

Keeping the internet open for innovation: a perspective on the net neutrality debate

An internet that supports **experimentation and differentiation** is critical to ensuring continued investment in all parts of the digital value chain. With that in mind, **we offer the following thoughts**, backed up by real-world scenarios and technological realities.

“Policies supporting increased competition should be the chief means of guaranteeing an open internet”

WHAT'S THE PROBLEM?

There is a consensus, particularly in the US and Europe, that consumers demand an open internet. A competitive marketplace virtually ensures openness: consumers can “vote with their feet” if one provider’s policies restrict or degrade access to the content, services or applications they want.

A few short-lived and commercially unsuccessful attempts in the US and Europe to thwart access to certain services have failed, not because of government intervention, but due to a well-functioning market. Under pressure from consumers, competitive providers have no choice but to offer an open internet.

We believe that policies supporting increased competition – and, if needed, measures aimed at ensuring fair competition practices – should be the chief means of guaranteeing an open internet.

We agree that customers should get what they pay for. Disclosures to consumers about the nature and quality of their access are an important part of customer choice. The more information that is made available, the better the consumer can tailor services to his or her preferences.

In markets with less competition, governments may need to exercise regulatory pressure to enforce requirements that will guarantee open internet access. However, the notion that all data bits must be treated equally – a concept that underpins net neutrality regulation – is a heavy-

handed and misguided response to concerns about openness.

Not only does overly restrictive net neutrality regulation add costs to doing business, it also discourages internet innovators from taking chances, and reduces much needed network investments.

Rather than risk time or money developing bold new services that may be determined to have crossed the line by treating one bit as higher or lower priority than another bit, innovators may simply choose to keep their inventions in the garage. Additionally, the tools that operators use today to manage networks for the benefit of all users are called into question by strict net neutrality regulations.

POLICY MAKERS AND NETWORK MANAGEMENT

An open internet must permit operators to offer differentiated QoS to customers and content and application providers. That is, it must support offerings outside the public internet, such as IPTV and operator-provided IP voice services, including VoLTE and VoIP, and the emerging world of connected devices – all commonly referred to as specialized services¹.

An open internet regime must also be capable of delivering guaranteed QoS to sectors including health, public safety, enterprise and utilities².

In addition, network management is crucial to





ensuring that all customers are given an acceptable internet experience in cases where there is competition for limited network resources. This is particularly important for wireless broadband data, where dynamically changing conditions (for example, a subway train full of passengers all moving from one cell to another) and limited resources (radio spectrum) demand the active management of networks.

We ask that policy makers focus on the problem needing to be solved, and we stress that treating every bit equally is not necessary – or even desirable – to ensure an open internet.

If the market for internet access is failing, perhaps due to a lack of competition, we make the following recommendations:

- ▶ Establish general requirements for broadband providers to give their customers access to lawful internet content, applications and services.
- ▶ Permit QoS distinctions for specialized services: for connected devices and enterprise services (for example, internet access for public safety, business and other non-mass-market customers), or where requested by the customer.
- ▶ QoS differentiation should therefore be permitted in two different ways: as a result of providing a specialized service, or as a user-requested feature in the provision of a public internet access service³.
- ▶ Allow for robust traffic management tools. As

long as traffic management is applied in a manner that does not harm consumers or competition, it should be permitted.

SPECIALIZED SERVICES

In addition to best effort or broadband internet access services, providers should be able to make use of network capacity to deliver content, applications and services that require an enhanced QoS, but are distinct from the internet access service.

We ask that policy makers permit different QoS for traffic that might cover the same facilities as broadband internet services. As long as customers get what they pay for in terms of broadband internet access, operators should generally be free to offer specialized services as well.

Video communication is gaining popularity, and is shifting to IP as the communications protocol. If an operator wants to provide such a service, users will expect it to offer the same level of quality as they are used to with fixed telephony. To deliver the service with a high-quality picture and no interruptions – using a reasonable low bandwidth – it is essential that IP packets are delivered without delay and without too many lost packets – in other words, with a higher QoS.

