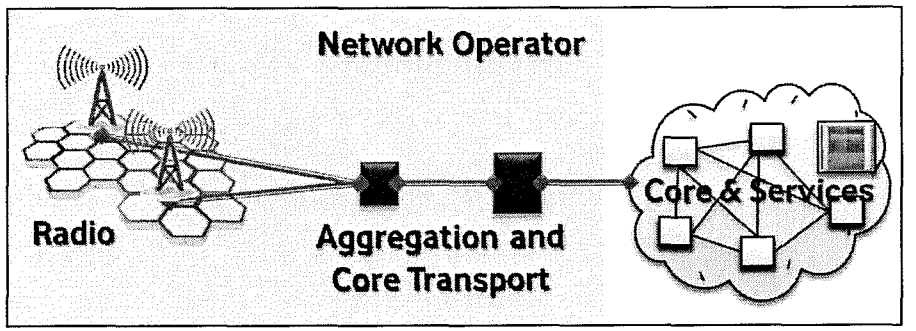
Examples of anti-spam techniques:

- Known Spammers list
- Inspecting embedded URLs
- Falsified address of the sender
- On the fly content checks

Specialised services

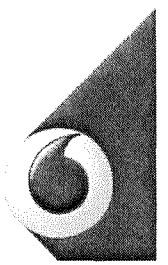
IP technology relies on pooling resources for high efficiency, that's why the entire world is moving to IP

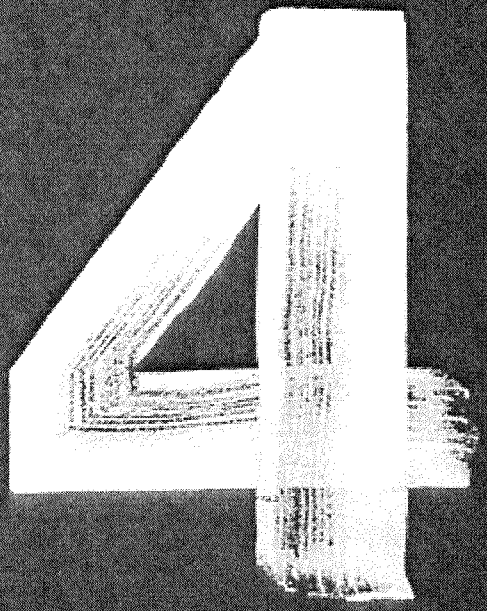
- Providing logically distinct capacity with strict admission control based on type of application is a very challenging and inefficient use of network resources.
- Currently the standards does not facilitate this type of separation, this actually goes against 3GPP and GSMA standards
- Instead all standards differentiate between services based on the minimum requirements of these services (e.g. Voice requires special treatment to maintain its quality under all conditions) while keeping all resources pooled for efficiency



Examples

- Voice?
- mHealth – time critical M2M services
- Enterprise services
- https://workspace2.vodafone.com/global/enterpriseproductmarketing/Pages/Product-Search.aspx?Product=Vodafone%20Intelligent%20Enterprise%20Hub

