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Net neutrality and the value chain for video

Structured abstract according to Info guidelines

Purpose
Video distribution over the Internet leads to heated net-neutrality related debates between network operators and Over-the-Top application providers. The purpose of this paper is to analyze this debate from a new perspective that takes into account all of the assets that companies try to exploit in the so-called battle for eyeballs in video distribution.

Methodology
We use a systematic value chain analysis to determine the points along the value chain where net neutrality interacts with video distribution. The inputs to the analysis are the existing and proposed policy measures for net neutrality in Europe and in the US, and a number of net neutrality incidents that have led to discussions earlier.

Findings
We find that the current and proposed policy measures aimed at net neutrality each contribute to a certain extent to their intended effects. However, our analysis also shows that they are likely to lead to new debates in other parts of the value chain, as players try to compensate the loss of influence or revenue streams by rearranging the ways in which they exploit their assets.

Practical implications
Further and new debates are expected in the areas of peering and interconnection, distribution of resources between over-the-top and managed services and the role of devices with tightly linked search engines, recommendation systems and app stores.

Originality/value
The new perspectives offered by our value-chain based analysis are valuable for policy makers who aim to promote net neutrality and simultaneously stimulate competition and innovation throughout the value chain.

1 Introduction

1.1 Net neutrality and video distribution

Net neutrality has, for a number of years, been a topic of often heated discussion in the Internet and telecom community. The issue was put firmly on the agenda by Tim Wu in his famous paper (Wu, 2003) following the discussion on a number of net-neutrality related issues by other authors (*e.g.* Lemley and Lessig, 2001). Since then, net neutrality has been analyzed extensively in academia and in regulatory circles (*e.g.* Marsden, 2010 and Marcus *et al.*, 2008). Important recent regulatory positions are contained in the FCC's 2010 Report and Order (FCC, 2011), the European Commission's communication on the open Internet and net neutrality in Europe (European Commission, 2011) and the European Parliament's resolution on that topic (European Parliament, 2011).

Looking at the historical development of net neutrality, there are two dominant factors that fuel the discussions on this important topic. The first factor is the recurrence of incidents around limitations in the access that end users have to popular applications. The best-known incident is probably the Comcast case, in which the large US cable operator and ISP was accused of interfering with the ability of its customers to use the BitTorrent peer-to-peer file sharing application (*e.g.* Marcus, 2010). Other well-known examples are the blocking of VoIP applications (such as Skype) by mobile operators (BEREC, 2010, BEREC, 2012). Incidents like these directly affect the open access that end users have to applications on the Internet. The second factor driving net neutrality discussions is the ever-

growing importance of the Internet in almost all sectors of business and in society as a whole. Innovations in Internet services and applications can only fulfill their expectations if Internet users have proper access to new applications, and, vice versa, if application providers can reach their intended end users over the Internet.

The focus of this paper is on the value chain for video distribution. Video distribution clearly is an area where the Internet opens up opportunities for many new applications for consumers and businesses. At the same time, video distribution is also an area where new applications meet an existing ecosystem with existing business models. Video distribution over the Internet (often called Over-the-Top or OTT video), and streaming video in particular, presents a number of challenges which make it interesting to study in the context of net neutrality (Van Eijk, 2011, Leurdijk *et al.*, 2011). First, large-scale distribution of streaming video requires large amounts of bandwidth (*e.g.* Schonfeld, 2010). Therefore, the growth of streaming video leads to the question which players in the value chain need to contribute to the investments in additional capacity. Secondly, OTT video services such as Netflix compete with the Video on Demand (VoD) services offered by telcos and cable companies in their triple play packages, while the end users use the Internet component of the same triple play packages to access the OTT content. Thirdly, other areas in the value chain for video distribution are also being contested by new players, in particular by powerful consumer electronics and search engine companies like Apple and Google. Thus, the value chain for video distribution is characterized by an ongoing struggle between the various business players to influence and control the access that consumers have to content and applications. This struggle is driven by commercial considerations: "owning" the customer by controlling his navigation and access to content is valuable as it opens up advertising and other commercial opportunities. The result is a "battle for eyeballs" that takes place amidst an increasing technical, economical and regulatory interconnectedness of the broadcast media and Internet domains along the entire value chain. Policy measures aimed at promoting net neutrality interact with this battle for eyeballs and can therefore only be properly assessed if the entire value chain is included in the analysis.

1.2 Research question on intended and unintended effects of policy measures

As a result of the historical development of the net neutrality debate, current policy measures such as transparency requirements are aimed primarily at Internet Service Providers (ISPs), which provide the Internet access service, an important part of the OTT video distribution value chain. However, as explained above, other parts of the value chain are important too in the struggle for control. Net neutrality therefore calls for a value chain approach. And, very important when defining policy measures, a measure aimed at one part of the chain can have an effect in other parts as well. The research question addressed in this study is therefore: What are the intended and potentially unintended effects of policy measures in the area of net neutrality, taking into account the entirety of the video distribution value chain? As described in the remainder of this paper, we find that the current and proposed policy measures each contribute to a certain extent to their intended effects. However, our analysis also shows that they are likely to lead to new debates in other parts of the value chain, as players try to compensate the loss of influence or revenue streams by rearranging the ways in which they exploit their assets. The findings of this study are therefore relevant for policy makers who aim to promote net neutrality and at the same time stimulate competition and innovation throughout the value chain.

Of course, net neutrality is about more than just the business and commercial perspectives sketched above. It also has a dimension relating to the content itself, which can move the discussion to another level where basic human rights are at stake, such as freedom of speech and uncensored access to information (*e.g*. Newman, 2008, Sluijs, 2011, Council of Europe, 2010). In this paper, however, our focus is on the business perspectives of the net neutrality debate.