Similarly, voice provided over a mobile network is also treated as a specialized service. Consumers demand that voice services – the foundation of mobile networks from their inception – do not have delays or cut-outs. Therefore, mobile net-

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¹ Connected devices may use parts of or the full internet protocol stack for their functionality, traveling wholly on networks logically separated from the public internet. A logical separation does not mean that it does not touch the public internet, as the same physical resources may be used.

² Note that these and other examples could be offered with a higher QoS than other content on the public internet, or offered as specialized services.

³ A user request for QoS could take multiple forms. In an environment with numerous competitors, the request might be signing up with a provider that offers the quality enhancements desired by a consumer. Customers could also select QoS by paying the operator to prioritize some traffic over others. If a customer desires a higher QoS for content that they visit every day, and is willing to pay for that content, we believe the operator should be free to offer it.

works are engineered to treat voice with a higher QoS than other forms of traffic.

ENSURING QOS

Notions of fair access and unhampered freedom of expression are part of the net neutrality debate when discussing people, but have no place when dealing with connected devices and machine communications. Rather, it is the vastly different needs of sensors and machines, and the networks and applications to support those needs, which characterize machine communication.

In a scenario where all bits are treated equally and there is a negligible penalty for inefficient delivery, a service or application provider could, for example, use repetitive codes – in other words, send the same message several times to ensure QoS. The theory here is that by being persistent you get better service. This uses a large amount of bandwidth and network resources, hampering the experience of others sharing the same network. It is an unfortunate behavior that has come about as a direct result of all bits being treated equally. Alternatively, the use of innovative compression, coding and QoS mechanisms would help to ensure both reasonable and fair network and bandwidth allocation.

A QUESTION OF PRIORITY

As Figure 1 shows, communications among vehicles for crash avoidance or navigation are more urgent than a 30-minute update on residential electricity usage. The notion that every data bit sent between connected cars should be treated with the same degree of priority as those transmitted from a smart electricity meter back to the power supply company ignores the difference in requirements of the machines that will increas-

ingly connect to the wireless internet.

This example illustrates the futility of attempting to apply a regime in which prioritization, or even de-prioritization, of data is prohibited, and we know that future services will only become more complex over time.

Rules treating all data equally would either over-provision resources for devices that do not require real-time communications or could endanger critical uses, like self-driving automobiles, by failing to prioritize their communications over others.

ROBUST NETWORK MANAGEMENT TOOLS

Traffic management ensures that the day-to-day delivery of broadband internet access can be maintained. Regulation should make it clear that non-discrimination does not prevent operators from treating different types of traffic differently in accordance with their technical requirements.

Operators need to be able to employ network management tools. For example, in a purely technical way, consider the differences in signal strength based on users' locations from a mobile network base station. As users move further away from the base station and closer to the cell edge, they may experience as much as a 60dB (1,000,000 times) difference in signal strength. This vast difference in signal strength makes the achievable speeds vary wildly for different users.

Despite this engineering reality, it seems that some of the most vocal supporters of applying a net neutrality regime to mobile broadband support the impractical concept that modern wireless networks – which currently adhere to the basic principle of delivering all bits as fast as the radio channel conditions allow – should instead dictate that every user's experience be equal to those experi-

“Vast differences in signal strength mean that service speed can vary greatly among different users”