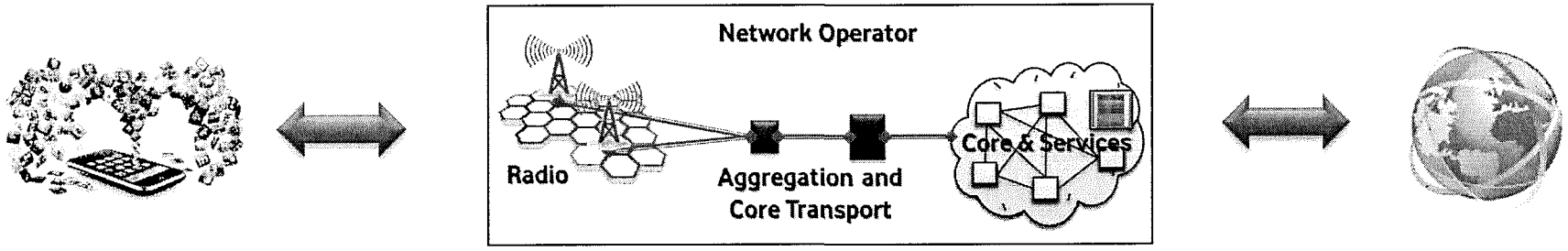




The proposals will distort competition

Congestion Management in the future

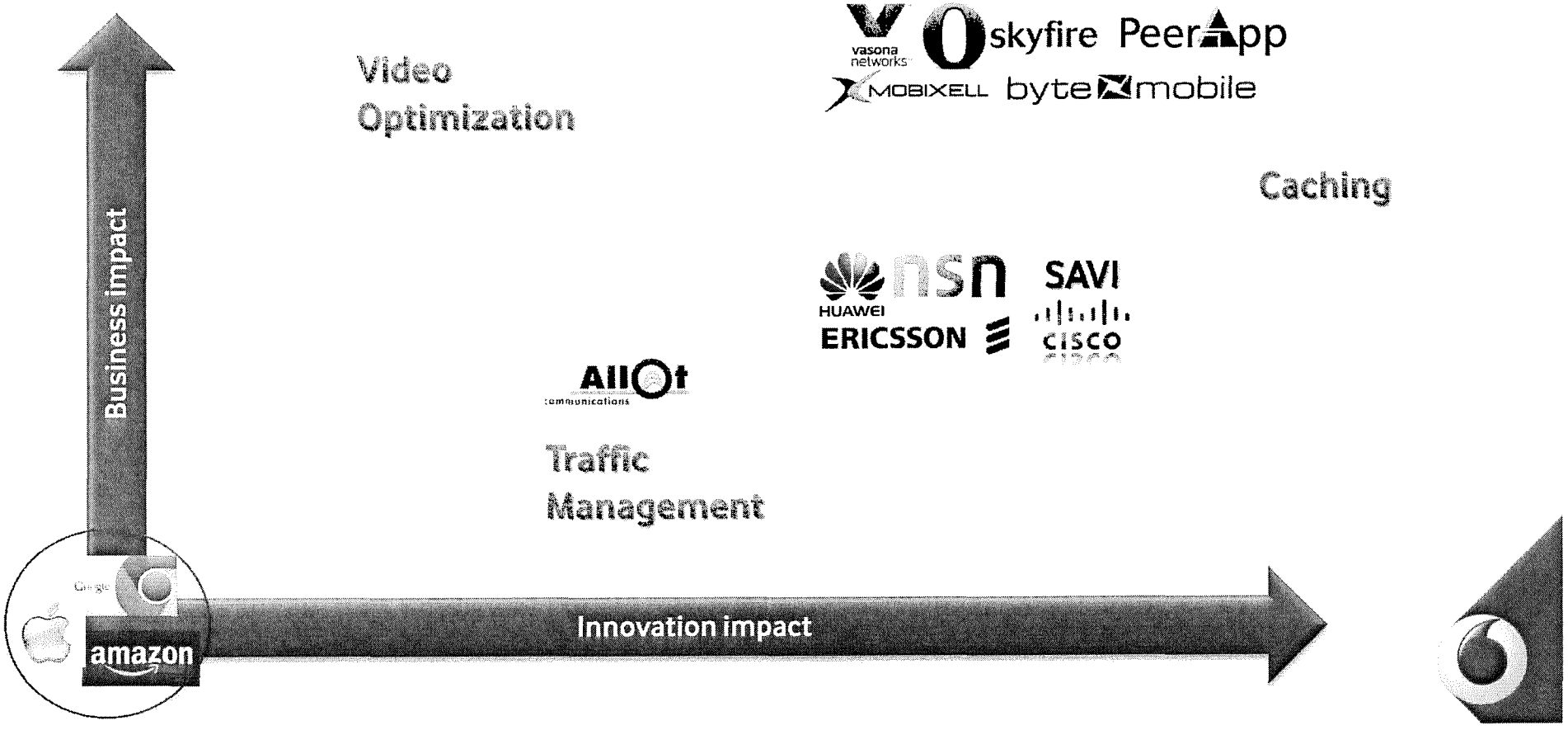
- With the proliferation of devices and wider LTE rollout, traffic will increase significantly and has to be managed in the best possible way.



If Network operators do **not** manage traffic, every application and content provider will try to absorb as much resources as possible from the network at both ends. This will be a completely non controlled environment, and even more prone to congestion

Best Traffic Management requires full control of all traffic to take the right decision based on criticality of the content (e.g. emergency) and its nature (e.g. Voice)

Innovation


Business impact
Video Optimization
vasona networks
skyfire
PeerApp
MOBIXELL
byte mobile
Caching
HUAWEI
nsn
SAVI
ERICSSON
cisco
AllOt
communications
Traffic Management
amazon
Innovation impact

The proposals will disadvantage European companies

US position	EU Commission	EU Parliament
TRANSPARENCY	TRANSPARENCY	TRANSPARENCY
NO BLOCKING/DISCRIMINATION	NO BLOCKING/DISCRIMINATION	NO BLOCKING/DISCRIMINATION
PREFERENTIAL TREATMENT PERMITTED PROVIDED NOT DISCRIMINATORY	PREFERENTIAL TREATMENT PERMITTED PROVIDED NO MATERIAL IMPACT ON INTERNET SPEEDS	PREFERENTIAL TREATMENT PERMITTED PROVIDED ON SEPARATE CAPACITY + NO DISCRIMINATION
REASONABLE TRAFFIC MANAGEMENT PERMITTED	TRAFFIC MANAGEMENT LIMITED TO CONGESTION	TRAFFIC MANAGEMENT LIMITED TO CONGESTION
SPAM FILTERS/PARENTAL CONTROLS/BLOCKING ILLEGAL CONTENT PERMITTED	SPAM FILTERS/BLOCKING ILLEGAL CONTENT PERMITTED BUT NO PARENTAL CONTROLS	NO SPAM FILTERS/NO PARENTAL CONTROLS/NO BLOCKING ILLEGAL CONTENT PERMITTED