1.3 Structure of this paper

The remainder of this paper is structured as follows. In Chapter 2, we sketch the technological and market trends in video delivery, such as rise of Over the Top (OTT) video providers. Both the unmanaged and managed lanes in the two-lane model for service delivery are considered. In Chapter 3, the main part of the paper, we study the background and goals of a number policy measures and regulatory interventions aimed at the promotion of net neutrality, such as transparency and no blocking. We also analyze the intended and potential unintended effects of these measures by investigating their impact on other parts of the value chain, where they may interact with actual and potential bottlenecks. Chapter 4 presents the conclusions of our analysis, emphasizing the need to include the entire value chain for video distribution in discussions on net neutrality.

2 The value chain for video distribution

2.1 Developments in the value chain

The starting point for our analysis is an examination of the different market positions and power relations between the various players involved in video distribution. In this section, we briefly address the most important developments in the value chain that are relevant for the net neutrality debate.

2.1.1 The rise of OTT video distribution

Although most people still prefer to watch linear TV, there is a notable shift from linear TV consumption to on demand TV consumption, especially among young people. The possibility to offer video directly to consumers through the open Internet has enabled creators of video content and TV channels to distribute their content independently from the traditional broadcasters, TV packagers and network operators. Some Hollywood studios, TV channels and TV producers have entered partnerships with OTT video providers like Hulu and Netflix. There are also numerous smaller, independent video providers, which offer their content directly online. This option, in combination with increased competition between distribution networks, has somewhat strengthened the position of video content providers and TV channels vis-à-vis network providers in the value chain. They no long need to rely exclusively on network providers for distribution deals, but can also offer their content independently on the open Internet. Distribution of video over the public Internet has thus widened the options for content producers.

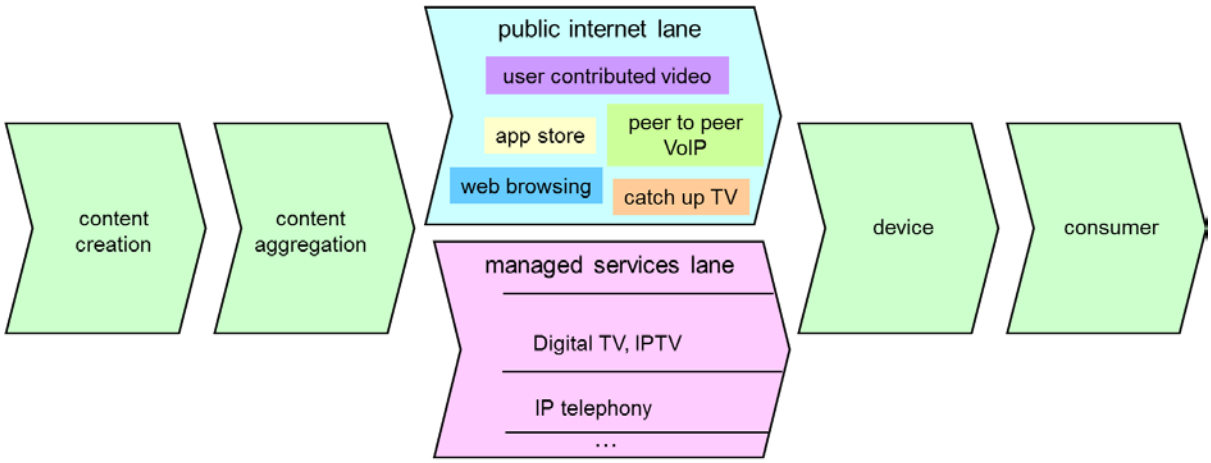

Figure 1. Value chain for video with a two-lane distribution model for complementing (and partly competing) OTT and managed video services.

The availability of broadband Internet has paved the way for new OTT video services like Hulu and Netflix. Conversely, OTT video services stimulate the use of broadband, to the benefit of broadband network providers. The relationship between OTT video providers and network providers is not unproblematic though, as the OTT video services also compete with the TV packages and on-demand services offered by the very same, vertically integrated network and service providers. Typically, these vertically integrated providers offer these services as managed services with certain explicit or implicit quality guarantees. The co-existence of (services and applications over) the public Internet and managed services leads to the so-called two-lane model (BEREC, 2010, Nooren, 2011, Marcus *et al.*, 2011). As illustrated in Figure 1, in the two-lane model, OTT services and managed services are delivered to the end user over a single broadband connection (*e.g.* cable, DSL or fiber). As an example, the VoD service offered by Netflix competes with the VoD services offered by network providers. From this perspective, network providers have an interest in slowing down the use of OTT video services.

2.1.2 New powerful players from the consumer electronics and search markets

New powerful players from other markets have entered the market for video distribution. Two well-known examples are Apple and Google. Apple has proved very successful in combining its devices (laptops, desktops, iPads and iPhones) with easy access to its iTunes online shop, which started as a music shop, but now also offers many movies and TV shows. Google started its expansion into video with the acquisition of YouTube in 2006, complementing its own Google Video services. Both Apple and Google have introduced devices linked to their own OTT TV services: Apple TV (http://www.apple.com/appletv) and Google TV (http://www.google.com/tv). Also the so-called Connected TVs from various consumer electronics manufacturers are relevant in this context. Apple TV and Google TV thus come to function as new platforms (and potentially also gatekeepers) for online streaming video content. Their selection of video content as well as their navigation menus, presentation and ranking of video content will affect which content users will find most easily. In this domain they compete with network providers, especially with those offering sophisticated EPGs and other navigation tools, either as separate services or included in proprietary set-top boxes.