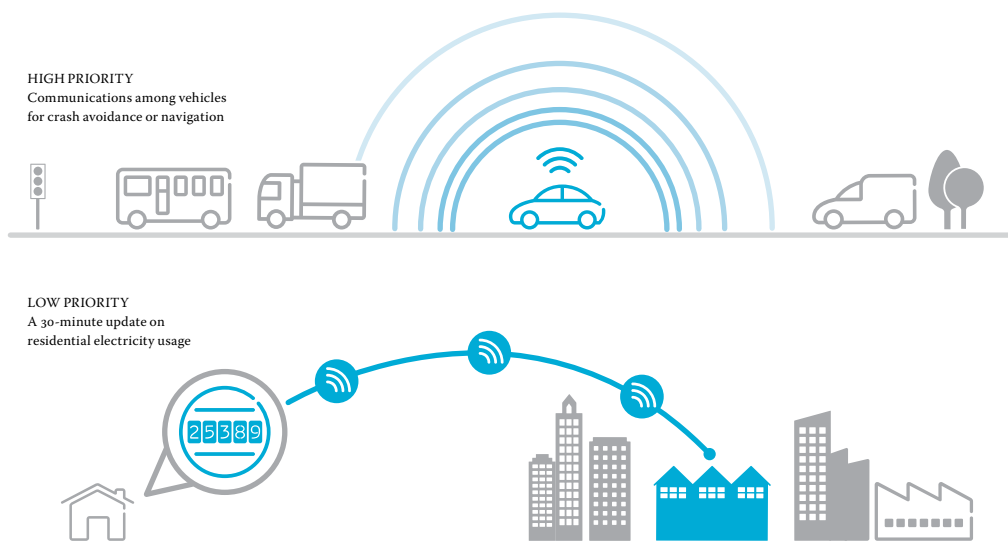


Figure 1: The vastly different needs of sensors and machines characterize machine communication.

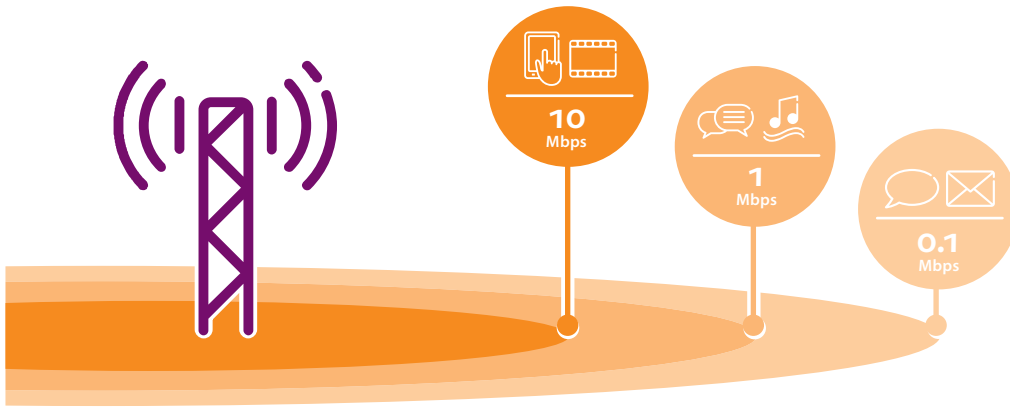


Figure 2: App coverage.

encing poor signal propagation.

This concept is key to understanding the network management decisions an operator faces every day across its entire network. Figure 2 illustrates the impact that proximity to the cell center can have on applications, showing the bandwidths that deliver high-quality video, music and text or email experiences.

Theoretically, a network could provide every device served by a particular base station with the same degraded quality experienced by those at the cell edge. Doing so would ensure that most users receive worse service, and the total capacity of the site would be significantly lowered. We see little value in using network management to guarantee only a baseline of service.

This is just one example of a network management concept in use today. Rather than prohibiting certain tools and limiting their use, we ask policy makers to continue allowing operators to make use of network management tools to improve everyone's broadband experience.

CONCLUSION

We support an internet that allows and encourages innovation, investment and customization.

When competition is lacking, policy makers may have an important role to play in terms of ensuring that mass-market consumers have access to the legal content, applications and services they desire. We support that ideal and believe operators should be permitted to employ QoS and robust network management tools. Policy makers, however, should refrain from prescriptive technical language that will not be future-proof and will eventually become detrimental to innovation and the consumer.

A more realistic, effective and efficient way to handle the open internet is for policy makers to apply principled and reasonable rules to mass market broadband internet access, and to leave other forms of communication largely unregulated. This will allow for the experimentation and innovation that has led to so many societal benefits. ●

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