2.2 Control points in the value chain

There are a number of important assets or control points in the video value chain. A proper understanding of these control points is crucial to come to a useful value-chain based analysis of net neutrality. Other authors have also pointed at the importance of taking into account the full value network or full internet ecosystem in assessing the need or desirability of regulation, instead of concentrating on the activities performed in isolated markets. Ballon and Van Heesvelde (2011) investigate the role of platforms and associated control points in ICTs in general, while Ballon and Walravens (2008) study their role in mobile services in particular. They point at the specificity of ICT markets, which are often characterized by the creation of multi-sided platforms with different types of business models, involving different degrees of control over assets and consumers. Herzhoff et al. (2010) present a systems-theoretical analysis of mobile VoIP, starting from so-called tussles that emerge around control points. Eaton et al. (2010) develop models for analyzing business models built around control points in the value network for mobile internet and telephony.

In this paper we distinguish the following crucial assets in the value chain for internet video:

- A first asset is the possession of content or content rights, which is ultimately what consumers watch and pay for, either in money or in exchange for 'eyeballs', *i.e.* attention to commercials.
- A second important asset is the possession of a direct relationship with customers, enabling payment and billing transactions and, especially in combination with information on consumer profiles, sophisticated marketing and consumer loyalty campaigns.
- Thirdly, the ability to guide people's attention and thereby their preferences and consumption patterns through search engines, electronic program guides, opening screens, and other navigation tools is also becoming an increasingly important asset in the online world.
- Last but not least, access to networks and bandwidth of course remains crucial.

The distribution of these assets over the different players determines their position and negotiation power. All of these assets might come into play when content providers and (vertically integrated) network and service providers negotiate agreements on transport and delivery of video content.

3 Intended and unintended effects of policy measures

The above analysis clearly shows that the value chain for video distribution is growing more and more complex as a result of the interconnectedness between the media and Internet markets. Players in each part of the chain try to build on their assets to protect or extend their influence. In the end, the competing players try to build a strong relation with the end user in the "battle for eyeballs". The policy measures and regulatory interventions aimed at promoting net neutrality have an effect on the struggles for influence and eyeballs in the value chain. In this chapter, we analyze a number of policy measures and evaluate their intended and potentially unintended effects in the value chain.

3.1 Transparency as a first, non-intrusive measure

Transparency is typically the first measure considered by regulators to promote net neutrality and open access to services and applications on the Internet. Transparency does not explicitly promote or prohibit specific traffic management methods that network operators can use, such as prioritizing, throttling (slowing down) or even blocking Internet traffic related to selected applications. Instead, transparency measures introduce an obligation for network operators to provide information on the traffic management measures they employ. The purpose of this transparency is to give end users a meaningful insight into the traffic management methods which are employed by network operators

(typically the ISPs) and what consequences they have for them. Based on this, end users can make an informed choice between different ISPs offering Internet access services. In the EU, a transparency obligation has been introduced in the universal service directive (European Union, 2002). Its implementation is analyzed in a number of BEREC studies (BEREC, 2011, BEREC, 2011a) and national studies (*e.g.* OFCOM, 2010, Nooren and Prins, 2011). In the US, the FCC has also included a transparency obligation in its rules (FCC, 2011). Transparency measures primarily focus at the public Internet lane in the distribution part of the value chain (Figure 2), corresponding to the fourth control point from section 2.2: ownership of networks.

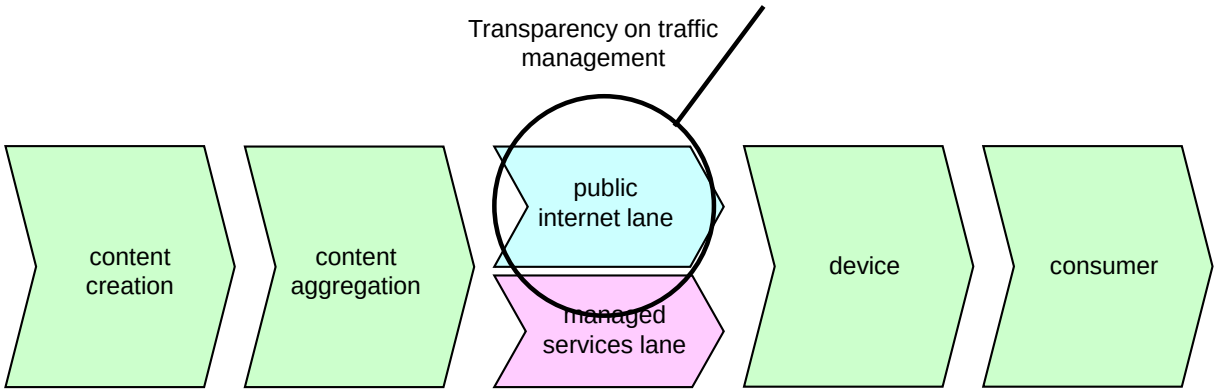

Figure 2. Transparency obligations focus at the public Internet lane part of the value chain.

Whether the transparency measure in itself is sufficient to promote and protect the open access of end users to services and applications on the Internet remains to be seen. Open access to the Internet is a topic that has the potential to draw substantial attention from a wide public, as has been demonstrated in the net neutrality incidents mentioned earlier. Moreover, there is evidence that suggests that transparency can also work if the information provided to the end users is not complete, or when the information does not reach all the end users (Sluijs, 2010). The key question, however, is whether consumers will indeed change ISPs in the current value chain environment. A significant obstacle is introduced by the bundling strategies that are widely employed by network operators. A consumer who has a triple play subscription would not only need to change his broadband Internet subscription, but also his telephony and his digital TV subscriptions, potentially including a change of set-top box. If barriers introduced by bundling and investments in Customer Premises Equipment keep end users from switching, then transparency could be a false solution that only legitimizes the traffic management practices by ISPs. These and other considerations have led lawmakers and regulators to the introduction of further policy measures, such as the no-blocking measure discussed next.

3.2 No blocking/throttling as a next step

The FCC explicitly prohibits blocking and throttling for Internet access services (FCC, 2011). In Europe, a similar measure has been adopted in the Netherlands. Legislation has also been proposed in Belgium and more EU member states may follow. The Dutch parliament passed a law including several net-neutrality related measures in June 2012, which will enter into force on January 1, 2013. There are a number of differences between the FCC and Dutch measures, such as the somewhat lighter measures for mobile in the FCCs rules, but the rationale is similar. In contrast to the transparency obligations described above, the no blocking/throttling measure works directly to support the objective of open access to all content and information on the Internet. A no blocking/throttling measure clearly removes potential technical obstacles for open access. However, the no blocking/throttling measures primarily aim at the public Internet lane part of the video distribution chain (Figure 3). They do not address potential obstacles in other parts of the value chain.

In general, the no blocking/throttling measures can interfere with useful network management practices employed by ISPs. The FCC rules therefore allow for ”reasonable network management”. The Dutch rules also leave room for network management required for proper delivery and access to services. The challenge is to judge whether a specific network management practice is reasonable or required when it involves blocking or throttling. In cases where ISPs block specific IP traffic flows to prevent botnets or protect network integrity, this judgment can be, but will not necessarily always be, relatively straightforward. But there is also a wider issue at stake in network management. The Internet supports an extensive and still-growing set of applications, with strongly varying network requirements in terms of delay, delay variation (jitter), packet loss and other parameters. By treating the IP traffic flows of applications in a way that best matches the application requirements, the user experience can be improved and networks can be operated more efficiently. This is particularly relevant in situations where a network is congested, but also during normal network loads. A (too) strict interpretation of the no blocking/throttling measure would thus remove useful instruments available in network management. This issue directly affects distribution of streaming video, as it is bandwidth intensive as well as sensitive (though not very sensitive) to delay and packet loss. At first sight, the no-throttling measure leaves room to prioritize flows from specific applications and thus promote the quality of their delivery. However, prioritizing one portion of the IP flows inherently means that the remainder of the IP traffic is handled with a relatively lower priority. It is still an open question at what point such a lower priority would be considered to effectively lead to throttling of applications that are not selected for priorization.

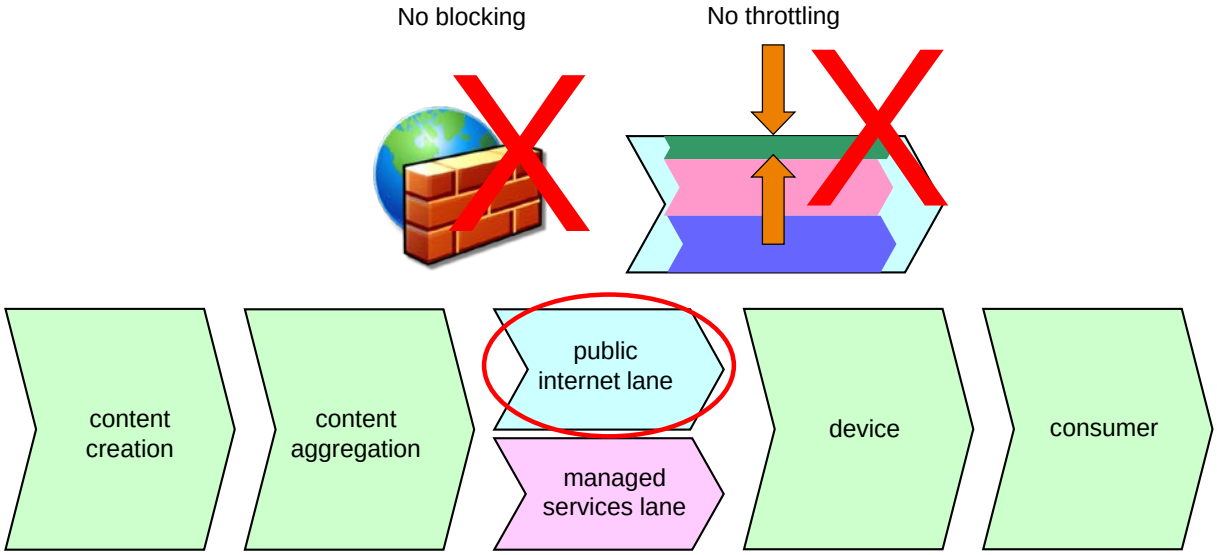

Figure 3. The no blocking and no throttling measures are imposed on ISPs that provide Internet access services.

3.3 No retail tariffing by ISPs of OTT as a business complement

In the Dutch rules, the no blocking/throttling measure is accompanied by a complementary measure that explicitly prohibits ISPs from charging their retail customers for the use of third party OTT services over their broadband subscriptions, see Figure 4.

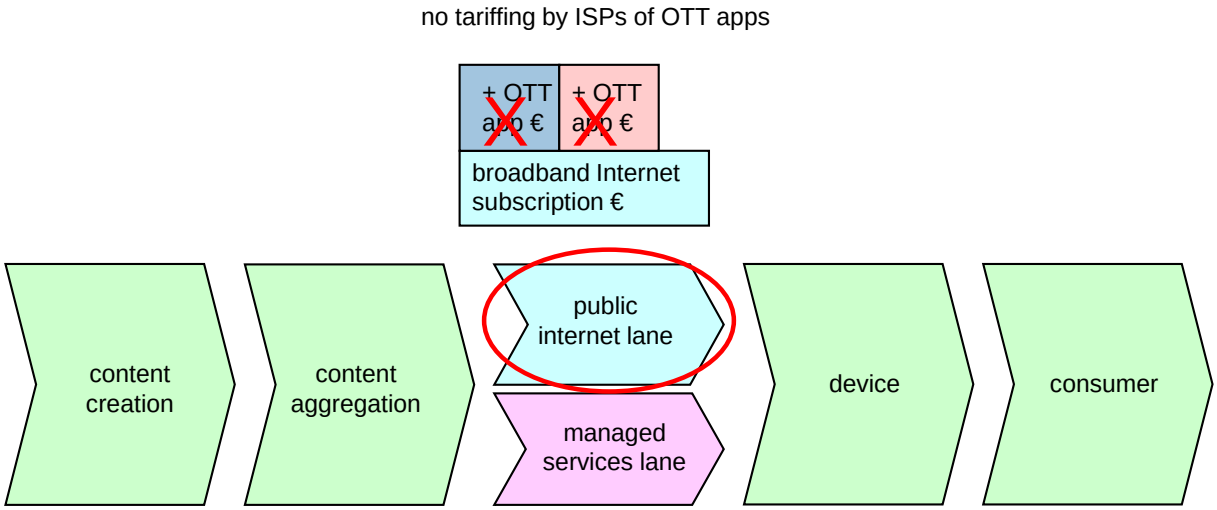

Figure 4. The Dutch measure prohibiting ISPs to charge their retail customers for the use of third party OTT services and applications.

Similar to the no blocking/throttling measure, this measure is aimed at the public Internet lane part of the distribution part in the chain. Clearly, it removes a potential obstacle to open access to the Internet for end users. This obstacle is not far fetched, as demonstrated in particular in mobile Internet access, where a number of operators have announced plans to charge their retail customers for use of third party OTT services. At the same time, the measure is rather prescriptive for business models and product development, in at least two areas. First, at the retail side, the measure forces ISPs in the direction of subscriptions that only charge for volume and speed in broadband access. This is probably a favorable effect for OTT content providers who can keep full control over the retail pricing of their services. It may also be an intended effect for regulators, as it could be a way to make the combined costs for network capacity and traffic management transparent and comparable in the retail pricing of broadband access subscriptions. It is clearly detrimental for vertically integrated providers that aim to provide their retail customers with bundled offers of Internet access, managed services and special arrangements for OTT services. If charging for volume and speed in broadband access leads to higher prices for (mobile) broadband, then this could be a negative, possibly unintended, effect for consumers. Secondly, at the interconnection/peering side, the measure weakens the position of network providers in their negotiations with content providers. As explained in section 3.4.1, interconnection and peering between network operators and content providers is one of the areas where players in the value chain use their assets to negotiate the conditions for distribution of content, including video. Prohibiting the network operators to charge their retail customers for the use of OTT services weakens the negotiating position of network operators vis-à-vis the content providers, as they lose the option to charge for specific OTT services.

The measures prohibiting network operators to charge their retail customers for the use of OTT services has received less attention than the no blocking/throttling measure. In the discussion following the Dutch rules, it is often considered an integral part of the no blocking/throttling measure. However, as described above, the “no charging of OTT apps by ISPs” measure is complementary and can have different effects. The two measures should therefore be assessed on their own merits. The “no charging of OTT apps by ISPs” measure might have a large effect on the value chain for video distribution, as it directly affects business models. Whether or not this is desirable is a question that has so far received insufficient attention.

3.4 Policy measures stimulate new net neutrality-related discussions

The policy measures examined in the previous sections have in common that they, explicitly or implicitly, focus on the public Internet lane portion of the distribution part. However, the ongoing struggle by the various business players in the video distribution value chain to influence and even control the access that consumers have to content and applications is not limited to the public Internet lane. The policy measures aimed at this admittedly important part can result in a transfer of issues from the public Internet lane to other parts of the value chain. Below, we examine three areas where the debate on net neutrality and open access could be affected and even intensified.

3.4.1 Interconnection and peering: a new battleground?

The relevance of interconnection and peering for the net neutrality debate is readily demonstrated by the Level3-Comcast case (Level3, 2010), illustrated in Figure 5. Level3 uses its Content Delivery Network (CDN) to distribute substantial amounts of streaming video for its customer Netflix, a large US provider of OTT VoD services. As a CDN provider, Level3 depends on ISPs such as Comcast for the final part of the delivery of the videos from the peering point to the end users' home. Level3 provides the video traffic to Comcast on the basis of peering agreements that Comcast and Level3 have. A conflict arose in 2010 when Comcast stated that it would no longer accept the growing amount of video traffic from Level3 without payment of an additional fee by Level3. This conflict is partly driven by the strongly asymmetric traffic profiles associated with large-scale distribution of streaming video: for streaming video, the amount of traffic from Level3's CDN into the Comcast network is much larger than the traffic flow in the opposite direction. In the (unregulated) market for Internet peering, a certain degree of asymmetry is accepted in settlement-free peering agreements, but for larger asymmetries typically a fee is paid by the party generating the larger amount of traffic. As such, the request by Comcast for payment of a fee is not unusual. What makes this conflict interesting for the net neutrality debate is that the Netflix OTT VoD service competes with Comcast's own managed VoD service. Therefore, the conditions for peering, traditionally seen as an issue between carriers of IP traffic, also affect the competition at retail level.

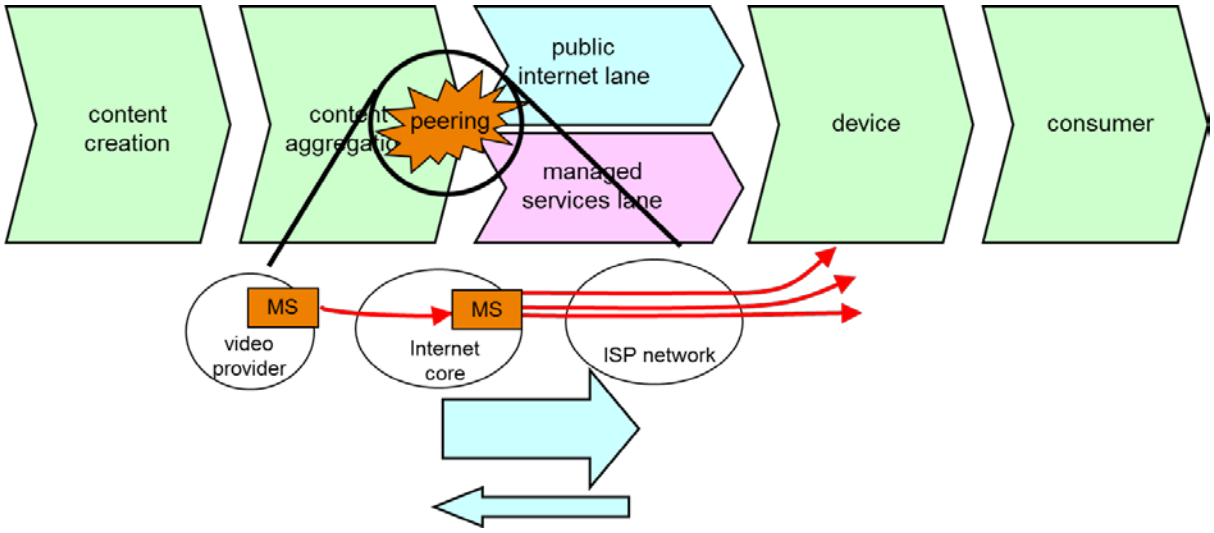

Figure 5. Peering agreements for streaming video exist in an environment of asymmetric traffic profiles and competition between OTT and managed services.

The Level3-Comcast case points at a path that can potentially be followed by network operators: they can try to gain additional revenues at the peering and interconnection side from the OTT players they are competing with on the retail side. Another option for network operators could be to offer OTT providers an improved delivery path through their network (*e.g.*, with certain bandwidth or

quality guarantees achieved through priorization). In the US, this would probably be unfeasible in fixed networks as the FCC has introduced its "No unreasonable discrimination" rule. Although it does not explicitly prohibit paid prioritization, the FCC's expectation is that it will be considered as unreasonable discrimination in practice. At the same time, the FCC has stated that it does not intend its rules to affect existing arrangements for network interconnection, including existing paid peering arrangements (FCC, 2011a).

At this time, the European rules for net neutrality do not cover the area of interconnection or peering. It is clearly an area that deserves more attention. In the European regulatory context for interconnection, the concept of Significant Market Power plays an important role: without it, the possibility to impose remedies via sector specific regulation is lacking. Until now, peering agreements have remained largely outside the regulatory treatment of interconnection. A recent consultation report by BEREC does reflect more concern about interconnection related issues (BEREC 2012a).

3.4.2 The rise of the managed services lane?

In the two-lane model (section 2.1.1), OTT services and managed services are delivered to the end user over a single broadband connection. Among these managed services are typically the TV packages and on-demand services offered by the vertically integrated network and service providers. The assignment of bandwidth to either the public Internet lane or the managed services lane is therefore relevant in a value-chain based net neutrality analysis. In particular, the three policy measures described earlier, transparency, no blocking/throttling and no ISP tariffing of OTT, all focus mainly on the public Internet lane portion of the distribution part of the chain. One way to look at the measures is that they promote the neutrality and openness of the public Internet lane and as such work towards their intended effects. Another way to look at these measures is that they make the public Internet lane less attractive for network operators as they introduce a number of obligations and restrictions in network management and business models. In comparison, the managed services lane becomes more attractive (Figure 6).

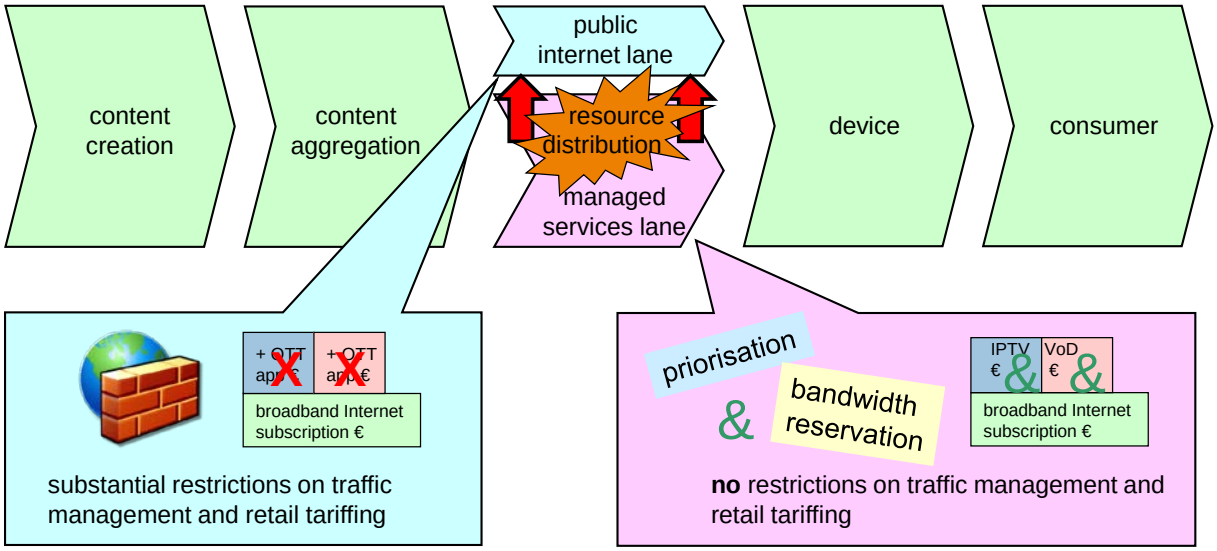

Figure 6. No blocking/throttling and no ISP tariffing of OTT measures may tempt network operators to assign more resources to the managed services lane at the cost of the public Internet lane.

Therefore, as a response to the policy measures, network operators could be tempted to widen the managed services lane by assigning more resources (*e.g.*, bandwidth) to it, at the cost of the resources available to the public Internet lane. Whether the public Internet lane would indeed be in danger of becoming the metaphorical "dirt road" remains to be seen (Sidak and Teece, 2010). The

competition between ISPs on the capacity and quality of their Internet access services can work to protect the public Internet lane from becoming such a dirt road, as good-quality Internet access is obviously valued by end users, but it is a risk that regulators should take into consideration.

Content providers also have an interest here. Large content providers can be in a position to negotiate a path in the managed service lane of network operators. They could then benefit from quality guarantees for the delivery of their content. The European Broadcasting Union is of the opinion that network operators should make their managed services available on fair, reasonable and non-discriminatory (FRAND) terms (EBU, 2010). Given acceptable conditions for access to the managed lane, large content providers and ISPs could even find shared interests in the battle for eyeballs and promote these interests by developing combined packages of digital TV, on-demand and other content in extended triple play packages. For smaller content providers it would be more difficult to negotiate attractive arrangements with network providers. This issue therefore also deserves more attention from regulators.

3.4.3 Steering the eyeballs with EPGs, app stores and devices?

A very powerful way to guide the end users' attention and thereby their preferences and eyeballs is through a combination of attractive devices, apps and cloud services. This concept, corresponding to the third control point from section 2.2, has been introduced in the mobile market through Apple's iPhone-iOS-iTunes combination. Apple has extended this concept to other market segments with its iPad and Apple TV. Google has also built a strong position in mobile through its Android OS-Android Market combination and is extending it with Google TV. Connected TVs based on, for example, the HBB TV standard (HBB TV, 2012) are also expected to become important, serving as a platform for multiple applications. Increasingly, search and navigation are linked to devices and apps on devices rather than to traditional search engines on the open Internet. The combination of smart devices and apps, with cloud storage and processing provides the OTT providers a wealth of information on end users that can be exploited in the battle for eyeballs and advertising revenues. Apple and Google have gained a strong position in this field, although they face fierce competition from Facebook that uses another mechanism, social networking, to obtain information on end users and guide their attention and choices.

Network operators have also identified the relevance of devices and have started to offer their services and content on popular devices in order to attract the end user's attention. For example, a number of cable and DSL based TV providers in the Netherlands provide the option to view channels from their digital TV packages as streaming video on a tablet. This streaming video option is tightly linked to the digital TV subscription, as it is only available at the address registered for the TV subscription. UPC has announced a further step in its project Horizon (Liberty Global, 2011), which combines digital TV content with Internet content, smart recommendations and an app store. Network operator initiatives like Horizon directly compete with Apple TV and Google TV in the battle for eyeballs, see Figure 7.

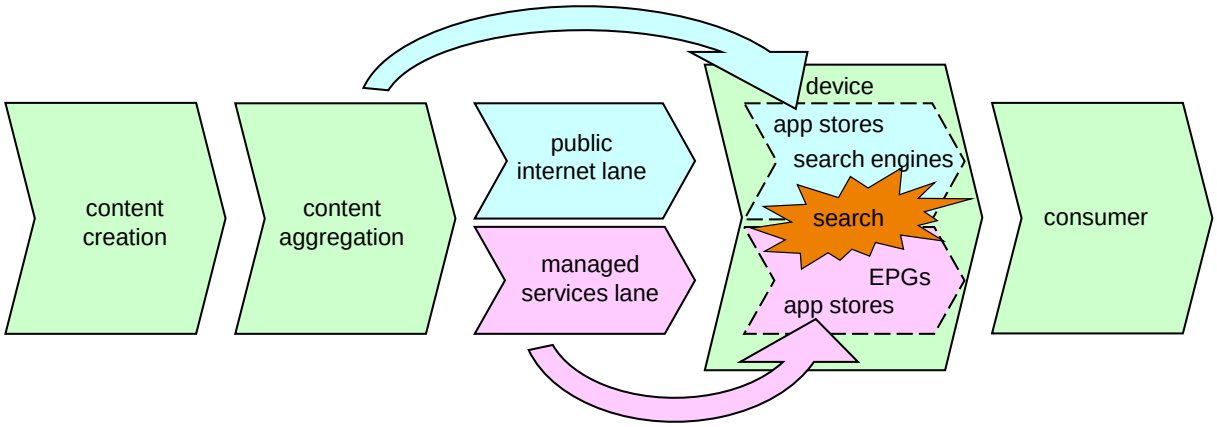

Figure 7. OTT providers and network operators both attempt to guide the attention and preferences of end users through combinations of devices, apps and recommendations.

The role of devices and apps in the battle for eyeballs is directly related to the net neutrality debate and can therefore not be neglected. Search neutrality (*e.g.* Grimmelmann, 2010) may seem to be a different type of neutrality than net neutrality, but it appears in the same struggle for influence in the value chain.

It is interesting to see that the transparency measure (section 3.1) imposes, to some extent, obligations on the network operators in the areas of devices and apps. The European Universal Service Directive (European Union, 2002) stipulates that operators must inform the end user about "any restrictions imposed by the provider on the use of terminal equipment supplied". Operator-defined preferences in EPGs, search and recommendation engines would in principle be covered by this obligation. How this obligation would be interpreted in practice is unclear at this point. More importantly, the obligation as such does not cover OTT players that provide search and recommendation tools to the end users, as they do not offer "services providing connection to a public communications network and/or publicly available electronic communications services". This again shows that a more consistent value chain approach is needed in order to secure the rights that these types of provisions are aiming at.

4 Conclusions

Net neutrality and video distribution are a combination that leads to complex considerations for regulators and the players in the value chain. It makes net neutrality dilemmas visible and concrete. Our analysis shows that net neutrality interacts with video distribution at different points along the value chain. We therefore call for a value chain approach, as assets in each part in the chain can develop into a control point for the open access to content and application.

The current and proposed policy measures focus mainly at the public Internet lane part of the distribution chain and impose obligations on network providers, and ISPs in particular: transparency, no blocking/throttling, no ISP tariffing of OTT. Although each of these measures contribute to their intended effects, our analysis shows that they are likely to lead to more debates in other areas, as players try to compensate the loss of influence or revenue streams by rearranging the ways in which they exploit their assets (Figure 8). Thus, a measure aimed at one part of the chain can have an effect in other parts as well. Incidents and debates have already occurred or can be expected in the areas of peering and interconnection, distribution of resources between public lane and managed lane and in particular the influencing of people's navigation on the Internet through search, recommendations and app stores linked to devices.

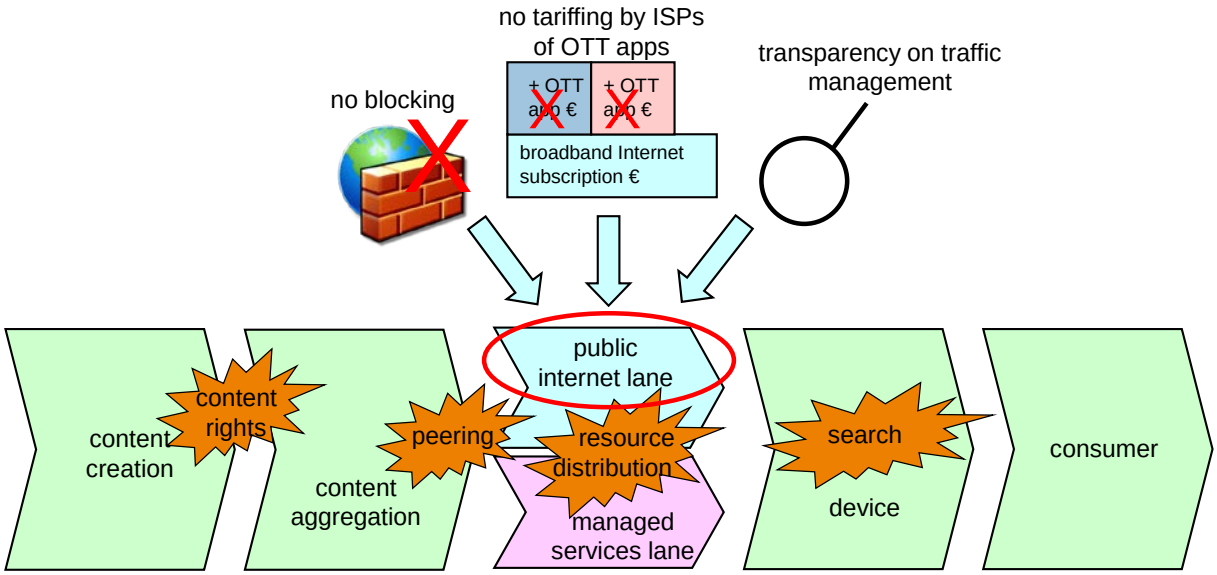

Figure 8. The focus of current policy measures on the public Internet lane can lead to debates in other parts of the value chain.

For the European policy and regulatory environment, these new debates bring a risk of divergence between the considerations and decisions of national law makers and regulators. Although the concerns around net neutrality are shared by most law makers and regulators, this does not necessarily lead to uniform results in the application of rules and guidelines. At the same time, the video distribution market with its CDNs, devices and applications has a European or even global scale that would benefit from uniformity or at least coherence in the policy measures aimed at promoting net neutrality. This should be taken into account when formulating new policies and guidelines, for example those developed by BEREC (2012b). It is crucial that the interventions on the European and Member State level are aligned. Furthermore, it seems unavoidable that European policy initiatives are brought up to speed with those in the United States.

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